

REGIONAL CONVEYANCE FACILITIES OF THE INTERIM WET WEATHER PLAN



Act 537 Plan Special Study

March 2022



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Abbreviations and Acronyms

AACE	Association for the Advancement of Cost Engineering
ACHD	Allegheny County Health Department
ALCOSAN	Allegheny County Sanitary Authority
ART	Allegheny River Tunnel
BOD	Biochemical Oxygen Demand
BOD ₅	5 day Biochemical Oxygen Demand
BODR	Basis of Design Report
BPC	Basin Planning Committee
CCT	Chartiers Creek Tunnel
CD	Consent Decree
CEA	Comprehensive Environmental Assessment
CIP	Capital Improvements Program
CSO	Combined Sewer Overflow
CtS	Controlling the Source
CWA	Clean Water Act
CWP	Clean Water Plan
DEP	Department of Environmental Protection (PaDEP)
DSI	Direct Stream Inflow
DSIR	Direct Stream Inflow Removal
EOPCC	Engineer's Opinion of Probable Construction Costs
EPA	Environmental Protection Agency
FEMA	Federal Emergency Management Agency
FWS	Fish and Wildlife Service
FSWG	Feasibility Study Working Group
GDR	Geotechnical Data Report
GIS	Geographic Information System
GROW	Green Revitalization of our Waterways
GSI	Green Stormwater Infrastructure
GSI/SC	Green Stormwater Infrastructure / Source Control
HGL	Hydraulic Grade Line
H&H	Hydrologic and Hydraulic
I/I	Inflow and Infiltration
IWWP	Interim Measures Wet Weather Plan

Act 537 Plan Special Study – IWWP Regional Conveyance Facilities
Abbreviations & Acronyms

KOC	Knee of the Curve
LNA	Lower Northern Allegheny
LOGR	Lower Ohio – Girty’s Run
MG	Million Gallons
MGD	Million Gallons per Day
MHI	Median Household Income
MR	Main Rivers
MRT	Monongahela River Tunnel
N/A	Not Applicable
NPDES	National Pollutant Discharge Elimination System
ORT	Ohio River Tunnel
PA	Pennsylvania
PaDEP	Pennsylvania Department of Environmental Protection
PNDI	Pennsylvania Natural Diversity Inventory
POC	Point of Connection
RTB	Retention Treatment Basin
SCS	Soil Conservation Service
SMR	Saw Mill Run
SMRT	Saw Mill Run Tunnel
SPC	Southwest Pennsylvania Commission
SS	Sewer Separation
SSO	Sanitary Sewer Overflow
SST	Satellite Sewage Treatment
TBD	To be Determined
TBM	Tunnel Boring Machine
UA	Upper Allegheny
USEPA	United States Environmental Protection Agency
WWP	Wet Weather Plan
WWPS	Wet Weather Pump Station
WWTP	Wastewater Treatment Plant

1.0 INTRODUCTION

1.1 Study Purpose

The purpose of this Special Study is to amend the Allegheny County Sanitary Authority (ALCOSAN)'s *Act 537 Sewage Facilities Plan* (537 Plan). ALCOSAN's 537 Plan was approved in 1996 and subsequently amended in 2018 to reflect ALCOSAN's expansion of wet weather treatment capacity at its Woods Run Wastewater Treatment Plant (WWTP). This special study is intended to serve as a second amendment to the Act 537 Plan covering the regional conveyance facilities included in ALCOSAN's approved Clean Water Plan. The regional conveyance facilities will consist of a conveyance and storage tunnel system aligned along the Ohio, Allegheny and Monongahela Rivers summarized below as the regional tunnel and a 120 million gallon per day (MGD) wet weather pump station to be constructed at or near ALCOSAN's Woods Run WWTP. The implementation of the proposed regional conveyance facilities coupled with expansion of wet weather treatment capacity to 600 MGD is projected to reduce the volume of untreated CSO discharges from 9,300 million gallons (MG) per typical year (projected future baseline conditions) to less than ALCOSAN's 2,700 MG per typical year overflow volume remaining performance criteria.¹⁻¹

The primary data sources for this study are ALCOSAN's Clean Water Plan (CWP) which was incorporated into the Modified Consent Decree entered by the U.S. Federal District Court for Western Pennsylvania on May 14, 2020 as well as the *Interim Measures Wet Weather Plan (IWWP) Regional Conveyance Facilities Preliminary Basis of Design Report* (BODR) submitted to USEPA, PaDEP and the Allegheny Health Department on October 1, 2020 pursuant to the Modified Consent Decree. The technical information presented in this Special Study represents a 20% preliminary design which advanced the proposed improvements, layouts, concepts, and recommendations summarized in previous ALCOSAN wet weather planning efforts.

Since issuing a draft of this Special Study in 2021, ALCOSAN received agency approval of its *Proposed Revisions to Interim Measures* report which proposed some modifications to the IWWP and an updated project schedule. This Special Study has been updated to reflect the approved revisions.

1.2 Study Scope

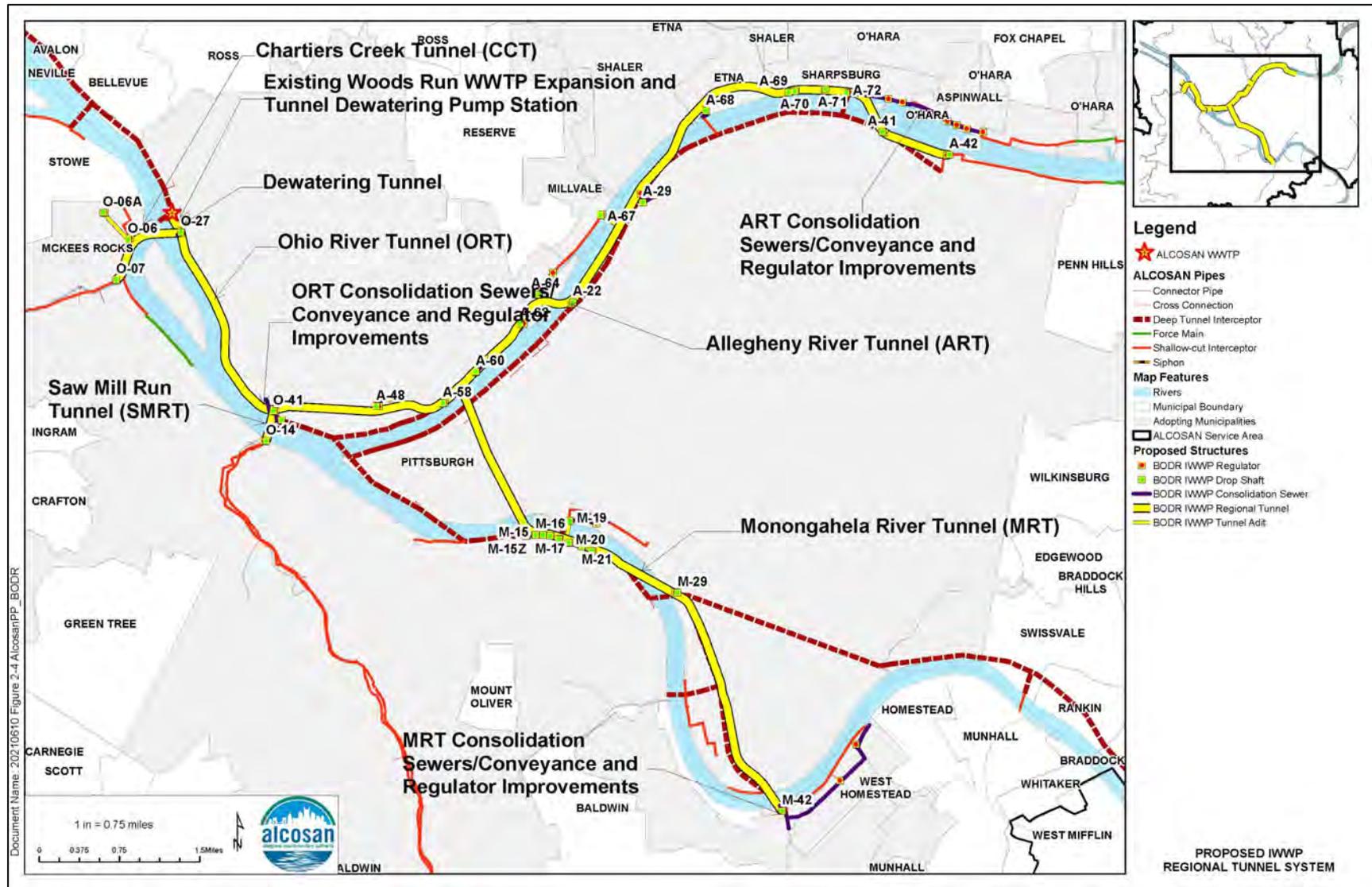
The scope of this Special Study is limited to Act 537 planning requirements that directly relate to the Regional Conveyance Facilities including the wet weather pump station to be constructed at ALCOSAN's Woods Run Wastewater Treatment Plant. The general tunnel system alignment and geographic scope are shown on Figure 1-1 on the following page. An overview of the entire ALCOSAN service area is presented in Section 3.1 of this report.

The IWWP Regional Conveyance Facilities described in this Special Study are being undertaken as critical elements of ALCOSAN's CWP for controlling combined sewer overflows (CSOs) and eliminating sanitary sewer overflows (SSOs) from its regional conveyance system. Due to the magnitude and financial impacts, the CWP must be fully implemented in stages with the first stage (the IWWP) focused primarily on CSO control but still providing some SSO reduction. Overflow control projects scheduled to be implemented through 2036 constitute the Interim

¹⁻¹ Source: ALCOSAN Clean Water Plan Section 11.2.11 (pg. 11-45) and 11.3.3 (pg. 11-59)

Act 537 Plan Special Study – IWWP Regional Conveyance Facilities Section 1 – Introduction

Figure 1-1: Proposed IWWP Regional Conveyance Facilities



Act 537 Plan Special Study – IWWP Regional Conveyance Facilities

Section 1 – Introduction

Measures Wet Weather Plan (IWWP). The IWWP includes the Regional Conveyance Facilities covered in this Special Study.

This Special Study details one major project within the larger framework of ALCOSAN's approved Clean Water Plan which is a blend of green and gray technologies. ALCOSAN's updated plan for the IWWP Regional Conveyance Facilities considered the greener approaches identified in ALCOSAN's *Starting at the Source* strategy and the Pittsburgh Water and Sewer Authority's *Green First Plan*. ALCOSAN also completed its *Controlling the Source* study in 2020, has offered more than \$60M in grants towards 136 municipal green stormwater infrastructure and source control projects via its Green Revitalization of Our Waterways (GROW) program, and continued partnering with and performing flow monitoring for its customer municipalities and authorities to identify cost-effective and impactful source control projects.

ALCOSAN has coordinated with PaDEP as to the aspects of the Act 537 planning requirements that are relevant to the IWWP Regional Conveyance Facilities. A copy of PaDEP's 537 instructions and checklist guide (form 3800-FM-BPNSM0003 dated 10/2012) is provided in Appendix A to this Special Study. The PaDEP checklist has been modified to grey out the requirements that are not applicable for this amendment, and to cross-reference the locations at which the specific checklist requirements are addressed. These modifications were discussed with PaDEP on July 23, 2020, and the checklist included in Appendix A is based on PaDEP's concurrence.

Following a 30-day period for public comment and a 60-day period for local planning agency review, ALCOSAN will update and finalize the Act 537 Special Study with responses to comments received and other documentation of the public participation process as required. The final Special Study will be submitted to PaDEP for approval. Upon PaDEP approval, this Special Study will amend the 1996 Act 537 Plan which was previously amended in 2018 to reflect the expansion of treatment capacity at ALCOSAN's WWTP.

1.3 Municipal Commitments

ALCOSAN will implement the IWWP Regional Conveyance Facilities on behalf of its 83 customer municipalities. The municipalities have adopted ALCOSAN's 1996 537 Plan as their respective municipalities' official municipal Act 537 plans, some of which have been amended subsequently to reflect evolving local conditions.

In ALCOSAN's 2020 discussions with PaDEP they indicated that formal municipal adoption of this Special Study via resolutions will not be required from all 83 municipalities. Adoption will be required by those municipalities through which the tunnel alignment passes and those locations where surface construction is proposed. Based on the plans reflected in the *IWWP Regional Conveyance Facilities BODR*, formal adoption of the Special Study is required from nine municipalities as shaded in grey in Figure 1-1:

1. Aspinwall Borough
2. City of Pittsburgh
3. Etna Borough
4. McKees Rocks Borough
5. Millvale Borough
6. O'Hara Township

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7. Shaler Township
8. Sharpsburg Borough
9. West Homestead Borough

In late 2021 and early 2022 ALCOSAN briefed the councils of eight of these municipalities and provided each with a draft of this Special Study. ALCOSAN has offered a briefing to the ninth municipality in March and is waiting a reply. The municipalities were invited to provide comments and encouraged to share a copy of the Special Study with their respective planning commissions. To date, Etna Borough, West Homestead Borough, Millvale Borough and O'Hara Township have accepted this Special Study as an amendment to the 1996 Act 537 Plan through a municipal resolution. A copy of these resolutions is included in Exhibit F of Appendix B (Uniform Environmental Report). The remaining municipalities are expected to pass resolutions in the near future, and these resolutions will be included in the final Special Study submitted to PaDEP for approval.

In addition to the nine customer municipalities listed above, ALCOSAN coordinated the development of this Special Study with the Pittsburgh Water and Sewer Authority and coordination with the Hampton Shaler Water Authority is ongoing. ALCOSAN first met with the Hampton Shaler Water Authority in 2019 and prepared a memo with several alternative alignments for the Allegheny River Tunnel that would reduce the risk of adverse impacts on the well field. The BODR reflects one such alignment. ALCOSAN met with Hampton-Shaler Water Authority staff and the Board of Directors in October 2021 to discuss outstanding concerns and recently provided them with a requested existing conditions memorandum to further discussions. In a March 7, 2022, letter the Hampton Shaler Water Authority recognized the necessity of the Allegheny River Tunnel and expressed conditional support to the extent that their aquifer would remain uncompromised. A copy of this letter is provided in Exhibit F of Appendix B. The tunnel alignment in question has no impact on the Ohio River Tunnel currently under design. The October 2020 *Preliminary Basis of Design Report* notes that the proposed Allegheny River Tunnel alignment will veer north of the well field to reduce the risk of adverse impacts on the well field. Design of the Allegheny River Tunnel is not scheduled to begin until 2025, allowing ample time for further coordination on an alignment satisfactory to both parties.

2.0 PREVIOUS WASTEWATER PLANNING

This section outlines the previous planning and engineering studies performed by ALCOSAN in support of the proposed wet weather Regional Conveyance Facilities.

2.1 Act 537 Sewage Facilities Plan

In fulfillment of the requirements of the Pennsylvania Sewage Facilities Act of 1965 (Act 537), and in accordance with the 1994 Federal Clean Water Act and in response to directives received from the PaDEP, the Board of Directors of ALCOSAN authorized the completion of a *Comprehensive Sewage Facilities Plan* during 1994. The Act 537 Plan was finalized and submitted to PaDEP during 1996 and was subsequently approved by PaDEP on October 4, 1999. Based on the recommendations of the Act 537 Plan, ALCOSAN structured a two-phase Capital Improvements Program (CIP) for the wastewater treatment plant (WWTP).

CIP Phase I included the expansion of primary and secondary treatment capacity, addition of odor control systems, conversion from chlorine gas to sodium hypochlorite disinfection, expansion and upgrade of solids handling facilities, and upgrade of plant electrical supply and distributed control systems. Phase I design and permitting was completed in 1997. The construction of new facilities commenced in 1997 and was completed in 2004. Under Phase I, secondary treatment capacity was increased to 275 MGD.

CIP Phase II focused on expanding the wet weather treatment capacity of the plant. The expansion strategy has since evolved from what was described in the 1996 Act 537 Plan to a wet weather capacity of 600 MGD with a conventional bypass of secondary treatment and expansion of secondary capacity to 295 MGD. Sodium hypochlorite disinfection and dichlorination will be used for flows that receive secondary treatment as well as for wet weather flows that bypass secondary treatment. This current expansion strategy was the subject of the 2018 Act 537 Special Study described in Section 2.5.

2.2 Proactive Planning and Implementation 1999 – 2008

2.2.1 1999 Regional Long Term Wet Weather Control Concept Plan

ALCOSAN proactively began to establish its CSO Control Program in 1992, well before the 1994 CSO Control Policy. It began comprehensive system characterization efforts including field verifying and digitizing the system maps, long term flow monitoring and the development of a hydrologic and hydraulic (H&H) model of the conveyance and treatment system. ALCOSAN completed four regulatory deliverables pursuant to its then current NPDES permit:

- *System Characterization Report* (1995)
- *Hydrologic and Hydraulic Characterization Report* (1996)
- *Documentation of the Implementation of the Nine Minimum Controls* (1996)
- *Regional Long Term Wet Weather Control Concept Plan* (1999)

In 1997 USEPA threatened federal enforcement action against 52 service area (or customer) municipalities for sanitary sewer overflows (SSOs). ALCOSAN proposed to expand the scope of its CSO long term control plan to include the elimination of SSOs at the points of connection between the sanitary sewer municipalities and the ALCOSAN interceptor system; and the threat of federal enforcement abated. As a result, the 1999 Concept Plan provided for 85% systemwide wet weather capture on an average annual basis per the CSO Policy and for

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Section 2 – Previous Wastewater Planning

elimination of SSOs at the points of connection between the municipal collection systems and ALCOSAN. The Concept Plan involved the expansion of the Woods Run WWTP per the 1996 Act 537 Plan and distributed storage and wet weather treatment facilities.

2.2.2 Planning and Implementation

After completion of the 1999 Concept Plan, ALCOSAN moved forward while a regulatory decision on the Concept Plan was pending. Key activities included:

- The evolution of the H&H model into the next (and subsequent) generations of the USEPA Stormwater Management Model (SWMM) model;
- The expansion of the Woods Run WWTP capacity to 250 MGD along with plant upgrades that will enable the ultimate expansion of wet weather treatment to 600 MGD;
- Ongoing long-term flow monitoring;
- The development and implementation of the county-wide synoptic radar-rainfall system;
- Continued evolution and refinement of the system geographic information system (GIS) including refinement of the service area sewershed delineations;
- A comprehensive field verification of the critical dimensions, etc. of the regulator structure components and other appurtenances;
- The establishment with Allegheny County Health Department (ACHD) of the 3 Rivers Wet Weather (3RWW) program and securing more than \$40 million in federal and state funding which was used for stream removal, collection system rehabilitation and green stormwater infrastructure projects; and
- Primary treatment process stress testing and secondary treatment pilot testing.

It is noteworthy that since the 1996 Act 537 Study and the 1999 *Regional Wet Weather Concept Plan*, the estimated wet weather overflows have been reduced due to the treatment plant expansion as well as through refinement of computer modeling, geographic information systems (GIS), and redevelopment of the service area.

2.3 2013 Wet Weather Plan

2.3.1 2008 Consent Decree

As a “major” permittee (daily wastewater flows exceeding one million gallons), the United States Environmental Protection Agency (USEPA)’s CSO Control Policy²⁻¹ requires that ALCOSAN’s schedule for CSO controls be placed in a judicial order such as a Federal Consent Decree (CD).

ALCOSAN entered into a federal CD on January 23, 2008, subsequently modified in May of 2020. Key elements of the original CD included:

²⁻¹ 59 Fed. Reg. 18688, April 19, 1994

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- The development of a comprehensive Wet Weather Plan (WWP) for the elimination of sanitary sewer overflows (SSOs), the control of CSOs such that applicable water quality requirements are met,
- To provide conveyance and treatment capacity for projected municipal flows within the ALCOSAN service area through 2046;
- Implementation of the WWP by September 30, 2026; and
- Various documentation as to ALCOSAN’s operation and maintenance of the regional conveyance interceptor system.

2.3.2 2013 Wet Weather Plan

Pursuant to the 2008 CD, ALCOSAN developed a comprehensive plan to achieve full compliance with water quality and other regulatory requirements. Based on new information including the field testing of the treatment plant processes and the performance of the plant expansion since 2007, the 2013 WWP revised the previous plant expansion plans to a hydraulic wet weather capacity of 600 MGD with a conventional bypass of secondary treatment. Secondary treatment capacity would be increased to 295 MGD.

The estimated capital costs for this full compliance plan were \$3.1 billion for ALCOSAN system improvements and \$500 million for municipal collection system improvements. ALCOSAN determined that the implementation of the \$3.6 billion plan for compliance with the CD would impose an unacceptable financial burden under the 2026 time frame. To moderate the financial burden, ALCOSAN instead proposed an adaptive course of wet weather controls that would provide significant sanitary sewer overflow controls and water quality benefits and would be technically feasible and affordable. This Balanced Priorities Alternative was termed the Recommended Plan. The approximate locations of the proposed Recommended Plan improvements that were included in the 2013 WWP are shown on Figure 2-1.

2.4 Modified Consent Decree and Interim Measures Wet Weather Plan

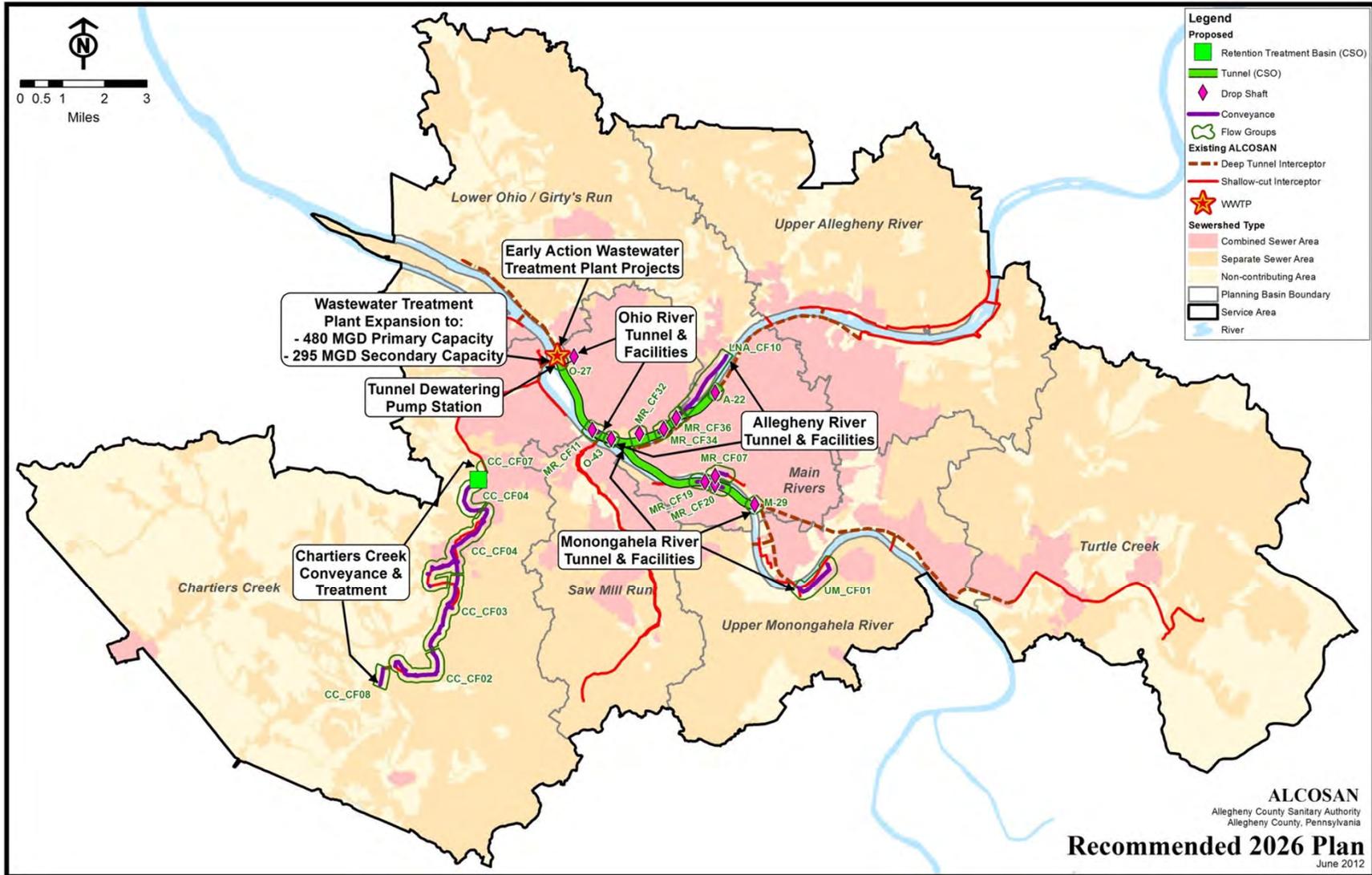
ALCOSAN’s Draft WWP was released for public and municipal comment on July 31, 2012 and submitted to the regulatory agencies in January 2013. Upon review of the ALCOSAN Draft WWP, USEPA concurred with the proposed control strategy and expressed support for the \$3.6 billion tunnel-based control strategy but acknowledged the affordability constraints. Since the Wet Weather Plan recommended only a \$2 billion plan that did not fully meet the requirements of the CD by 2026, the agencies could not approve the Plan. Rather than approving or disapproving the WWP, the agencies suggested instead an alternative approach that included modifying the CD to provide for phased implementation and to extend the 2026 deadline.

Following submission of the Draft WWP, ALCOSAN and the regulatory agencies began negotiating a Modified CD that fully embraces the use of Green Stormwater Infrastructure (GSI) and inflow/infiltration (I/I) reduction and recognizes the financial infeasibility of implementing all CD requirements by 2026.

These discussions resulted in the modification of the 2013 WWP into an approved plan known as the Clean Water Plan (CWP) and were incorporated into the CD which was formally modified in May of 2020. The CWP requires implementation of an Interim Measures Wet

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Figure 2-1: 2013 ALCOSAN Wet Weather Plan - Recommended Plan

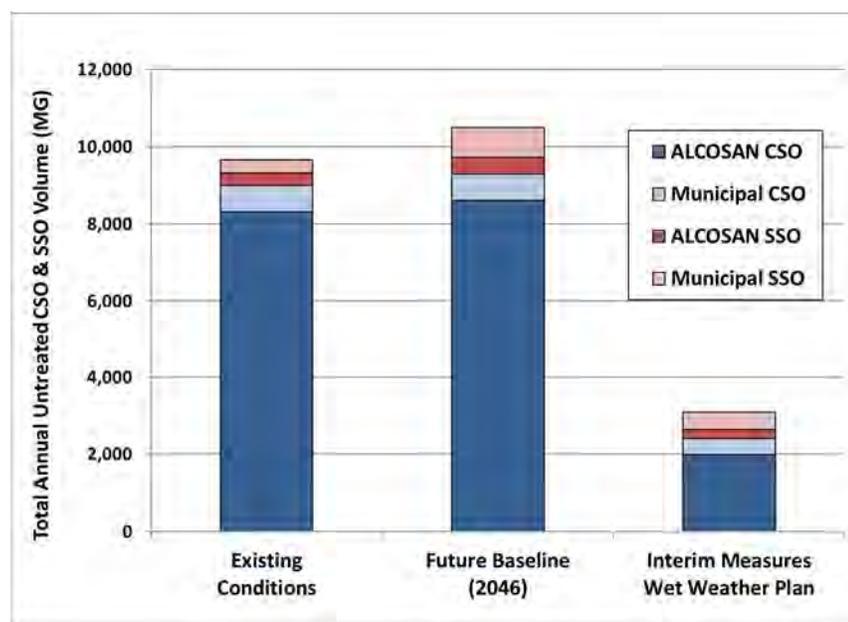


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Weather Plan (IWWP) by 2036 and Final Measures to be determined and implemented after post-construction monitoring of the IWWP. The IWWP requires the implementation of initial wet weather control measures including IWWP Regional Conveyance Facilities and the expansion of the wet weather treatment capacity at the Woods Run WWTP to 480 MGD initially with an ultimate wet weather capacity of 600 MGD. The IWWP also includes the regionalization of intermunicipal trunk sewers and provides opportunities to integrate GSI and other source reduction practices. Figure 2-2 shows the IWWP is projected to reduce untreated CSO volume from 9,300 MG per typical year (projected future baseline conditions) to less than ALCOSAN's 2,700 MG per typical year overflow volume remaining performance criteria.

Since the identification of specific flow reduction project commitments requires on-going coordination with customer municipalities, the IWWP is premised on a phased and adaptive management implementation framework that supports early implementation of green projects, demonstration of effectiveness, and

Figure 2-2: Forecasted Overflow Volume Reduction from IWWP Projects



the substitution or reduction of grey infrastructure where GSI and I/I reduction can be shown to cost effectively provide equivalent or better performance. Accordingly, the Modified CD includes several adaptive management milestones where new information can be used to propose modifications to IWWP projects and implementation schedules. Furthermore, the IWWP was divided into three phases and is scheduled to run through 2036:

- **Phase 1** elements focus on flow reduction, flow optimization, regionalization, existing infrastructure inspection and rehabilitation, WWTP expansion, and preliminary planning;
- **Phase 2** elements include projects that might be influenced by Phase 1 projects and are dependent on the completion of preliminary planning to proceed, including expanding total wet weather treatment capacity to 600 MGD and construction of the Ohio River Tunnel (ORT) segment; and
- **Phase 3** projects represent adaptive projects that may be influenced and modified based on the outcome of Phase 1 and Phase 2 evaluations and demonstration projects. These include expanding secondary treatment capacity to 295 MGD, the Allegheny River

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Tunnel (ART) segment, the Monongahela River Tunnel (MRT) segment, the Upper Monongahela Retention Treatment Basin and priority projects to control overflows along transferred intermunicipal trunk sewers.

Table 2-1 provides a listing and description of the ALCOSAN projects that comprise the IWWP, which are also shown on Figure 2-3. Through the adaptive management framework, the IWWP will be revised to include additional ALCOSAN and municipal projects up to a \$2 billion (in 2010 dollars) affordability threshold. Many of the municipalities have expressed an interest in advancing source controls. As a key requirement of the Modified CD, ALCOSAN will coordinate with municipalities with the goal of entering into legally binding agreements which will allow the source control plans to be incorporated as part of the IWWP. In addition, once regionalization is complete, ALCOSAN will identify priority projects to control overflows along transferred sewers and the municipalities will identify controls for municipal overflows which remain their responsibility after regionalization.

Table 2-1: Elements of ALCOSAN Interim Measures Wet Weather Plan

<p>Regional Flow Optimization and Preliminary Planning (Phase 1)</p> <ul style="list-style-type: none"> • Green Revitalization of Our Waterways (GROW) municipal flow reduction program • Inspection and rehabilitation of existing infrastructure • Regionalization and rehabilitation of inter-municipal trunk sewers and associated facilities • Preliminary Planning
<p><i>IWWP Phase 1 Woods Run WWTP Expansion (Primary treatment capacity expanded to 480 MGD)</i></p> <ul style="list-style-type: none"> • Expand main pump station capacity • Wet weather headworks • Major on-site conveyance • Wet weather disinfection • Sludge thickening facilities
<p><i>IWWP Phase 2 Woods Run WWTP Expansion</i></p> <ul style="list-style-type: none"> • Expand primary treatment capacity to 600 MGD • Wet weather (regional storage / conveyance tunnel system dewatering) pump station
<p><i>Ohio River Segment of the IWWP Regional Conveyance Facilities (IWWP Phase 2)</i></p> <ul style="list-style-type: none"> • Ohio River Tunnel (ORT) • CSO consolidation sewers – main rivers • Tunnel cross connection • Chartiers Creek Tunnel (CCT) • CSO consolidation sewers – Chartiers Creek • Saw Mill Run Tunnel (SMRT) and consolidation sewers

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Allegheny River Segment of the IWWP Regional Conveyance Facilities + Secondary Treatment Capacity Expansion (IWWP Phase 3)

- Expansion of secondary treatment capacity to 295 MGD
- Allegheny River Tunnel (ART)
- CSO consolidation sewers – Lower Ohio basin – Girty’s Run basin
- CSO consolidation sewers – Main Rivers basin
- CSO consolidation sewers – Upper Allegheny River basin
- Tunnel cross connections

Monongahela River Segment (IWWP Phase 3)

- Monongahela River Tunnel (MRT)
- CSO consolidation sewers – Monongahela River basin
- Tunnel cross connection

Other IWWP Phase 3 Program Elements

- Upper Monongahela CSO Retention Treatment Basin and consolidation sewers
- Priority projects to control overflows along transferred intermunicipal trunk sewers (to be identified in 2024)

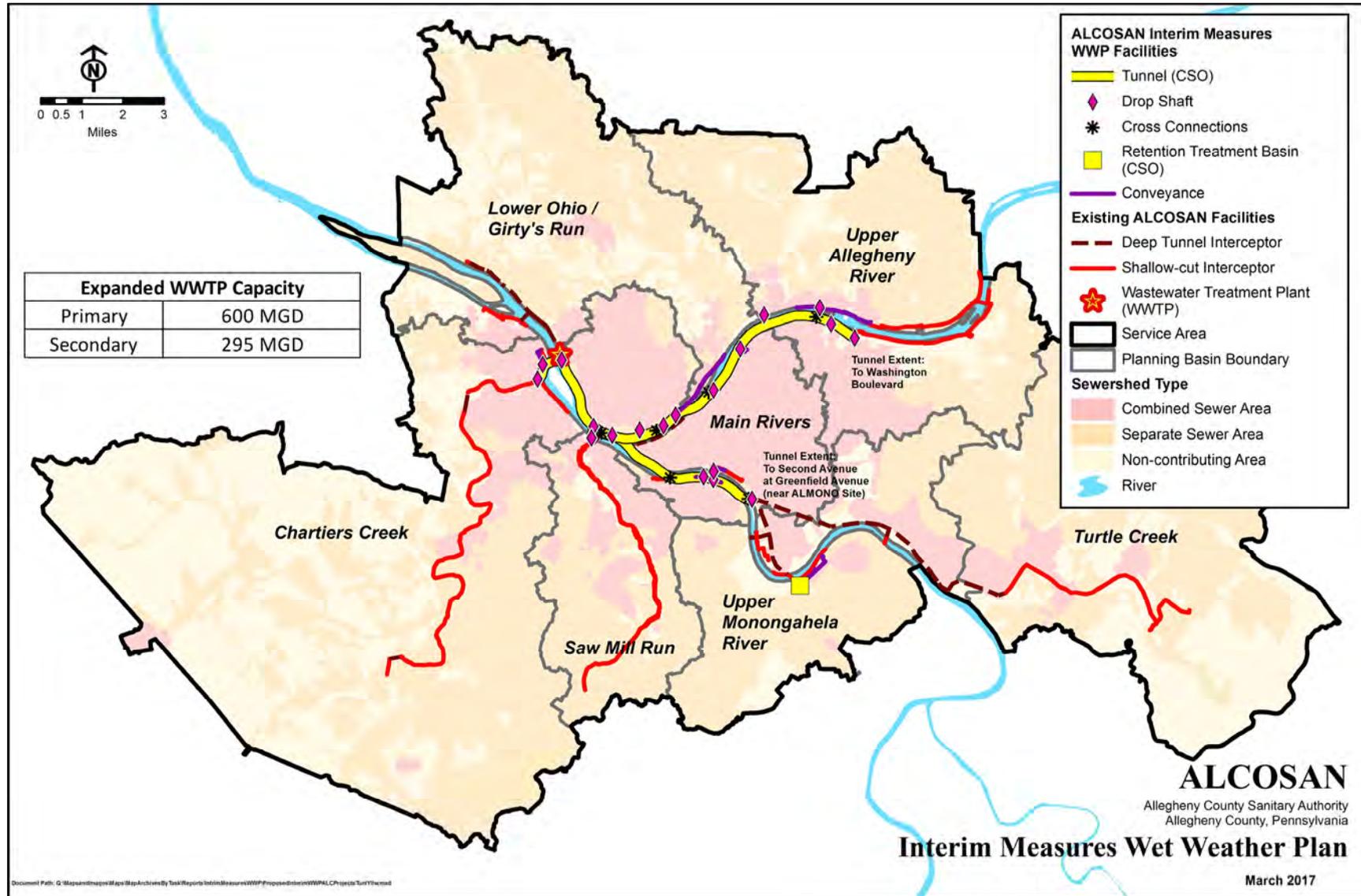
2.5 2018 Special Study

In July of 2018 ALCOSAN completed an *Act 537 Special Study*. The purpose of this Special Study was to amend the 1996 *Act 537 Sewage Facilities Plan* to reflect ALCOSAN’s strategy for the expansion of wet weather treatment capacity at its Woods Run Wastewater Treatment Plant (WWTP) as updated in the 2017 *Clean Water Plan*. This wet weather capacity expansion will be a key element of ALCOSAN’s Wet Weather Plan.

The Act 537 Special Study was approved by the Pennsylvania Department of Environmental Protection (PaDEP) on December 21, 2018. Its approval enabled ALCOSAN to apply for a NPDES Part 1 Discharge Permit for the expanded wet weather discharges from the Woods Run WWTP and for a NPDES Part 2 Construction Permit for the construction related to the expansion of wet weather capacity. The modifications to the Woods Run WWTP in the approved Act 537 Special Study / Amended Act 537 Wastewater Facilities Plan are shown in plan view on Figure 2-4.

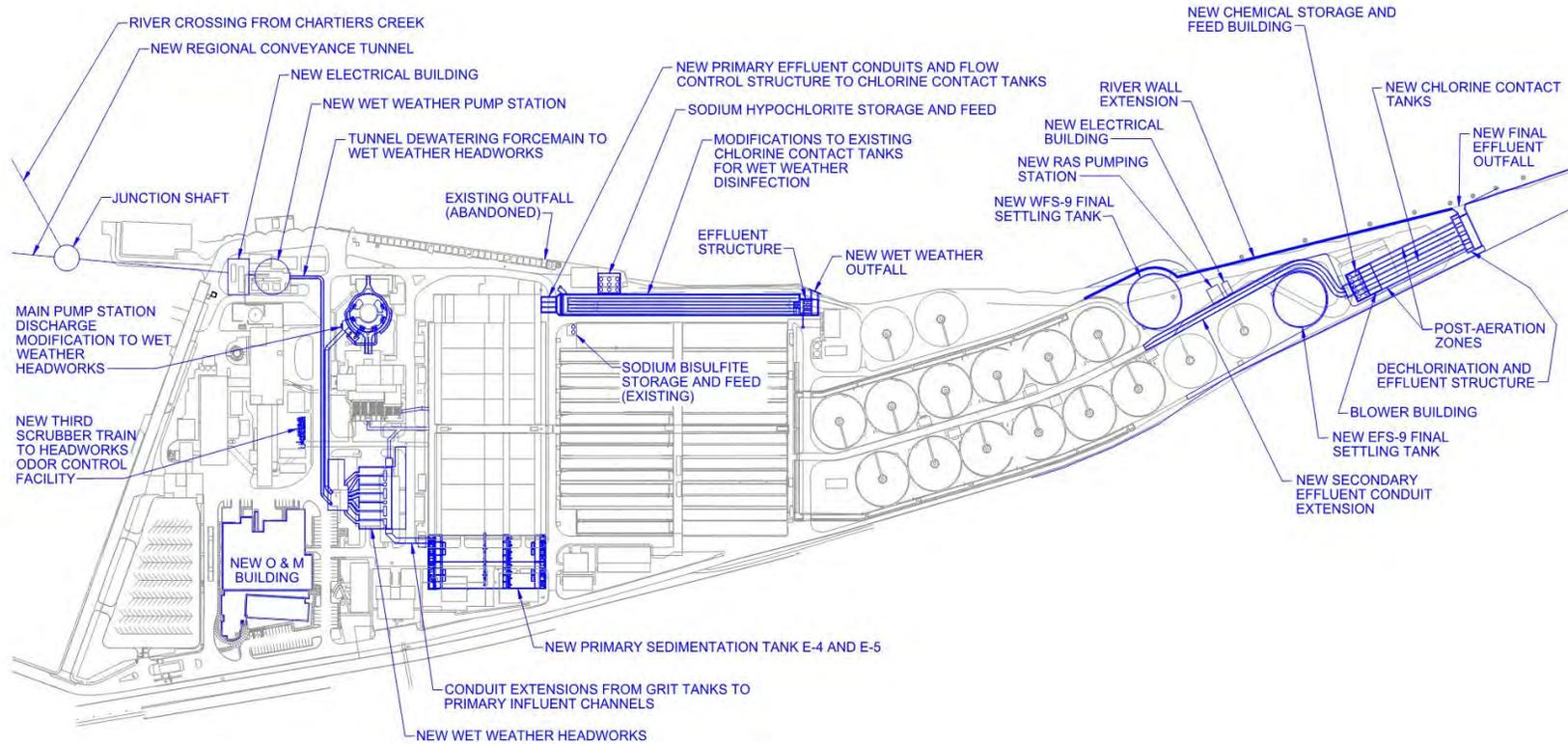
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Figure 2-3: Interim Measures Wet Weather Plan Grey Infrastructure Projects



**Act 537 Plan Special Study – IWWP Regional Conveyance Facilities
Section 2 – Previous Wastewater Planning**

Figure 2-4: Recommended WWTP Expansion Conceptual Site Plan



2.6 2018 Woods Run WWTP Basis of Design Report

In 2018 ALCOSAN completed a Basis of Design Report (BODR) for the wet weather capacity expansion of the Woods Run WWTP that will be completed pursuant to the Clean Water Plan. The BODR builds upon prior planning work related to the wet weather expansion of the Woods Run WWTP. The report documented the design approach, standards and detailed requirements for the recommended improvements that will be constructed under the WWTP Expansion Program. Another intent of the report was to provide the PaDEP with the information necessary to issue a Water Quality Management Part 2 construction permit (Part 2 permit). The approach of submitting a unified and comprehensive Part 2 permit application, early in the WWTP Expansion Program and supported by a detailed BODR, was proposed by ALCOSAN and accepted by PaDEP. The BODR has served as the foundation and stepping off point for the plant expansion final design work that is currently underway.

2.7 2020 IWWP Regional Conveyance Facilities – Preliminary Basis of Design Report

ALCOSAN's Modified CD required the submittal of a *Preliminary Basis of Design Report* (BODR) for the regional tunnels and near surface facilities to USEPA, PaDEP and the Allegheny County Health Department. The preliminary planning effort began in 2017 concurrent with the finalization of the Clean Water Plan and three years prior to the Modified CD being entered. The BODR was submitted to the regulatory agencies in October of 2020.

The BODR further defined the proposed work for the recommended IWWP Regional Conveyance Facilities, and contains design criteria, considerations, and assumptions to refine the project budget and support final design. Included are:

- A value engineering review of the alternatives related to the potential expansion of the main pumping station from 480 MGD to 600 MGD. (not being pursued);
- Optimization of the proposed regional tunnel extents, alignment, and proposed sizing;
- Analysis of tunnel dewatering and wet weather pump station alternatives;
- Geotechnical boring investigations and assessments;
- Property evaluation and assessment;
- Proposed regional tunnel system transient and surge analysis;
- Flow management and operational strategies;
- Evaluation of construction packaging and project delivery alternatives; and
- Preparation of a geotechnical data report (GDR).

The BODR submission also includes sections in response to the *Existing Sewer Consolidation/Conveyance System Improvement* report required per Appendix Z of the Modified CD. The recommended facilities are discussed further in Section 6.

3.0 CURRENT CONDITIONS

This section provides a brief physical and demographic analysis of the ALCOSAN service area, all of which will ultimately be served by the proposed Regional Tunnel System. Attention is then focused on the geographic scope and existing physical and environmental characteristics of the proposed sub-surface alignment and surface appurtenances of the Regional Tunnel System.

3.1 Planning Area Description

3.1.1 Overview of ALCOSAN Service Area

Existing ALCOSAN Treatment Plant and Interceptor System

ALCOSAN owns and operates approximately 91 miles of interceptor that conveys sewage from the combined and separate sewer collection systems that are owned by 83 municipalities or municipal authorities. There are over 300 regulator structures along the ALCOSAN interceptor system that are owned and operated by ALCOSAN. There are six pumping stations and one ejector station within the service area which are owned and operated by ALCOSAN. All treatment is provided at the plant located on the North Side of the City of Pittsburgh near Woods Run. A simplified map of the ALCOSAN interceptor system and the location of the treatment plant are shown on Figure 3-1.

This map does not include the inter-municipal trunk sewers that are currently owned by multiple municipalities and authorities but are under consideration for regionalization into the ALCOSAN system. ALCOSAN's Regional Conveyance Division operates and maintains the interceptor system with a staff of 36 employees, consisting of field supervisors and maintenance employees in various capacities.

Service Area Characteristics

ALCOSAN provides regional wastewater conveyance and treatment for the City of Pittsburgh and all or a portion of 82 other municipalities and approximately 100 permitted major industries. ALCOSAN has a service area of approximately 310 square miles. Roughly 17 percent of the area is served by combined sewer systems (where wastewater and storm water runoff are conveyed through a single sewer pipe system), 52% is served by separate sanitary sewer systems (where wastewater and storm water are conveyed through two distinct piping systems), and 31% are non-contributing areas that are either undeveloped or served by individual on-lot systems.³⁻¹

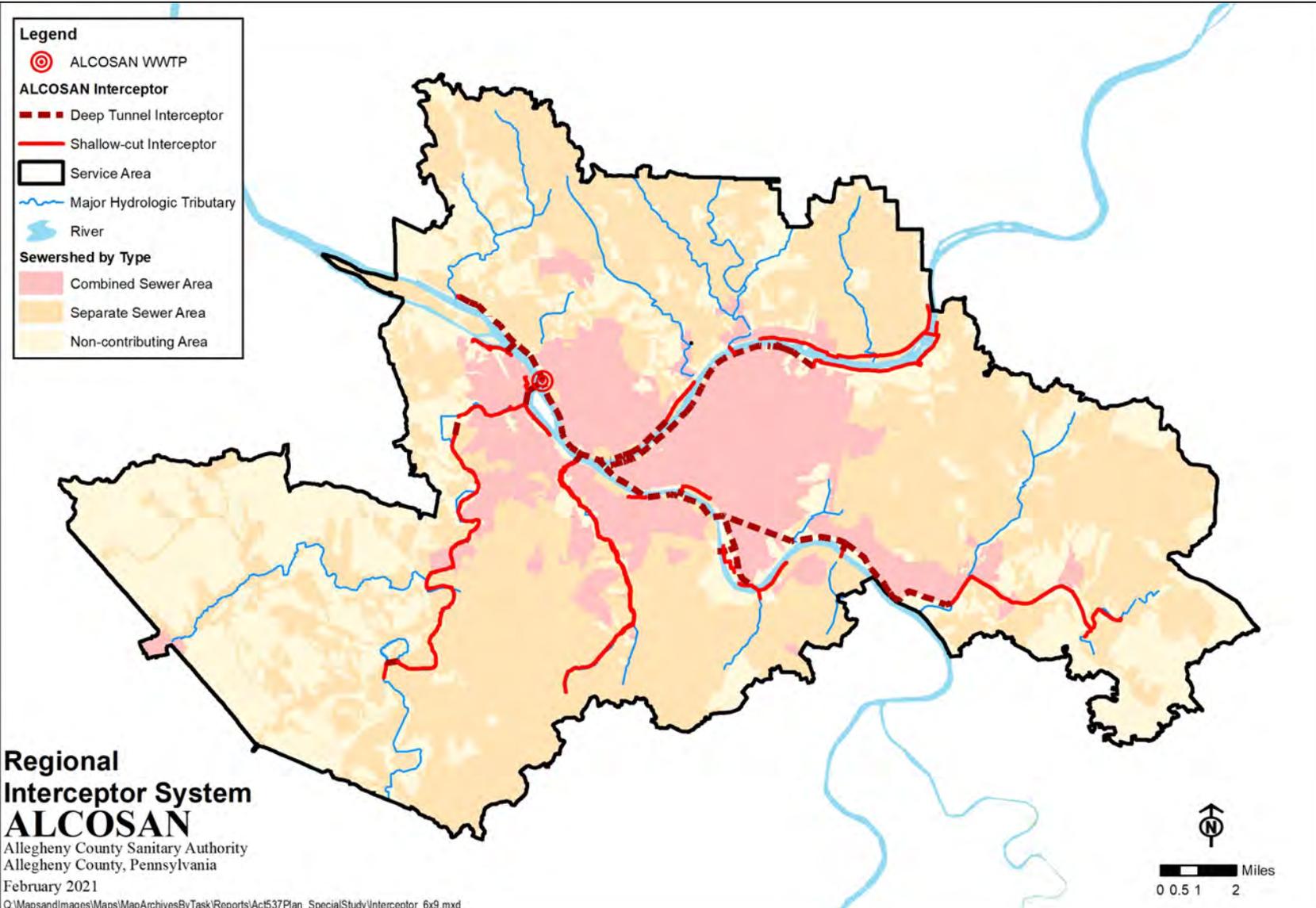
Service Population

The total population living within the ALCOSAN service area is approximately 836,500 according to the 2010 block level census data for Allegheny County. Of these, 347,500 people live in areas served by combined sewer systems, around 476,000 people live in areas served by separate sanitary sewer systems and 13,000 people live in non-contributing areas that are either undeveloped or served by individual on-lot systems. Additional service population information is provided in Section 5 of this report.

³⁻¹ Allegheny County Sanitary Authority Clean Water Plan page ES-4

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Figure 3-1: ALCOSAN Conveyance Interceptor System and Service Area



3.1.2 Overview of Wastewater Flows

The 2019 average flow to the wastewater treatment plant was approximately 209 million gallons per day (MGD). A five year history of flows to the treatment plant is provided in Table 3-1. The plant’s permitted monthly average capacity was increased from 200 MGD to 250 MGD as of 2009. The fifty million gallon per day increase in permitted monthly average plant flows resulted from treatment capacity projects that occurred pursuant to ALCOSAN’s 1996 Act 537 Sewage Facilities Plan. Additional flow and loading data for 2015 through 2019 are presented in Section 5.3.1 of this report.

Table 3-1: Treatment Plant Flow Data³⁻²

Year	Average Daily Flow (MGD)	Maximum Monthly Average Flow (MGD)	Annual Precipitation ³⁻³ (in inches)
2015	192	224	40.56
2016	195	225	35.01
2017	201	222	42.15
2018	216	237	57.83
2019	209	232	52.46
Average	203	228	45.60

Average billable flow (as measured through potable water meters or sewage flow meters for the largest users) was 54 MGD during 2019. Of the average daily total plant flow of 209 MGD in 2019, approximately twenty-six percent was billable flow with the remaining seventy-four percent attributable to storm water from the combined sewer areas, groundwater infiltration from the combined sewer areas and inflow/infiltration from the sanitary sewer areas as shown on Table 3-2.

Table 3-2: Average Daily Billable and Total Flow to Treatment Plant

Category	Flow Volumes	
	(MGD)	%
Billable Flow	54	26%
Non-Billable Flow	155	74%
Totals	209	100%

The average daily per-capita billable flow was approximately 64 gallons, representing total wastewater production by all user classes expressed on a per-capita basis.

A breakdown of average billed wastewater generation by user class for the five year period of 2015 to 2019 is provided on Table 3-3. Based on an analysis of billed water consumption data, the residential water user class accounts for approximately 72% of the billable flow. The second largest user class is the commercial class at 18%. Public users, such as schools, account for 8% of

³⁻² Source: ALCOSAN’s 2019 Wasteload Management Report to PaDEP, March 2020.

³⁻³ Source: National Weather Service - Pittsburgh

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the billed flow. The industrial class, that includes major users under the Industrial Pretreatment Program, account for approximately 2% of the billed wastewater generation.

Table 3-3: Average Billable Wastewater Flow and Accounts by User Class 2015 - 2019

User Class	Billable Flow			Accounts	
	Thousand Gallons	MGD	%	Number	%
Residential	14,962,800	41.0	71.9%	299,240	95.7%
Commercial	3,705,600	10.2	17.8%	10,190	3.3%
Public / School / Institutional	1,737,700	4.8	8.4%	2,500	0.8%
Industrial	391,500	1.1	1.9%	620	0.2%
Totals	20,797,600	57.0	100.0%	312,550	100.0%

3.1.3 Special Study Area Geographic Scope

The technical and geographic scope of this Act 537 special study is focused on the conveyance and storage tunnels and related appurtenances comprising the Regional Conveyance Facilities under ALCOSAN’s IWWP as was shown on Figure 1-1.

3.2 Special Study Area Physical Characteristics

3.2.1 Aquatic Features (Streams, Lakes, Impoundments, etc.)

Due to the urban nature of the property under which the ALCOSAN conveyance structures are to be constructed, there are very few open stream channels remaining in this area. The proposed tunnels, conveyance piping and storage structures will be located along major waterways in the ALCOSAN service area. Presented in Table 3-4 are the currently identified aquatic features, including their Chapter 93 designation, near areas of proposed ALCOSAN structures. Site specific aquatic feature determinations will be performed during the final design of the proposed facilities.

Table 3-4: Streams in the Vicinity of Proposed Construction Areas

Streams	Chapter 93 Designation
Ohio River	Warm Water Fishes (WWF)
Chartiers Creek	Warm Water Fishes (WWF)
Saw Mill Run	Warm Water Fishes (WWF)
Jacks Run	Warm Water Fishes (WWF)
Allegheny River	Warm Water Fishes (WWF)
Shades Run	Warm Water Fishes (WWF)
Girtys Run	Warm Water Fishes (WWF)
Pine Creek	Trout Stocking (TSF)
Guyasuta Run	Warm Water Fishes (WWF)

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Streams	Chapter 93 Designation
Squaw Run	High Quality Water Warm Water Fishes (HQ-WWF)
Monongahela River	Warm Water Fishes (WWF)
4-Mile Run	Warm Water Fishes (WWF)
Becks Run	Warm Water Fishes (WWF)
Streets Run	Warm Water Fishes (WWF)
West Run	Warm Water Fishes (WWF)
Homestead Run	Warm Water Fishes (WWF)

As shown on Table 3-4, the designated use of the majority of the streams is warm water fishes, which indicates that these streams should be protected for the maintenance and propagation of fish, flora and fauna that are native to warm water habitats. Pine Creek’s designated use is trout stocking and Squaw Run’s designated use is high-quality waters warm water fishes.

3.2.2 Soils, Geology, and Topographic Features (P.A.C. Title 25-71.21.a.ii and iii)

Consideration of soils, geology and topographic features is not applicable to this special study since these planning considerations address site suitability for on-lot wastewater systems in areas not served by municipal collection sewer systems.

3.2.3 Potable Water Supplies

Five major potable water suppliers have surface water intakes within the ALCOSAN service area as listed in Table 3-5 and Figure 3-2, and one utilizes groundwater from aquifers along the Allegheny River. Two systems draw surface water outside of the ALCOSAN service area but supply portions of municipalities within the ALCOSAN service area.

The Hampton Shaler Water Authority has a potable water well field adjacent to the Allegheny River. The October 2020 *Preliminary Basis of Design Report* notes that the proposed ART Alignment will veer north of the well field to reduce the risk of adverse impacts on the well field.³⁻⁴ Coordination with the Hampton Shaler Water Authority is ongoing. ALCOSAN first met with the Hampton Shaler Water Authority in 2019 and prepared a memo with several alternative alignments for the Allegheny River Tunnel that would reduce the risk of adverse impacts on the well field. The BODR reflects one such alignment. ALCOSAN met with Hampton Shaler Water Authority staff and the Board of Directors in October 2021 to discuss outstanding concerns and recently provided them with a requested existing conditions memorandum to further discussions. In a March 7, 2022 letter the Hampton Shaler Water Authority recognized the necessity of the Allegheny River Tunnel and expressed conditional support to the extent that their aquifer would remain uncompromised. A copy of this letter is provided in Exhibit F of Appendix B. The tunnel alignment in question has no impact on the

³⁻⁴ Source: Preliminary Basis of Design Report, page 11-39

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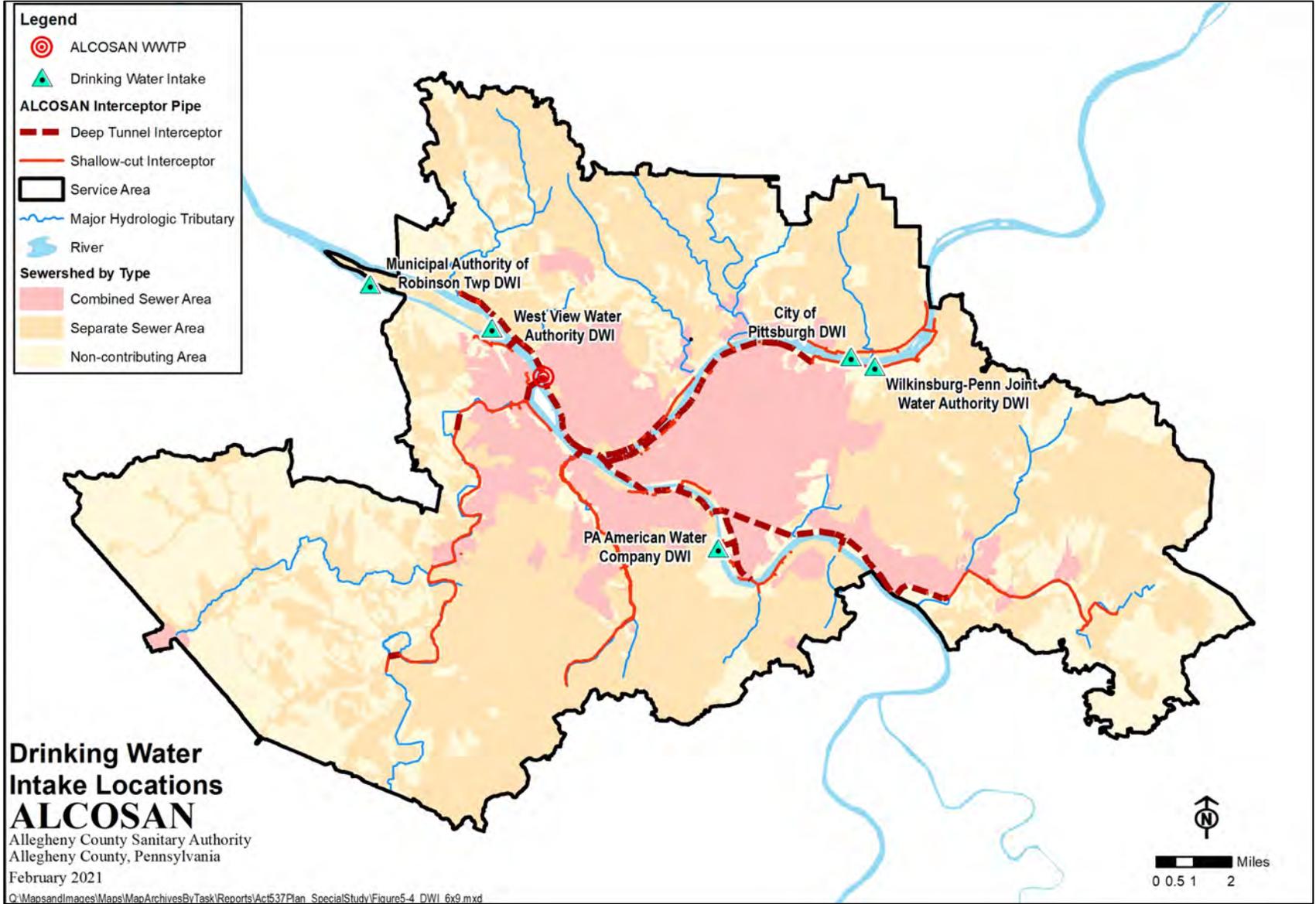
Ohio River Tunnel currently under design. Design of the Allegheny River Tunnel is not scheduled to begin until 2025, allowing ample time for further coordination on an alignment satisfactory to both parties.

Table 3-5: Water Suppliers with Surface Water Intakes Within the ALCOSAN Service Area

Water Supplier	Customers Served (approximate)	Primary Source	Municipalities Served (Direct Sales)
Pennsylvania American Water	200,000	Monongahela River	Boroughs of Baldwin, Bethel Park, Brentwood, Bridgeville, Carnegie, Castle Shannon, Crafton, Dormont Dravosburg, Elizabeth, Glassport, Greentree, Heidelberg, Ingram Jefferson, Liberty, Lincoln, McDonald, Mt Oliver, Munhall, Pleasant Hills, Rosslyn Farms, Thornburg, West Elizabeth, West Homestead, West Mifflin, Whitaker, Whitehall; Townships of: Baldwin, Collier, Elizabeth, Forward, Scott, South Fayette, Upper St. Clair Municipality of Mt. Lebanon; Cities of: Clairton Pittsburgh and 27 Washington County municipalities.
Pittsburgh Water & Sewer Authority	85,000 ³⁻⁵	Allegheny River	City of Pittsburgh, Aspinwall Borough, Fox Chapel Borough, Millvale Borough, Reserve Township
Robinson Twp. Municipal Authority	4,700	Ohio River	Robinson Township
Borough of West View Municipal Authority	200,000	Ohio River	Avalon Borough, Bellevue Borough, Ben Avon, Ben Avon Heights, Bradford Woods, Emsworth Borough, Franklin Park, Kennedy Township, Kilbuck Township, Marshall Township, McCandless Township, McKees Rocks Borough, Ohio Township, Pine Township, Ross Township, Sewickley Hills Borough, Stowe Township, West View Borough, 28th Ward of the City of Pittsburgh. Sections of the following communities: Adams Township, Cranberry Township, Economy Borough, Reserve Township, Robinson Township, Sewickley Heights Borough, Sewickley Hills Borough, Shaler Township.
Wilkinsburg-Penn Joint Water Authority	40,000	Allegheny River	Braddock Hills, Chalfant, Churchill, East McKeesport, East Pittsburgh, Edgewood, Forest Hills, North Braddock, Pitcairn, Rankin, Swissvale, Trafford, Turtle Creek, Wilkinsburg, Wilkins Township, Wilmerding Sections of: Braddock (4th Ward), Monroeville, Municipality of Penn Hills, North Huntingdon, North Versailles, Pittsburgh (13th Ward)

³⁻⁵ Portions of the Pittsburgh area south of the Ohio and Monongahela Rivers are served by the Pennsylvania American Water Company, resulting in the number of water customers for the Pittsburgh Water & Sewer Authority (85,000) being less than the number of sewer customers (around 106,000)

Figure 3-2: Surface Water Intakes



3.2.4 Wetlands

Wetlands within the Regional Conveyance Facilities have been identified pursuant to Pennsylvania administrative code Title 25 Chapter 105. Portions of the proposed Regional Conveyance Facilities will parallel or be adjacent to the Ohio, Allegheny and Monongahela Rivers which are classified as riverine wetlands. A wetlands map showing these and other existing wetlands is provided in Section 7 of this report. The impacts of proposed surface facilities construction on wetlands, waterways and floodplains are provided in Section 7.2 of this report.

4.0 ALCOSAN’S CAPITAL IMPROVEMENT PROGRAM

This section describes ALCOSAN’s Capital Improvement Program (CIP) and the estimated long-term costs of the Clean Water Plan (CWP), including the WWTP expansion and the Regional Conveyance Facilities. The scope and schedule of projects described herein are subject to change as conditions evolve.

4.1 ALCOSAN’s Annual Capital Improvement Program

ALCOSAN maintains a comprehensive capital budget, the Capital Improvement Program (CIP). The CIP is updated and approved by the Board of Directors annually. The projects contained in the CIP can be broadly categorized as:

- Major repairs, rehabilitation, system upgrades and improvements to enhance capacities or operating efficiencies of the existing WWTP and Regional Conveyance infrastructure; and
- Long term capital improvements pursuant to ALCOSAN’s CWP. These projects go towards the requirements that combined sewer overflows from the ALCOSAN conveyance interceptor system be controlled and that sanitary sewer overflows from the conveyance interceptor system be eliminated.

There were 38 active projects listed on ALCOSAN’s 2021 CIP as approved by the Board of Directors with a total estimated cost of \$934.2 million of which \$130.3 million has been expended as of December 31, 2020. As shown on Table 4-1, at \$812 million, the bulk of the CIP is dedicated to the implementation of the first phase of the CWP.

**Table 4-1: ALCOSAN’s Approved 2021 Capital Improvements Plan
Covering Projected Expenditures for 2021 – 2024 (\$ millions)**

Capital Expenditure	Current Estimated Total Costs	Expended Through 12/31/20	Remaining as of 12/31/20	Projected 2021 - 2024	Beyond 2024
General Capital Improvements	\$125	\$14.9	\$107.5	\$107.6	\$0.0
Clean Water Plan – Phase 1					
In the 2021 CIP	\$811.8	\$115.4	\$696.4	\$522.7	\$173.7
Subsequent CIPs	\$0.0	\$0.0	\$0.0	\$0.0	\$1,715.8
Subtotal CWP	\$811.8	\$115.4	\$696.4	\$522.7	\$1,889.6
Grand Total	\$934.2	\$130.3	\$803.9	\$630.2	\$1,889.6

The approved 2021 CIP included \$811.8 million for the first phase of the CWP, of which \$638.1 million is projected to be expended through 2024. An additional \$1,716 million in CWP capital costs will be addressed in subsequent CIPs. The individual projects that comprise the approved CIP are listed in Table 4-2 for general CIP projects and in Table 4-3 for CWP projects.

The capital projects will be funded with ALCOSAN’s existing funds, retained earnings (surpluses) and are to be supplemented by the recent Series 2020 revenue bonds and subsequent bonds through 2036.

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Section 4 – ALCOSAN’s Capital Improvement Program**

Table 4-2: ALCOSAN 2021 CIP General Capital Improvements

Count	Proj. Number	Description	Current Estimated Costs	Expended Through 2019	2020 Expenditures (projected in 2020 Annual Report)	Remaining	2021	2022	2023	2024	2021-2024
1	S408	Biosolids Strategic Plan	\$1,525,600	\$4,371	\$100,000	\$1,421,229	\$500,000	\$800,000	\$121,229	\$0	\$1,421,229
2	S419	Mobile Equipment 2020	\$947,900	\$0	\$947,900	\$0	\$0	\$0	\$0	\$0	\$0
3	S423	Plant Energy Efficiency Upgrades	\$2,319,000	\$1,126,176	\$20,000	\$1,172,824	\$600,000	\$572,824	\$0	\$0	\$1,172,824
4	S438	Four Mile Run Regulator(M-29) & Outfall Improvements	\$3,804,000	\$145,739	\$10,000	\$3,648,261	\$200,000	\$3,000,000	\$448,261	\$0	\$3,648,261
5	S458	Conveyance, Rehabilitation & Enhancements	\$4,003,900	\$1,164,061	\$1,145,800	\$1,694,039	\$1,694,039	\$0	\$0	\$0	\$1,694,039
6	S459	Energy Recovery Facility Improvements	\$2,300,000	\$1,105,340	\$1,194,660	\$0	\$0	\$0	\$0	\$0	\$0
7	S460	Plant And Safety Upgrade (2018 - 2019)	\$4,500,000	\$2,372,534	\$2,172,466	\$0	\$0	\$0	\$0	\$0	\$0
8	S464	New Lab and Industrial Waste Facility	\$54,000,000	\$258,832	\$1,100,000	\$52,641,168	\$14,000,000	\$15,000,000	\$15,000,000	\$8,641,168	\$52,641,168
9	S469	Sewer Rehab for Saw Mill Run and Mon Subaqueous Interceptor	\$20,100,000	\$96,734	\$788,000	\$19,215,266	\$16,082,600	\$3,132,666	\$0	\$0	\$19,215,266
10	S470	Flap Gate & Misc Regulator Improvements, Various Locations	\$3,122,000	\$91,775	\$250,000	\$2,780,225	\$2,250,000	\$530,225	\$0	\$0	\$2,780,225
11	S471	Remote Pump Station Improvements	\$6,076,000	\$10,913	\$179,100	\$5,885,987	\$2,173,800	\$3,137,100	\$575,087	\$0	\$5,885,987
12	S472	Plant and Safety Upgrade (2020 - 2021)	\$2,400,000	\$0	\$600,000	\$1,800,000	\$1,600,000	\$200,000	\$0	\$0	\$1,800,000
13	S473	Energy Recovery Facility Improvements (2020-2021)	\$1,200,000	\$0	\$10,000	\$1,190,000	\$1,000,000	\$190,000	\$0	\$0	\$1,190,000
14	S474	New Access Shaft Manholes Near A-14 and M-49 Crossing	\$4,876,000	\$0	\$5,000	\$4,871,000	\$2,000,000	\$2,871,000	\$0	\$0	\$4,871,000
15	S476	Precipitation Monitoring System Replacement and Upgrade	\$711,200	\$0	\$3,400	\$707,800	\$299,000	\$223,000	\$94,000	\$91,800	\$707,800
16	S000	2021 Low Cost Capital Improvements	\$2,024,200	\$0	\$0	\$2,024,200	\$2,024,200	\$0	\$0	\$0	\$2,024,200
		Total	\$122,454,400	\$6,376,475	\$8,546,326	\$107,576,599	\$49,483,239	\$33,121,815	\$16,238,577	\$8,732,968	\$107,576,599

537 Plan Special Study – IWWP Regional Conveyance Facilities Section 4 – ALCOSAN’s Capital Improvement Program

Table 4-3: ALCOSAN CIP – Estimated Capital Costs of the First Phase of the Clean Water Plan

	Proj. Number	Description	Current Estimated Costs (in 2020 \$)	Expended Through 2019	2020 Expenditures (projected in 2020 Annual Report)	Remaining	2021	2022	2023	2024	2021-2024	Beyond 2024
Clean Water Plan Program Elements in the Current ALCOSAN CIP	S430	Wet Weather Plant Expansion (Program Costs)	\$49,000,000	\$8,384,093	\$3,000,000	\$37,615,907	\$6,500,000	\$6,200,000	\$6,000,000	\$6,000,000	\$24,700,000	\$12,915,907
	S437	Ravine Street Stream Removal & Sewer Separation	\$4,929,800	\$104,663	\$67,200	\$4,757,937	\$43,000	\$4,714,937	\$0	\$0	\$4,757,937	\$0
	S440	Green Revitalization of Our Waterways Program	\$100,000,000	\$1,074,558	\$4,500,067	\$94,425,375	\$13,990,000	\$14,000,000	\$15,000,000	\$16,000,000	\$58,990,000	\$35,435,375
	S446	Regionalization	\$44,505,000	\$22,968,305	\$1,750,000	\$19,786,695	\$8,000,000	\$8,000,000	\$3,786,695	\$0	\$19,786,695	\$0
	S447	Municipal Source Control Evaluation Program	\$5,942,600	\$3,968,020	\$713,000	\$1,261,580	\$1,053,100	\$208,480	\$0	\$0	\$1,261,580	\$0
	S448	Interim Wet Weather Planning Compliance	\$22,850,000	\$8,056,092	\$1,500,000	\$13,293,908	\$2,000,000	\$2,000,000	\$2,000,000	\$2,000,000	\$8,000,000	\$5,293,908
	S451	Property Acquisitions	\$41,029,000	\$161,894	\$3,500,000	\$37,367,106	\$9,000,000	\$9,000,000	\$7,000,000	\$7,000,000	\$32,000,000	\$5,367,106
	S455	Green Infrastructure Program Manager	\$6,300,800	\$1,850,222	\$1,272,000	\$3,178,578	\$1,205,000	\$1,260,000	\$713,578	\$0	\$3,178,578	\$0
	S456	Program Management Information System	\$9,000,000	\$1,654,866	\$500,000	\$6,845,134	\$500,000	\$500,000	\$500,000	\$500,000	\$2,000,000	\$4,845,134
	S461	North End Facilities	\$141,000,000	\$5,196,930	\$18,500,000	\$117,303,070	\$33,000,000	\$33,000,000	\$25,000,000	\$14,000,000	\$105,000,000	\$12,303,070
	S462	Wet Weather Headworks Expansion	\$136,000,000	\$1,991,176	\$5,200,000	\$128,808,824	\$12,000,000	\$32,000,000	\$33,000,000	\$33,000,000	\$110,000,000	\$18,808,824
	S463	Solids Thickening and Dewatering Improvement	\$33,000,000	\$209	\$0	\$32,999,791	\$500,000	\$2,000,000	\$2,500,000	\$18,000,000	\$23,000,000	\$9,999,791
	S466	Wet Weather Disinfection	\$41,000,000	\$476	\$300,000	\$40,699,524	\$2,500,000	\$1,500,000	\$17,000,000	\$14,503,070	\$35,503,070	\$5,196,454
	S467	New Primary Tanks	\$38,000,000	\$0	\$0	\$38,000,000	\$500,000	\$1,500,000	\$3,200,000	\$18,000,000	\$23,200,000	\$14,800,000
	S468	Electrical Distribution System Upgrade	\$17,000,000	\$233,159	\$400,000	\$16,366,841	\$2,000,000	\$5,400,000	\$300,000	\$7,966,841	\$15,666,841	\$700,000
	S475	Tunnel Program Management	\$40,000,000	\$0	\$5,000	\$39,995,000	\$5,000,000	\$8,000,000	\$8,000,000	\$4,476,000	\$25,476,000	\$14,519,000
	TBD	Tunnel Construction Manager	\$50,000,000	\$0	\$0	\$50,000,000	\$0	\$0	\$0	\$0	\$0	\$50,000,000
	S477	Water Quality Monitoring Program	\$1,384,600	\$0	\$5,100	\$1,379,500	\$51,000	\$51,000	\$160,000	\$210,000	\$472,000	\$907,500
	S478	Flow Targets	\$1,508,800	\$0	\$0	\$1,508,800	\$167,000	\$167,000	\$180,000	\$400,000	\$914,000	\$594,800
	S479	Clay Street Sewer Separation	\$629,600	\$0	\$533,000	\$96,600	\$96,600	\$0	\$0	\$0	\$96,600	\$0
S480	Spring Garden	\$11,094,400	\$0	\$3,000	\$11,091,400	\$417,000	\$2,271,000	\$5,878,000	\$2,525,400	\$11,091,400	\$0	
S484	Delafield Avenue DSI	\$5,130,700	\$0	\$0	\$5,130,700	\$111,000	\$2,470,000	\$2,500,000	\$14,000	\$5,095,000	\$35,700	
S485	Ohio River Tunnel (ORT) Final Design Consultation	\$12,481,000	\$0	\$10,000	\$12,471,000	\$2,000,000	\$4,000,000	\$4,000,000	\$2,471,000	\$12,471,000	\$0	
		Subtotal	\$811,786,300	\$66,935,116	\$48,480,414	\$696,370,770	\$100,633,747	\$138,242,417	\$136,718,273	\$147,066,311	\$522,660,748	\$173,710,022
CWP Elements Not Yet in the CIP	TBD	Regional Conveyance Facilities Construction & Related	\$1,473,906,000	\$0	\$0	\$1,473,906,000	\$0	\$0	\$0	\$0	\$0	\$1,473,906,000
	TBD	Tunnel Dewatering Pump Station	\$108,450,000	\$0	\$0	\$108,450,000	\$0	\$0	\$0	\$0	\$0	\$108,450,000
		Remaining to be Committed	\$133,489,351	\$0	\$0	\$133,489,351	\$0	\$0	\$0	\$16,540,256	\$16,540,256	\$116,949,096
				0%	0%	100%	0%	0%	0%	12%	12%	88%
		Total	\$2,527,631,651	\$66,935,116	\$48,480,414	\$2,412,216,121	\$100,633,747	\$138,242,417	\$136,718,273	\$163,606,567	\$539,201,004	\$1,873,015,118

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4.2 Estimated Capital Costs of ALCOSAN’s IWWP

The implementation of ALCOSAN’s Interim Measures Wet Weather Plan (IWWP) is divided into three phases and is scheduled to run through 2036. Table 4-4 provides a listing and description of the ALCOSAN projects that comprise the IWWP. The CWP estimated capital costs, including costs expended to date continue to total the approximately \$2.0 billion (in 2010 dollars) documented in the submitted 2013 Wet Weather Plan.⁴⁻¹ The substance of the CWP and overall program costs remain substantially unchanged. The financial projections used in Section 8 of this report are based on annual capital costs being inflated to the year of their projected occurrence.

Table 4-4: ALCOSAN IWWP Estimated Capital Costs

CWP Program Element	Estimated Capital Cost (millions year 2010 \$)
<i>Phase 1 - Flow Optimization and Preliminary Planning</i>	
Green Revitalization of Our Waterways (GROW) Municipal Flow Reduction Project Partnership Program	\$200
Inspection and rehabilitation of existing infrastructure	
Regionalization and rehabilitation of Inter-Municipal Trunk Sewers and Associated Facilities	
Preliminary Planning	\$12
Subtotal Regional Flow Optimization Strategy and Preliminary Planning	\$212
<i>Phase 1 - Woods Run WWTP Expansion</i>	
Expand main pump station capacity	\$31
Wet weather headworks	\$105
Major on-site conveyance	\$63
Wet weather disinfection	\$90
Sludge thickening facilities	\$9
Subtotal Phase 1 Woods Run WWTP Expansion	\$298
<i>Phase 2 - Woods Run WWTP Expansion</i>	
Expand primary treatment capacity	\$44
Wet Weather Pump Station	\$148
Subtotal Phase 2 Woods Run WWTP Expansion	\$192
<i>Phase 2 – Ohio River Tunnel and Facilities</i>	
Ohio River Tunnel (ORT)	\$83
CSO consolidation sewers – MR Basin	\$13

⁴⁻¹ The 2013 Wet Weather Plan was modified into the 2019 Clean Water Plan (CWP) during the course of regulatory negotiations that resulted in the 2020 Modified Consent Decree.

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CWP Program Element	Estimated Capital Cost (millions year 2010 \$)
Tunnel cross connection	\$19
Chartiers Creek Tunnel (CCT)	\$38
CSO Consolidation Sewers and PS – CC Basin	\$62
Saw Mill Run Tunnel (SMRT) and consolidation sewer	<u>\$27</u>
Subtotal Phase 2 Ohio River Tunnel and Facilities	\$242
<i>Phase 3 - Woods Run WWTP Expansion</i>	
Secondary treatment capacity expansion	\$37
<i>Phase 3 – Allegheny River Tunnel and Facilities</i>	
Allegheny River Tunnel (ART)	\$301
CSO consolidation sewers – LOGR Basin	\$45
CSO consolidation sewers – MR Basin	\$45
CSO consolidation sewers – UA Basin	\$54
Tunnel cross connections	<u>\$37</u>
Subtotal Phase 3 Allegheny River Tunnel and Facilities	\$482
<i>Phase 3 – Monongahela River Tunnel and Facilities</i>	
Monongahela River Tunnel (MRT)	\$150
CSO consolidation sewers – MR Basin	\$47
Tunnel cross connection	<u>\$28</u>
Subtotal Phase 3 Monongahela River Tunnel and Facilities	\$225
<i>Phase 3 – Upper Monongahela CSO Retention Treatment Basin</i>	
CSO RTB and consolidation sewers	\$106
Priority Projects to Control Overflows Along Transferred Sewers (to be identified in 2024)	TBD ~\$206
Total IWWP	\$2,000

5.0 Service Population, Flow, and Loading Projections

5.1 Current ALCOSAN Service Population

ALCOSAN serves the City of Pittsburgh and all or portions of eighty-two other municipalities within Allegheny, Washington and Westmoreland Counties. The ALCOSAN-served portions of municipalities range in size from 8 acres (Pleasant Hills Borough) to 37,300 acres (Pittsburgh). The municipal populations served by ALCOSAN range from 95 people (Pleasant Hills) to 302,000 people (Pittsburgh) (Figure 5-1).

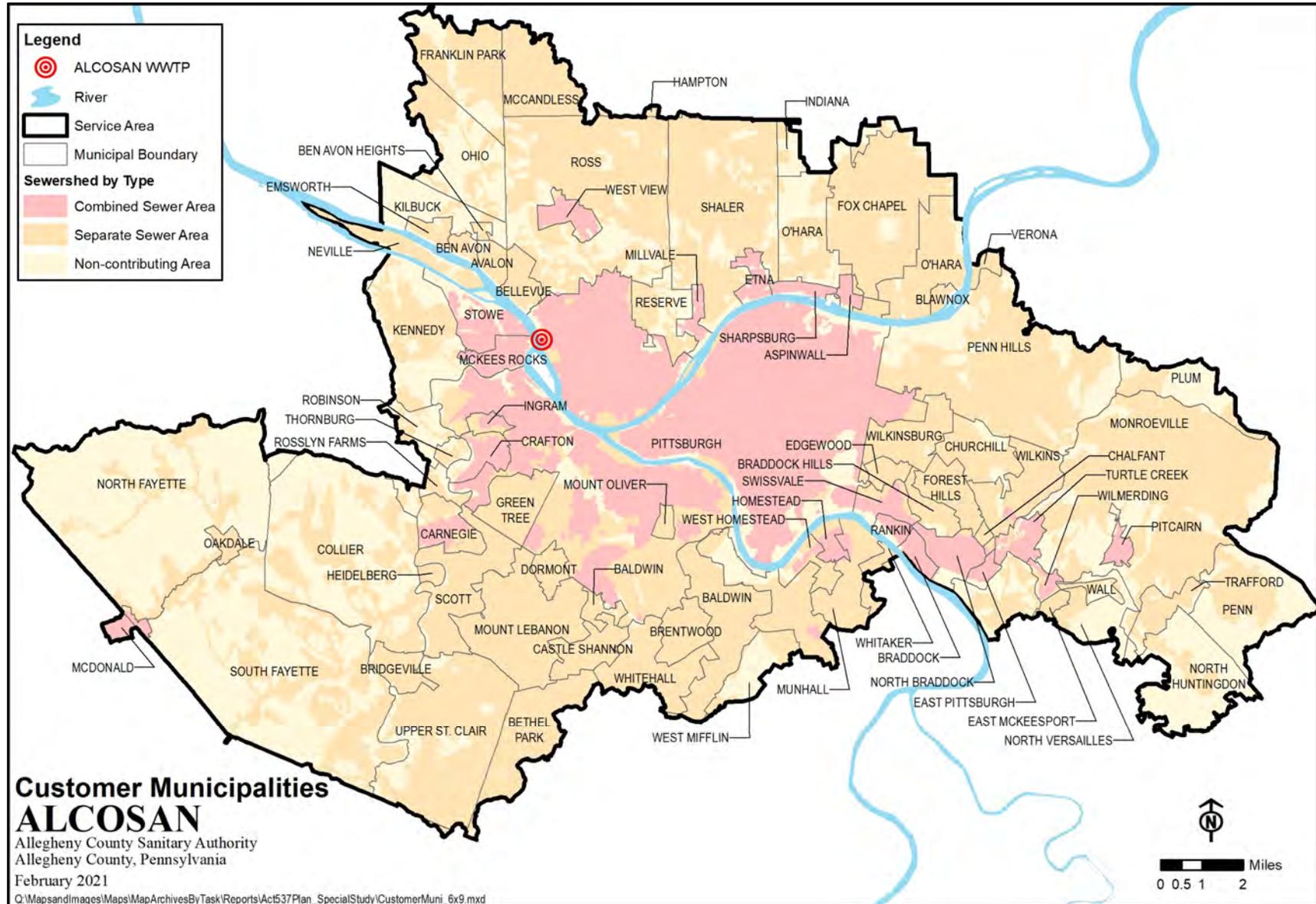
Nearly one third of the 83 Municipalities in the ALCOSAN service are only partially served by ALCOSAN. In such areas, the municipal wastewater collection systems flow into other wastewater treatment plants or on-lot private wastewater treatment systems such as septic systems are used. Tables 5-1 and 5-2 show the number of fully and partially served municipalities with their 2010 census ALCOSAN service populations and number of households.

Table 5-1: Municipal Acreage and Population Distribution

Municipal Acreage Distribution					
Acreage	<100	100 to 500	500 to 2,000	2,000 to 10,000	10,000+
Number of Municipalities	2	29	30	18	4
Municipal Population Distributions					
Population	<1,000	1,000 to 5,000	5,000 to 20,000	20,000 to 50,000	100,000+
Number of Municipalities	12	38	27	5	1

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Figure 5-1: ALCOSAN Customer Municipalities



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**Table 5-2: 2010 Service Area Municipal Population⁵⁻¹
(Rounded to the Nearest Thousand)**

Entire municipality within ALCOSAN Service Area	
Number of Municipalities	60
Population Served	658,000
Households Served (Census)	287,000
Municipality partially within ALCOSAN Service Area	
Number of Municipalities	23
Population Served	178,000
Households Served (Census)	64,000
Total Municipalities	
	83
Total Population Served	837,000
Total Households Served	351,000
Total Residential Accounts Served	301,000
Total Accounts	314,000

5.2 Municipal Population Projections

5.2.1 Overview

For ALCOSAN to develop a regional WWP for its service area, planning information was needed from each of the 83 customer municipalities who own and operate their respective wastewater collection systems. The ALCOSAN CD designated 2046 as the planning horizon for the development of the WWP and addressed specific municipal information and data ALCOSAN was required to request⁵⁻². The CD also set milestone dates for ALCOSAN to request the specified information and for the municipalities to submit this information to ALCOSAN⁵⁻³. This section summarizes the municipal planning information obtained to estimate future condition wastewater flow for 2046 and the activities ALCOSAN conducted to obtain the information and coordinate with the municipalities. This section also summarizes the means used to estimate service population and sewershed area growth projected through 2046, the analyses that were conducted to estimate future wastewater flow under dry and wet weather conditions, and the planned projects that will impact future wastewater flow. More detailed information on municipal coordination requirements, goals and activities is provided in Section 2 of the WWP.

⁵⁻¹ 2010 Census Summary File 1 Pennsylvania /prepared by the U.S. Census Bureau, 2011.

⁵⁻² ALCOSAN CD paragraph 70; Appendix P paragraph 7; and Appendix R paragraphs 3, 7, and 8. <https://www.alcosan.org/docs/default-source/clean-water-plan-documents/2020-consent-decree.pdf>

⁵⁻³ ALCOSAN CD paragraph 70

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5.2.2 Municipal Planning Information Obtained⁵⁻⁴

This subsection summarizes the CD requirements and the activities ALCOSAN conducted to request and obtain the municipal planning information and data needed to develop the regional WWP and meet CD requirements. The subsection includes a summary of the various coordination activities ALCOSAN used to facilitate the collection of needed planning information from its customer municipalities.

Applicable Consent Decree Requirements: The CD contains certain requirements regarding the collection and coordination of municipal planning information that would be utilized in the preparation of the WWP⁵⁻⁴. The CD requires ALCOSAN to make the planning assumption that control facilities will need to be designed and constructed with sufficient size and capacity to capture and treat all the dry and wet weather flow the customer municipalities convey to the ALCOSAN system, unless certain conditions are met⁵⁻⁵. Municipal flow may be excluded if existing municipal trunk sewers have insufficient hydraulic capacity to convey all the flow to the ALCOSAN system, and/or the municipality decides not to increase the pipe capacity, and/or the municipality elects to provide its own facilities or to use other alternative means to control its wastewater flow.

The CD contains the operational requirement that the ALCOSAN system continue to capture sufficient wastewater flow and provide sufficient treatment to meet established water quality goals for at least 20 years after completing the construction and implementation of the Wet Weather Plan remedial controls and activities⁵⁻⁶. Under the schedule in the 2008 CD, implementation of the WWP would be completed in 2026 and this requirement would necessitate WWP facilities, programs, and activities to provide a sufficient level of wastewater control for projected flow increases through 2046. To meet this CD requirement, ALCOSAN coordinated with its customer municipalities to develop and quantify wastewater estimates for planning year 2046. Section 2 of the WWP provides detailed documentation of the activities conducted by ALCOSAN to implement its municipal coordination and public participation programs and how the information obtained was used by ALCOSAN in developing the WWP. This WWP section summarizes the information required to develop the WWP and the activities conducted to obtain the information; specifically, municipal information needed to project future sewershed area growth, population and wastewater flow.

The CD lists information and data that ALCOSAN is required to request from each of its customer municipalities and to consider and integrate in developing the regional WWP⁵⁻⁷. The following are CD requirements which relate directly to the information needed to project future flows from customer municipalities at both a municipal and sewershed (point of connection) level.

⁵⁻⁴ The procedures for information exchange between ALCOSAN and the customer municipalities were set forth in Part VI, Section N paragraphs 69 – 76 of the ALCOSAN CD entered in January 2008 and remain in the Modified CD entered in May 2020. <https://www.alcosan.org/docs/default-source/clean-water-plan-documents/2020-consent-decree.pdf>

⁵⁻⁵ ALCOSAN CD paragraphs 17 and 18

⁵⁻⁶ ALCOSAN CD paragraphs 19 and 20

⁵⁻⁷ ALCOSAN CD paragraph 70

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- The most recent maps of the configuration of the municipal collection systems
- Available flow monitoring data to characterize wastewater flow generated by the municipalities and routed to the ALCOSAN system
- Forecasts of the total future flow and volume that each point of connection will contribute to the ALCOSAN system when the WWP is implemented and the associated total future service population
- A characterization of the flows from combined and separate municipal collection systems for each point of connection to the ALCOSAN system, a description of how the characterization was prepared, and a description of how these flows will be managed in the future by the municipality
- Hydraulic capacity evaluations and system hydraulic characterizations of the municipal wastewater collection systems to determine if peak wet weather flow can be successfully conveyed to the ALCOSAN system
- Description of the municipal program(s) that will be used to manage wastewater flow so system capacities are not exceeded and established water quality goals are met

The CD also includes a requirement to create an ALCOSAN Advisory Committee⁵⁻⁸. A plan of action was described in the CD for ALCOSAN follow-through should a customer municipality fail to provide some or all of the requested information.

Mechanisms for Obtaining Municipal Information: To obtain the required planning information, ALCOSAN issued a series of certified letters, with return receipt acknowledgements, to each of the customer municipalities with formalized requests for information. The ALCOSAN letters included due dates for submitting the requested information. For larger sewershed points of connection to the ALCOSAN system where multiple municipalities contribute flow and needed to coordinate flow contributions and control strategies, customer municipalities were requested to provide draft feasibility studies by July 2012. This allowed better integration of municipal information into the WWP. After each of the municipal submissions was received, ALCOSAN conducted an assessment to verify the completeness and reliability of the information for integration into the development of the WWP.

Mechanisms for Coordinating Municipal Information: There were several means that ALCOSAN utilized to provide the needed coordination associated with the information requested from its customer municipalities. A list of the coordination workgroups is provided below. Detailed descriptions of the workgroups and how they functioned to provide the required coordination are provided in the 2013 WWP Section 2, *Municipal Coordination and Public Participation*.

- A Customer Municipal Advisory Committee (CMAC)
- Seven Basin Planning Committees (BPCs)
- A Feasibility Study Working Group (FSWG)

⁵⁻⁸ ALCOSAN CD paragraph 79 <https://www.alcosan.org/docs/default-source/clean-water-plan-documents/2020-consent-decree.pdf>

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These groups were coordinated and assisted by 3 Rivers Wet Weather, which is a nonprofit environmental organization created in 1998 by ALCOSAN and the Allegheny County Health Department to support ALCOSAN’s customer municipalities in addressing the region’s wet weather overflow problem. Meetings were also conducted on an as needed basis between ALCOSAN, the seven Basin Planner teams, and individual municipalities to discuss and resolve apparent discrepancies between future flow projections developed by ALCOSAN and those developed by the municipalities.

5.2.3 Projections for Population Growth

In order to estimate future 2046 wastewater flows for the development of the WWP, projections for future population and sewershed area growth were needed. Two sources of information were used to quantify population growth: projections from the Southwestern Pennsylvania Commission (SPC) and projections provided by the customer municipalities. This subsection describes the activities and analyses ALCOSAN conducted to obtain, compile, and analyze this information.

Future population projections for the ALCOSAN service area were obtained from the SPC. The SPC is the regional planning agency serving the 10-county area surrounding Pittsburgh and directs the use of all state and federal transportation and economic development funds allocated to the region. SPC is the region's designated Local Development District and Economic Development District by the US Department of Commerce and in this role, SPC establishes regional economic development priorities and provides a wide range of planning services to the region. SPC analysis data provide population projections through 2040. This available information was used as reasonable surrogate data for the 2046 planning year required by the CD. Census data were obtained to provide 2010 populations.

The population data provided by the census and by SPC include people living within areas served by combined and separate sewer systems and people living within areas that are served by individual on-lot treatment systems and do not contribute flow to the ALCOSAN system. For customer municipalities that have sewershed areas where wastewater treatment is provided by another sewer authority, only the population within sewershed areas served by ALCOSAN was included.

The customer municipalities were asked to provide ALCOSAN with future population projections. At the time the municipal projections were being developed, 2010 census data were not available and municipalities used various versions of extrapolated 2000 census data to estimate existing condition population. In addition, at the time the customer municipalities were developing their future population projections, the SPC projections only extended through 2035. It was the 2035 population projections that were discussed with the customer municipalities. The ALCOSAN planning basin teams shared these SPC projections with each of the customer municipalities. The municipalities either agreed with the SPC projection or provided their own population growth projections. The ALCOSAN basin planner teams conducted the municipal coordination and documented the municipal responses. Subsequently, the SPC extended their population projections through 2040 at the request of the ALCOSAN municipalities. The projections from the customer municipalities were incorporated into the hydrologic and hydraulic (H&H) models and used for the development of the WWP.

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In Table 5-3, the existing planning basin populations are compared to the SPC future projections and the population projections compiled by the Basin Planners based on municipal input. The information is organized and totaled by each of the seven planning basins that comprise the ALCOSAN service area. In Table 5-4, the existing population from the 2010 census and the population projections from SPC and the municipalities are provided for each of the customer municipalities as compiled by the Basin Planners based on municipal input.

For customer municipalities that have sewershed areas where wastewater treatment is provided by another sewer authority, only the population within sewershed areas served by ALCOSAN was included in the numbers reported in Tables 5-3 and 5-4. Population projections were also obtained for the portion of Cecil Township which has a minor contributing population but is not a direct ALCOSAN customer municipality. Cecil Township customers contribute flow to ALCOSAN via sewer connections and a service agreement to the adjacent downstream neighbor, South Fayette Township.

Projected population growth varies greatly from municipality to municipality. As can be seen from the table information, there were some customer municipalities with relatively aggressive projected growth rates over the analysis period. In contrast, there also were several municipalities where the population within the ALCOSAN service area was projected to decrease during the analysis period.

Table 5-3: Comparison of SPC and Municipal Population Projections by Planning Basin

Planning Basin Area⁽²⁾	2010 Census Population⁽¹⁾	SPC Population Projections⁽²⁾ Percent Change	Basin Planner Projected Percent Change
Chartiers Creek	154,566	19.1%	26.3%
Lower Ohio - Girty's Run	92,061	17.6%	11.8%
Main Rivers	164,070	15.3%	6.2%
Saw Mill Run	106,722	7.4%	6.6%
Turtle Creek - Thompson Run	89,370	23.0%	26.5%
Upper Allegheny River	112,957	15.4%	3.7%
Upper Monongahela River	116,809	16.9%	10.3%
Total ALCOSAN Service Area	836,556	16.3%	13%

(1) Note: Census and SPC populations include areas served by combined sewers, areas served by separate sewers and non-contributing areas that are served by individual on-lot treatment systems.

(2) Note: Only municipal populations within the ALCOSAN service area were included.

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Table 5-4: Comparison of SPC and Municipal Population Projections by Municipality

Customer Municipality	2010 Census Population⁽¹⁾	SPC Population Projections⁽¹⁾ Percent Change	Basin Planner Projections Percent Change
Aspinwall Borough	2,804	15%	0.0%
Avalon Borough	4,703	14%	0.0%
Baldwin Borough	12,319	0%	11%
Baldwin Township	1,988	10%	5.2%
Bellevue Borough	8,371	7%	8.6%
Ben Avon Borough	1,777	24%	13%
Ben Avon Heights Borough	371	-5%	57%
Bethel Park, Municipality of	11,444	8%	1.7%
Blawnox Borough	1,399	16%	0.0%
Braddock Borough	2,117	29%	30%
Braddock Hills Borough	1,880	11%	27%
Brentwood Borough	9,637	13%	7.6%
Bridgeville Borough	5,137	10%	0.45%
Carnegie Borough	7,962	4%	9.8%
Castle Shannon Borough	8,303	9%	-0.04%
Chalfant Borough	790	-9%	-25%
Churchill Borough	3,005	16%	-5.8%
Collier Township	7,081	55%	126%
Crafton Borough	5,932	7%	18%
Dormont Borough	8,591	-8%	2.6%
East McKeesport Borough	1,548	31%	-18%
East Pittsburgh Borough	1,819	12%	8.9%
Edgewood Borough	3,120	-44%	-0.74%
Emsworth Borough	2,445	12%	6.2%
Etna Borough	3,450	22%	0.0%
Forest Hills Borough	6,518	14%	-19%
Fox Chapel Borough	5,195	25%	11%
Franklin Park Borough	4,718	33%	10%
Green Tree Borough	4,431	13%	14%
Heidelberg Borough	1,246	14%	3.3%
Homestead Borough	3,157	38%	28%

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Customer Municipality	2010 Census Population⁽¹⁾	SPC Population Projections⁽¹⁾ Percent Change	Basin Planner Projections Percent Change
Indiana Township	881	-34%	0.0%
Ingram Borough	3,331	18%	0.19%
Kennedy Township	7,661	85%	24%
Kilbuck Township	692	25%	34%
McCandless Township	8,829	-12%	0.0%
McDonald Borough	2,129	12%	0.27%
McKees Rocks Borough	6,104	8%	16%
Millvale Borough	3,733	20%	31%
Monroeville, Municipality of	27,903	15%	25%
Mt. Lebanon, Municipality of	33,138	8%	16%
Mount Oliver Borough	3,399	7%	10%
Munhall Borough	11,355	5%	4.5%
Neville Township	1,077	-33%	4.2%
North Braddock Borough	4,899	27%	47%
North Fayette Township	5,831	148%	263%
North Huntingdon Township	2,033	56%	996%
North Versailles Township	3,885	16%	48%
Oakdale Borough	1,457	-3%	3.6%
O'Hara Township	8,346	54%	0.0%
Ohio Township	3,384	25%	32%
Penn Hills, Municipality of	33,682	14%	10%
Penn Township	4,324	67%	185%
Peters Township	176	2%	149%
Pitcairn Borough	3,294	15%	-14%
Pittsburgh (City of)	305,369	16%	6.4%
Pleasant Hills Borough	95	-49%	12%
Plum Borough	1,625	109%	311%
Rankin Borough	2,113	10%	25%
Reserve Township	3,345	27%	6.2%
Robinson Township	900	94%	474%
Ross Township	30,903	13%	20%
Rosslyn Farms Borough	427	54%	189%

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Customer Municipality	2010 Census Population⁽¹⁾	SPC Population Projections⁽¹⁾ Percent Change	Basin Planner Projections Percent Change
Scott Township	17,018	8%	13%
Shaler Township	28,734	11%	0.0%
Sharpsburg Borough	3,445	14%	0.0%
South Fayette Township ⁽²⁾	14,402	36%	107%
Stowe Township	6,361	-2%	6.8%
Swissvale Borough	8,988	10%	7.6%
Thornburg Borough	462	17%	120%
Trafford Borough	3,191	3%	6.7%
Turtle Creek Borough	5,342	17%	-0.14%
Upper St. Clair Township	19,112	11%	24%
Verona Borough	2,383	-9%	0.0%
Wall Borough	577	9%	45%
West Homestead Borough	1,931	28%	18%
West Mifflin Borough	6,245	-3%	18%
West View Borough	6,766	13%	8.7%
Whitaker Borough	1,272	32%	1.8%
Whitehall Borough	13,117	16%	8.0%
Wilkins Township	6,362	18%	4.1%
Wilkinsburg Borough	15,922	18%	6.0%
Wilmerding Borough	2,186	25%	13%
Total ALCOSAN Service Area	836,556	16%	13%

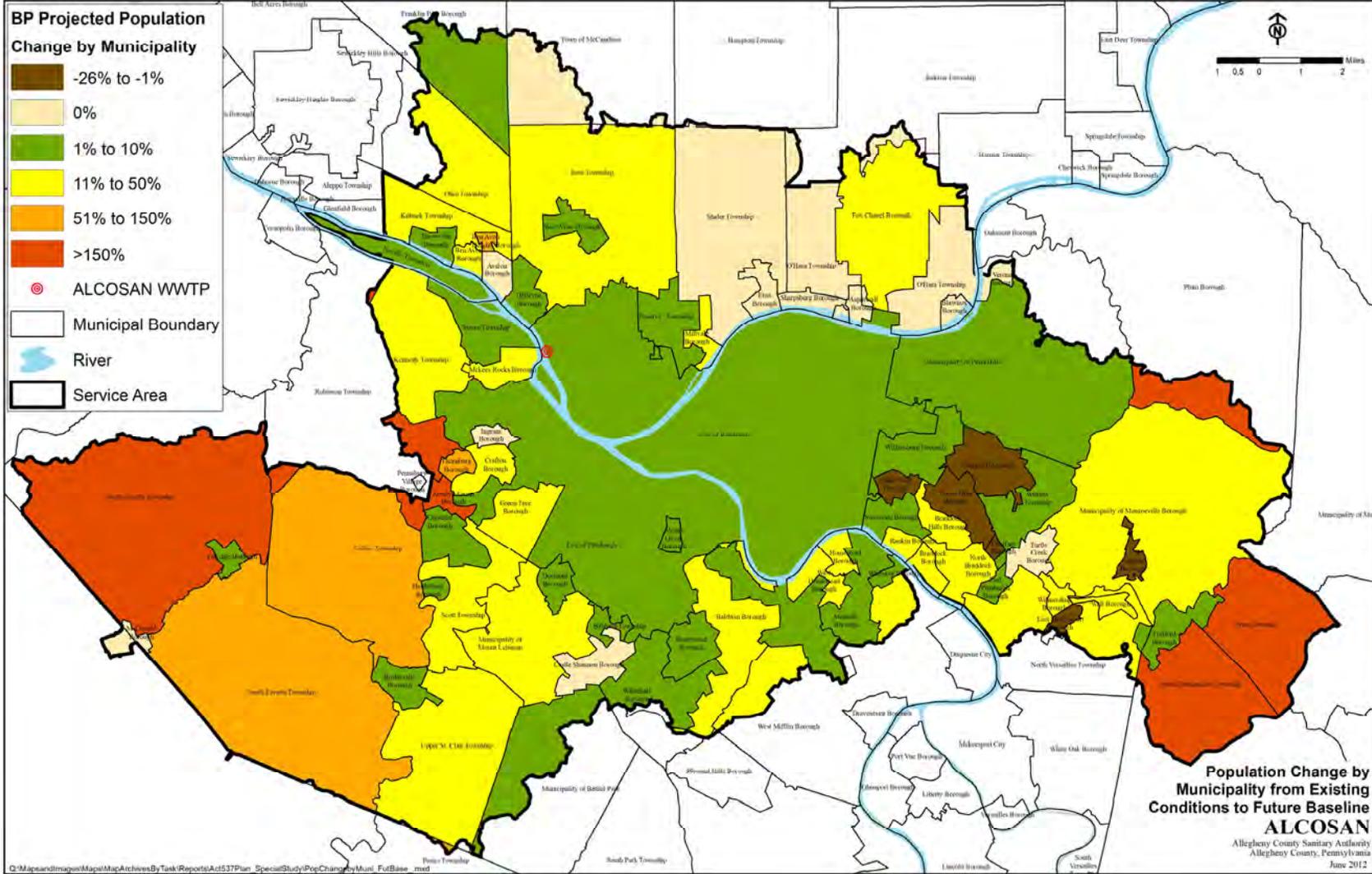
(1) Note: Census and SPC populations include areas served by combined sewers, areas served by separate sewers and non-contributing areas that are undeveloped or served by individual on-lot treatment systems.

(2) Note: South Fayette populations include the minor Cecil Township service area.

Figure 5-2 is a Geographic Information Systems (GIS) map showing the projected percentage change between existing and projected 2046 populations served by the ALCOSAN system, as compiled by the Basin Planners based on information provided by the customer municipalities.

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Figure 5-2: Projected Percentage Change between Existing and Projected 2046 Populations



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5.2.4 Projected Service Area Growth

Projected geographic service area growth within the ALCOSAN service area is shown on Table 5-5. Many of the municipalities reported they are fully built-out and would not anticipate any significant expansion of their existing sewer systems. Any projected population growth within these municipalities would presumably be:

- A result of fill-in construction on empty lots located within existing areas already served by combined or separate wastewater collection systems
- Demolition and redevelopment within existing sewer areas at a higher density
- Via increased population within existing dwelling units.

Other municipalities have undeveloped areas where future population growth is associated with an expansion of the sewershed area for their existing municipal wastewater collection sewer systems.

Table 5-5: Projected Future Sewershed Area Growth by Planning Basin

Planning Basin Area	2010 Sewershed Area (miles²)	2040 Sewershed Area (miles²)	Projected Percent Change
Chartiers Creek	47.9	61.2	27.7%
Lower Ohio - Girty's Run	27.2	27.2	0.0%
Main Rivers	23.0	23.0	0.0%
Saw Mill Run	18.3	18.3	0.0%
Turtle Creek - Thompson Run	36.0	42.0	16.7%
Upper Allegheny River	35.2	35.2	0.0%
Upper Monongahela River	26.1	26.1	0.0%
Total ALCOSAN Service Area	213.7	233.0	9.0%

5.3 Woods Run WWTP Current and Future Wastewater Flow and Loading

5.3.1 Recent and Near-Term Flow and Organic Loading⁵⁻⁹

A key goal of Act 537 is to monitor the capacity utilization of municipal wastewater treatment plants in Pennsylvania and to project the need for capacity expansion. Hydraulic plant capacity is evaluated in terms of average daily wastewater flow to and through the plant, expressed in million gallons per day or MGD. Organic waste loading is evaluated in terms of pounds of five-day biochemical oxygen demand (BOD₅) treated at the plant on a daily basis.

⁵⁻⁹ The data source for tables 5-5 through 5-7 is ALCOSAN's Chapter 94 Municipal Wasteload Management Annual Report for Calendar Year 2021.

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Monthly hydraulic loading and organic loading for the period of 2017 through 2021 are provided in Tables 5-6 and 5-7 respectively.

Table 5-6: Monthly Average Flow for the Past Five Years (MGD)

Month	2017	2018	2019	2020	2021	5 Year Avg.
January	221.6	213.8	229.2	225.5	182.8	214.6
February	211.4	201.2	232.1	227.4	192.1	212.8
March	221.9	225.0	206.7	224.4	199.0	215.4
April	222.2	230.8	207.8	229.9	181.2	214.4
May	215.3	211.4	219.9	198.1	201.1	209.2
June	207.0	224.0	216.5	162.4	187.0	199.4
July	211.4	208.6	227.1	164.9	192.2	200.8
August	191.0	183.5	189.8	173.5	195.4	186.6
September	162.9	207.0	172.9	171.2	206.7	184.1
October	179.3	218.5	191.6	154.9	183.7	185.6
November	200.3	237.0	199.6	158.9	177.7	194.7
December	173.1	232.0	217.7	191.4	198.7	202.6
Annual Average Plant Flow ⁵⁻¹⁰	201.5	216.1	209.2	190.2	191.5	201.7
Maximum 3 Month Avg	219.8	229.2	232.7	227.2	198.1	221.4
Permit Limit	250					
Maximum to Average Ratio	1.09	1.06	1.11	1.19	1.03	1.10

The annual average flow at ALCOSAN’s Woods Run WWTP ranged from 190.2 MGD in 2020 to 216.1 MGD in 2018 for the five-year period. For Act 537 planning purposes, the three consecutive months with the highest average flows are also tracked. The maximum three-month average for the 2017 - 2021 period ranged from around 198.1 MGD in 2021 to 232.7 MGD in 2019. These figures may be compared to the current plant permitted capacity of 250 MGD and the secondary treatment capacity planned under the IWWP of 295 MGD.

⁵⁻¹⁰ Annual average plant flows are affected by annual precipitation totals and patterns.

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Section 5 – Flow and Loading Projections**

Table 5-7: Monthly Average BOD₅ Loads for the Past Five Years (pounds per day)

Month	2017	2018	2019	2020	2021	5 Year Avg.
January	107,693	147,055	97,700	128,965	95,594	115,401
February	89,757	104,531	92,868	120,064	105,853	102,615
March	112,255	145,853	120,755	89,289	100,828	113,796
April	114,079	163,013	112,431	80,182	126,711	119,283
May	123,610	123,706	105,357	85,018	115,685	110,675
June	131,813	105,376	97,264	90,879	126,038	110,274
July	134,867	102,090	75,549	86,831	103,419	100,551
August	122,135	113,692	98,765	92,677	97,029	104,860
September	141,354	84,679	98,924	101,207	103,787	105,990
October	124,242	108,656	115,970	103,501	103,598	111,193
November	104,208	106,476	122,672	106,549	108,897	109,760
December	132,659	92,243	130,349	100,890	109,280	113,084
Annual Average	119,889	116,448	105,717	98,838	108,060	109,790
Maximum Month	141,354	163,013	130,349	128,965	126,711	138,078
Existing Design Capacity	287,010					
Maximum to Average Ratio	1.18	1.40	1.23	1.30	1.17	1.26

ALCOSAN’s near term projected hydraulic and organic loadings at the Woods Run WWTP are provided on Table 5-8. Annual average flow to the plant is projected to be around 228 MGD in 2026, with the maximum three concurrent month flow volume to be 251 MGD. Annual average organic loading in 2026 is projected to be around 124,300 pounds per day with a maximum month loading of approximately 156,300 pounds per day. These projections are below the current NPDES permit limits of 250 MGD and 287,020 pounds of BOD₅ respectively. Moreover, the treatment capacity is scheduled to increase to 295 MGD as part of the IWWP.

Table 5-8: Projected Flows and Organic Loadings 2022 - 2026

Plant Loading Metric	2022	2023	2024	2025	2026
Projected Plant Flow (MGD)					
Annual Average	206.0	210.8	216.1	222.0	228.3
Maximum 3 Month Average	226.3	231.6	237.4	243.8	250.8
Projected BOD ₅ (lbs/day)					
Annual Average	112,115	114,725	117,619	120,799	124,262
Maximum Month	141,026	144,309	147,950	151,949	156,306

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5.3.2 Long Term Flow Projections

The projected long term service population and average annual plant flows through the 2046 planning period are summarized on Table 5-9.

Table 5-9: Projected Service Population and Average Annual Plant Flows Through 2046

Year	Service Population	Annual Average Plant Flow (MGD)	
2010	836,556*	Actual (from ALCOSAN Chap. 94 Reports)	185
2011	839,401		202
2012	842,255		183
2013	845,120		193
2014	847,994		192
2015	850,877		192
2016	853,771		195
2017	856,674		201
2018	859,588		216
2019	862,511		209
2020	865,444		190
2021	868,387		192
2022	871,340	Projected (2022 – 2026) (from Chap. 94 Reports)	206
2023	874,303		211
2024	877,276		216
2025	880,259		220
2026	883,252		228
	~		~
2046	945,308		240

*Based on 2010 Census data polygons as correlated with detailed sewershed mapping.

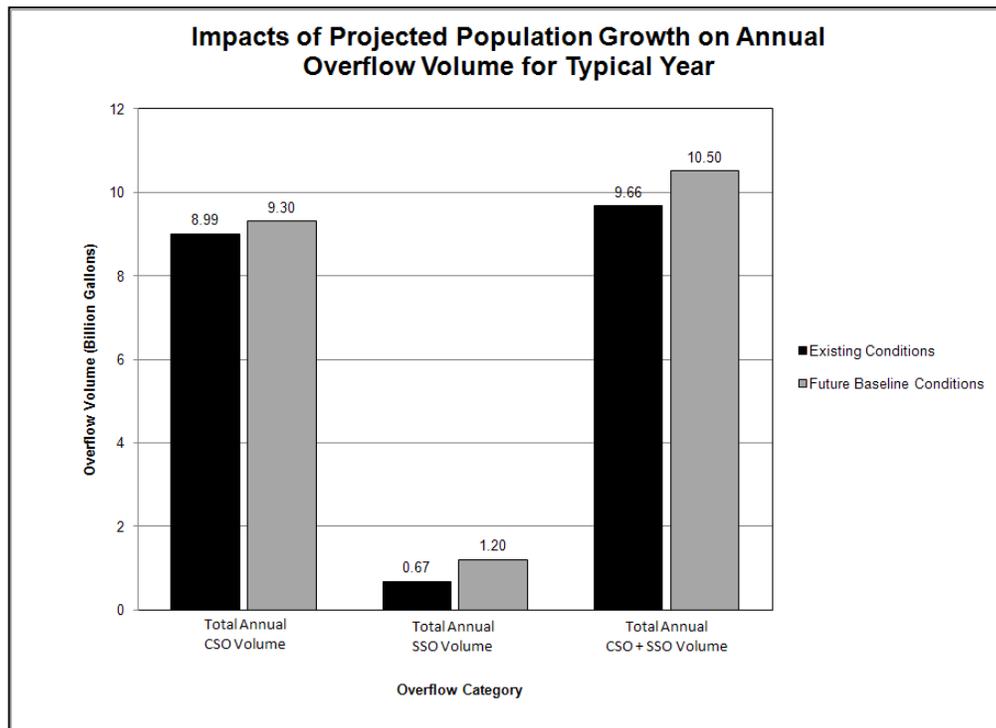
The average annual plant flow is projected to be approximately 240 MGD in 2046. This projected 2046 average flow accounts for growth in the base flow resulting from the projected population growth and from the increase in wet weather capture that will result from the implementation of the IWWP.

Additional H&H model simulations were conducted during ALCOSAN’s WWP development to predict the impacts of future baseline condition flows on the frequency, duration and volume of typical year CSO and SSO discharges from ALCOSAN and municipal outfalls. The model indicated that system-wide, flow increases from future projected population growth would increase the total annual volume of CSO and SSO discharges by 8 percent to approximately 10,500 MG during a year with historically average rainfall. Much of the projected future growth

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is expected to occur within existing and newly constructed separate sewershed areas. The computed increase in the total system-wide volume of SSO discharges would double to approximately 1,200 MG under current conditions. Future growth within combined sewershed areas would result in a total system-wide increase of 3 percent in the total system-wide annual volume of CSO discharges to approximately 9,300 MG. The increases in total annual CSO and SSO discharge volumes resulting from projected future population growth are depicted in Figure 5-3 below. These projected increases will be addressed through the expansion of the Woods Run Wastewater Treatment Plant, the proposed IWWP Regional Conveyance Facilities that are the subject of this Special Study and through the implementation of the other elements of ALCOSAN’s IWWP.

Figure 5-3: Impacts of Projected Population Growth on Annual Discharge Volume



6.0 ALTERNATIVE ANALYSIS AND PROPOSED FACILITIES

6.1 Introduction and Context

This section presents a summary of the alternatives analyses conducted during the development of ALCOSAN’s Clean Water Plan (CWP), ALCOSAN’s Source Flow Reduction Program, and the subsequent Regional Conveyance Facilities Basis of Design Report relating to the proposed regional conveyance facilities that are the subject of this Special Study. These regional conveyance facilities are critical elements of ALCOSAN’s CWP for controlling combined sewer overflows (CSOs) and eliminating sanitary sewer overflows (SSOs). Due to the associated costs the CWP must be implemented in affordable stages. Overflow control projects scheduled to be implemented through 2036 constitute the Interim Measures Wet Weather Plan (IWWP). The IWWP includes the regional conveyance facilities covered in this Special Study.

The genesis of the proposed regional conveyance was documented extensively in Section 9 (alternatives analysis) of ALCOSAN’s CWP (<https://www.alcosan.org/our-plan/plan-documents/clean-water-plan>), including the development of detailed planning level capital, operating & maintenance and life-cycle (present worth) cost estimates for twenty-six detailed system-wide alternatives. The system-wide alternatives were developed based on the analysis of many more basin level alternatives with control strategies ranging from local to regional focused projects. Preferred basin alternatives were combined into a series of basin-based, regional-based, and hybrid system-wide alternatives aimed towards identifying the most cost-effective means of achieving water quality objectives for the region as described below.

1. Basin-based control strategies focused on utilizing wet weather control facilities located within the seven planning basins, including source controls, storage, and local treatment technologies.
2. Regional-based control strategies focused on utilizing regional conveyance and storage with local consolidation sewers to capture and route wet weather flows to a new regional tunnel for conveyance to the Woods Run Treatment Plant.
3. Hybrid control strategies included a mix of technologies with some basins utilizing a new regional storage and conveyance tunnel and others utilizing satellite facilities.

The twenty-six system-wide alternatives described in Section 9 of the CWP are summarized in Table 6-1. Based upon the extensive analyses presented in Section 9 of the CWP, ALCOSAN selected a regional-based control strategy utilizing a new tunnel storage and conveyance system to deliver captured wet weather flow to an expanded Woods Run WWTP using a new 120 MGD wet weather pump station. This control strategy was subsequently endorsed by the PaDEP, USEPA and the ACHD approval of the CWP.

ALCOSAN’s 2018 Act 537 Special Study provided the basis for the amendment of ALCOSAN’s 1996 Act 537 Plan concerning the expansion of the Woods Run WWTP. This Act 537 Special Study is intended to provide the basis for a second amendment to the 1996 Plan to include the new regional conveyance facilities.

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Table 6-1: Summary of System-Wide Control Alternatives Evaluated (Source: CWP Section 9.5 Tables 9-68 and 9-69)

Alt. #	Description	ALCOSAN Control Level		WWTP Influent Pumping Capacity (MGD)		Treatment Capacity (MGD)		Clean Water Plan Cost Estimates (in millions of 2010 dollars)			
		CSO (Overflows/Year)	SSO (Design Storm)	Main P.S.	WWPS	Primary	Secondary	Capital	O&M	R&R	Present Worth
Basin-Based Control Strategy											
1	Basin-Based Control Strategy	0	2-Year	480	120	600	295	\$7,604	\$283	\$55	\$7,940
1	Basin-Based Control Strategy	1-3	2-Year	480	120	600	295	\$6,613	\$254	\$48	\$6,915
1	Basin-Based Control Strategy	4-6	2-Year	480	120	600	295	\$5,590	\$223	\$44	\$5,855
1	Basin-Based Control Strategy	7-12	2-Year	480	120	600	295	\$4,982	\$203	\$41	\$5,226
1	Basin-Based Control Strategy	13-20	2-Year	480	120	600	295	\$3,896	\$165	\$36	\$4,097
5	85% CSO Capture by Receiving Stream with Remote CSO Treatment & Storage	85% Capture	2-Year	480	—	480	295	\$2,529	\$130	\$28	\$2,688
Regional-Based Control Strategy											
2	Regional-Based Control Strategy	0	2-Year	400	200	600	295	\$4,933	\$133	\$33	\$5,098
2	Regional-Based Control Strategy	1-3	2-Year	400	200	600	295	\$4,463	\$133	\$48	\$4,644
2	Regional-Based Control Strategy	4-6	2-Year	400	200	600	295	\$4,206	\$127	\$37	\$4,370
2	Regional-Based Control Strategy	7-12	2-Year	400	200	600	295	\$3,811	\$123	\$36	\$3,969
2	Regional-Based Control Strategy	13-20	2-Year	400	200	600	295	\$3,560	\$124	\$34	\$3,717
4	Complete Sewer Separation and SSO Conveyance / Storage	0	2-Year	--	--	Not Determined	Not Determined	\$9,794	\$125	\$14	\$9,933
Preliminary Hybrid Alternatives for Evaluating Satellite Sewage Treatment and Regional Tunnel Extents											
3	Regional Tunnel w/Remote CSO Treatment and Storage (Tunnel from WWTP to A-42 and M-29)	4-6	2-Year	480	120	600	295	\$4,200	\$146	\$37	\$4,383

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Section 6 – Alternatives Analysis**

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		CSO (Overflows/ Year)	SSO (Design Storm)	Main P.S.	WWPS	Primary	Secondary	Capital	O&M	R&R	Present Worth
3c	Same as Alt. 3 except Satellite WWTP Serving M-30 and Upstream	4-6	2-Year	480 WWTP	120 WWTP	600 WWTP	275 WWTP	\$4,267	\$233	\$50	\$4,550
				125 Satellite		125 Satellite					
3d	Same as Alt. 3 except Tunnel along Allegheny stops around A-35	4-6	2-Year	480	120	600	295	\$4,214	\$152	\$37	\$4,403
3e	Same as Alt. 3 except tunnel along Monongahela stops at around M-42	4-6	2-Year	480	120	600	295	\$3,988	\$141	\$37	\$4,166
3f- Prelim	Same as Alt.3 except tunnel along Monongahela stops at around M-59	4-6	2-Year	480	120	600	295	\$3,891	\$137	\$37	\$4,065
3g	Same as Alt 3. except tunnel along Monongahela stops at around T-04	4-6	2-Year	480	120	600	295	\$3,903	\$129	\$37	\$4,069
Hybrid Alternatives for Evaluating SSO Level of Control											
3f	Same as Alt. 3f-Prelim except tunnel end moved from M-59 to M-51	4-6	2-Year	480	120	600	295	\$4,071	\$130	\$35	\$4,236
3h	Same as Alt. 3f except 10-year SSO control	4-6	10-Year	480	120	600	295	\$4,076	\$131	\$35	\$4,242
3i	Same as Alt. 3f except typical year SSO control	4-6	Typical Year	480	120	600	295	\$3,932	\$129	\$34	\$4,094
Additional Hybrid Alternatives for Evaluating Presumption and Demonstration Approaches											
3j	Same as Alt. 3f except tunnel diameter reduced	4-6	2-Year	480	120	600	295	\$3,996	\$129	\$35	\$4,160
8a	Alt. 3 tunnel extent with diameter reduced	13-15 (4-6 in Sensitive areas)	2-Year	480	120	600	295	\$3,645	\$133	\$34	\$3,811

**Act 537 Plan Special Study – Regional Conveyance Facilities
Section 6 – Alternatives Analysis**

Table 6-1: Summary of System-Wide Control Alternatives Evaluated (Source: CWP Section 9.5 Tables 9-68 and 9-69)

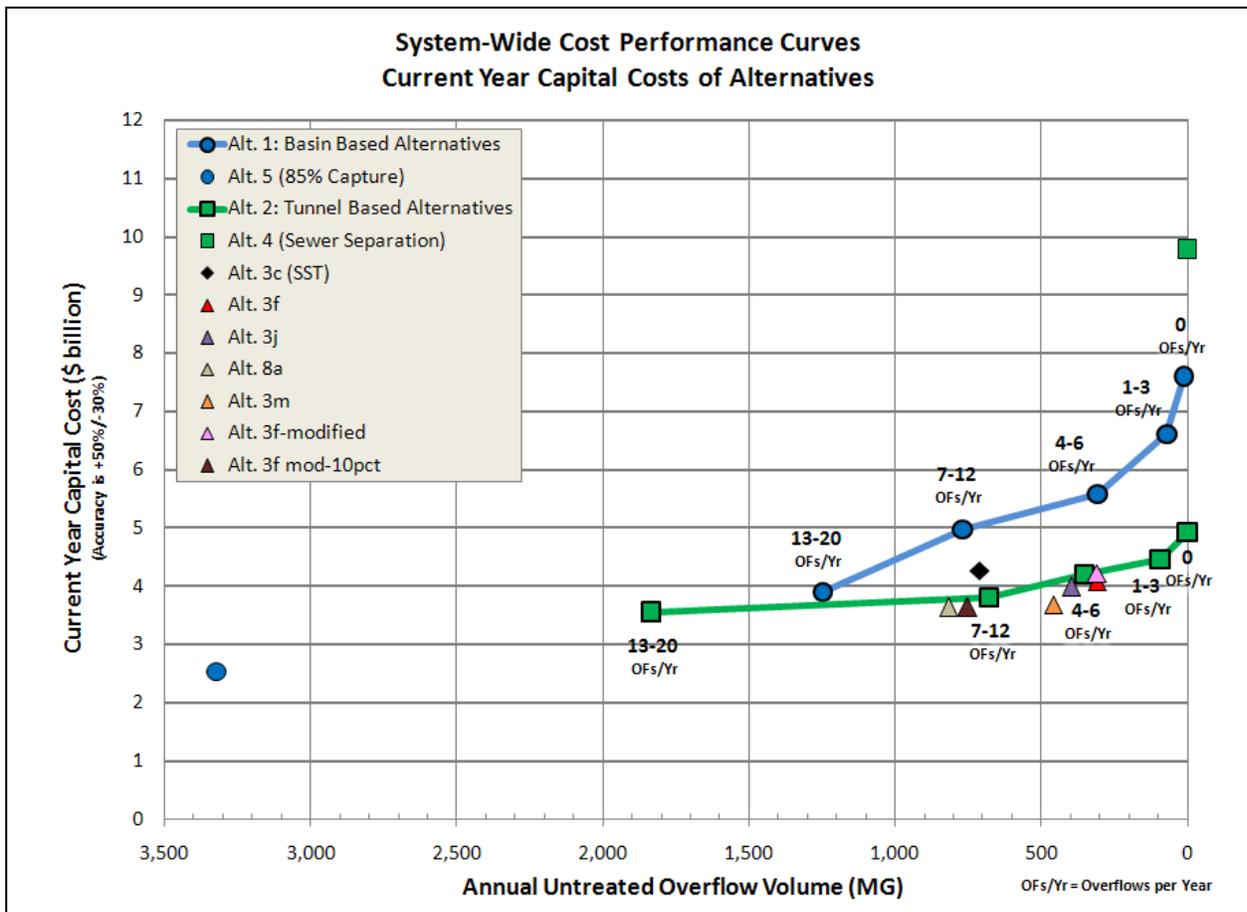
Alt. #	Description	ALCOSAN Control Level		WWTP Influent Pumping Capacity (MGD)		Treatment Capacity (MGD)		Clean Water Plan Cost Estimates (in millions of 2010 dollars)			
		CSO (Overflows/ Year)	SSO (Design Storm)	Main P.S.	WWPS	Primary	Secondary	Capital	O&M	R&R	Present Worth
3m	Same as Alt.8a except upper Monongahela served by regional tunnel (same tunnel extent as Alt. 3f)	13-15 (4-6 in Sensitive areas)	2-Year	480	120	600	295	\$3,680	\$128	\$34	\$3,841
3f-mod	Same as Alt. 3f except higher level of CSO control for outfalls in Sensitive areas	4-6 (0 in Sensitive areas)	2-Year	480	120	600	295	\$4,216	\$126	\$34	\$4,386
3f-mod-10pct	Same as Alt. 3f-mod except small volume overflows not connected to new conveyance	Varies	2-Year	480	120	600	295	\$3,550	\$146	\$87	\$3,780

6.2 Regional Conveyance Facilities Alternatives Analysis

The performance results of the regional-based control alternatives included cost-benefit analyses using the knee-of-the curve (KOC) approach as shown in Figure 6-1. While the KOC analyses evaluated arguably the two most important criteria (cost and performance) for each of the system-wide alternatives, they did not account for other considerations such as public factors, operational impacts, and implementation concerns. As a result, a system-wide alternatives ranking analysis was conducted to take those criteria into account.

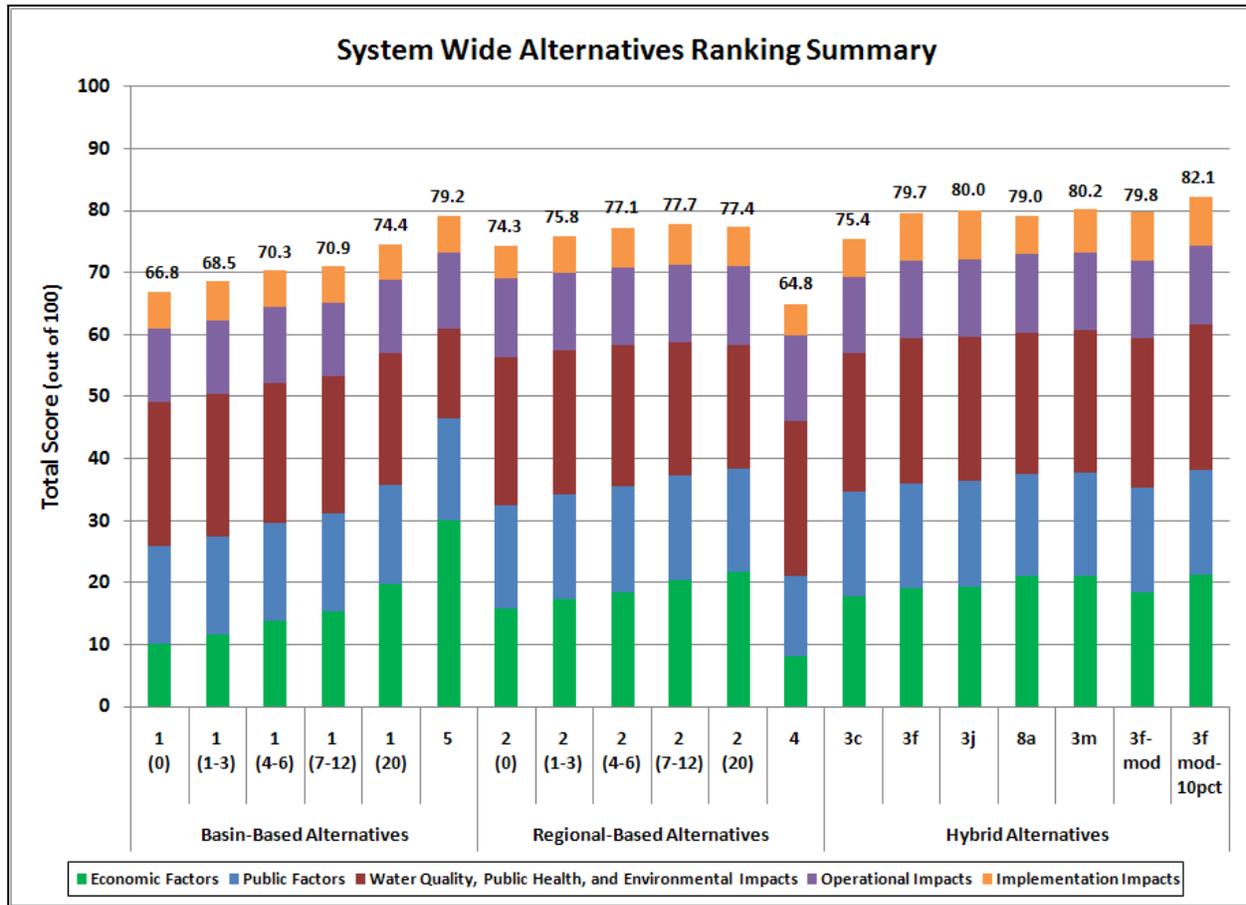
Input was solicited from each of the seven Basin Planning Committees, the Customer Municipality Advisory Committees (CMAC), and the Regional Stakeholders Group (RSG) and were finalized based on incorporating recommendations made by ALCOSAN representatives. The system-wide alternative scoring was based upon a potential maximum total score of 100 points. Information was collected for the various ranking criteria from H&H modeling results, alternative costing tool summaries, and the basin alternative ranking results. Using these data, an alternatives ranking software program was developed and used to assign scoring to the various cost and non-cost criteria. Figure 6-2 summarizes the results, with additional details documented in Section 9.5.7: System-Wide Alternatives Ranking Analysis of ALCOSAN’s CWP.

Figure 6-1: System-Wide Alternatives Knee of the Curve Analysis Results



**Act 537 Plan Special Study – Regional Conveyance Facilities
Section 6 – Alternatives Analysis**

Figure 6-2: System-Wide Alternatives Cost and Non-Cost Factor Scoring Results



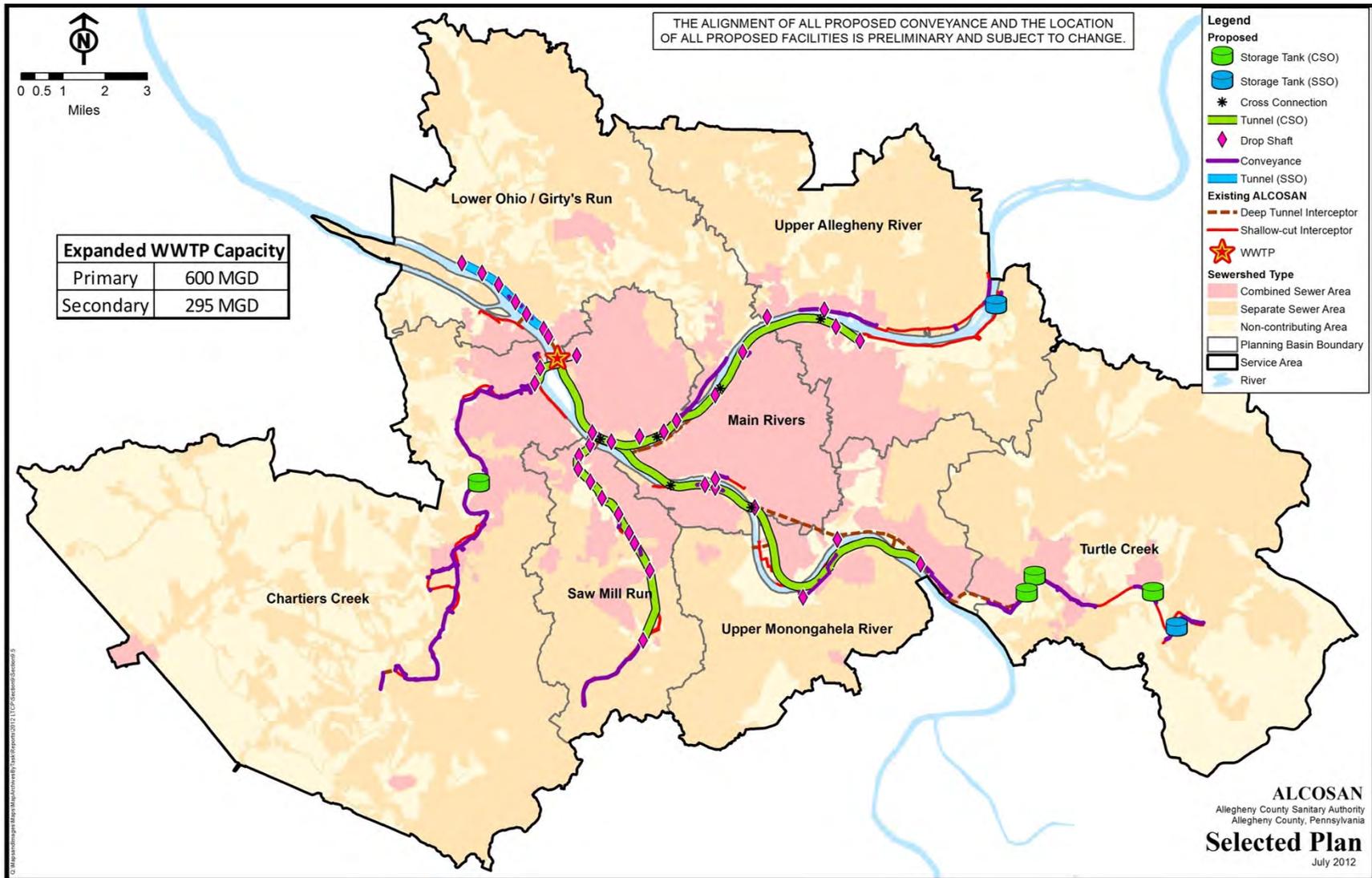
System-wide alternative 3f-modified-10pct was chosen as ALCOSAN’s Selected Plan based on the KOC analysis, the alternatives ranking analyses, and the following considerations:

- Meets all compliance requirements
- Highest ranked system-wide alternative
- Provides enhanced control to sensitive areas
- Best water quality benefit / cost performance
- Increased ability to expand capacity
- Overall most cost-effective system-wide solution
- Municipal and public participation influenced decision for Selected Plan

This alternative represented the most cost-effective system-wide solution to achieving compliance with ALCOSAN’s CD and the National CSO Control Policy and is based on expanded treatment capacity at the Wood’s Run plant, new regional conveyance/storage tunnels, and several remote storage facilities. A map of the preliminary locations/alignments of the ALCOSAN facilities, as envisioned in 2012, is shown on Figure 6-3.

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Figure 6-3: ALCOSAN's Selected Plan



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Since the \$3.6 billion Selected Plan was determined to be unaffordable, ALCOSAN and the regulatory agencies negotiated a more affordable IWWP as a part of a Modified Consent Decree, as described in Section 2.4. The \$2 billion (2010 dollars) IWWP generally represented a subset of the projects included in the Selected Plan, targeting those projects that provided the most cost-effective overflow volume reduction and water quality benefit.

While finalizing the Modified CD, ALCOSAN advanced planning and design of IWWP projects to meet agreed to completion deadlines. ALCOSAN conducted more refined alternatives analyses for the regional conveyance and storage components of the IWWP using new information generated from geotechnical investigations, property acquisition assessments, H&H modeling, environmental assessments, and municipal flow reduction progress. The refined alternatives analyses focused on alignments for the new tunnels and optimization of consolidation sewers, drop shafts, and other near surface facilities that convey flow to the tunnels.

Alternative horizontal and vertical alignment analyses determined that there would be no benefit to revising the vertical alignment of the tunnel system. However, horizontal alignment optimization opportunities were identified and resulted in proposed refinements to IWWP facilities. The driving factors used to develop the alternative horizontal alignments included:

- Identifying appropriate tunnel launch/retrieval sites
- Optimizing lengths of tunnels and connector tunnels (adits) to minimize cost
- Minimum radius of curvature of 1,000 feet for constructability purposes
- Keeping in the right-of-way to minimize private property easements
- Adjusting tunnel alignment to optimize the extent of connector tunnels (adits) and surface connections
- Avoiding large zones of claystone⁶⁻¹
- Qualitative screening factors such as environmental, constructability, public factors, redevelopment, differential costs, property, etc.

The refined tunnel horizontal alignment generally follows the major drop structures which convey flow to the tunnel to minimize the distance between the tunnels and preferred drop shaft locations and passes through preferred tunnel launch/retrieval shaft sites identified during the alternative analysis.

The consolidation sewer and drop shaft optimization process included revisiting the groupings of outfalls, or flow groups, controlled by conveying flow through consolidation sewers to a single drop shaft. During the analysis of preferred tunnel alignments, it was determined that some consolidated flow groupings could be more cost-effectively controlled with individual connections to the tunnels. This increased the number of drop shafts, reduced the length of consolidation sewers, and reduced surface disruption. For outfalls no longer requiring control via a new consolidation sewer, these refinements presented opportunities to consider control through system optimization. The optimization process considered several different alternate control measures including green infrastructure, maximizing conveyance to the existing

⁶⁻¹ Claystone is a fine-grained rock comprised of lithified clay sediments (majority of particles are less than 1/256 mm in size). Claystone has the texture and composition of shale, but it lacks the laminations and is less fissile than shale. Claystone generally has a blocky, thick to massive appearance. Source: Ohio Department of Natural Resources.

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interceptor and WWTP through modifying existing regulators and/or the improved HGL from the WWTP expansion, and extending the new tunnel in lieu of a remote retention treatment basin.

All recommended refinements to IWWP facilities were documented in the *Preliminary Basis of Design Report (BODR)* submitted to PaDEP and USEPA in October 2020, as detailed in Section 2.7 of this Special Study. The BODR refined and revised the regional conveyance facilities as they were originally envisioned in the approved CWP and constitutes a 20% level of design for the regional conveyance facilities. Proposed revisions to IWWP facilities were submitted to the regulatory agencies in November 2020 and were approved in March 2021.

6.3 Source Flow Reduction Program

6.3.1 Overview

ALCOSAN's wet weather program also includes the use of Green Stormwater Infrastructure (GSI) and other source controls. For more than 20 years, ALCOSAN and its customer municipalities have partnered to implement source reduction projects across the service area. The Modified Consent Decree recognizes the overflow reduction potential of source controls and allows for revisions to the Regional Conveyance Facilities detailed in this Special Study, if they can be shown to provide equivalent or better performance. Since the submission of its Clean Water Plan in 2013, ALCOSAN has been working with its customer municipalities to advance the use of source controls by supporting the identification and implementation of flow reduction projects. The following milestones represent key source flow reduction program progress:

- 2015 – ALCOSAN completed and distributed its *Starting at the Source*⁶⁻² report which evaluated the potential overflow reduction from source controls, identifying numerous project opportunities and providing an institutional framework for advancing source reduction projects through municipal partnerships
- 2016 – ALCOSAN established the Green Revitalization of Our Waterways (GROW) program that incentivizes municipal source reduction projects through an ALCOSAN cost sharing grant program
- 2017 – ALCOSAN municipalities completed source reduction demonstration projects and submitted Municipal Source Reduction Studies (MSRS) to PADEP and ACHD
- 2017 – ALCOSAN procured a Green Infrastructure and Source Control Program Manager to advance source reduction opportunity analyses and expand advocacy for municipal participation in the GROW program
- 2017 – ALCOSAN embarked on a Preliminary Planning Program which included identifying sewersheds where implementation of GSI and other source control strategies could provide a similar level of control as IWWP required grey infrastructure facilities
- 2019 – ALCOSAN issued a detailed Green Stormwater Infrastructure Guidance Manual describing project siting, selection, sizing, cost estimating, construction inspection, and operation and maintenance best practices for use by municipalities in coordination with the GROW program⁶⁻³

6-2 https://www.alcosan.org/docs/default-source/clean-water-plan-documents/starting-at-the-source-tech-report/scs-technical-report_aug2015v2.pdf

6-3 [https://www.alcosan.org/docs/default-source/grow/alcosan_monitoring_guidancedoc_final-\(003\).pdf?sfvrsn=ed853032_2](https://www.alcosan.org/docs/default-source/grow/alcosan_monitoring_guidancedoc_final-(003).pdf?sfvrsn=ed853032_2)

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- 2019 – ALCOSAN issued a Green Stormwater Infrastructure and Source Control Monitoring Guide to assist municipalities with the pre- and post-construction monitoring requirements of the GROW program
- 2020 – ALCOSAN issued its *Controlling the Source (CtS)*⁶⁻⁴ report, providing municipalities and other regional partners with additional assistance in identifying and implementing impactful source control projects that cost effectively reduce sewer system inflows and overflows

6.3.2 Analytical Framework for Identifying Source Reduction Projects

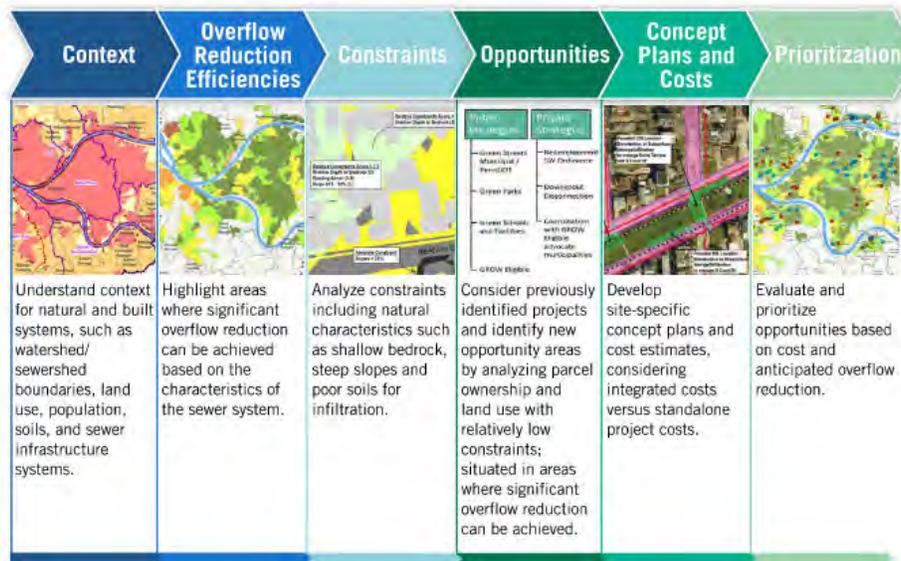
ALCOSAN has developed analytical processes for identifying and prioritizing the most impactful source control project opportunities structured around the following four source control project types:

- **Green Stormwater Infrastructure (GSI)** – stormwater control measures that use plant systems, soil systems, permeable pavement, and other approaches to store, infiltrate, evapotranspire or reuse stormwater, thereby reducing stormwater discharge into the municipal combined sewer systems;
- **Direct Stream Inflow Removal (DSIR)** – the practice of removing and re-routing natural streams and springs that had been routed into a municipal sewer system historically;
- **Sewer Separation (SS)** – the practice of separating all or portions of a municipal combined sewer system into separate sanitary sewer and storm sewer systems; and
- **Inflow & Infiltration (I/I) Reduction** – the practice reducing groundwater infiltration into sewers and the inflow of stormwater into sanitary sewer systems.

ALCOSAN’s analytical framework considers factors such as physical constraints; projects previously identified by ALCOSAN and others; inflow and overflow reduction; overflow reduction efficiencies; and costs through a six-step process. Since some features of the process vary by source control method, a generic process with four source-control specific processes are being utilized. As an example, the GSI specific process is illustrated in Figure 6-4. Resultant prioritized potential opportunities are discussed with municipalities who identify specific projects that would typically be implemented by the municipalities with potential GROW funding and technical support from ALCOSAN.

6-4 https://www.alcosan.org/docs/default-source/clean-water-plan-documents/controlling-the-source/2020-07-10_qsi-sc_cts_mainreport_final_r0.pdf?sfvrsn=11875ff6_8

Figure 6-4: GSI Flow Reduction Opportunity Identification & Prioritization Process



6.3.3 Source Controls Implementation Progress

Since its inception ALCOSAN’s GROW Program has offered grant awards totaling over \$60 million towards 136 municipal green stormwater infrastructure and source control projects. The program has also leveraged millions more in municipal, authority, and third-party funding. These projects are anticipated to reduce sewer overflows into the region’s waterways by an estimated 245 MG per year. In 2019 ALCOSAN’s Board voted to increase the award cap to \$10 million per project, up from the original \$2 million per project per cycle, in order for ALCOSAN to help its partners fund larger projects that could arise as the GROW program continues.

ALCOSAN is also advancing several other source control projects/initiatives as follows:

- **Flow Monitoring and Flow Isolation Studies (Municipal Source Control Evaluation Program)** - Starting in 2016, ALCOSAN has conducted a comprehensive flow monitoring and flow isolation study program, performing this monitoring for its municipalities at no charge to provide data and information to its customer municipalities so they can make informed decisions in identifying cost-effective flow reduction opportunities.
- **Ravine Street Direct Stream Removal and Clay Street Sewer Separation Projects** – Removal of the Ravine Street direct stream inflow from the municipal combined sewer system has long been a priority of ALCOSAN, Sharpsburg Borough and other local stakeholders. ALCOSAN, Sharpsburg Borough, O’Hara Township, Shaler Township and the State of Pennsylvania have committed funds to the construction of the project. The Clay Street Sewer Separation Project was bid and substantially completed in 2020. Construction for the Ravine Street Direct Stream Removal began in the fall of 2021.
- **Homestead Transforming 12th Avenue Project** – ALCOSAN is currently designing a project that will use GSI to reduce impervious area and capture and retain stormwater runoff from the Barrett Elementary School playground and parking lot property. The

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project may also use adjacent vacant lots to maximize the stormwater removed from the combined sewer system via infiltration and/or capture and slow release.

- **Green Leave Behind Projects** - As part of the construction activities associated with the IWWP, ALCOSAN will need access to various construction sites, including tunnel boring machines launch and retrieval, drop shaft, and new consolidation sewer locations. During construction, ALCOSAN will temporarily impact these sites and can leave behind an improved site legacy. The duration of construction and the nature of the temporary impact will vary from site to site. The site restoration definition will need to comply, at a minimum, with all applicable legal and regulatory requirements and obligations. It is not uncommon to provide a community amenity when restoring a site, thereby mitigating potential negative community impact perceptions about the project. In this context ALCOSAN has begun to consider opportunities to implement “Enhanced Site Restorations” or “Green-Leave Behinds” at selected sites, with the general intent of providing enhanced benefits to the communities affected while considering the affordability, adaptability and regional characteristics of the IWWP. As design of the first tunnel segment progresses, ALCOSAN will continue to evaluate opportunities to create “high impact, low investment” site restoration strategies which balance innovation with affordability and collaborate with the Registered Community Organizations for local input into the leave behinds.

The following opportunities were identified in the CtS report issued in July 2020 using the analytical framework summarized in Section 6.3.2:

- 195 potential GSI opportunities were identified with 59 were prioritized for concept development;
- Fifteen high-ranking DSI locations were selected to be included in a DSIR feasibility study, completed in May 2020;
- A total potential contributing area of 1,300 acres (380 impervious acres) were identified as meriting further evaluation as to their potential for sewer separation;
- Approximately 100 potential sewer separation opportunity areas were identified; and
- The I/I reduction opportunities process has been applied to specific sewersheds where flow monitoring and flow isolation studies have been performed. ALCOSAN has completed evaluations for 10 point of connections (POCs) within the service area with four additional POCs currently under evaluation.

An interactive Web Map was created to facilitate access to CtS information, including existing conditions, previously identified project locations, overflow reduction efficiencies, and identified opportunities. The full CtS report and the Web Map are hosted on ALCOSAN’s website: <https://www.alcosan.org/our-plan/plan-documents/controlling-the-source>

6.3.4 Adaptive Impact on IWWP Regional Conveyance Facilities

While the flow reduction progress described above is significant, the varied objectives and geographic spread of these projects has resulted in widely distributed dry and wet weather flow reduction benefits. While wide-spread flow reduction provides meaningful benefits, reducing the size of a particular element of ALCOSAN’s IWWP regional tunnel would require more

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targeted wet weather flow reduction. Since the currently proposed source reduction projects are not concentrated in any POC sewershed directly tributary to the proposed regional tunnel, the systemwide inflow reductions achieved by these completed and proposed projects are not expected to be sufficient to eliminate or reduce the tunnels in the IWWP or the Selected Plan.

Conversely, some of the best opportunities to reduce grey infrastructure components of the Regional Conveyance Facilities described in this Special Study would be to target GSI or SS in the POC sewersheds directly tributary to the proposed regional tunnel, as there may be potential to eliminate certain consolidation sewers or drop shafts. In a past analysis to identify potential cost savings, five IWWP POC sewersheds were identified that warrant further evaluation for source reduction project opportunities which could provide equivalent overflow reduction performance for comparable or lower cost relative to the planned near-surface grey infrastructure. These opportunities are shown in Table 6-2 and have the potential to eliminate selected consolidation sewers, regulator modifications, or drop shafts. These potential cost-saving opportunities are being retained for possible further evaluation in the adaptive management window (early in design) for each tunnel segment. POCs referenced in the table do not exclude other POCs from being considered for source reduction. In addition, ALCOSAN will continue coordination and cooperation with the PWSA on improvement projects in the areas of IWWP POCs listed in the Draft City-Wide Green First Plan at 30 Priority Sewersheds. Table 6-3 provides these PWSA priority sewersheds by tunnel segment.

Table 6-2: Sewersheds where Green Infrastructure has the Potential to Eliminate Grey Infrastructure in IWWP Regional Conveyance Facilities

Outfall	Potential Control Measure Revision
A-77 (Aspinwall)	To be adaptively evaluated for control using green infrastructure or other source controls based on level of municipal interest as tunnel design advances. * Discharges to a sensitive area. Required level of control is 0 overflows per typical year.
A-78 (Aspinwall and Fox Chapel)	
M-18 (City of Pittsburgh) *	
M-20 (City of Pittsburgh) *	
O-40 (City of Pittsburgh) *	

Table 6-3: IWWP POC's Identified as PWSA Green First Priority Sewersheds

Planning Basin	Outfall
Ohio River Tunnel Segment	O-27, O-39, O-40, O-41
Allegheny River	A-22, A-41, A-42, A-48, A-58, A-60, A-61, A-62, A-63, A-64, A-65
Monongahela River Tunnel Segment	M-15, M-15Z, M-16, M-18, M-19, M-19B, M-20, M-21, M-22, M-29

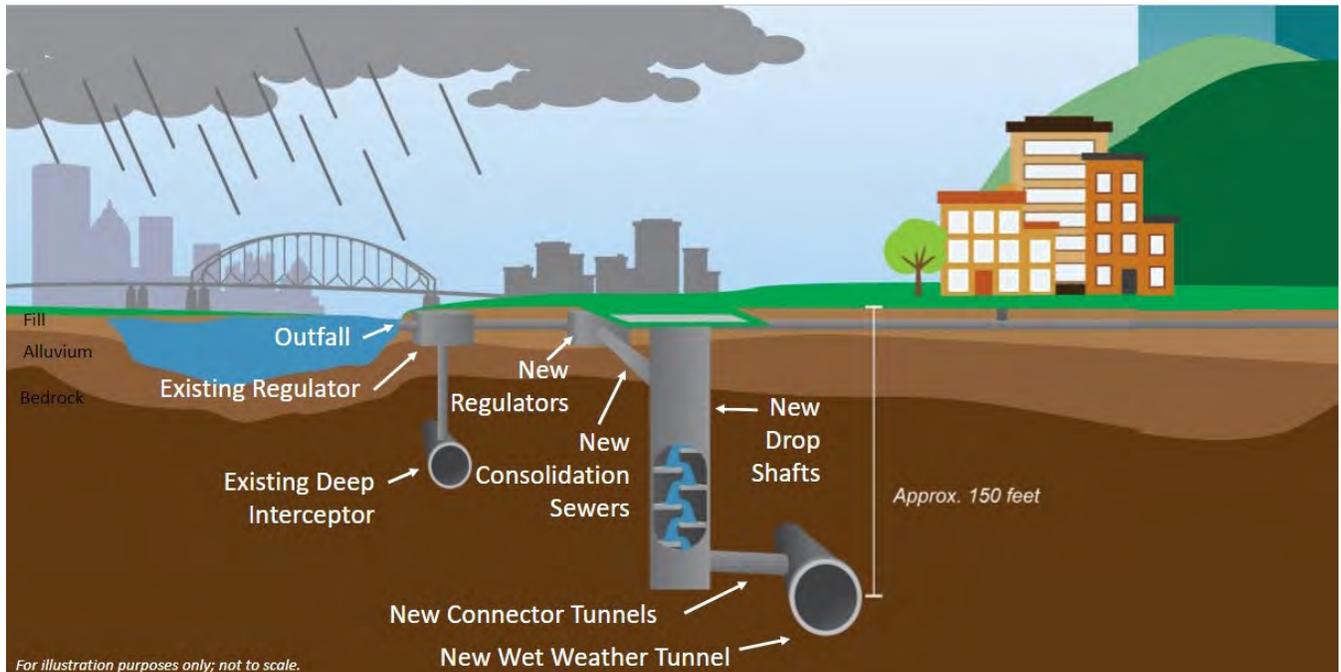
While the Preliminary Planning for the Regional Conveyance Facilities has evaluated GSI/SC opportunities in relation to the defined IWWP regional conveyance facilities, additional opportunities may arise in the future as ALCOSAN considers priority projects along transferred intermunicipal trunk sewers and the Final Measures projects to be identified once the IWWP projects are completed

6.4 IWWP Regional Conveyance Facilities as Currently Proposed

6.4.1 Overview

The IWWP Regional Conveyance Facilities represent a subset of ALCOSAN’s Selected Plan and will consist of conveyance and storage tunnels designed to capture wet weather flows that currently overflow from ALCOSAN’s existing regional conveyance system and convey them to the Woods Run WWTP for treatment. The proposed facilities consist of three major tunnel segments along the Ohio River, the Allegheny River and the Monongahela River ranging from 14-feet to 18-feet in diameter. Related facilities include consolidation sewers, drop shafts, regulator structures, modified outfalls, and related appurtenances designed to optimize regional conveyance system flow capture and protect the system from surges during large events. A wet weather pump station (WWPS) is also proposed for pumping from the tunnel to ALCOSAN’s treatment system. A conceptual illustration of the tunnel system facilities, including near surface facilities, is shown in Figure 6-5 with example photographs from other cities shown on the following page.

Figure 6-5: Cross-Sectional Conceptual Diagram of Tunnel System Facilities



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Drop shaft during and after construction



Main tunnels are planned to be 16 to 18 feet in finished diameter and will be constructed an average of 150 feet below ground. They will primarily be constructed using large tunnel boring machines (TBMs) that will be lowered from the surface and later retrieved via construction shafts.

Connector tunnels (adits) are short tunnels that send combined sewage from the drop shafts to the main tunnel. Connector tunnels will typically be 8 feet in finished diameter and be located at similar depths as the main tunnel.

Construction shafts are deep, vertical structures used to lower a TBM into the main tunnel to launch it or to remove it. After construction, construction shafts are typically converted to drop shafts and/or access shafts.

Drop shafts are deep, vertical structures that convey combined sewage from near surface consolidation sewers to the deep level of the connector tunnel or main tunnel. Their design includes hydraulic structures to manage flow as it drops and to dissipate the energy generated to prevent damage to the drop shaft and the tunnels.

Access shafts are used for tunnel inspection and maintenance including the lowering of equipment and personnel into the tunnel if necessary.

Regulators divert combined sewage from municipal systems to downstream facilities. Dry weather flow is directed through the existing sewers to the treatment plant, while wet weather flows is directed to the new tunnels for conveyance to the treatment plant and some temporary storage. Flows that exceed design capacities will continue to discharge to receiving waters through permitted CSO outfalls as they do today.

Consolidation sewers convey combined sewage from regulators to drop shafts and are considered “near surface facilities” as they are built at similar depths as existing sewers. They are anticipated to range between 24-inches and 144-inches in diameter at depths of 10 to 50 feet below ground.

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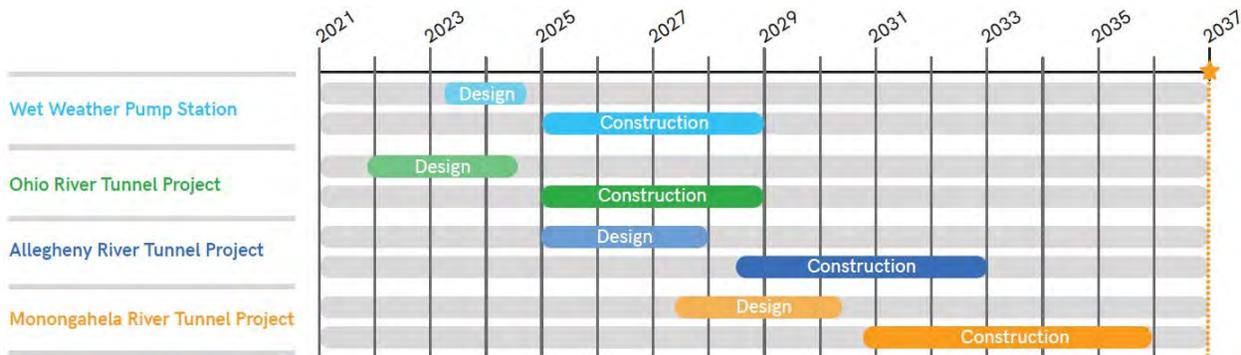
The Ohio River segment includes the Ohio River Tunnel (ORT), Chartiers Creek Tunnel (CCT) and the Saw Mill Run Tunnel (SMRT), a total of 9 drop shafts, 4 of which are planned to be constructed within tunnel boring machine (TBM) launch or retrieval shafts, 6 connector tunnels (adits) and near surface facilities associated with 10 points of connection. The ORT preliminary design is based on an 18-foot diameter tunnel that is approximately 24,200 lineal feet or 4.6 miles long, with depths ranging from 130 to 190 feet below grade. The ORT includes 14-foot diameter tunnel segments crossing under the Ohio River to convey wet weather flows from the existing ALCOSAN Chartiers Creek and Saw Mill Run regional conveyance interceptor sewers.

The Allegheny River Tunnel (ART) segment preliminary design is based on an 18-foot-diameter tunnel that is approximately 28,550 lineal feet, or 5.4 miles, a total of 11 drop shafts, 1 of which is planned to be constructed within a TBM retrieval shaft, 10 connector tunnels (adits) and near surface facilities associated with 20 points of connection. The depth of the ART varies from 100 to 200 feet below grade.

The Monongahela River Tunnel (MRT) segment preliminary design is based on an 18-foot-diameter tunnel that is approximately 28,040 lineal feet or 5.30 miles. Although an 18-foot-diameter tunnel is currently recommended, given the smaller inflows in the MRT, a 16-foot-diameter or smaller tunnel should be evaluated during the adaptive management phases of the IWWP. The MRT includes a total of 8 drop shafts, 1 of which is planned to be constructed within a TBM launch shaft, 7 connector tunnels (adits) and near surface facilities associated with 11 points of connection. The depth of the MRT varies from 110 to 390 feet below grade.

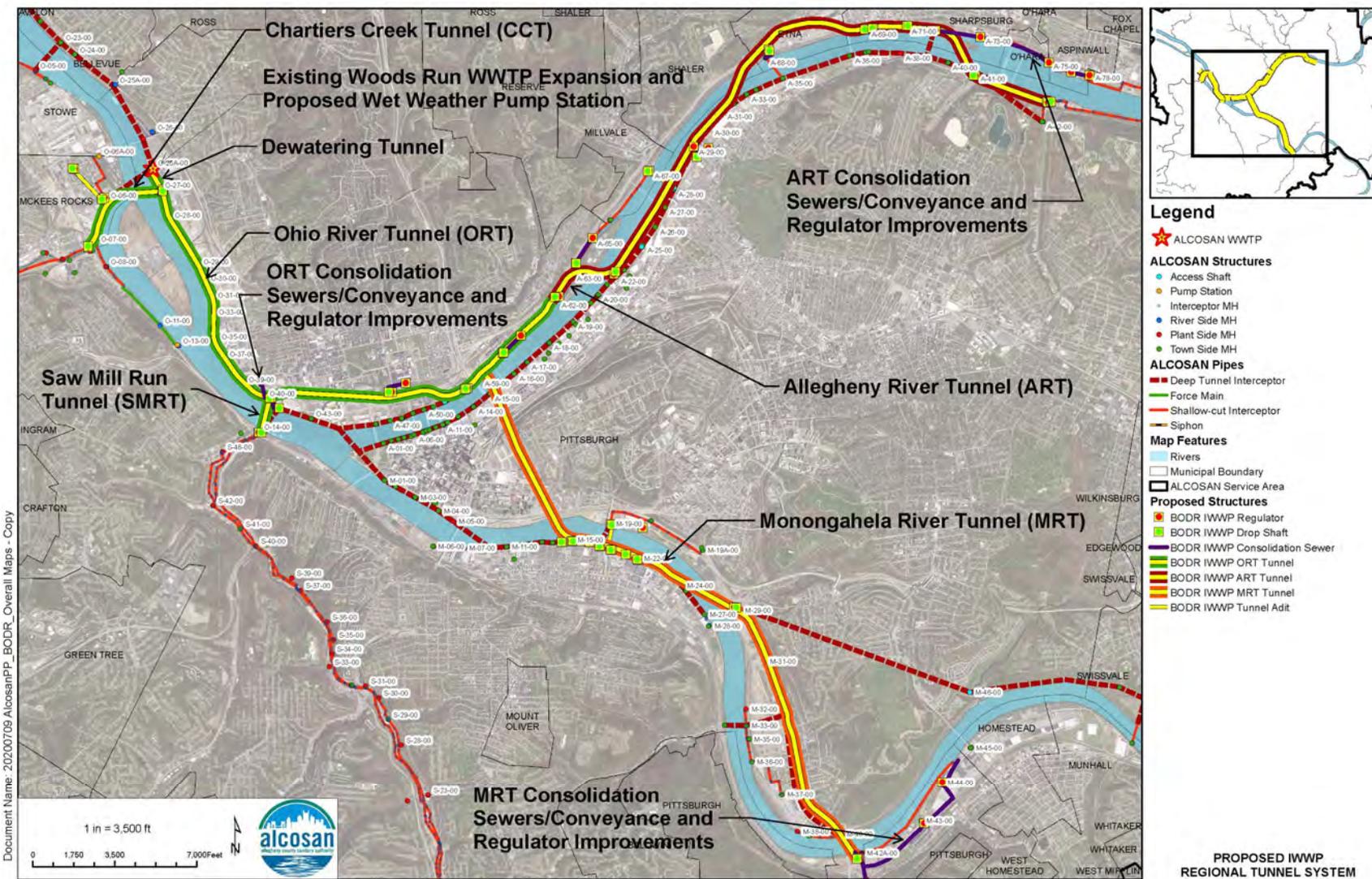
The current design and construction schedule for the proposed IWWP Regional Conveyance Facilities is shown in Figure 6-6. The currently proposed regional conveyance facilities and tunnel alignments are shown in Figure 6-7.

Figure 6-6: Current Schedule for Proposed IWWP Regional Conveyance Facilities



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Figure 6-7: Proposed IWWP Regional Conveyance Facilities



The tunnel system will terminate at a new 120 MGD WWPS approximately 150 feet below grade to be located at or near ALCOSAN’s Woods Run WWTP. The WWPS will convey flows from the regional tunnel to the headworks for treatment during wet weather events and dewater the tunnel after wet weather events. This 120 MGD WWPS will augment the 480 MGD Main Pumping Station, producing a combined capacity of 600 MGD to match the planned future wet weather treatment capacity of the WWTP. While assumptions on the operational protocols and design criteria for the WWPS are included in the *IWWP Regional Conveyance Facilities BODR* in the context of operation and performance of the tunnels, preparation of a separate basis of design report for the WWPS is currently underway.

6.4.2 Basis of Design

The hydraulic basis of design of the IWWP regional conveyance facility improvements has been developed to achieve performance expectations established by ALCOSAN’s Modified CD and approved Wet Weather Plan. Once complete, IWWP facilities must collectively reduce ALCOSAN CSOs to less than 2,700 MG during the Typical Year using estimated municipal flows in 2046. In addition, overflows must be eliminated during the Typical Year for 15 outfalls which discharge directly to sensitive areas, except that one overflow is allowed at the A-67 outfall. The basis of design also addresses hydraulic surge control to mitigate the risk of manhole geysers, air blow-off, infrastructure damage or system backups that could occur during large intense rain events. To achieve these performance criteria, the tunnels are sized, in coordination with planned treatment plant upgrades, to provide the needed conveyance capacity and storage volume.

For surge control, a set of model simulations was performed using the July 4, 2003 event and a 5-year, 24-hour event. The July 4, 2003 event was utilized as it was an intense storm that generated large peak rates along the ART, which was identified as a major consideration for surge control. The 5-year, 24-hour storm was then used to evaluate surge mitigation approaches to safely fill the tunnels to surcharge conditions during events greater than the CSO control design. Along with providing the needed conveyance capacity, the tunnel volume was confirmed to achieve the established IWWP performance of not more than 2,700 MG of CSO during Typical Year simulations using 2046 flows. The resultant preliminary tunnel sizing is summarized in Table 6-4.

For each tunnel segment, near surface facilities are needed to collect and convey flows from the municipal collection system into the new tunnels. Near surface facilities include consolidation sewers, drop shafts, regulating structures, modified outfalls, and near surface cross-connections to the existing tunnel system. Peak Typical Year flow rates from the Systemwide Selected Plan model were used to determine design flows for the sizing of regulators, inflow control gates/coarse screens, consolidation sewers and drop shafts. The flow rates from this model include proposed municipal improvements and future wastewater flow projections to reflect the year 2046 conditions. Table 6-5 identifies the proposed IWWP near surface facilities. A location map is provided as Figure 6-8. Both the table and figure reflect several changes as reflected in ALCOSAN’s approved *Proposed Revisions to Interim Measures* report.

As shown in Table 6-5, the tunnel planning to date has identified six locations where existing outfalls may need to be modified or supplemented to act as a tunnel relief outfall that mitigates the risk of manhole geysers, infrastructure damage or system backups that could

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occur during large intense and rare rain events. Each of these sites will be evaluated further as the tunnel design progresses to see if modifications to existing outfalls can meet tunnel relief needs. If one or more new outfalls are determined to be necessary to manage extreme rain events, it would be accomplished by relocating current discharge volumes without compromising the significant net systemwide reduction shown in Section 6.4.3.

Table 6-4: IWWP Regional Conveyance Facilities Preliminary Basis of Design

Tunnel Segment	Length (miles)	Diameter (ft)	Storage Volume	Conveyance Capacity¹ (MGD)	Peak Flow Rate² (MGD)
Ohio River Tunnel (including CCT and SMRT)	5.7	18 (ORT) 14 (CCT) 14 (SMRT)	53	1,620 (ORT) 830 (CCT) 830 (SMRT)	1500 (ORT) 120 (CCT) 140 (SMRT)
Allegheny River Tunnel	5.4	18	54	1,620	1,300
Monongahela River Tunnel	5.3	16-18	42-53	1,180-1,620	520
Total	16.5		149-160	NA	NA

1. Based on 0.1% slope proposed for all tunnel segments
2. Reflects the highest typical year peak flow rate at any point along each tunnel segment based on hydraulic model predictions.

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Table 6-5: Proposed IWWP Regional Conveyance Near-Surface Facilities

Site No.	Description of Near Surface Facilities	Tunnel Segment	Municipality	Closest ALCOSAN Structure
1	Upstream terminus of Chartiers Creek Tunnel, drop shaft, consolidation sewer, potential new tunnel relief outfall nearby several existing outfalls (C-03 through C-09) which will remain, and cross-connection to existing system	Chartiers Creek	McKees Rocks	O-07
2	Possible work shaft for constructing connecting tunnel to Site 3	Chartiers Creek	McKees Rocks	O-06
3	Drop shaft, regulator and consolidation sewer	Chartiers Creek	McKees Rocks	O-06A
4	Wet Weather Pump Station and force main	Ohio River	Pittsburgh	WWTP
5	Chartiers Creek Tunnel junction with the Ohio River Tunnel, drop shaft, regulator, consolidation sewer and potential new tunnel relief outfall located within 150 feet downstream of existing outfall which would remain (alternate site being explored)	Ohio River	Pittsburgh	O-27
6	Saw Mill Run Tunnel junction with the Ohio River Tunnel, drop shaft, regulator, consolidation sewer and potential relocation of existing CSO outfall to a new CSO outfall in same vicinity. Site has been reduced in size.	Ohio River	Pittsburgh	O-41
7	Upstream terminus of Saw Mill Run Tunnel, drop shaft, 2 regulators and consolidation sewer	Saw Mill Run	Pittsburgh	O-14
8	Drop shaft, 2 regulators and consolidation sewer	Ohio River	Pittsburgh	A-48
9	Drop shaft, 2 regulators and consolidation sewer	Ohio River	Pittsburgh	A-58
10	Drop shaft, regulator and consolidation sewer. Site has been reduced in size.	Ohio River	Pittsburgh	A-60
11	Upstream terminus of Ohio River Tunnel with drop shaft, regulator and consolidation sewer; downstream terminus of Allegheny River Tunnel with launch shaft (alternate site being explored)	Ohio River	Pittsburgh	A-62
12	Drop shaft, 2 regulators and consolidation sewer	Allegheny River	Pittsburgh	A-64
13	Drop shaft, regulator and consolidation sewer	Allegheny River	Pittsburgh	A-22

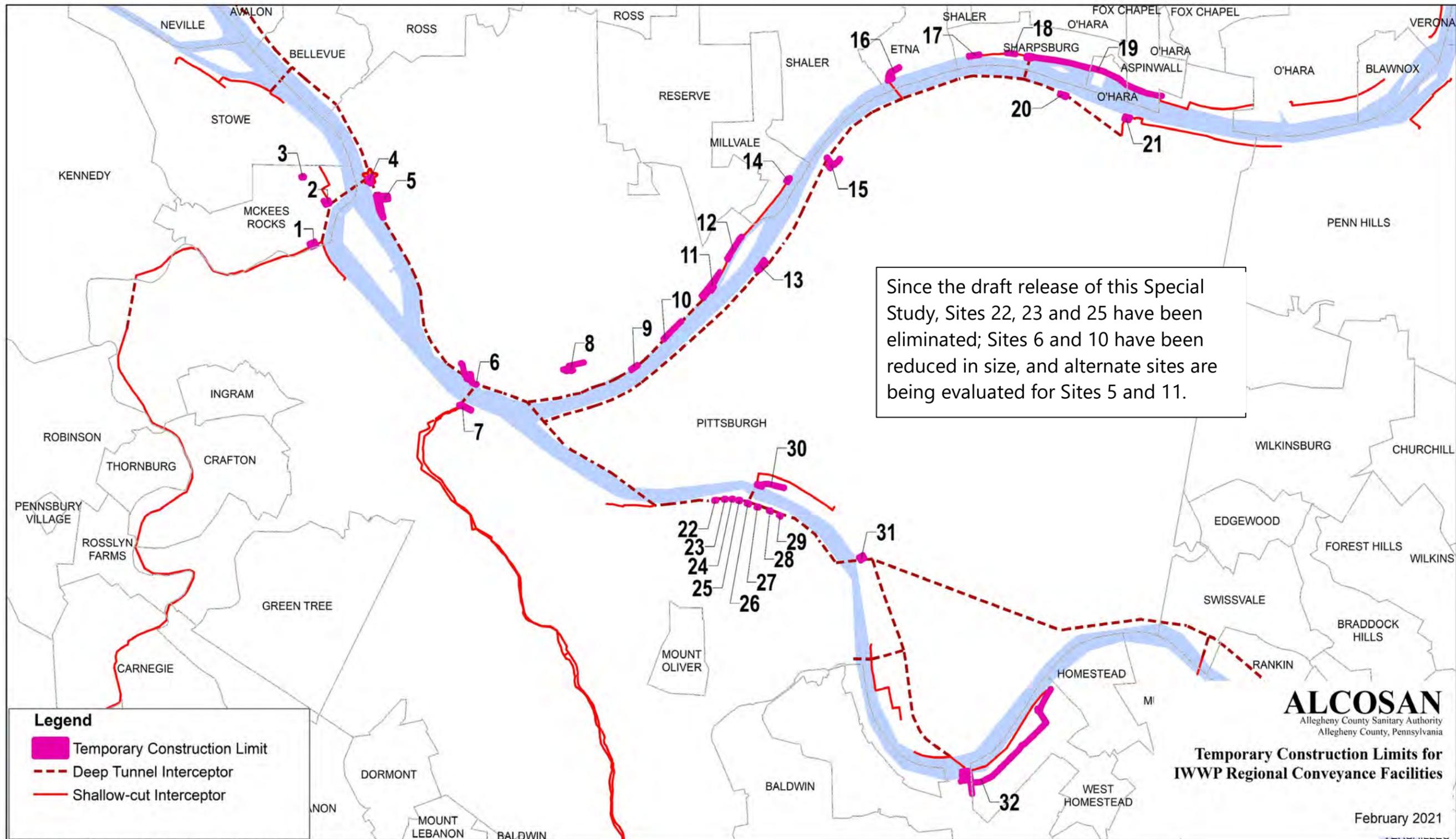
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Site No.	Description of Near Surface Facilities	Tunnel Segment	Municipality	Closest ALCOSAN Structure
14	Drop shaft, regulator and consolidation sewer	Allegheny River	Millvale	A-67
15	Drop shaft, 2 regulators and consolidation sewer	Allegheny River	Pittsburgh	A-29
16	Drop shaft, regulator and consolidation sewer	Allegheny River	Etna	A-68
17	2 drop shafts, 2 regulators and consolidation sewers	Allegheny River	Sharpsburg	A-69 & A-70
18	Drop shaft, regulator and consolidation sewer	Allegheny River	Sharpsburg	A-71
19	Drop shaft, 7 regulators, consolidation sewer, potential relocation of existing CSO outfall to a new CSO outfall in same vicinity, and cross-connection to existing system	Allegheny River	Sharpsburg and Aspinwall	A-72
20	Drop shaft, 2 regulators and consolidation sewer	Allegheny River	Pittsburgh	A-41
21	Upstream terminus of the Allegheny River Tunnel, drop shaft, 2 regulators, consolidation sewer and potential new tunnel relief outfall located about 2,300 feet upstream of existing outfall which would remain	Allegheny River	Pittsburgh	A-42
22	Drop shaft eliminated. Site no longer required.	Monongahela River	Pittsburgh	M-15Z
23	Drop shaft eliminated. Site no longer required.	Monongahela River	Pittsburgh	M-15
24	Drop shaft, regulator and consolidation sewer	Monongahela River	Pittsburgh	M-16
25	Drop shaft eliminated. Site no longer required.	Monongahela River	Pittsburgh	M-17
26	Drop shaft, regulator and consolidation sewer	Monongahela River	Pittsburgh	M-18
27	Drop shaft, regulator and consolidation sewer	Monongahela River	Pittsburgh	M-20
28	Drop shaft, regulator and consolidation sewer	Monongahela River	Pittsburgh	M-21
29	Drop shaft, regulator and consolidation sewer	Monongahela River	Pittsburgh	M-22
30	Drop shaft, 2 regulators and consolidation sewer	Monongahela River	Pittsburgh	M-19
31	Drop shaft, regulator and consolidation sewer	Monongahela River	Pittsburgh	M-29

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Site No.	Description of Near Surface Facilities	Tunnel Segment	Municipality	Closest ALCOSAN Structure
32	Upstream terminus of the Mon. River Tunnel, drop shaft, 3 regulators, consolidation sewer, potential new tunnel relief outfall and new CSO outfall both located about 200 feet downstream of the mouth of Streets Run (existing CSO outfall discharging to Streets Run would remain)	Monongahela River	West Homestead and Pittsburgh	M-42

Figure 6-8: IWWP Near-Surface Facilities Location Map



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6.4.3 CSO Reduction Benefits

The IWWP makes substantial progress towards achieving CWA and CD requirements, which will be fully realized following implementation of subsequent Clean Water Plan phases. Figure 6-9 presents the forecasted typical year CSO volume reduction for each ALCOSAN receiving water after completion of the IWWP in 2036. Impressive reductions will be realized along the three main rivers and downstream portions of Chartiers Creek. Figure 6-10 illustrates the progressive CSO reduction benefits following each major construction milestone. Once complete, IWWP improvements are projected to reduce untreated CSO volume per typical year to less than ALCOSAN’s 2,700 MG overflow volume remaining performance criteria. This will cumulatively prevent over 65,000 MG of CSO discharge to receiving waters through 2040. ALCOSAN’s Clean Water Plan implementation has also resulted in the closure of 14 CSOs, 2 of which discharged to sensitive areas, since entry of the original CD in 2008.

Figure 6-9: IWWP CSO Volume Reduction by Receiving Water

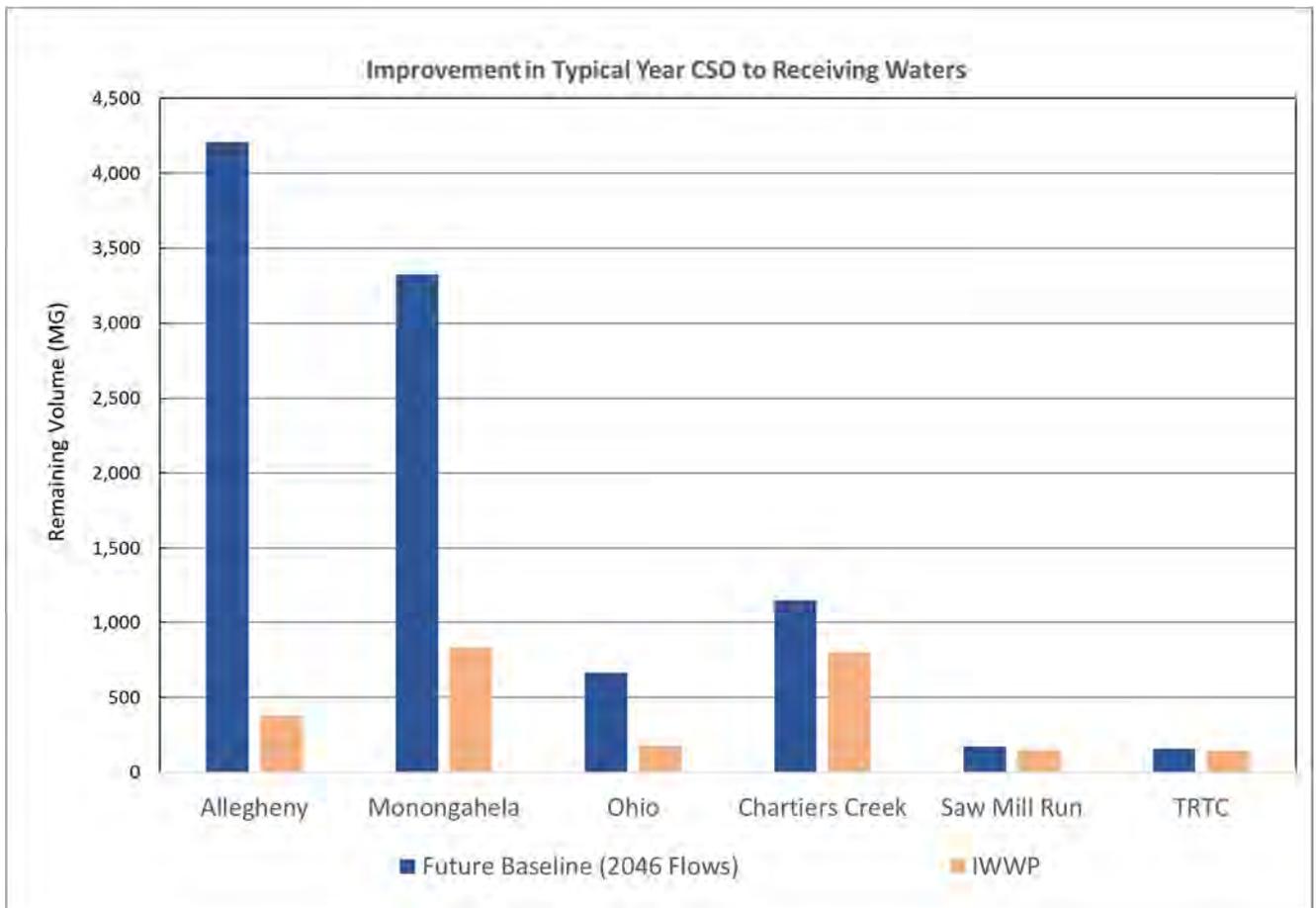
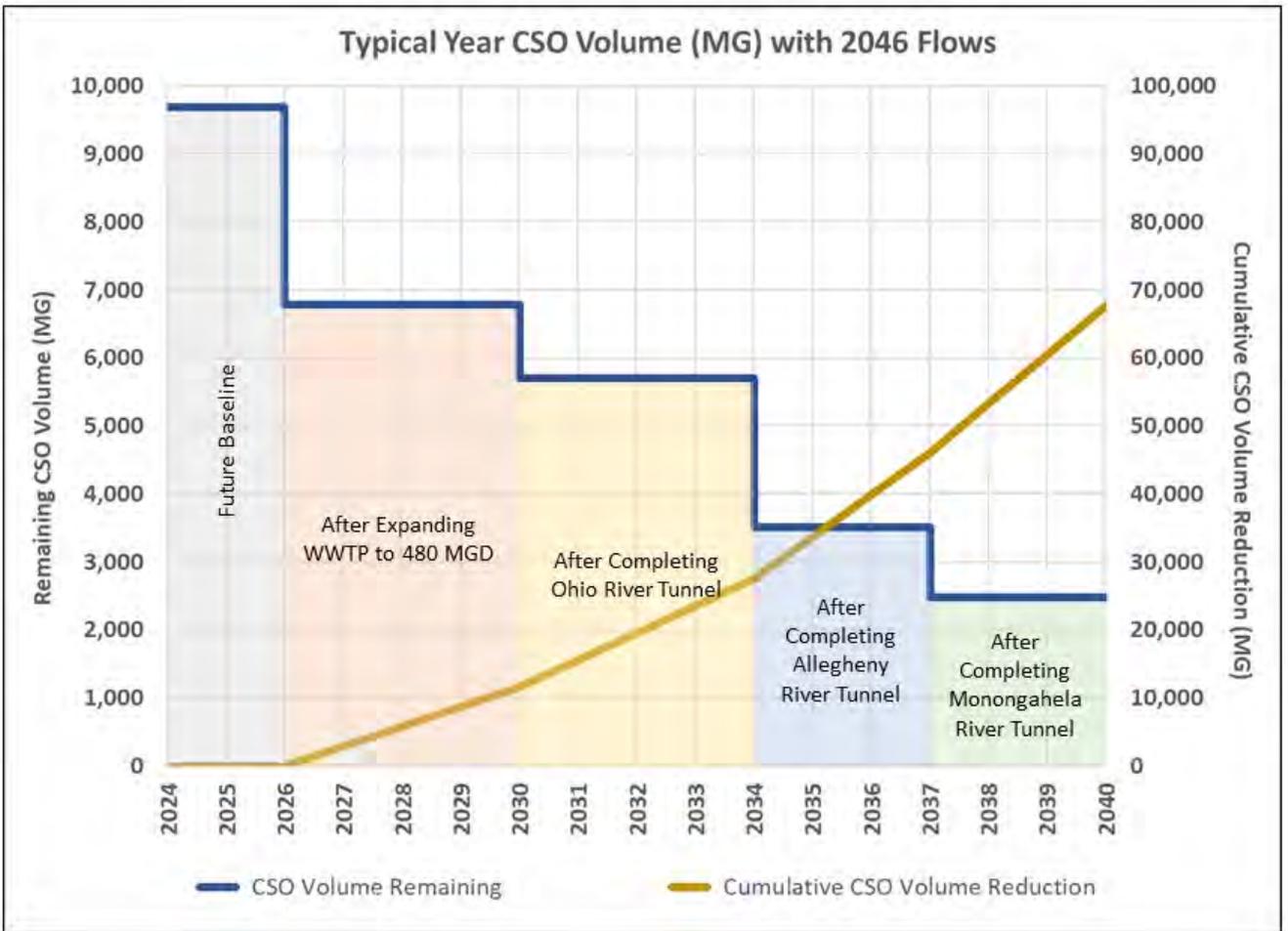
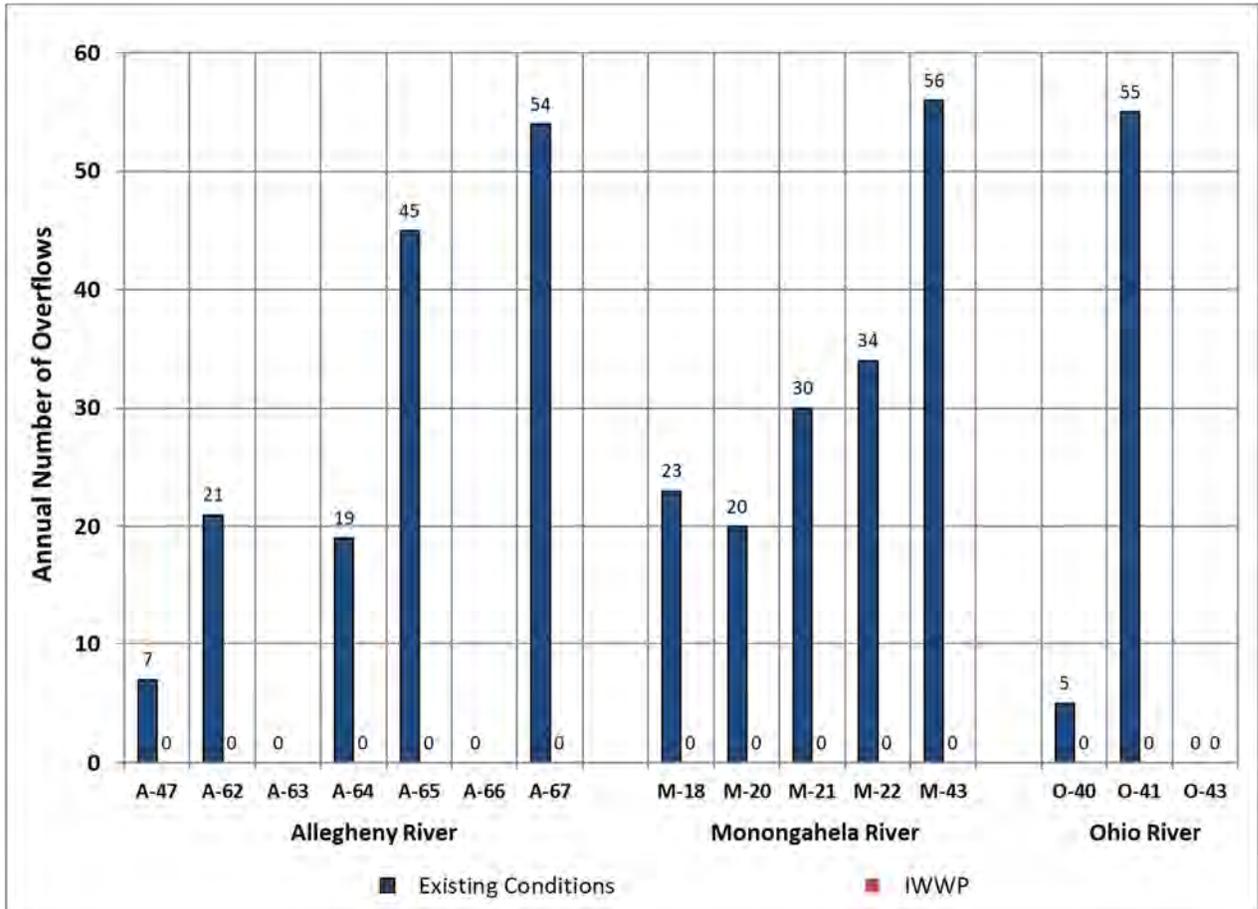


Figure 6-10: IWWP CSO Volume Reduction by Construction Milestone



The IWWP also provides control of CSO discharges to Sensitive Areas. Figure 6-11 shows the improvement in overflow frequency to the 15 outfalls that discharge to sensitive areas for existing conditions and after completion of IWWP facilities. The IWWP model estimates zero overflows in the TY at each of these sensitive area outfalls. The updated Selected Plan model also estimates zero overflows at each sensitive area outfall, but the Final Measures to be determined in the future may still involve one overflow at A-67, equivalent to the original Selected Plan. All contributing sanitary flows to two outfalls that discharged to sensitive areas, A-63 and A-66, were eliminated as part of the Route 28 Widening Project and the outfalls were converted to storm outfalls.

Figure 6-11: Typical Year CSO Frequency Reduction for Outfalls Discharging to Sensitive Areas



6.4.4 Engineer’s Opinion of Probable Construction Cost

The Engineer’s Opinion of Probable Construction Cost (EOPCC) for the three tunnels and all appurtenances as presented in the BODR⁶⁻⁵ is summarized on Table 6-6. Table 6-6 also includes the EOPCC for the WWPS as updated in 2021 by ALCOSAN’s program manager for the WWTP expansion program. The tunnel cost estimates are an Association for the Advancement of Cost Estimating (AACE) Class III estimate with an expected accuracy range of +20% to -15%. The base construction cost estimates for the tunnel are in May 2020 dollars. The WWPS cost estimate is an AACE Class IV estimate with an expected accuracy range of +30% to -20%. The base construction cost estimate for the WWPS is in September 2021 dollars.

⁶⁻⁵ Source: Preliminary Basis of Design Report for Regional Conveyance Facilities of the Interim Wet Weather Plan October, 2020 prepared by Wade Trim, page 1-19.

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Table 6-6: Summary of IWWP Regional Conveyance Facility Costs (2020 \$ Million)

Regional Conveyance Facility	Construction Cost
Ohio River Tunnel (including CCT and SMRT)	\$411
Allegheny River Tunnel	\$439
Monongahela River Tunnel	\$408
Wet Weather Pump Station	\$135
Total	\$1,393

7.0 ENVIRONMENTAL AND REGULATORY CONSISTENCY REVIEW

PaDEP guidelines require the proposed facility upgrade plan to be evaluated for consistency with certain planning, environmental and natural resource laws and policies of the Commonwealth. Sections 7.1 through 7.3 address this consistency review requirement. Section 7.4 summarizes a recently completed and approved comprehensive environmental assessment for ALCOSAN's WWTP expansion and regional conveyance facilities. Section 7.4 also includes discussion of a no-action alternative to the proposed IWWP regional conveyance facilities. A Uniform Environmental Report covering the IWWP Regional Conveyance Facilities described in this Special Study is provided as Appendix B.

7.1 Clean Water Act and Pennsylvania Clean Streams Law

7.1.1 CWA Section 208

Section 208 of the Clean Water Act calls for the development of plans for the identification of treatment works necessary to meet the anticipated municipal and industrial waste treatment needs of an area over a 20-year period. Section 5 of this special report documents that ALCOSAN's Woods Run Wastewater Treatment Plant will have adequate capacity through and beyond the 2046 planning year. ALCOSAN's 1996 Act 537 Plan (amended in 2018) was developed in conformance to the Comprehensive Water Quality Management Plan developed for the Pittsburgh region under Sections 4 and 5 of the Clean Streams Law and 208 of the Clean Water Act for all areas of the Commonwealth.

7.1.2 Facilities Plans Developed Under Titles II or VI of the Clean Water Act

ALCOSAN's Woods Run WWTP was upgraded proactively to secondary treatment in the early 1970s under the Water Pollution Control Act of 1956 and prior to the Clean Water Act of 1972 amending the Water Pollution Control Act. Therefore, a facilities plan under Title II (Section 201) was not developed by ALCOSAN. The approved and amended 1996 Act 537 Plan is the functional equivalent of a Section 201 facilities plan.

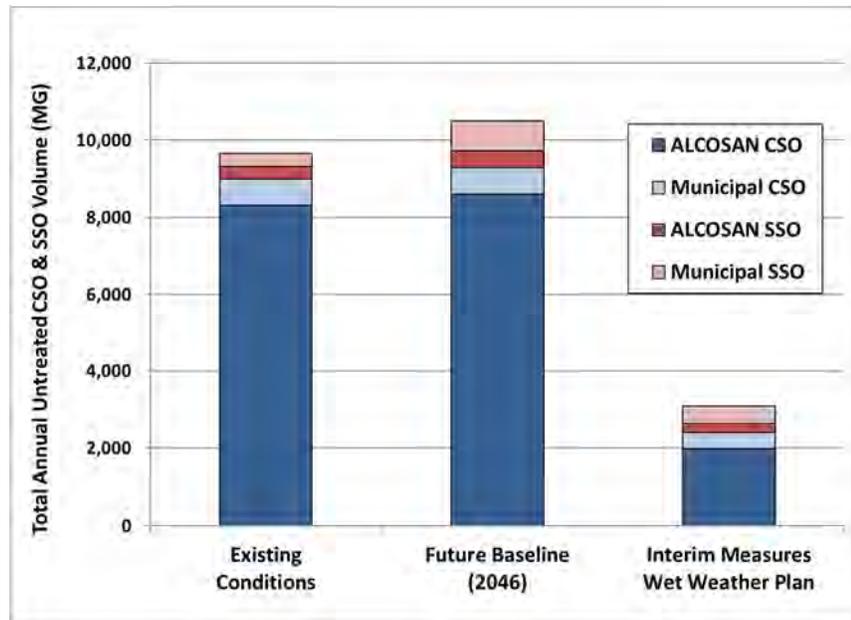
7.1.3 Antidegradation Requirements

Implementing the regional conveyance facilities along with the expansion of wet weather treatment capacity as outlined in this study will enable ALCOSAN to continue complying with current and future NPDES' discharge limits, its approved IWWP and Modified CD. In addition, the wet-weather treatment strategy enabled by the regional conveyance facilities is in keeping with USEPA's Combined Sewer Overflow Control Policy (April 1994) which encourages permittees to maximize the use of available treatment facilities for wet weather flows thereby ensuring that combined sewer flows receive primary treatment and disinfection prior to discharge.

The tunnel planning to date has identified six locations where existing outfalls may need to be modified or supplemented to act as a tunnel relief outfall that mitigates the risk of manhole geysers, infrastructure damage or system backups that could occur during large intense and rare rain events. Each of these sites will be evaluated further as the tunnel design progresses to see if modifications to existing outfalls can meet tunnel relief needs. If one or more new outfalls are determined to be necessary to manage extreme rain events, it would be

accomplished by relocating current discharge volumes without compromising the significant net systemwide reduction. Figure 7-1 shows the IWWP is projected to reduce the volume of untreated CSO discharges from 9,300 MG per typical year (projected future baseline conditions) to less than ALCOSAN’s 2,700 MG per typical year overflow volume remaining performance criteria.

Figure 7-1: Projected Overflow Volume Reduction from IWWP



7.2 Site Environmental Impacts

In this section, the environmental impacts of implementing the regional conveyance facilities projects described in this report are considered.

7.2.1 County Stormwater Management Plans

Stormwater management at the regional conveyance system near surface facilities such as consolidation sewers, drop shafts and regulator chambers is regulated under the Pennsylvania Clean Streams Law, the Allegheny County Subdivision and Land Development Ordinance and local municipal stormwater requirements. At a site scale, the stormwater runoff characteristics of these structures will be designed to conform with local ordinances and requirements. At a regional scale, these facilities will be consistent with the applicable requirements of Allegheny County’s 2018 Act 167 Stormwater Management Plan. These facilities will reduce the peak flow rate of stormwater (in CSO discharges) entering the receiving streams within the project area and ALCOSAN service area by capturing, storing, treating and gradually releasing the captured and treated combined sewage flows back into the Ohio River through the Woods Run Wastewater Treatment Plant. Stormwater Management Plans will also be developed for surface features that are required to support the tunnel designs.

During the project design, ALCOSAN will coordinate with the Allegheny County Conservation District as to the need for an Earth Disturbance Permit (NPDES for Stormwater Discharges Associated with Construction Activities).

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7.2.2 Wetlands

Wetlands possess three essential characteristics: 1) hydric soils; 2) wetland hydrology; and 3) hydrophytic vegetation. All characteristics must be fulfilled for an area to be classified as a wetland.⁷⁻¹ The U. S. Fish and Wildlife Service (FWS) has identified wetlands throughout the United States primarily by stereoscopic analysis of high-altitude aerial photographs. Wetlands were identified on the photographs based on vegetation, visible hydrology and geography by Classification of Wetlands and Deep Water Habitats of the United States.⁷⁻²

A map of wetlands in the FWS National Wetlands Inventory located within the study area is provided as Figure 7-1 on the following page. Portions of the proposed Regional Conveyance Facilities will parallel or be adjacent to the Ohio, Allegheny and Monongahela Rivers which are classified as riverine wetlands. However, based upon current planning as documented in the Regional Conveyance Facilities Basis of Design Report submitted to PaDEP on October 1, 2020, none of the 32 surface facility sites or their temporary construction limits is anticipated to encroach on wetlands in this inventory. Impacts to the riverine wetlands are discussed in the following section.

Hydric soils can also be an indicator of potential wetlands. Hydric soils information for Allegheny County is provided by the U. S. Department of Agriculture's Natural Resources Conservation Service (NRCS). The NRCS has identified those soils, within each county, with the potential of containing hydric components. Those soils with inclusions of hydric components have the potential for being classified as hydric soils and must be field checked for an actual determination.

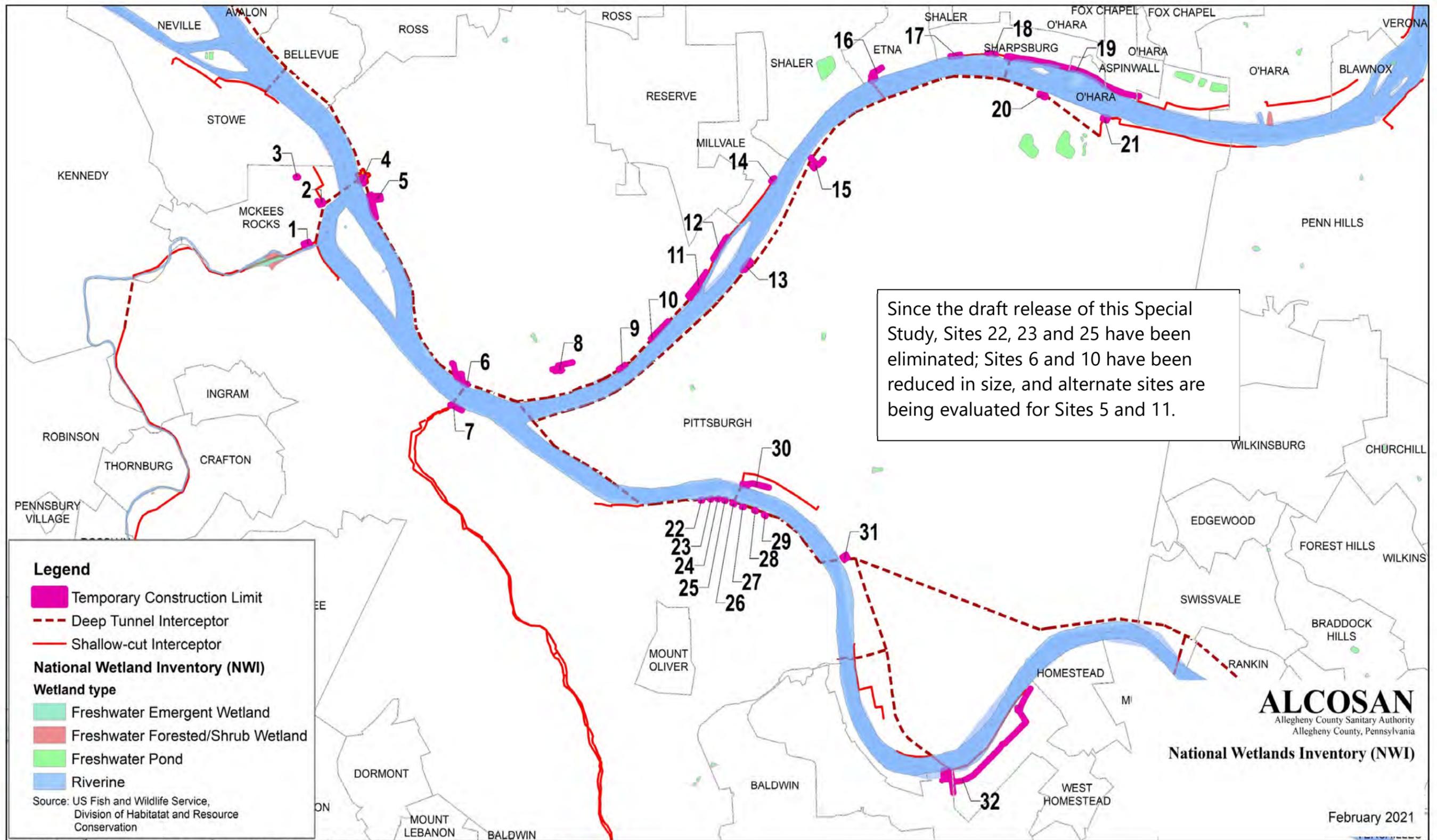
Based on soils information provided by the NRCS, almost all sites that will be impacted by the proposed construction are characterized as UB – Urban Land indicative of disturbed, urban areas. The other soil types are: GQF – Gilpin-Upshur complex, very steep; UCD – Urban land – Culleoka complex, moderately steep; and URB – Urban land – Guernsey complex, moderately steep. The URB soil type is the only soil identified by NRCS as having the potential to be classified as a hydric soil, and this soil type only occurs at Site 8 as shown on Figure 7-2.

Site specific wetland identification will be performed during final design of the proposed facilities and will consider the findings described above.

⁷⁻¹ USEPA/USCOE Field Guide for Determining Wetlands, 1989.

⁷⁻² FWB/OBS 79/31

Figure 7-2: Proposed Regional Conveyance Facilities – Surface Facilities Wetlands Map



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7.2.3 Waterway Disturbances and Floodplain Impacts

Chapter 105 Permits under the PADEP are required for any construction activity that changes, expands, or diminishes, the course, current, or cross-section of any watercourse, floodway, or body of water. Work in navigable waters of the United States are not eligible for coverage under these General Permits. During review of the General Permit application, PADEP determines if a Submerged Land License Agreement is required.

Joint Permits, administered by both the PADEP and the United States Army Corps of Engineers, are required for all permanent obstructions to waterways of the United States/Commonwealth. The Joint Permit Application (JPA) is an extensive permit application that includes components of previously discussed permits including the PNDI review, the NPDES permit and approval, flood plain clearances, etc. Certain disturbances may be eligible for coverage under the Pennsylvania State Programmatic General Permit, rather than requiring a Joint Permit.

Chapter 106 Permits, under the PADEP, are required for the placement of fill or structures within the floodplain or floodway. If surface obstructions (i.e. above-grade structures) are planned, these permits may require a detailed hydrologic analysis to evaluate the potential impacts of proposed structures in the floodplain or floodway. In Pennsylvania, the Chapter 106 permitting is included with the Joint Permit Application.

A FEMA Flood Hazard map is provided in Figure 7-3. The map shows the 32 surface facility locations required to construct the regional conveyance facilities with anticipated temporary construction site limits. Three of these sites have since been eliminated with approval of ALCOSAN's *Proposed Revisions to Interim Measures* report. Based on the preliminary planning completed to date, 17 of the 29 remaining surface facility sites are partially or fully within the 100-year floodplain as listed in Table 7-1. Some sites will also involve construction in the floodway such as for proposed tunnel relief outfalls. These preliminary findings will be verified during final design. The design will comply with applicable regulations and required permits will be obtained.

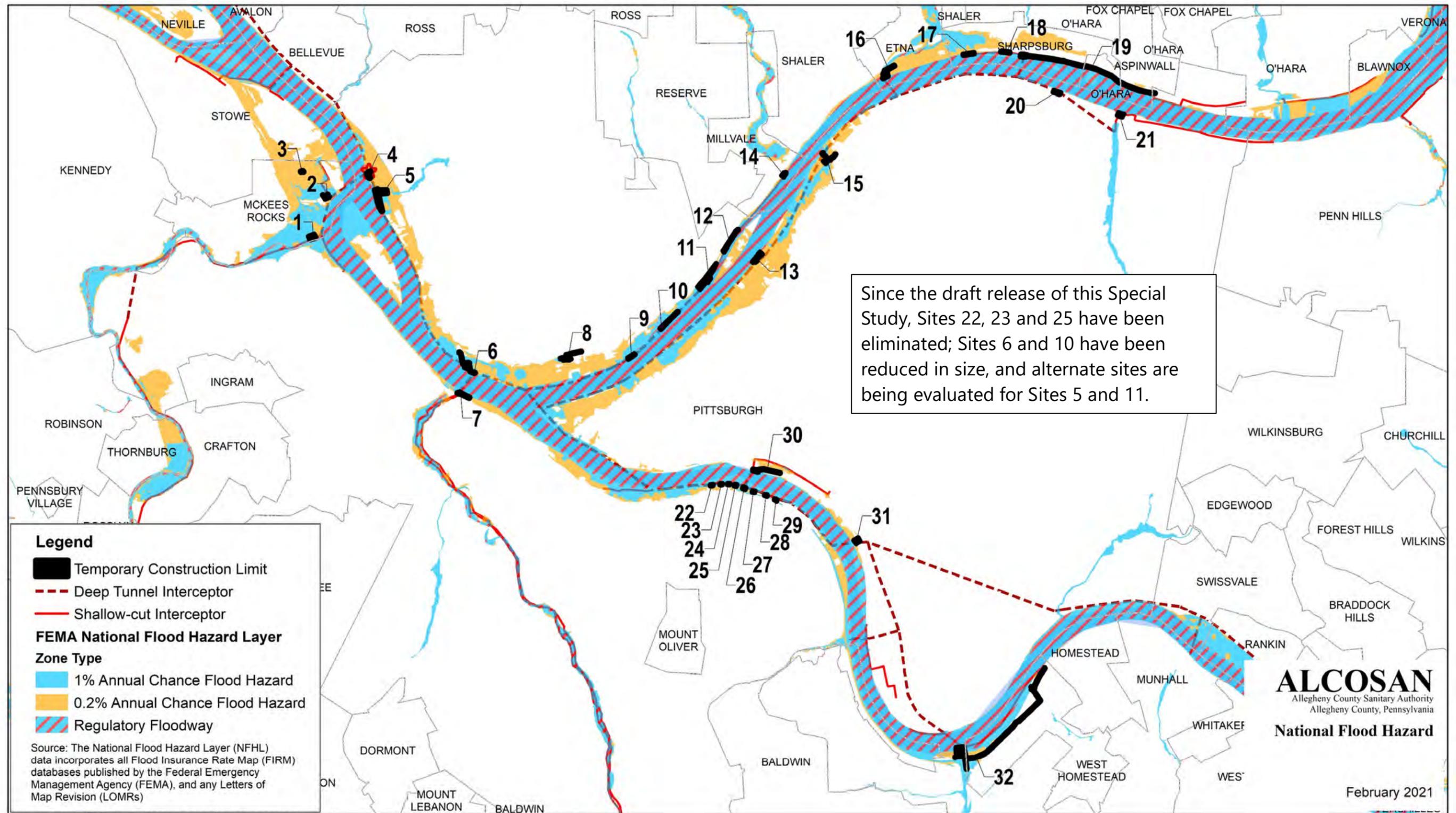
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Table 7-1: Proposed Regional Conveyance Facilities within the Floodplain

Site No.	Tunnel Segment	Closest ALCOSAN Structure
1	Chartiers Creek	O-07
2	Chartiers Creek	O-06
5 ¹	Ohio River	O-27
6	Ohio River	O-41
7	Saw Mill Run	O-14
9	Ohio River	A-58
10	Ohio River	A-60
11 ¹	Ohio River	A-62
12	Allegheny River	A-64
14	Allegheny River	A-67
15	Allegheny River	A-29
17	Allegheny River	A-69 & A-70
18	Allegheny River	A-71
19	Allegheny River	A-72
24	Monongahela River	M-16
26	Monongahela River	M-18
32	Monongahela River	M-42

1. Alternate site being explored.

Figure 7-3: Proposed Regional Conveyance Facilities – Surface Facilities Flood Hazard Map



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7.2.4 Rare, Endangered or Threatened Plant and Animal Species

A search was conducted through the Pennsylvania Natural Heritage Program, Pennsylvania Natural Diversity Inventory (PNDI) of the surface areas that will be impacted by the proposed construction of the IWWP Regional Conveyance Facilities. As of February 18, 2022, comments were received from the following agencies:

- Pennsylvania Department of Conservation & Natural Resources – Bureau of Forestry. The Bureau of Forestry indicated that no impact is anticipated on species and resources under the Pennsylvania Department of Conservation & Natural Resource’s responsibility.
- Pennsylvania Game Commission – has indicated that no impact is anticipated on the species and resources of concern under the Game Commission’s responsibility.
- In a February 2021 comment letter, the US Fish and Wildlife Service identified federally listed and proposed endangered and threatened species within the project area and requested additional information relating to the new tunnel relief outfalls that may be constructed under the IWWP. The letter acknowledges that the proposed project is adjacent to the Allegheny, Ohio and Monongahela Rivers. The Allegheny and Ohio River may be inhabited by the following federally listed, endangered mussel species: northern riffleshell (*Epioblasma torulosa rangiana*), clubshell (*Pleurobema clava*), and rayed bean (*Villosa fabalis*). Additional specific information including proposed erosion and sediment controls and effluent limits will need to be provided to the USFWS as the design progresses.

The project is also within the range of the federally endangered Indiana bat (*Myotis sodalis*), and the northern long-eared bat (*Myotis septentrionalis*), federally listed as threatened. Because the proposed project includes less than ten acres of tree removal, the USFWS does not anticipate adverse impacts to the Indiana bat. There are no known hibernacula or nesting sites of the northern long-eared bat therefore, incidental takings would be permitted during the construction.

Bald Eagles were identified as nesting within 0.5 miles of the proposed project. The USFWS recommended that the proposed construction near nesting areas be evaluated with regards to the *National Bald Eagle Management Guidelines*. Their preferred alternative is to avoid nesting areas. Permitting and documentation will be required for construction sites near nesting sites and will be provided as part of the design process.

In April 2021, ALCOSAN sent a response to the US Fish and Wildlife Service addressing the species identified and provided the requested additional information about the tunnel relief outfalls which may be constructed. The response included a discussion of the effluent limits potentially impacting mussels stating that ALCOSAN will be in compliance with the requirements of the Clean Water Act and their modified Consent Decree.

- On August 31, 2021, the Pennsylvania Fish and Boat Commission provided a preliminary response to the initial PNDI request. They responded that rare and protected fish and mussel species are known from the vicinity of the project site. They required additional information to allow for a more thorough evaluation of potential adverse impacts from the proposed project. ALCOSAN responded on December 9, 2021

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by providing information on the sites that had direct potential impacts to waterways. The information included drawings, proposed design details, information on tunneling practices and a brochure discussing ALCOSAN's Regional Tunnel System. A follow up conference call was held on February 9th to discuss this information and address additional questions. ALCOSAN is waiting for a written response from the meeting and is preparing a requested table of additional information for six sites with potential new/modified outfalls. It is anticipated that aquatic habitat assessments and mussel surveys may need to be conducted as the tunnel designs progress.

Copies of the PNDI responses and related correspondences are provided in Exhibit C of Appendix B (Uniform Environmental Report).

7.2.5 Historical and Archaeological Resources Protection

ALCOSAN requested a project review for the surface areas to be impacted and structures that are in areas that will be impacted by the proposed construction of the Regional Conveyance Facilities from the Pennsylvania Historical Museum Commission (PHMC) for archeological and historical significance.

ALCOSAN submitted Project Review Forms for the initial 32 sites to the PHMC for review in February 2021. ALCOSAN received comments in May 2021. ALCOSAN responded to these comments in September 2021, received acknowledgements in October 2021 and held a call with PHMC the same month. The original comments and current status of resolution are summarized below:

- Site 5 contains existing structures that PHMC identified as being eligible for listing in the National Register of Historic Places (NRHP). ALCOSAN has since eliminated this site from consideration and is now exploring an alternate site.
- Additional information was requested about existing structures at Site 21 and it was noted the site might be considered a federal undertaking under Section 106 of the National Historic Preservation Act. After ALCOSAN supplied additional photographs and documentation, PHMC indicated no further information or documentation is needed.
- PHMC requested more information on the potential to affect historic properties. ALCOSAN responded by explaining that as the project's sites for each tunnel segment are finalized and design advances, a zone of influence for construction vibration will be identified. A survey will be completed within that zone of influence to identify NRHP-listed or NRHP-eligible resources as well as other properties over 50 years of age that have the potential to be eligible for the NRHP. The results of this survey for each phase (Reconnaissance Identification Survey) will be provided to PHMC for review. Should it be determined that any historic structure within the zone of influence will potentially be adversely affected by the project, that structure will be included in a monitoring and condition survey program.
- Since the project is located in an urban area and near some previously recorded archaeological sites, PHMC requested a Phase IA archaeological study to assess the site's potential for NRHP significant archaeological resources, including historic background research and a geomorphology assessment. Due to the nature of the comments ALCOSAN contracted with an archaeological survey firm and prepared the requested

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Phase IA Archaeological Survey, submitting it in February 2022. The survey excluded two sites for which alternate sites are being explored, but these will be surveyed in an addenda when the alternate sites are finalized. The survey cleared six sites and recommended further investigations at the remaining sites.

- PHMC responded to the Phase IA survey in March 2022. For the Archaeological Resources Review the PHMC fully concurred with the findings and the recommended additional investigations. For the Above Ground Resources Review, the PHMC requested a separate follow up submission with additional documentation on the elimination of three of the original sites and the reduction in the limits of disturbance for two of the original sites. ALCOSAN will be preparing a response shortly.
- Based on the PHMC response, ALCOSAN is beginning plans to conduct a geomorphology assessment and/or Phase IB Archaeological Survey at selected sites to support the design of the Ohio River Tunnel (where recommended in the Phase IA survey).

Copies of the PHMC response and related correspondences are provided in Exhibit B of Appendix B (Uniform Environmental Report).

7.2.6 State Water Plans

By enabling a significant reduction in combined sewage overflows into the Allegheny, Monongahela and Ohio Rivers the proposed IWWP Regional Conveyance Facilities will improve the quality surface water supplies within the Pittsburgh region and is therefore in conformance with the Pennsylvania State Water Plan for the Ohio Watershed Region.

7.2.7 Pennsylvania Prime Agricultural Land

No prime agricultural soils have been identified in the areas to be affected by the IWWP Regional Conveyance Facilities. Based on NRCS soil data there is no prime agricultural land within the 32 sites where near surface construction is proposed.

7.3 Water Quality Standards, Effluent Limitations and Regulatory Requirements

PaDEP guidelines require the proposed facility upgrade plan be evaluated for consistency with existing sewerage and water-quality plans. Key existing plans are discussed below:

Pennsylvania Act 537 Comprehensive Sewage Facilities Plan as Amended

The regional conveyance facilities described in this report are consistent with ALCOSAN's Act 537 Plan as approved by PaDEP on October 4, 1999 and amended in December of 2018.

ALCOSAN Interim Measures Wet Weather Plan

The proposed regional conveyance facilities coupled with the expansion of the wet weather treatment capacity, the source control program and our regionalization efforts are the backbone of ALCOSAN's IWWP which was approved by PaDEP and USEPA and incorporated into ALCOSAN's 2020 Modified CD.

ALCOSAN NPDES Permit

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ALCOSAN operates its existing regional conveyance system and the Woods Run WWTP pursuant to its NPDES Part 1 operating permit PA0025984. The permit was amended in 2020 to allow for the IWWP phase 1 expansion of the treatment plant to 295 MGD secondary and 600 MGD primary capacity as summarized in Section 2 of this Special Study. The PaDEP also issued a Part 2 (Construction) permit for the expansion work at the Woods Run WWTP. The wet weather conveyance strategy detailed in this Special Study conforms with the wet weather treatment capacity expansion enabled through the Part 1 and Part 2 permits. This Special Study will serve as the regulatory basis for ALCOSAN’s application for and PaDEP’s consideration of the NPDES permits required for the construction and eventual operation of the regional conveyance facilities described herein.

7.4 Environmental Assessment

7.4.1 Comprehensive Environmental Assessment

To create a usable footprint for expanding the treatment capacity at ALCOSAN’s existing Woods Run WWTP, ALCOSAN obtained a PaDEP Water Obstruction and Encroachment Permit in May 2020. Since the expansion is part of a phased project that includes the IWWP regional conveyance facilities, obtaining this permit required preparation and approval of a Comprehensive Environmental Assessment (CEA) for WWTP expansion and the IWWP regional conveyance facilities as defined at the time of the permit application.

The CEA was approved with the issuance of the permit. Both the assessment and the permit are included in Exhibit D of Appendix B (Uniform Environmental Report). The permit only authorizes the construction of the water obstructions and encroachments that are associated with the current phase (WWTP expansion) of the overall project, as listed in the permit.

Additional authorization may be required for future water obstructions and/or encroachments as part of the IWWP regional conveyance facilities. As part of any such future/additional authorizations, the CEA will need to be updated with each subsequent application for a Water Obstruction & Encroachment Permit. The permit also stipulates that care should be taken during the design of future phases of the overall project to avoid or minimize impacts to regulated waters of the commonwealth or other significant adverse impacts on the environment, to the extent practicable.

7.4.2 No-Action Alternative

This subsection addresses the water-quality impacts of not implementing the proposed regional conveyance facilities and expansion of the wet weather treatment capacity at the Woods Run WWTP as described in Section 6 of this study.

Environmental Impacts

The implementation of the proposed regional conveyance facilities coupled with expansion of wet weather treatment capacity to 600 MGD is projected to decrease the volume of untreated CSO discharges from 9,300 MG per typical year (projected future baseline conditions) to less than ALCOSAN’s 2,700 MG overflow volume remaining performance criteria. In addition, the project will virtually eliminate overflows in the typical year for 15 outfalls located in Sensitive Areas as identified in ALCOSAN’s Modified CD. Reducing the volume of overflows into the receiving rivers and streams will have significant positive short and long-term benefits in terms of enhanced river and waterfront recreational opportunities, public health and the protection of

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public water supplies. Conversely, if the proposed regional conveyance facilities are not implemented, the overflow volumes will be more than double than with the project implemented and all the significant positive benefits of the project will not be realized.

Economic Impacts

The potential economic impacts of not implementing the proposed regional conveyance facilities coupled with the wet weather capacity expansion described in this study are significant. These include, but are not necessarily limited to:

- The regional conveyance facilities described in this report coupled with the expansion of the wet weather treatment capacity at the Woods Run Wastewater Treatment Plant are foundational components of ALCOSAN's IWWP;
- If ALCOSAN was precluded from implementing the regional conveyance facilities described in this report, it and the customer municipalities would likely be unable to meet their respective wet weather control obligations under the Clean Water Act and the Pennsylvania Clean Streams Law. This could lead to the imposition of sewer-bans and other impediments to economic redevelopment and to unproductive compliance penalties.
- The strong waterfront based economic redevelopment and urban renewal which the City of Pittsburgh and other riverfront municipalities have experienced over the past years could be threatened by the perceived lack of local and state commitment to invest in the area's infrastructure and in the area's environmental assets.
- The delays in addressing the region's CSOs and SSOs resulting from the failure to implement the plant expansion and the cascading impacts on the entire wet weather control strategy would result in additional cost burdens due to the impacts of construction inflation over time.

7.4.3 Uniform Environmental Assessment

As noted in the introduction to Section 7, a Uniform Environmental Report covering the IWWP Regional Conveyance Facilities described in this Special Study is provided as Appendix B.

8.0 FINANCIAL AND INSTITUTIONAL EVALUATION

8.1 ALCOSAN Financial Status

This sub-section provides an overview of ALCOSAN’s financial condition. This is done in the context of ALCOSAN’s financial capability to implement the Interim Measures Wet Weather Plan (IWWP), including the Regional Tunnel System. The IWWP’s impact on affordability, i.e., the ratepayers’ ability to afford the cost of wastewater services as the plan is implemented, is also summarized.

8.1.1 ALCOSAN Financial Summary

ALCOSAN’s operating costs, debt service and revenues for 2020 through 2025 are summarized on Table 8-1. Revenues for fiscal 2020 totaled approximately \$189 million and were budgeted at \$193 million for 2021. Revenues are projected to increase to \$205 million in 2022.

Table 8-1: Summary of Revenue and Expenses (in \$ millions)

Line Item	Actual	Projected				
	2020	2021*	2022	2023	2024	2025
Revenue						
Operating	\$186.8	\$192.5	\$203.0	\$220.7	\$236.1	\$252.5
Non-Operating	\$2.0	\$0.1	\$0.2	\$0.3	\$0.6	\$0.7
Total	\$188.8	\$192.6	\$203.2	\$221.0	\$236.7	\$253.2
Operating Expenses	(\$84.3)	(\$103.2)	(\$107.4)	(\$111.8)	(\$116.4)	(\$121.2)
Operating Income	\$102.5	\$89.3	\$95.8	\$108.9	\$119.7	\$131.3
Debt Service						
Existing	\$59.4	\$59.9	\$60.9	\$61.0	\$57.9	\$55.9
Projected	\$0.0	\$0.0	\$0.0	\$15.0	\$15.0	\$25.7
Total	\$59.4	\$59.9	\$60.9	\$75.9	\$72.9	\$81.6
Net Revenues	\$43.1	\$29.4	\$34.9	\$33.0	\$46.7	\$49.7
Debt Service Coverage Ratio (Based On):					-	
Existing	173%	149%	157%	179%	207%	235%
Projected	173%	149%	157%	143%	164%	161%

*2021 actuals pending forthcoming 2021 year-end financial reports.

Actual 2020 operating costs totaled \$84 million, reflecting due to hiring delays and other COVID impacts; the approved operating budget for 2020 was \$102 million. The 2021 projected expenditures were \$103 million; finalization of actual 2021 costs and revenues are pending the completion of annual financial reporting requirements. Debt service payments for 2020 were around \$60 million and will be substantially the same for 2021. The 2022 projected operating

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costs are \$107 million and \$61 million for debt service. The calculated operating coverage ratio for 2020 was 173% and is projected at 149% for 2021 and 157% for 2022.⁸⁻¹

8.1.2 Projected Debt Service Coverage Requirements

Coverage Requirements

The Standard Municipal Agreements and the Standard Industrial Agreements authorize ALCOSAN to set the sewage service charges to finance administrative costs, operating expenses, debt service, and additional coverages pursuant to the 1997 Trust Indenture. Administrative costs and operating expenses are subtracted from revenues to calculate operating income, which is used to pay the Authority’s debt service and meet other obligations of the Indentures.

The indentures specify two debt coverage tests that the Authority must meet annually as well as an additional bonds test that must be met to sell additional bonds. The two tests the Authority must meet annually are:⁸⁻²

1. **Test 1** - The beginning balance of the Revenue Fund in any given year must be at least 25% of the projected operating expenses for that fiscal year. The sum of beginning Fund balances in excess of 25% of the projected operating expenses and the operating income must equal at least 110% of the given year’s annual debt service.
2. **Test 2** - The authority must have operating income equal to at least 100% of the total debt service due in the year.
3. **Test 3** - For new debt, there is an additional bonds test that requires ALCOSAN to have operating income in the test year of 110% of the average annual debt service remaining under the 1997 indenture.

Historically, ALCOSAN has reliably met the terms of its indenture, raising rates as necessary to meet the coverage obligations. ALCOSAN’s 2020 and projected performance against these metrics is summarized on Table 8-2.

Table 8-2: ALCOSAN Bond Coverage Tests*

Coverage Test	2020	2021	2022	2023	2024	2025
Test 1 – [Operating Income + Revenue Fund Beginning Balance Excess / Debt Service ≥ 110%]	432%	456%	499%	462%	540%	553%
Test 2 – [Operating Income / Debt Service ≥ 100%]	173%	149%	157%	143%	164%	161%
Test 3 – [Operating Income / Average Annual Debt Service Remaining] > 110%	275%	244%	268%	312%	353%	398%

* Includes current ALCOSAN debt service and additional debt service for anticipated borrowing for 2023 and beyond.

⁸⁻¹ The operating ratio is determined by subtracting the operating costs from the revenue, and dividing the remainder by the annual debt service.

⁸⁻² Source: Article VII: Rate Covenant and Particular Covenants in ALCOSAN’s Sewer Revenue Bonds, Series 1997, First Indenture July 1, 1997.

8.2 Available Staff and Administrative Resources

8.2.1 Organization

ALCOSAN was formed in 1946 to design, construct, and operate a regional interceptor system and wastewater treatment plant facility. At that time, raw sewage and industrial wastes flowed directly into Pittsburgh’s waterways. The original ALCOSAN primary treatment plant and interceptor system was designed and constructed in the 1950s. It was placed into operation in 1959.

The ALCOSAN Board of Directors is authorized to have up to seven members, with three members appointed by the City of Pittsburgh and Allegheny County respectively. One member is appointed jointly. The membership of the current Board of Directors is shown on Table 8-3.

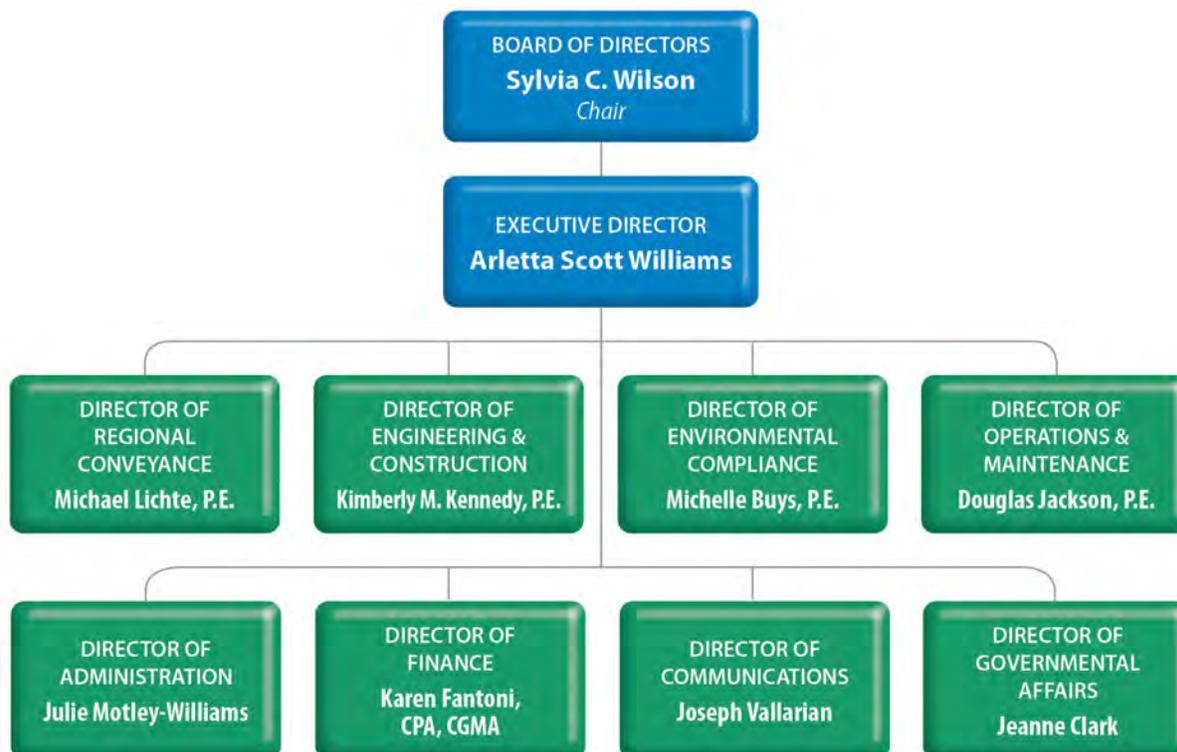
Table 8-3: ALCOSAN Board of Directors

Member	Position	Affiliation
Sylvia C. Wilson	Chair	County/City
Shannah Tharp-Gilliam	Vice Chair	City
Harry A. Readshaw	Treasurer	County
Corey O’Connor	Secretary	City
Jack Shea	Member	County
John K. Weinstein	Member	County
Rep. Emily Kinkead	Member	City

8.2.2 ALCOSAN Executive Staff

ALCOSAN's administrative staff is headed by the Executive Director, who carries out the Board's policies. The Executive Director's senior staff includes the Director of Operations and Maintenance, the Director of Engineering and Construction, the Director of Environmental Compliance, the Director of Finance, the Director of Administration, the Director of Regional Conveyance, the Director of Communications, and the Director of Governmental Affairs. The current Director of Operations and Maintenance is also the Deputy Executive Director. The current organizational structure is shown on Figure 8-1.

Figure 8-1: ALCOSAN Executive Structure



8.3 ALCOSAN’s Legal Operating Environment

8.3.1 General

ALCOSAN is a corporate and political body created in March 1946, under Pennsylvania Municipality Authorities Act (Act). The Authority is authorized to collect, transport, treat and dispose of sewage in Allegheny County, and certain adjacent areas. Key powers⁸⁻³ under the Act include:

- To have existence for a term of 50 years and for such further period or periods as may be provided in articles of amendment;
- To sue and be sued;
- To acquire, purchase, hold, lease as lessee, and use any franchise, property;
- To finance projects by loan, mortgages, security agreements or any other instruments;
- To make bylaws for the management and regulation of its affairs;
- To fix, alter, charge, and collect rates and other charges in the area served by its facilities at reasonable and uniform rates;

⁸⁻³ Condensed from 53 Pa.C.S.A. 5607(d).

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- To borrow money, make and issue negotiable notes, bonds, refunding bonds and other evidences of indebtedness or obligations;
- To make contracts and to execute all instruments necessary or convenient for the carrying on of its business;
- To pledge revenues of the authority as security for obligations of the authority;
- To have the power of eminent domain;
- To do all acts and things necessary or convenient for the promotion of its business and the general welfare of the authority to carry out the powers granted to it; and
- To contract with any municipality, corporation, or a public authority.

Under the Act, ALCOSAN may not pledge the credit or taxing power of the Commonwealth or its political subdivisions; moreover, ALCOSAN's financial obligations are not obligations of the Commonwealth or its political subdivisions.

8.3.2 Statutory Framework

ALCOSAN's legal responsibilities and operating environment are governed by a number of federal and state statutes. Principal among these are:

- Federal Clean Water Act (as amended by the Water Quality Act of 1987);
- Pennsylvania Clean Streams Law;
- Pennsylvania Sewage Facilities Act (Act 537);
- Pennsylvania Municipality Authorities Act; and
- Pennsylvania Municipal Code.

Federal Clean Water Act

The Clean Water Act (CWA) established a National goal of making all US water bodies safe for fishing and swimming. The CWA requires the implementation of technology-based and water quality-based controls to meet this goal. These requirements include secondary treatment of sewage from sanitary sewered areas and the protection of receiving stream water quality from combined sewer overflows (CSOs) pursuant to the Water Quality Act of 1987. USEPA's CSO Control Policy⁸⁻⁴ attempts to balance the financial capabilities of municipalities with combined sewers with the need to control overflows consistent with the water quality requirements of the Clean Water Act. As a "major" permittee (daily wastewater flows exceeding one million gallons), the Policy requires that ALCOSAN's schedule for compliance with the Policy be placed in a judicial order such as a Federal Consent Decree (CD). ALCOSAN entered into the original federal Consent Decree with the U.S. Environmental Protection Agency (USEPA), the Pennsylvania Department of Environmental Protection (PaDEP) and the Allegheny County Health Department (ACHD)⁸⁻⁵ in the U.S. District Court for the Western District of Pennsylvania on January 23, 2008.

⁸⁻⁴ 59 Fed. Reg. 18688, April 19, 1994

⁸⁻⁵ Civil Action 7-0737.

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The CWA also prohibits unpermitted discharges such as sanitary sewer overflows. These are typically ad-hoc discharges through manholes, etc. due to hydraulic constraints in municipal sewerage. Nationally in many larger regional systems such as ALCOSAN, overflows occur purpose-built hydraulic regulator structures at the points of connection of the regional interceptor system and municipal sanitary sewers. These devices were installed to provide hydraulic relief during wet weather and to reduce potential back-ups and flooding. Overflows from these structures must now be eliminated pursuant to the CWA.

The 2008 CD required the development of a WWP for the elimination of SSOs, the control of CSOs and to provide conveyance and treatment capacity for municipal flows generated within the ALCOSAN service area and conveyed to the ALCOSAN interceptor system. ALCOSAN complied with the deadline for the submittal of a plan to the United States Environmental Protection Agency, the Pennsylvania Department of Environmental Protection, and the Allegheny County Health by January 30, 2013.

The submittal of the WWP was followed by lengthy negotiations between ALCOSAN and the regulatory agencies⁸⁻⁶ concerning the implementation schedule and strategy for the long term wet weather controls. A revised WWP entitled the Clean Water Plan (CWP) has been incorporated into the Modified Consent Decree entered by the U.S. Federal District Court for Western Pennsylvania on May 14, 2020. The IWWP is a subset of the CWP, comprised of control projects to be implemented through 2036.

The Modified Consent Decree, among other things:

- Approves the CWP under which ALCOSAN will reduce sewer overflows;
- Extends the time period for ALCOSAN to implement the long-term plan from 2026 to 2036; and
- Incorporates additional adaptive management opportunities to modify the long-term plan.

Pennsylvania Clean Streams Law

The Pennsylvania Clean Streams Law predates the federal Clean Water Act by 35 years and was the mechanism leading to the creation of ALCOSAN. Thus, ALCOSAN was, and continues to be a means through which the customer municipalities comply with the Clean Streams Law. Absent ALCOSAN, the sewage disposal responsibilities would revert directly to the respective municipalities. Requirements of the Clean Streams Law closely parallel those under the federal Clean Water Act. ALCOSAN's National Pollutant Discharge Elimination System (NPDES) operating permit was issued under both laws.

Pennsylvania Sewage Facilities Act

Act 537 requires all municipalities to develop and maintain updated sewage facilities plans to protect public health from water-borne diseases, prevent future sewage disposal problems, and protect water quality. The Act also specifies state policy of efficient resource utilization through the consolidation of wastewater facilities, if warranted. Most ALCOSAN member

⁸⁻⁶ United States Environmental Protection Agency, Pennsylvania Department of Environmental Protection and the Allegheny County Health Department

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municipalities adopted a county-wide (circa 1970) 537 Plan as the basis for their plans.⁸⁻⁷ Revisions to the municipal plans since 1970 have focused on local collection sewer issues. In 1996 at the request of PaDEP, ALCOSAN prepared a 537 Plan addressing the upgrading and expansion of its treatment plant. This plan was subsequently adopted by the ALCOSAN municipalities as an update to the 1970 document. The plan was approved in October of 1999.

In July of 2018 ALCOSAN completed an Act 537 Special Study. The purpose of this Special Study was to amend the 1996 Act 537 Sewage Facilities Plan to reflect ALCOSAN's strategy for the expansion of wet weather treatment capacity at its Woods Run Wastewater Treatment Plant (WWTP) as updated in the 2017 Clean Water Plan. This wet weather capacity expansion will be a key element of ALCOSAN's Wet Weather Plan. The Act 537 Special Study was approved by the Pennsylvania Department of Environmental Protection (PaDEP) on December 21, 2018.

Pennsylvania Municipal Code

Responsibility for providing the necessary infrastructure was given to local government units, although the regulatory functions rested with the Commonwealth. Therefore, Chapter 12 of the Pennsylvania Municipal Code (Act 39) addresses the rights and responsibilities of local governments for providing sewage treatment capabilities.

Municipalities were given the right to enter onto all public and private lands in order to excavate and lay sewers and drains, making just compensation to the owner. Further, they were empowered to set and collect rates, rentals, or charges for the use of sewers, sewer systems, or sewage treatment works by the owners of these lands. Municipalities also were given the ability to relinquish their responsibility for providing sewage treatment to municipal authorities.

Pennsylvania Municipality Authorities Act

The Pennsylvania Municipal Code states that "it shall be lawful for any county, city, borough, incorporated town, or township to execute such agreements and contracts ... with an authority" to provide "sewer, sewerage, or sewage treatment service to it or to its inhabitants." Any rights granted to an authority through the municipal code are in addition to the powers and privileges granted to authorities by the Municipality Authorities Act. The municipal code was construed to expand, rather than limit, the powers set forth in the Municipality Authorities Act.

Pennsylvania passed its Municipality Authorities Act in 1945 with the primary purpose of expanding municipal borrowing powers. Authorities are a means of bringing officials who are unburdened with other governmental responsibilities to the administration of projects. Also, authorities are a way to take advantage of economies of scale by providing services to a large area. ALCOSAN is empowered to finance, build, and operate facilities required for compliance with other statutes through the Pennsylvania Municipality Authorities Act.

8.3.3 Clean Water Act / Pennsylvania Clean Streams Law Compliance Status

ALCOSAN has generally been in compliance with its National Pollutant Discharge Elimination System (NPDES) discharge permit for the ALCOSAN treatment plant and permitted combined sewer outfalls. The permit requires enhanced secondary treatment and imposes limits on organic waste (carbonaceous biochemical oxygen demand), total suspended solids, ammonia nitrogen, fecal coliform and residual chlorine. Treatment plant effluent limits are consistently

⁸⁻⁷ The *Comprehensive Sewerage Needs Plan 1970 - 2000* prepared by Green Engineering Company

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met at current plant flows and the concentration of remaining pollutants discharged from the treatment plant are significantly lower than the permit allows. ALCOSAN has also been in compliance with the various requirements of its 2008 consent decree and the Modified 2020 Consent Decree.

8.4 Institutional Relationship with Customer Municipalities

8.4.1 Municipal Collection System Overview

ALCOSAN provides wastewater conveyance and treatment to all or portions of eighty-three municipalities within its service area. The municipalities or municipal authorities own and operate their respective collection sewer systems, totaling approximately 4,500 miles of sewers. The municipal systems are diverse, and include 60 sanitary sewer systems, of which 15 are reported to have sanitary sewer overflows. Thirteen of the municipalities have combined sewer systems, of which five are reported to have combined sewer overflows within their respective municipal collection sewerage. The remaining municipal collection systems are classified as “mixed” systems, such as the City of Pittsburgh, of which portions have sanitary sewers and portions have combined systems. The geographic coverage of the systems range from less than one square mile to approximately 55 square miles.

8.4.2 Municipal Service Contracts

ALCOSAN, the City of Pittsburgh, and certain other municipalities in and around Allegheny County have entered into Standard Municipal Agreements (agreements) under which ALCOSAN is designated the exclusive agent of the respective municipalities to furnish sewage treatment and disposal service, and which provide uniform sewage charges throughout the service area. The Standard Municipal Agreements require the participating municipalities to convey sewage at their own expense, to specified points of connection to ALCOSAN’s interceptor sewers. Such agreements cannot be terminated before the expiration of one year after the payment of all Authority indebtedness.

The Standard Municipal Agreement was developed in the 1950s at the time of the construction of the initial interceptor system and treatment plant. ALCOSAN has also entered into an “Upper Allegheny Agreement” with certain communities for which additional expenditures for connecting facilities were required. These include the Boroughs of Verona and Blawnox and the Township of O’Hara and the Municipality of Penn Hills. In addition to the provisions in the Standard Municipal Agreement, the Upper Allegheny Agreement authorizes ALCOSAN to impose an additional service charge to recover additional construction and operating costs related to providing services. Service agreements entered into since 1983 also impose limitations on the type and volume of flows from municipalities, exclude storm water, and impose surcharges for excessive inflow and infiltration.

Each municipality was given the option of either paying the aggregate of all user bills within its jurisdiction or authorizing ALCOSAN to bill the municipality’s users directly. If charges are not paid within sixty days, the municipality is required to pay ALCOSAN the delinquent balance sixty days after notification of delinquency by ALCOSAN. The annual municipal budgets are required to include funds that are sufficient to meet its obligation to ALCOSAN. If the entire amount due to ALCOSAN is not paid out of current revenues, the balance must be paid out of the current revenues of the municipality for succeeding years.

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The sewage service charges authorized to be made by ALCOSAN under the Standard Municipal Agreements are calculated to yield the amount required to pay the administrative and operating expenses of the Authority, and the amounts required to be paid under the Indenture.

In addition to the Standard Municipal Agreement, industrial agreements (“Standard Industrial Agreements”) have been executed by the City of Pittsburgh and ALCOSAN with some corporations whose acceptable industrial wastes enter the system’s intercepting sewers directly instead of through a municipal sewer.

8.4.3 Regionalization

ALCOSAN is working with its customer municipalities to transfer ownership and maintenance responsibility for certain inter-municipal trunk sewers and related sewerage facilities. ALCOSAN has been collecting municipal information to identify additional multi-municipal sewers; to evaluate the location and condition of the sewers for transfer; and to determine approximate extents, exhibits, and mapping for the transfer agreements. ALCOSAN has also been meeting with municipal officials and their engineers regarding concerns that may affect the agreements or schedule.

As of March 2022, approximately 264 miles of trunk sewers meet the criteria and are being considered for transfer. Also included are 76 diversion chambers, four pump stations, and four equalization tanks that have been proposed as part of the inter-municipal asset transfer. Eighty transfer agreements are under active consideration by the municipalities. ALCOSAN is assisting the municipalities with the permit transfer process. ALCOSAN continues to meet (virtually) with municipal officials and engineers to coordinate the repair of critical and significant defects by municipalities prior to the transfer of these sewers and facilities.

8.5 Financing Plan

This section describes ALCOSAN’s strategy for financing future capital improvements including the Regional Tunnel System and other IWWP wet weather control facilities.

8.5.1 Projected Financing Needs

ALCOSAN’s best current understanding of future capital requirements for the period of 2021 through the 2036 CWP implementation deadline is shown on Table 8-4. Future CIP expenditures, excluding the implementation of the IWWP are expected to continue at an average rate of around \$31 million annually through 2036. These annual expenditures are shown with a 2.72% annual capital inflation in the table. Total non-wet weather CIP expenditures through 2036 are projected, including inflation, at \$635 million. The projected remaining inflated capital costs for the ALCOSAN IWWP are estimated to total \$2.9 billion through 2036. It should be noted that the IWWP capital expenditure schedule and capital costs are subject to revision as the program moves into design and construction. That said, ALCOSAN does not currently anticipate that the overall program costs through 2036 will change significantly.

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**Table 8-4: Projected Capital Expenditures Through 2036 Inflated to Year of Expenditure
(Subject to revision as CWP is implemented)**

Year	ALCOSAN Capital Costs				Total	
	IWWP ⁸⁻⁸		Capital Improvement Program			
	Uninflated in 2020 dollars	Inflated	Current Cost	Inflated	Current Cost	Inflated
2021	\$86.6	\$86.6	\$8.5	\$8.5	\$52.5	\$52.5
2022	\$124.2	\$124	\$49.5	\$49.5	\$136.1	\$136.1
2023	\$121.7	\$122	\$33.1	\$33.1	\$157.4	\$157.4
2024	\$140.0	\$158	\$16.2	\$16.2	\$138.0	\$138.0
2025	\$148.5	\$172	\$8.7	\$9.8	\$148.7	\$167.4
2026	\$261.2	\$312	\$32.0	\$37.1	\$180.5	\$209.3
2027	\$259.3	\$319	\$32.0	\$38.2	\$293.2	\$350.1
2028	\$143.9	\$182	\$32.0	\$39.4	\$291.3	\$358.3
2029	\$139.2	\$182	\$32.0	\$40.5	\$175.9	\$222.8
2030	\$220.4	\$296	\$32.0	\$41.8	\$171.2	\$223.4
2031	\$197.0	\$273	\$32.0	\$43.0	\$252.4	\$339.2
2032	\$246.5	\$352	\$32.0	\$44.3	\$229.0	\$317.0
2033	\$175.4	\$258	\$32.0	\$45.6	\$278.5	\$397.1
2034	\$67.7	\$102	\$32.0	\$47.0	\$207.4	\$304.6
2035	\$55.9	\$87	\$32.0	\$48.4	\$99.7	\$150.8
2036	\$5.5	\$8.88	\$32.0	\$49.9	\$87.9	\$136.9
Totals	\$2,393.3	\$3,033.5	\$491.6	\$635.2	\$2,884.8	\$3,668.6
Average	\$149.6	\$189.6	\$30.7	\$39.7	\$180.3	\$229.3

8.5.2 Capital Funding

Alternative Capital Funding Options

ALCOSAN evaluated alternatives to the municipal revenue bond market as capital sources as suggested in EPA’s LTCP guidance document⁸⁻⁹ and other EPA guidance.⁸⁻¹⁰ As noted in the 1995 *Guidance for Funding Options*:

“Grants will likely play only a limited role in future CSO funding. The reliance on direct federal wastewater construction grants has been replaced with a reliance on SRF loans and other local funding options.”

The Federal funding situation since 1995 has not improved. Moving forward, ALCOSAN has and will continue to work with the region’s state Legislative and Congressional delegations

⁸⁻⁸ Amounts shown do not include GROW program expenditures which ALCOSAN is self-funding. These costs are shown in 2020 dollars, reflecting the results of recent facilities planning, design and construction cost data.

⁸⁻⁹ Section 4.3.3, *Combined Sewer Overflows - Guidance For Long-Term Control Plan*, EPA 832-0-95-002, September 1995.

⁸⁻¹⁰ *Combined Sewer Overflows Guidance for Funding Options* EPA 832-B-95-007, August 1995

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towards workable funding for wet weather controls. Funding that has been obtained to date as USEPA Special Appropriations Projects and from Sections 219 and 206 of the Water Resources Development Act through the Corps of Engineers has been used by ALCOSAN to support projects such as direct stream inflow removals.⁸⁻¹¹

Some options listed in the Guidance are more applicable to the municipalities than to ALCOSAN due to eligibility or funding restrictions. For example, PennVest has a \$20 million limit on total financing by any recipient. The Rural Utilities Services (RUS) provides low interest loans, and limited grants for municipal water and sewer infrastructure. This program would be more applicable to the ALCOSAN municipalities with populations of less than 10,000. ALCOSAN has worked with the local RUS office towards availing the municipalities of this program.

ALCOSAN's Capital Financing Strategy

ALCOSAN anticipates using combinations of pay-as-you-go funding utilizing accumulated reserve funds and revenue bond financing owing to ALCOSAN's strength in the municipal bond market. As of August 2020, ALCOSAN has a rating of 'Aa3' long-term (with a stable outlook) from Standard & Poor's Rating Services and A1 from Moody's Investors Services.

As a special purpose governmental enterprise established pursuant to the Pennsylvania Municipality Authorities Act, ALCOSAN has no legal authority to establish or levy property tax assessments. Therefore, ALCOSAN cannot issue general obligation bonds. ALCOSAN's upper-medium grade bond ratings are supported by the current contractual relationship between ALCOSAN and the municipalities wherein ALCOSAN's revenues flow from the municipalities rather than through retail billings. As a result, ALCOSAN's revenue bonds are arguably analogous to "double barreled" bonds as described in the EPA guidance documents.

8.5.3 Alternative Revenue Streams

EPA's 1997 financial capability guidance references four funding mechanisms and sources of funding "if loans and grants are not available or if a need exists to reduce the financial impact of CSO controls on the users."⁸⁻¹² The applicability of these revenue sources to ALCOSAN may be summarized as follows.

- **Establish special assessment district** – Unlike municipalities, ALCOSAN as a municipal authority has no legal authority to establish or levy property tax assessments;
- **Increase user fees** – The implementation of ALCOSAN's WWP is premised on a series of substantial rate increases;
- **Impose / increase taxes (such as income taxes, sales taxes or property taxes)** – as noted above, ALCOSAN has no statutory authority to impose taxes; and
- **Privatize wastewater treatment** – To date, the option of the privatization of ALCOSAN facilities has not appeared to be viable or advantageous.

⁸⁻¹¹ See Section 10.2 of the Wet Weather Plan document for additional details on some of these projects.

⁸⁻¹² Combined Sewer Overflows – Guidance for Financial Capability Assessment and Schedule Development, EPA 832-B-97-004, Page 48

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Moving forward into the WWP implementation phase, ALCOSAN will evaluate evolving financial instruments as appropriate.

8.6 Affordability Analysis

8.6.1 Rate History

The coverage ratios shown in Section 8.1.2 were based on projected operating revenues resultant from user rates calculated to generate operating revenues sufficient to exceed the Trust Indenture requirements. The history of recent rate increases and the potential rate increases that were used in the above coverage calculations are shown on Table 8-5. The rates shown in the table reflect the five-year rate increase strategy that was enacted by the ALCOSAN Board of Directors on October 28, 2021

Table 8-5: ALCOSAN Rates 2016 – 2026

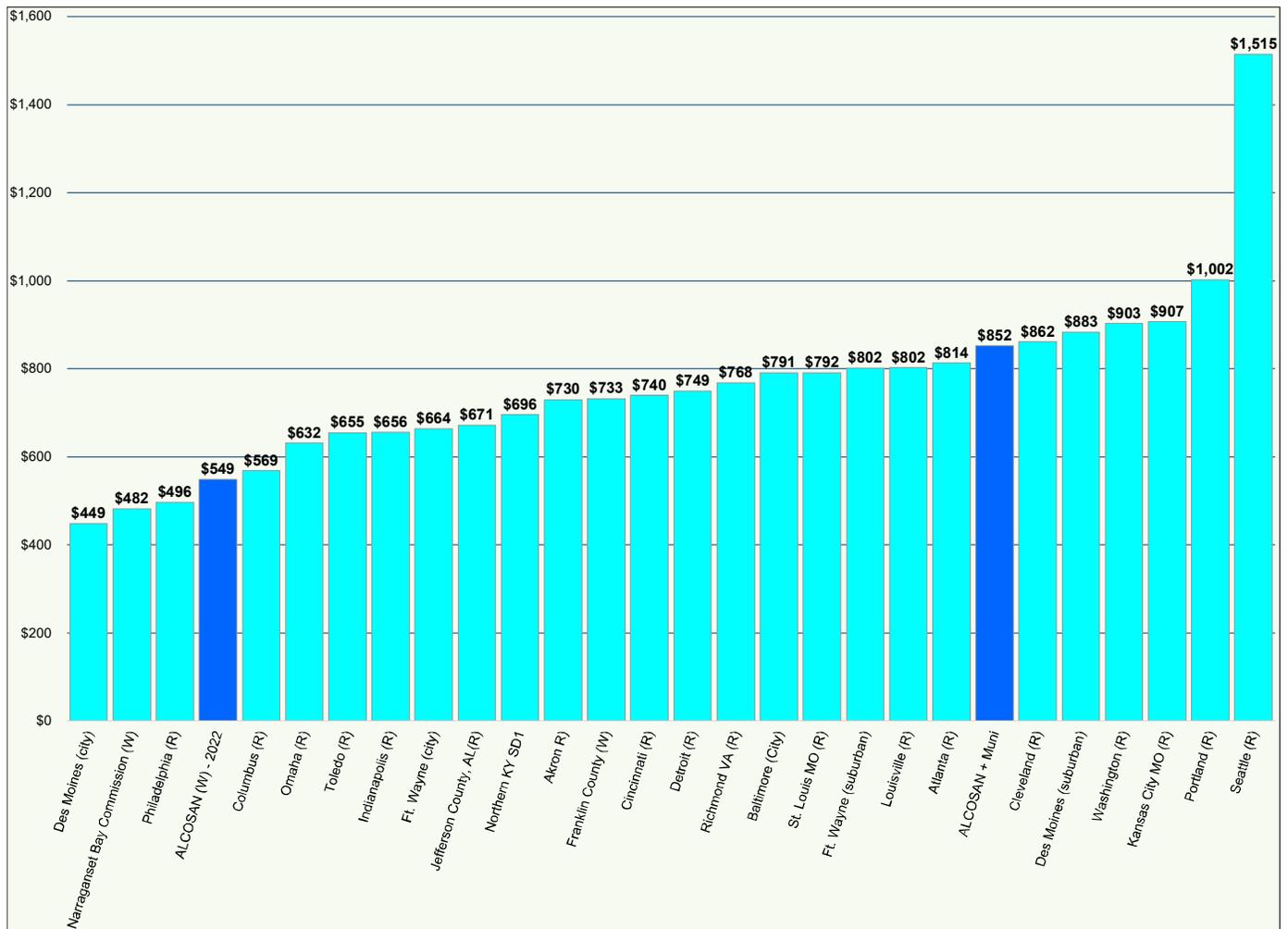
Year	Commodity Charge		Quarterly Service Charge	
	Rate	Increase	Rate	Increase
2016	\$6.22	11.0%	\$13.08	11.0%
2017	\$6.91	11.0%	\$14.51	11.0%
2018	\$7.42	7.5%	\$15.60	7.5%
2019	\$7.94	7.0%	\$16.69	7.0%
2020	\$8.50	7.0%	\$17.86	7.0%
2021	\$9.10	7.0%	\$19.11	7.0%
2022	\$9.73	7.0%	\$20.45	7.0%
2023	\$10.41	7.0%	\$21.88	7.0%
2024	\$11.14	7.0%	\$23.41	7.0%
2025	\$11.92	7.0%	\$25.05	7.0%
2026	\$12.76	7.0%	\$26.80	7.0%

8.6.2 Rate Comparisons

ALCOSAN’s 2022 typical costs per household are compared to comparable wastewater agencies and are shown on Figure 4-1. The comparable data are from 2019 - 2022, reflecting available information. The typical costs shown for certain of the comparable agencies may include items such as stormwater fees, meter fees, and fixed wastewater charges.

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**Figure 8-2
Peer City Comparison of Annual Costs per Typical Residential User***



*2019 – 2022 rates as published on the utilities’ websites. “R” = retail services including collection systems, “W” = wholesale treatment services for customer municipalities. This comparison is subject to ongoing update and refinement.

8.6.3 Affordability Impacts of the Wet Weather Plan

ALCOSAN has documented previously that future capital expenditure by ALCOSAN and the customer municipalities totaling \$2.0 billion or more in 2010 dollars would result in a service area annual cost per typical household that would equal or exceed two percent of the median household income of the ALCOSAN service area. The annual total wastewater and stormwater costs where applicable as a percent of household income is termed the Residential Indicator (RI) by USEPA. Under USEPA guidelines such as the 1997 Combined Sewer Overflow – Guidance for Financial Capability Assessment and Schedule Development (EPA 832-B-97-004), annual household wastewater costs of 2.0% or greater constitute a high burden. ALCOSAN subsequently reaffirmed that the approximately \$2.0 billion Recommended Plan detailed in its 2013 Wet Weather Plan resulting in a regional RI of 2.0%.

9.0 IMPLEMENTATION SCHEDULE

This section details ALCOSAN’s plan for the successful delivery of the Interim Measures Wet Weather Plan (IWWP), which includes the IWWP Regional Conveyance Facilities that are the subject of this Special Study, by December 31, 2036. Section 9.1 addresses the schedule for the IWWP as reflected in the approved CWP and Modified CD while Section 9.2 presents the approved revised schedule for the IWWP Regional Conveyance Facilities based on the completion of preliminary planning to a 20% level of design.

9.1 Overall Interim Measures Wet Weather Plan

Figure 9-1 shows the implementation schedule for all defined IWWP overflow control projects as reflected in ALCOSAN’s Modified CD and Section 11 of its Clean Water Plan, including the Wet Weather Pump Station.

The adaptive management provisions of the Modified CD anticipated future revisions to the CWP as summarized in Table 9-1 and permits ALCOSAN to propose revisions at any time. The first planned revision related to preliminary planning for the IWWP Regional Conveyance Facilities was approved in early 2021. Now that preliminary planning for the IWWP Regional Conveyance Facilities has been completed, a revised schedule has been approved for those facilities, as summarized in the next section, with the same final completion date of 2036 for the overall IWWP.

Table 9-1: Planned Revisions of the Clean Water Plan

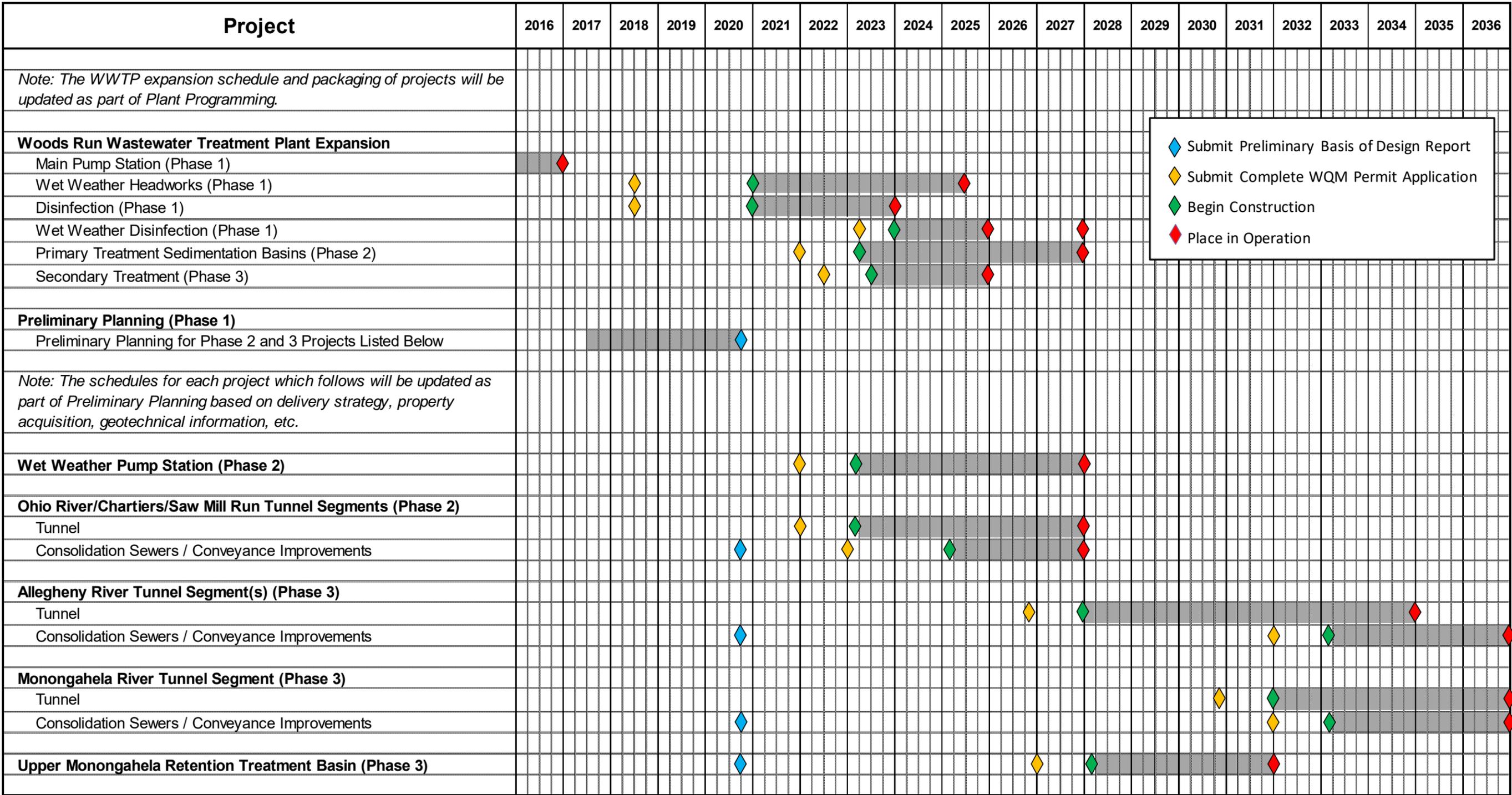
Adaptive Management Topic	Planned Clean Water Plan Revision*
Preliminary Planning for IWWP regional conveyance CSO controls	2020 (approved in 2021)
Controls along regionalized sewers	2024
Source controls	Following municipal flow reduction commitments
Final Measures	Following post-construction monitoring

*ALCOSAN can propose revisions at any time

9.2 IWWP Regional Conveyance Facilities

As planned, the schedule for the IWWP Regional Conveyance facilities projects was reviewed, optimized, and updated as part of preliminary planning based on delivery strategy, property acquisition, geotechnical considerations, constructability, and other screening factors. The implementation schedule from Section 11 of the CWP, as shown on Figure 9-1, was used as a starting point for optimizing project sequencing, contract packaging, and scheduling. For the three tunnel projects included in the schedule, each includes two elements:

Figure 9-1: Schedule of Activities for ALCOSAN's IWWP



- ◆ Submit Preliminary Basis of Design Report
- ◆ Submit Complete WQM Permit Application
- ◆ Begin Construction
- ◆ Place in Operation

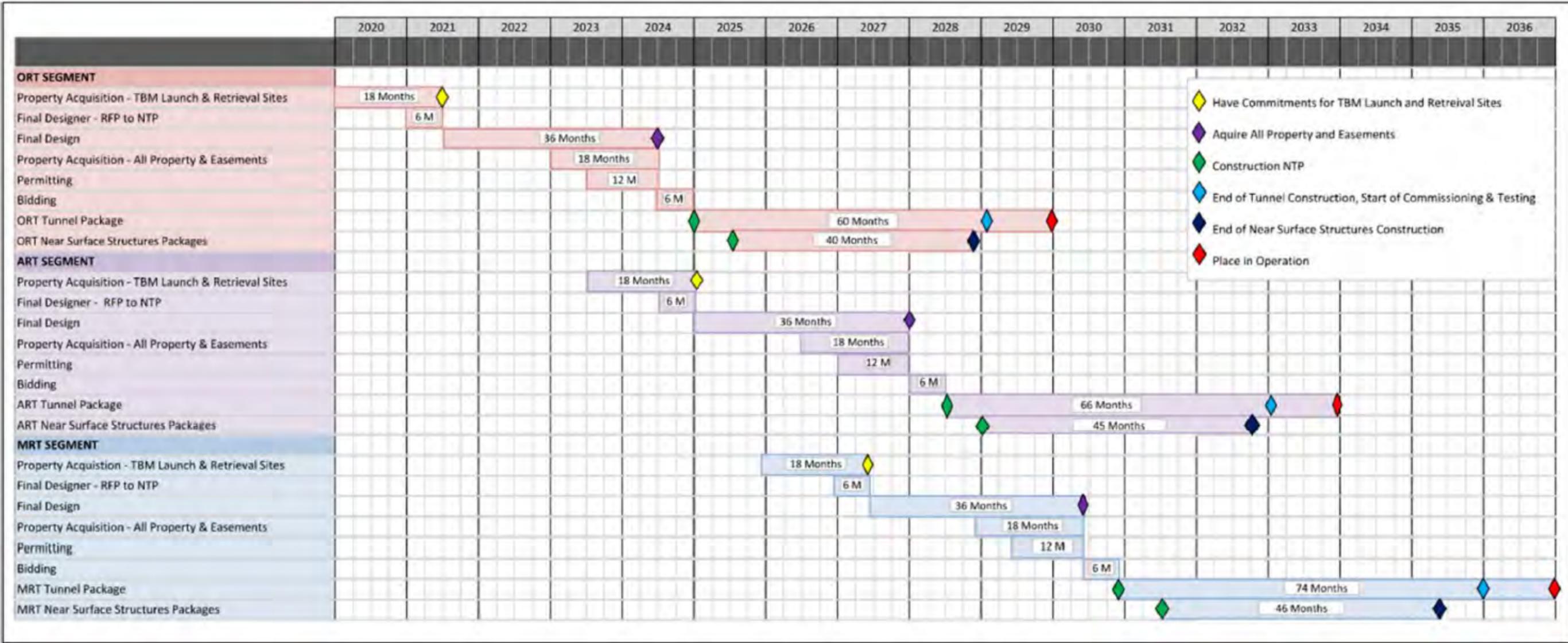
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the main tunnel segment which stores and conveys flow to the WWTP; and the near surface facilities (NSF) which serve to capture and convey wet weather flow from the POCs to the tunnel drop shafts. As indicated on the schedule, it was understood that the interim milestones, such as Begin Construction and Place-in-Operation dates, would be refined as part of Preliminary Planning. As such, baseline ORT, ART, and MRT alignments were updated after completing the evaluation and analysis of alternatives.

The preferred preliminary alignments for the ORT, ART, and MRT, and tunnel boring machine (TBM) launch and retrieval sites that were used as a basis for the Preliminary Planner's sequencing, contract packaging, and schedule evaluations are shown on Figure 1-1. The preferred scenario for contract packaging is to have three tunnel construction packages, one for the ORT, CCT, and SMRT; one for the ART; and one for the MRT, with each tunnel being staged from a different TBM launch shaft site. The primary benefits of this scenario over others include the most uniform cash flow combined with the greatest overall schedule flexibility. It should be noted that the overall tunnel packaging approach is heavily dependent on the locations of available TBM launch and retrieval sites. If, during final design, TBM launch site(s) differ from those assumed to be available during preliminary planning, overall tunnel contract packaging will be re-evaluated.

The approved revised implementation schedule for ALCOSAN's IWWP is shown in Figure 9-2. It indicates a sequence of constructing the ORT segment first by 2029, followed by the ART and MRT segments. An explanation and justification for the schedule changes are provided in ALCOSAN's *Proposed Revisions to Interim Measures* report which has received agency approval. The revisions report also includes a schedule modification for the WWPS which is also scheduled for completion in 2029 to coincide with the conveyance and storage capacity of the Ohio River Tunnel.

Figure 9-2: Approved Revised IWWP Regional Conveyance Facilities Implementation Schedule



\\cdmnc.internal.cdm.com\offices\ALC\Alcosan\PD_Tasks\IT1_RegCoord\1.2ACT537\Tunnel Special 537 Study ALCsvr01\Report\Sec 9 Imp Schedule\Tunnel 537 Report Section 9 Rev 02-09-21.do\cdmnc.internal.cdm.com\offices\ALC\Alcosan\PD_Tasks\IT1_RegCoord\1.2ACT537\Tunnel Special 537 Study ALCsvr01\Report\03-04-21 Final Revisions\9 Tunnel 537 Report Section 9 Rev 03-08-21.docx

10.0 PUBLIC AND STAKEHOLDER PARTICIPATION

[This section will be updated once all public and stakeholder participation is completed.]

10.1 Public Information and Participation Activities

10.1.1 Clean Water Plan Public Input

During the development of the Clean Water Plan, ALCOSAN sponsored numerous public outreach and stakeholder coordination opportunities; including seven Basin Planning Committees, a Customer Municipality Advisory Committee, a Regional Stakeholder Workgroup, and a myriad of annual public outreach forums fostering awareness and encouraging public involvement in the development of the CWP. ALCOSAN also participated in various 3 Rivers Wet Weather working group forums.

The 2008 consent decree required ALCOSAN to solicit comments on the Draft CWP no later than six months prior to the January 30, 2013 due date. On June 15, 2012, ALCOSAN issued a formal public notice that the Draft CWP was available for review through legal advertisement, through e-mail and surface mail distribution lists, and through its website.

ALCOSAN's Draft CWP was released for public comment on July 31st, 2012. The public comment period began with the Plan's release and ended 80 days later on October 19, 2012. ALCOSAN conducted an extensive effort to educate and engage the public about the Draft CWP and to solicit feedback.

In response to the public and municipal comments received by ALCOSAN, there have been a number of changes made to the Draft CWP since its release for public and municipal review on July 31st, 2012 and submission to the regulatory agencies during January 2013. Principal among these was an expanded focus of the CWP on wet weather source reduction through green stormwater infrastructure and the reduction of inflow and infiltration through municipal collection system rehabilitation. This approach was documented in the 2015 ALCOSAN document *Starting at the Source* and was formulized in 2017 revisions to the plan that resulted in the current Clean Water Plan. Additional details as to the public, stakeholder and municipal participation in the development of the CWP is provided in Section 2 of the Clean Water Plan.

10.1.2 Public Participation and Municipal Coordination for Proposed Revisions to the IWWP

The Modified Consent Decree allows ALCOSAN to propose revisions to the CWP at any time, but also stipulates certain municipal coordination and public participation requirements as part of the revisions process. In November 2020 ALCOSAN submitted a *Proposed Revisions to Interim Measures* report for agency review and approval which described proposed revisions to the IWWP Regional Conveyance Facilities. That report was subsequently approved. In the process of developing that report, ALCOSAN coordinated with its municipal customers and provided an opportunity for public participation as follows.

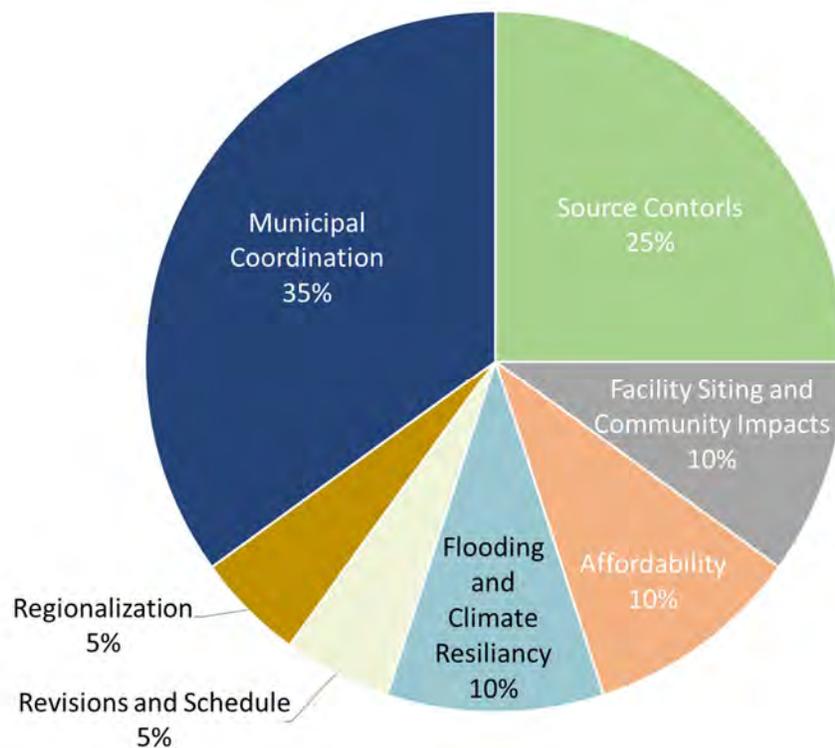
In July 2020 ALCOSAN sent a Clean Water Plan Update email and fact sheet to all its customer municipalities which summarized six proposed changes to the CWP. The

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municipal notification was also posted to ALCOSAN’s secure municipal web site. ALCOSAN’s original intent was to also present the proposed changes at a July meeting of the ALCOSAN Advisory Committee, which is comprised of municipal representatives. Unfortunately, the committee elected to cancel its July meeting due to COVID-19 concerns. As a result, ALCOSAN instead reached out to all of the ALCOSAN Advisory Committee members via phone.

Due to COVID-19 concerns, ALCOSAN elected to conduct the public meeting as a virtual public meeting. The meeting was advertised on ALCOSAN’s public web site and was held on August 12th, 2020. The audience of approximately 45 were invited to submit questions and comments via chat during the presentation. Following the presentation, each question and comment was read and responded to. A total of 14 questions were addressed, covering several subject categories as summarized in Figure 10-1. Some questions addressed multiple subjects each of which are represented in the chart.

Figure 10-1: Public Meeting Question Categories



10.1.3 Additional Public Participation in this Act 537 Special Study

ALCOSAN has provided draft copies of this Special Study to the municipalities identified in Section 10.2 as well as the Pittsburgh Water and Sewer Authority and the Hampton Shaler Sewer Authority. This public release Special Study is being provided to the local agencies identified in Section 10.3 and to each of the ALCOSAN customer municipalities for review and

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comment. The final Special Study will reflect comments received and ALCOSAN's responses.

ALCOSAN will hold two virtual public meetings on the Special Study on March 30, 2022. ALCOSAN has also prepared a summary companion document and is sending copies of the public release Special Study to public libraries within the vicinity of the proposed project. Documentation of ALCOSAN's municipal and public outreach will be added as Exhibit E of Appendix B (Uniform Environmental Report) in the final Special Study.

10.2 Municipal Commitments

ALCOSAN will implement the IWWP Regional Conveyance Facilities on behalf of its 83 customer municipalities. The municipalities have adopted ALCOSAN's 1996 537 Plan as their respective municipalities' official municipal Act 537 plans; some of which have been amended subsequently to reflect evolving local conditions.

In ALCOSAN's 2020 discussions with PaDEP they indicated that formal municipal adoption of this Special Study via resolutions will not be required for all 83 municipalities. Adoption will be required by those municipalities through which the tunnel alignment passes and those locations where surface construction is proposed. Based on the plans reflected in the *IWWP Regional Conveyance Facilities BODR*, formal adoption of the Special Study is required from nine municipalities:

1. Aspinwall Borough
2. City of Pittsburgh
3. Etna Borough
4. McKees Rocks Borough
5. Millvale Borough
6. O'Hara Township
7. Shaler Township
8. Sharpsburg Borough
9. West Homestead Borough

In late 2021 and early 2022 ALCOSAN briefed the councils of eight of these municipalities and provided each with a draft of this Special Study. ALCOSAN has offered a briefing to the ninth municipality in March and is awaiting a reply. The municipalities were invited to provide comments and encouraged to share a copy of the Special Study with their respective planning commissions. To date, Etna Borough, West Homestead Borough, Millvale Borough and O'Hara Township have accepted this Special Study as an amendment to the 1996 Act 537 Plan through a municipal resolution. A copy of these resolutions is included in Exhibit F of Appendix B (Uniform Environmental Report). The remaining municipalities are expected to pass resolutions in the near future and these resolutions will be included in the final Special Study submitted to PaDEP for approval.

10.3 Agency Reviews

Review copies of this public release Special Study are being sent to the following agencies:

- Allegheny County Health Department;
- Allegheny County Department of Economic Development;
- Southwestern Pennsylvania Commission;
- City of Pittsburgh Department of City Planning;
- The planning commissions for the other municipalities listed above in Section 10.2;
- Pennsylvania Department of Environmental Protection;
- Pennsylvania Department of Conservation and Natural Resources (since some project sites are within one mile of Point State Park); and
- U. S. National Park Service (since some project sites are within one mile of national historic landmarks).

Courtesy copies are also being sent to the Pittsburgh Water and Sewer Authority and the Hampton Shaler Water Authority for their review and comment. Coordination with the Hampton Shaler Water Authority is ongoing. ALCOSAN first met with the Hampton Shaler Water Authority in 2019 and prepared a memo with several alternative alignments for the Allegheny River Tunnel that would reduce the risk of adverse impacts on the well field. The BODR reflects one such alignment. ALCOSAN met with Hampton-Shaler Water Authority staff and the Board of Directors in October 2021 to discuss outstanding concerns and recently provided them with a requested existing conditions memorandum to further discussions. In a March 7, 2022 letter the Hampton Shaler Water Authority recognized the necessity of the Allegheny River Tunnel and expressed conditional support to the extent that their aquifer would remain uncompromised. A copy of this letter is provided in Exhibit F of Appendix B. The tunnel alignment in question has no impact on the Ohio River Tunnel currently under design. The October 2020 *Preliminary Basis of Design Report* notes that the proposed Allegheny River Tunnel alignment will veer north of the well field to reduce the risk of adverse impacts on the well field. Design of the Allegheny River Tunnel is not scheduled to begin until 2025, allowing ample time for further coordination on an alignment satisfactory to both parties.

Copies of ALCOSAN's letters of transmittal, local agency comments received during the 60-day local agency comment period and ALCOSAN's responses to these comments will be provided in Exhibit G of Appendix B (Uniform Environmental Report) of the final Special Study.

10.4 Documentation of Public Notices

Public notices as to the draft document's availability for review and comment will be published in the Pittsburgh Post-Gazette and the New Pittsburgh Courier. In addition, public notice will be provided via notices on ALCOSAN's web site and social media accounts, as well as being sent out via ALCOSAN's direct marketing email service. The documentation will be included in Exhibit H of Appendix B (Uniform Environmental Report) of the final Special Study.

10.5 Public Comments and Responses

Documentation of public comments received during the 30-day public comment period and ALCOSAN's responses to these comments will be provided in Exhibit I of Appendix B (Uniform Environmental Report) of the final Special Study.

Appendix A

Act 537 Plan Content and Environmental Assessment Checklist

Act 537 Plan Content and Environmental Assessment Checklist

NOTE: The checklist contained in this appendix has been modified to grey out the requirements that are not applicable for this proposed amendment to ALCOSAN's 1996 Act 537 Plan. The locations at which the applicable checklist requirements that were determined by PaDEP and ALCOSAN are cross-referenced.

PART 2 ADMINISTRATIVE COMPLETENESS CHECKLIST			
DEP Use Only	Indicate Page Topic Starts on in Plan	Indicate Section # in Plan	
			In addition to the main body of the plan, the plan must include items one through eight listed below to be accepted for formal review by the department. Incomplete Plans will be returned unless the municipality is clearly requesting an advisory review.
_____	<u>TOC-1</u>	<u>TOC</u>	1. Table of Contents
			2. Plan Summary
_____	<u>3-1</u>	<u>3.1</u>	A. Identify the proposed service areas ...
	<u>1-1</u>	<u>1.2</u>	...and major problems evaluated in the plan. (Reference - Title 25, §71.21.a.7.i).
_____	<u>6-14</u>	<u>6.4</u>	B. Identify the alternative(s) chosen to solve the problems and serve the areas of need identified in the plan. Also, include any institutional arrangements necessary to implement the chosen alternative(s). (Reference Title 25 §71.21.a.7.ii).
_____	<u>6-25</u>	<u>6.4</u>	C. Present the estimated cost of implementing the proposed alternative (including the user fees) and the proposed funding method to be used. (Reference Title 25, §71.21.a.7.ii).
_____	<u>1-3</u>	<u>1.3</u>	D. Identify the municipal commitments necessary to implement the Plan. (Reference Title 25, §71.21.a.7.iii).
_____	<u>9-1</u>	<u>9.2</u>	E. Provide a schedule of implementation for the project that identifies the MAJOR milestones with dates necessary to accomplish the project to the point of operational status. (Reference Title 25, §71.21.a.7.iv).
_____	<u>10-3</u>	<u>10.2</u>	3. Municipal Adoption: Original , signed and sealed Resolution of Adoption by the municipality which contains, at a minimum, alternatives chosen and a commitment to implement the Plan in accordance with the implementation schedule. (Reference Title 25, §71.31.f) Section V.F. of the Planning Guide.
_____	<u>10-4</u>	<u>10.3</u>	4. Planning Commission / County Health Department Comments: Evidence that the municipality has requested, reviewed and considered comments by appropriate official planning agencies of the municipality, planning agencies of the county, planning agencies with area wide jurisdiction (where applicable), and any existing county or joint county departments of health. (Reference-Title 25, §71.31.b) Section V.E.1 of the Planning Guide.

DEP Use Only	Indicate Page Topic Starts on in Plan	Indicate Section # in Plan	
_____	<u>10-4</u>	<u>10.4</u>	5. Publication: Proof of Public Notice which documents the proposed plan adoption, plan summary, and the establishment and conduct of a 30 day comment period. (Reference-Title 25, §71.31.c) Section V.E.2 of the Planning Guide.
_____	<u>10-5</u>	<u>10.5</u>	6. Comments and Responses: Copies of ALL written comments received and municipal response to EACH comment in relation to the proposed plan. (Reference-Title 25, §71.31.c) Section V.E.2 of the Planning Guide.
_____	<u>9-1</u>	<u>9.2</u>	7. Implementation Schedule: A complete project implementation schedule with milestone dates specific for each existing and future area of need. Other activities in the project implementation schedule should be indicated as occurring a finite number of days from a major milestone. (Reference-Title 25, §71.31.d) Section V.F. of the Planning Guide. Include dates for the future initiation of feasibility evaluations in the project's implementation schedule for areas proposing completion of sewage facilities for planning periods in excess of five years. (Reference Title 25, §71.21.c).
_____	<u>7-1</u>	<u>7.0</u>	8. Consistency Documentation: Documentation indicating that the appropriate agencies have received, reviewed and concurred with the method proposed to resolve identified inconsistencies within the proposed alternative and consistency requirements in 71.21.(a)(5)(i-iii). (Reference-Title 25, §71.31.e). Appendix B of the Planning Guide

PART 3 GENERAL PLAN CONTENT CHECKLIST

_____	<u>2-1</u>	<u>2.1</u>	I. Previous Wastewater Planning A. Identify, describe and briefly analyze all past wastewater planning for its impact on the current planning effort:
_____	<u>2-1</u>	<u>2.1</u>	1. Previously undertaken under the Sewage Facilities Act (Act 537). (Reference-Act 537, Section 5 §d.1).
_____	<u>N/A</u>	_____	2. Has not been carried out according to an approved implementation schedule contained in the plans. (Reference-Title 25, §71.21.a.5.i.A-D). Section V.F of the Planning Guide.
_____	<u>N/A</u>	_____	3. Is anticipated or planned by applicable sewer authorities or approved under a Chapter 94 Corrective Action Plan. (Reference-Title 25, §71.21.a.5.i.A&B). Section V.D. of the Planning Guide.
_____	<u>N/A</u>	_____	4. Through planning modules for new land development, planning "exemptions" and addenda. (Reference-Title 25, §71.21.a.5.i.A).
_____	<u>3-1</u>	<u>3.1</u>	II. Physical and Demographic Analysis utilizing written description and mapping (All items listed below require maps, and all maps should show all current lots and structures and be of appropriate scale to clearly show significant information).
_____	<u>3-1</u>	<u>3.1.1</u>	A. Identification of planning area(s), municipal boundaries, Sewer Authority/Management Agency service area boundaries. (Reference-Title 25, §71.21.a.1.i).

DEP Use Only	Indicate Page Topic Starts on in Plan	Indicate Section # in Plan	
_____	<u>3-4</u>	<u>3.2.1</u>	B. Identification of physical characteristics (streams, lakes, impoundments, natural conveyance, channels, drainage basins in the planning area). (Reference-Title 25, §71.21.a.1.ii).
_____	<u>3-5</u>	<u>3.2.2</u>	C. Soils - Analysis with description by soil type and soils mapping for areas not presently served by sanitary sewer service. Show areas suitable for in-ground onlot systems, elevated sand mounds, individual residential spray irrigation systems, and areas unsuitable for soil dependent systems. (Reference-Title 25, §71.21.a.1.iii). Show Prime Agricultural Soils and any locally protected agricultural soils. (Reference-Title 25, §71.21.a.1.iii).
_____	<u>3-5</u>	<u>3.2.2</u>	D. Geologic Features - (1) Identification through analysis, (2) mapping and (3) their relation to existing or potential nitrate-nitrogen pollution and drinking water sources. Include areas where existing nitrate-nitrogen levels are in excess of 5 mg/L. (Reference-Title 25, §71.21.a.1.iii).
_____	<u>3-5</u>	<u>3.2.2</u>	E. Topography - Depict areas with slopes that are suitable for conventional systems; slopes that are suitable for elevated sand mounds and slopes that are unsuitable for onlot systems. (Reference-Title 25, §71.21.a.1.ii).
_____	<u>3-5</u>	<u>3.2.3</u>	F. Potable Water Supplies - Identification through mapping, description and analysis. Include public water supply service areas and available public water supply capacity and aquifer yield for groundwater supplies. (Reference-Title 25 §71.21.a.1.vi). Section V.C. of the Planning Guide.
_____	<u>3-9</u>	<u>3.2.4</u>	G. Wetlands-Identify wetlands as defined in Title 25, Chapter 105 by description, analysis and mapping. Include National Wetland Inventory mapping and potential wetland areas per USDA, SCS mapped hydric soils. Proposed collection, conveyance and treatment facilities and lines must be located and labeled, along with the identified wetlands, on the map. (Reference-Title 25, §71.21.a.1.v). Appendix B, Section II.I of the Planning Guide.
_____	_____	_____	III. Existing Sewage Facilities in the Planning Area - Identifying the Existing Needs
_____	_____	_____	A. Identify, map and describe municipal and non-municipal, individual and community sewerage systems in the planning area including:
_____	_____	_____	1. Location, size and ownership of treatment facilities, main intercepting lines, pumping stations and force mains including their size, capacity, point of discharge. Also include the name of the receiving stream, drainage basin, and the facility's effluent discharge requirements. (Reference-Title 25, §71.21a.2.i.A).
_____	_____	_____	2. A narrative and schematic diagram of the facility's basic treatment processes including the facility's NPDES permitted capacity, and the Clean Streams Law permit number. (Reference-Title 25, §71.21.a.2.i.A).

DEP Use Only	Indicate Page Topic Starts on in Plan	Indicate Section # in Plan	
_____	_____	_____	3. A description of problems with existing facilities (collection, conveyance and/or treatment), including existing or projected overload under Title 25, Chapter 94 (relating to municipal wasteload management) or violations of the NPDES permit, Clean Streams Law permit, or other permit, rule or regulation of DEP. (Reference-Title 25, §71.21.a.2.i.B).
_____	_____	_____	4. Details of scheduled or in-progress upgrading or expansion of treatment facilities and the anticipated completion date of the improvements. Discuss any remaining reserve capacity and the policy concerning the allocation of reserve capacity. Also discuss the compatibility of the rate of growth to existing and proposed wastewater treatment facilities. (Reference-Title 25, §71.21.a.4.i & ii).
_____	_____	_____	5. A detailed description of the municipality's operation and maintenance requirements for small flow treatment facility systems, including the status of past and present compliance with these requirements and any other requirements relating to sewage management programs. (Reference-Title 25, §71.21.a.2.i.C).
_____	_____	_____	6. Disposal areas, if other than stream discharge, and any applicable groundwater limitations. (Reference-Title 25, §71.21.a.4.i & ii).
_____	_____	_____	B. Using DEP's publication titled <i>Sewage Disposal Needs Identification</i> , identify, map and describe areas that utilize individual and community onlot sewage disposal and, unpermitted collection and disposal systems ("wildcat" sewers, borehole disposal, etc.) and retaining tank systems in the planning area including:
_____	_____	_____	1. The types of onlot systems in use. (Reference-Title 25, §71.21.a.2.ii.A).
_____	_____	_____	2. A sanitary survey complete with description, map and tabulation of documented and potential public health, pollution, and operational problems (including malfunctioning systems) with the systems, including violations of local ordinances, the Sewage Facilities Act, the Clean Stream Law or regulations promulgated thereunder. (Reference-Title 25, §71.21.a.2.ii.B).
_____	_____	_____	3. A comparison of the types of onlot sewage systems installed in an area with the types of systems which are appropriate for the area according to soil, geologic conditions, topographic limitations sewage flows, and Title 25 Chapter 73 (relating to standards for sewage disposal facilities). (Reference-Title 25, §71.21.a.2.ii.C).
_____	_____	_____	4. An individual water supply survey to identify possible contamination by malfunctioning onlot sewage disposal systems consistent with DEP's <i>Sewage Disposal Needs Identification</i> publication. (Reference-Title 25 §71.21.a.2.ii.B).

DEP Use Only	Indicate Page Topic Starts on in Plan	Indicate Section # in Plan	
_____	_____	_____	5. Detailed description of operation and maintenance requirements of the municipality for individual and small volume community onlot systems, including the status of past and present compliance with these requirements and any other requirements relating to sewage management programs. (Reference-Title 25, §71.21.a.2.i.C).
_____	_____	_____	C. Identify wastewater sludge and septage generation, transport and disposal methods. Include this information in the sewage facilities alternative analysis including:
_____	_____	_____	1. Location of sources of wastewater sludge or septage (Septic tanks, holding tanks, wastewater treatment facilities). (Reference-Title 25 §71.71).
_____	_____	_____	2. Quantities of the types of sludges or septage generated. (Reference-Title 25 §71.71).
_____	_____	_____	3. Present disposal methods, locations, capacities and transportation methods. (Reference-Title 25 §71.71).
_____	_____	_____	IV. Future Growth and Land Development A. Identify and briefly summarize all municipal and county planning documents adopted pursuant to the Pennsylvania Municipalities Planning Code (Act 247) including:
_____	_____	_____	1. All land use plans and zoning maps that identify residential, commercial, industrial, agricultural, recreational and open space areas. (Reference-Title 25, §71.21.a.3.iv).
_____	_____	_____	2. Zoning or subdivision regulations that establish lot sizes predicated on sewage disposal methods. (Reference – Title 25§71.21.a.3.iv).
_____	_____	_____	3. All limitations and plans related to floodplain and stormwater management and special protection (Ch. 93) areas. (Reference-Title 25 §71.21.a.3.iv) Appendix B, Section II.F of the Planning Guide.
_____	_____	_____	B. Delineate and describe the following through map, text and analysis.
_____	_____	_____	1. Areas with existing development or plotted subdivisions. Include the name, location, description, total number of EDU's in development, total number of EDU's currently developed and total number of EDU's remaining to be developed (include time schedule for EDU's remaining to be developed). (Reference-Title 25, §71.21.a.3.i).

DEP Use Only	Indicate Page Topic Starts on in Plan	Indicate Section # in Plan	
_____	_____	_____	2. Land use designations established under the Pennsylvania Municipalities Planning Code (35 P.S. 10101-11202), including residential, commercial and industrial areas. (Reference-Title 25, §71.21.a.3.ii). Include a comparison of proposed land use as allowed by zoning and existing sewage facility planning. (Reference-Title 25, §71.21.a.3.iv).
_____	_____	_____	3. Future growth areas with population and EDU projections for these areas using historical, current and future population figures and projections of the municipality. Discuss and evaluate discrepancies between local, county, state and federal projections as they relate to sewage facilities. (Reference-Title 25, §71.21.a.1.iv). (Reference-Title 25, §71.21.a.3.iii).
_____	_____	_____	4. Zoning, and/or subdivision regulations; local, county or regional comprehensive plans; and existing plans of any other agency relating to the development, use and protection of land and water resources with special attention to: (Reference-Title 25, §71.21.a.3.iv). --public ground/surface water supplies --recreational water use areas --groundwater recharge areas --industrial water use --wetlands
_____	<u>5-12</u>	<u>5.3</u>	5. Sewage planning necessary to provide adequate wastewater treatment for five and ten year future planning periods based on projected growth of existing and proposed wastewater collection and treatment facilities. (Reference-Title 25, §71.21.a.3.v).
_____	<u>6-1</u>	<u>6.1</u>	V. Identify Alternatives to Provide New or Improved Wastewater Disposal Facilities
_____	_____	_____	A. Conventional collection, conveyance, treatment and discharge alternatives including:
_____	_____	_____	1. The potential for regional wastewater treatment. (Reference-Title 25, §71.21.a.4).
_____	_____	_____	2. The potential for extension of existing municipal or non-municipal sewage facilities to areas in need of new or improved sewage facilities. (Reference-Title 25, §71.21.a.4.i).
_____	<u>6-14</u>	<u>6.4</u>	3. The potential for the continued use of existing municipal or non-municipal sewage facilities through one or more of the following: (Reference-Title 25, §71.21.a.4.ii).
_____	_____	_____	a. Repair. (Reference-Title 25, §71.21.a.4.ii.A).

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_____	6-14	6.4	b. Upgrading. (Reference-Title 25, §71.21.a.4.ii.B).
_____	_____	_____	c. Reduction of hydraulic or organic loading to existing facilities. (Reference-Title 25, §71.71).
_____	_____	_____	d. Improved operation and maintenance. Reference-Title 25, §71.21.a.4.ii.C).
_____	_____	_____	e. Other applicable actions that will resolve or abate the identified problems. (Reference-Title 25, §71.21.a.4.ii.D).
_____	_____	_____	4. Repair or replacement of existing collection and conveyance system components. (Reference-Title 25, §71.21.a.4.ii.A).
_____	_____	_____	5. The need for construction of new community sewage systems including sewer systems and/or treatment facilities. (Reference-Title 25, §71.21.a.4.iii).
_____	_____	_____	6. Use of innovative/alternative methods of collection/conveyance to serve needs areas using existing wastewater treatment facilities. (Reference-Title 25, §71.21.a.4.ii.B).
_____	_____	_____	B. The use of individual sewage disposal systems including individual residential spray irrigation systems based on:
_____	_____	_____	1. Soil and slope suitability. (Reference-Title 25, §71.21.a.2.ii.C).
_____	_____	_____	2. Preliminary hydrogeologic evaluation. (Reference-Title 25, §71.21.a.2.ii.C).
_____	_____	_____	3. The establishment of a sewage management program. (Reference-Title 25, §71.21.a.4.iv). See also Part "F" below.
_____	_____	_____	4. The repair, replacement or upgrading of existing malfunctioning systems in areas suitable for onlot disposal considering: (Reference-Title 25, §71.21.a.4).

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_____	_____	_____	a. Existing technology and sizing requirements of Title 25 Chapter 73. (Reference-Title 25, §73.31-73.72).
_____	_____	_____	b. Use of expanded absorption areas or alternating absorption areas. (Reference-Title 25, §73.16).
_____	_____	_____	c. Use of water conservation devices. (Reference-Title 25, §71.73.b.2.iii).
_____	_____	_____	C. The use of small flow sewage treatment facilities or package treatment facilities to serve individual homes or clusters of homes with consideration of: (Reference-Title 25, §71.64.d).
_____	_____	_____	1. Treatment and discharge requirements. (Reference-Title 25, §71.64.d).
_____	_____	_____	2. Soil suitability. (Reference-Title 25, §71.64.c.i).
_____	_____	_____	3. Preliminary hydrogeologic evaluation. (Reference-Title 25, §71.64.c.2).
_____	_____	_____	4. Municipal, Local, Agency or other controls over operation and maintenance requirements through a Sewage Management Program. (Reference-Title 25, §71.64.d). See Part "F" below.
_____	_____	_____	D. The use of community land disposal alternatives including:
_____	_____	_____	1. Soil and site suitability. (Reference-Title 25, §71.21.a.2.ii.C).
_____	_____	_____	2. Preliminary hydrogeologic evaluation. (Reference-Title 25, §71.21.a.2.ii.C).
_____	_____	_____	3. Municipality, Local Agency or Other Controls over operation and maintenance requirements through a Sewage Management Program (Reference-Title 25, §71.21.a.2.ii.C). See Part "F" below.

DEP Use Only	Indicate Page Topic Starts on in Plan	Indicate Section # in Plan	
_____	_____	_____	4. The rehabilitation or replacement of existing malfunctioning community land disposal systems. (See Part "V", B, 4, a, b, c above). See also Part "F" below.
_____	_____	_____	E. The use of retaining tank alternatives on a temporary or permanent basis including: (Reference- Title 25, §71.21.a.4).
_____	_____	_____	1. Commercial, residential and industrial use. (Reference-Title 25, §71.63.e).
_____	_____	_____	2 Designated conveyance facilities (pumper trucks). (Reference-Title 25, §71.63.b.2).
_____	_____	_____	3. Designated treatment facilities or disposal site. (Reference-Title 25, §71.63.b.2).
_____	_____	_____	4. Implementation of a retaining tank ordinance by the municipality. (Reference-Title 25, §71.63.c.3). See Part "F" below.
_____	_____	_____	5. Financial guarantees when retaining tanks are used as an interim sewage disposal measure. (Reference-Title 25, §71.63.c.2).
_____	_____	_____	F. Sewage Management Programs to assure the future operation and maintenance of existing and proposed sewage facilities through:
_____	_____	_____	1. Municipal ownership or control over the operation and maintenance of individual onlot sewage disposal systems, small flow treatment facilities, or other traditionally non-municipal treatment facilities. (Reference-Title 25, §71.21.a.4.iv).
_____	_____	_____	2. Required inspection of sewage disposal systems on a schedule established by the municipality. (Reference-Title 25, §71.73.b.1.).
_____	_____	_____	3. Required maintenance of sewage disposal systems including septic and aerobic treatment tanks and other system components on a schedule established by the municipality. (Reference-Title 25, §71.73.b.2).
_____	_____	_____	4. Repair, replacement or upgrading of malfunctioning onlot sewage systems. (Reference-Title 25, §71.21.a.4.iv) and §71.73.b.5 through:

DEP Use Only	Indicate Page Topic Starts on in Plan	Indicate Section # in Plan	
_____	_____	_____	a. Aggressive pro-active enforcement of ordinances that require operation and maintenance and prohibit malfunctioning systems. (Reference-Title 25, §71.73.b.5).
_____	_____	_____	b. Public education programs to encourage proper operation and maintenance and repair of sewage disposal systems.
_____	_____	_____	5. Establishment of joint municipal sewage management programs. (Reference-Title 25, §71.73.b.8).
_____	_____	_____	6. Requirements for bonding, escrow accounts, management agencies or associations to assure operation and maintenance for non-municipal facilities. (Reference-Title 25, §71.71).
_____	_____	_____	G. Non-structural comprehensive planning alternatives that can be undertaken to assist in meeting existing and future sewage disposal needs including: (Reference-Title 25, §71.21.a.4). 1. Modification of existing comprehensive plans involving:
_____	_____	_____	a. Land use designations. (Reference-Title 25, §71.21.a.4).
_____	_____	_____	b. Densities. (Reference-Title 25, §71.21.a.4).
_____	_____	_____	c. Municipal ordinances and regulations. (Reference-Title 25, §71.21.a.4).
_____	_____	_____	d. Improved enforcement. (Reference-Title 25, §71.21.a.4).
_____	_____	_____	e. Protection of drinking water sources. (Reference-Title 25, §71.21.a.4).
_____	_____	_____	2. Consideration of a local comprehensive plan to assist in producing sound economic and consistent land development. (Reference-Title 25, §71.21.a.4).
_____	_____	_____	3. Alternatives for creating or changing municipal subdivision regulations to assure long-term use of on-site sewage disposal that consider lot sizes and protection of replacement areas. (Reference-Title 25, §71.21.a.4).

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_____	_____	_____	4. Evaluation of existing local agency programs and the need for technical or administrative training. (Reference-Title 25, §71.21.a.4).
_____	<u>7-11</u>	<u>7.4.2</u>	H. A no-action alternative which includes discussion of both short-term and long-term impacts on: (Reference-Title 25, §71.21.a.4).
_____	<u>7-11</u>	<u>7.4.2</u>	1. Water Quality/Public Health. (Reference-Title 25, §71.21.a.4).
_____	<u>7-11</u>	<u>7.4.2</u>	2. Growth potential (residential, commercial, industrial). (Reference-Title 25, §71.21.a.4).
_____	<u>7-11</u>	<u>7.4.2</u>	3. Community economic conditions. (Reference-Title 25, §71.21.a.4).
_____	<u>7-11</u>	<u>7.4.2</u>	4. Recreational opportunities. (Reference-Title 25, §71.21.a.4).
_____	<u>7-11</u>	<u>7.4.2</u>	5. Drinking water sources. (Reference-Title 25, §71.21.a.4).
_____	<u>7-11</u>	<u>7.4.2</u>	6. Other environmental concerns. (Reference-Title 25, §71.21.a.4).
_____	<u>7-1</u>	<u>7.1</u>	VI. Evaluation of Alternatives A. Technically feasible alternatives identified in Section V of this checklist must be evaluated for consistency with respect to the following: (Reference-Title 25, §71.21.a.5.i.).
_____	<u>7-1</u>	<u>7.1.1</u>	1. Applicable plans developed and approved under Sections 4 and 5 of the Clean Streams Law or Section 208 of the Clean Water Act (33 U.S.C.A. 1288). (Reference-Title 25, §71.21.a.5.i.A). Appendix B, Section II.A of the Planning Guide.
_____	_____	_____	2. Municipal wasteload management Corrective Action Plans or Annual Reports developed under PA Code, Title 25, Chapter 94. (Reference-Title 25, §71.21.a.5.i.B). The municipality's recent Wasteload Management (Chapter 94) Reports should be examined to determine if the proposed alternative is consistent with the recommendations and findings of the report. Appendix B, Section II.B of the Planning Guide.

DEP Use Only	Indicate Page Topic Starts on in Plan	Indicate Section # in Plan	
_____	<u>7-1</u>	<u>7.1.2</u>	3. Plans developed under Title II of the Clean Water Act (33 U.S.C.A. 1281-1299) or Titles II and VI of the Water Quality Act of 1987 (33 U.S.C.A 1251-1376). (Reference-Title 25, §71.21.a.5.i.C). Appendix B, Section II.E of the Planning Guide.
_____	_____	_____	4. Comprehensive plans developed under the Pennsylvania Municipalities Planning Code. (Reference-Title 25, §71.21.a.5.i.D). The municipality's comprehensive plan must be examined to assure that the proposed wastewater disposal alternative is consistent with land use and all other requirements stated in the comprehensive plan. Appendix B, Section II.D of the Planning Guide.
_____	<u>7-1</u>	<u>7.1.3</u>	5. Antidegradation requirements as contained in PA Code, Title 25, Chapters 93, 95 and 102 (relating to water quality standards, wastewater treatment requirements and erosion control) and the Clean Water Act. (Reference-Title 25, §71.21.a.5.i.E). Appendix B, Section II.F of the Planning Guide.
_____	<u>7-10</u>	<u>7.2.6</u>	6. State Water Plans developed under the Water Resources Planning Act (42 U.S.C.A. 1962-1962 d-18). (Reference-Title 25, §71.21.a.5.i.F). Appendix B, Section II.C of the Planning Guide.
_____	<u>7-10</u>	<u>7.2.7</u>	7. Pennsylvania Prime Agricultural Land Policy contained in Title 4 of the Pennsylvania Code, Chapter 7, Subchapter W. Provide narrative on local municipal policy and an overlay map on prime agricultural soils. (Reference-Title 25, §71.21.a.5.i.G). Appendix B, Section II.G of the Planning Guide.
_____	<u>7-2</u>	<u>7.2.1</u>	8. County Stormwater Management Plans approved by DEP under the Storm Water Management Act (32 P.S. 680.1-680.17). (Reference-Title 25, §71.21.a.5.i.H). Conflicts created by the implementation of the proposed wastewater alternative and the existing recommendations for the management of stormwater in the county Stormwater Management Plan must be evaluated and mitigated. If no plan exists, no conflict exists. Appendix B, Section II.H of the Planning Guide.
_____	<u>7-3</u>	<u>7.2.2</u>	9. Wetland Protection. Using wetland mapping developed under Checklist Section II.G, identify and discuss mitigative measures including the need to obtain permits for any encroachments on wetlands from the construction or operation of any proposed wastewater facilities. (Reference-Title 25, §71.21.a.5.i.I) Appendix B, Section II.I of the Planning Guide.
_____	<u>7-8</u>	<u>7.2.4</u>	10. Protection of rare, endangered or threatened plant and animal species as identified by the Pennsylvania Natural Diversity Inventory (PNDI). (Reference-Title 25, §71.21.a.5.i.J). Provide DEP with a copy of the completed Request For PNDI Search document. Also provide a copy of the response letter from the Department of Conservation and Natural Resources' Bureau of Forestry regarding the findings of the PNDI search. Appendix B, Section II.J of the Planning Guide.

DEP Use Only	Indicate Page Topic Starts on in Plan	Indicate Section # in Plan	
_____	<u>7-9</u>	<u>7.2.5</u>	11. Historical and archaeological resource protection under P.C.S. Title 37, Section 507 relating to cooperation by public officials with the Pennsylvania Historical and Museum Commission. (Reference-Title 25, §71.21.a.5.i.K). Provide the department with a completed copy of a Cultural Resource Notice request of the Bureau of Historic Preservation (BHP) to provide a listing of known historical sites and potential impacts on known archaeological and historical sites. Also provide a copy of the response letter from the BHP. Appendix B, Section II.K of the Planning Guide.
_____	_____	_____	B. Provide for the resolution of any inconsistencies in any of the points identified in Section VI.A. of this checklist by submitting a letter from the appropriate agency stating that the agency has received, reviewed and concurred with the resolution of identified inconsistencies. (Reference-Title 25, §71.21.a.5.ii). Appendix B of the Planning Guide.
_____	<u>7-10</u>	<u>7.3</u>	C. Evaluate alternatives identified in Section V of this checklist with respect to applicable water quality standards, effluent limitations or other technical, legislative or legal requirements. (Reference-Title 25, §71.21.a.5.iii).
_____	<u>6-1</u>	<u>6.1</u>	D. Provide cost estimates using present worth analysis for construction, financing, on going administration, operation and maintenance and user fees for alternatives identified in Section V of this checklist. Estimates shall be limited to areas identified in the plan as needing improved sewage facilities within five years from the date of plan submission. (Reference-Title 25, §71.21.a.5.iv).
_____	<u>8-10</u>	<u>8.5.2</u>	E. Provide an analysis of the funding methods available to finance the proposed alternatives evaluated in Section V of this checklist. Also provide documentation to demonstrate which alternative and financing scheme combination is the most cost-effective; and a contingency financial plan to be used if the preferred method of financing cannot be implemented. The funding analysis shall be limited to areas identified in the plan as needing improved sewage facilities within five years from the date of the plan submission. (Reference-Title 25, §71.21.a.5.v).
_____	_____	_____	F. Analyze the need for immediate or phased implementation of each alternative proposed in Section V of this checklist including: (Reference-Title 25, §71.21.a.5.vi).
_____	_____	_____	1. A description of any activities necessary to abate critical public health hazards pending completion of sewage facilities or implementation of sewage management programs. (Reference-Title 25, §71.21.a.5.vi.A).
_____	_____	_____	2. A description of the advantages, if any, in phasing construction of the facilities or implementation of a sewage management program justifying time schedules for each phase. (Reference-Title 25, §71.21.a.5.vi.B).

DEP Use Only	Indicate Page Topic Starts on in Plan	Indicate Section # in Plan	
_____	<u>8-4</u>	<u>8.3</u>	G. Evaluate administrative organizations and legal authority necessary for plan implementation. (Reference - Title 25, §71.21.a.5.vi.D.).
_____	<u>8-1</u>	<u>8.0</u>	VII. Institutional Evaluation A. Provide an analysis of all existing wastewater treatment authorities, their past actions and present performance including:
_____	<u>8-1</u>	<u>8.1</u>	1. Financial and debt status. (Reference-Title 25, §71.61.d.2).
_____	<u>8-3</u>	<u>8.2</u>	2. Available staff and administrative resources.
_____	<u>8-4</u>	<u>8.3</u>	3. Existing legal authority to:
_____	<u>8-4</u>	<u>8.3</u>	a. Implement wastewater planning recommendations. (Reference-Title 25, §71.61.d.2).
_____	<u>8-4</u>	<u>8.3</u>	b. Implement system-wide operation and maintenance activities. (Reference-Title 25, §71.61.d.2).
_____	<u>8-4</u>	<u>8.3</u>	c. Set user fees and take purchasing actions. (Reference-Title 25, §71.61.d.2).
_____	<u>8-4</u>	<u>8.3</u>	d. Take enforcement actions against ordinance violators. (Reference-Title 25, §71.61.d.2).
_____	<u>8-4</u>	<u>8.3</u>	e. Negotiate agreements with other parties. (Reference-Title 25, §71.61.d.2).
_____	<u>8-4</u>	<u>8.3</u>	f. Raise capital for construction and operation and maintenance of facilities. (Reference-Title 25, §71.61.d.2).
_____	_____	_____	B. Provide an analysis and description of the various institutional alternatives necessary to implement the proposed technical alternatives including:

DEP Use Only	Indicate Page Topic Starts on in Plan	Indicate Section # in Plan	
_____	_____	_____	1. Need for new municipal departments or municipal authorities. (Reference-Title 25, §71.61.d.2).
_____	_____	_____	2. Functions of existing and proposed organizations (sewer authorities, onlot maintenance agencies, etc.). (Reference-Title 25, §71.61.d.2).
_____	_____	_____	3. Cost of administration, implementability, and the capability of the authority/agency to react to future needs. (Reference-Title 25, §71.61.d.2).
_____	_____	_____	C. Describe all necessary administrative and legal activities to be completed and adopted to ensure the implementation of the recommended alternative including:
_____	_____	_____	1. Incorporation of authorities or agencies. (Reference-Title 25, §71.61.d.2).
_____	_____	_____	2. Development of all required ordinances, regulations, standards and inter-municipal agreements. (Reference-Title 25, §71.61.d.2).
_____	_____	_____	3. Description of activities to provide rights-of-way, easements and land transfers. (Reference-Title 25, §71.61.d.2).
_____	_____	_____	4. Adoption of other municipal sewage facilities plans. (Reference-Title 25, §71.61.d.2).
_____	_____	_____	5. Any other legal documents. (Reference-Title 25, §71.61.d.2).
_____	_____	_____	6. Dates or timeframes for items 1-5 above on the project's implementation schedule.
_____	_____	_____	D. Identify the proposed institutional alternative for implementing the chosen technical wastewater disposal alternative. Provide justification for choosing the specific institutional alternative considering administrative issues, organizational needs and enabling legal authority. (Reference-Title 25, §71.61.d.2).

DEP Use Only	Indicate Page Topic Starts on in Plan	Indicate Section # in Plan	
_____		<u>Schedule – Section 9, Justification – Section 6</u>	VIII. Implementation Schedule and Justification for Selected Technical & Institutional Alternatives A. Identify the technical wastewater disposal alternative which best meets the wastewater treatment needs of each study area of the municipality. Justify the choice by providing documentation which shows that it is the best alternative based on:
_____	<u>6-5</u>	<u>6.2</u>	1. Existing wastewater disposal needs. (Reference-Title 25, §71.21.a.6).
_____	<u>6-5</u>	<u>6.2</u>	2. Future wastewater disposal needs. (five and ten years growth areas). (Reference-Title 25, §71.21.a.6).
_____	<u>6-5</u>	<u>6.2</u>	3. Operation and maintenance considerations. (Reference-Title 25, §71.21.a.6).
_____	<u>6-5</u>	<u>6.2</u>	4. Cost-effectiveness. (Reference-Title 25, §71.21.a.6).
_____	<u>8-3</u>	<u>8.2</u>	5. Available management and administrative systems. (Reference-Title 25, §71.21.a.6).
_____	<u>8-9</u>	<u>8.5</u>	6. Available financing methods. (Reference-Title 25, §71.21.a.6).
_____	<u>7-11</u>	<u>7.4</u>	7. Environmental soundness and compliance with natural resource planning and preservation programs. (Reference-Title 25, §71.21.a.6).
_____	<u>8-9</u>	<u>8.5</u>	B. Designate and describe the capital financing plan chosen to implement the selected alternative(s). Designate and describe the chosen back-up financing plan. (Reference-Title 25, §71.21.a.6)
_____	<u>9-1</u>	<u>9.2</u>	C. Designate and describe the implementation schedule for the recommended alternative, including justification for any proposed phasing of construction or implementation of a Sewage Management Program. (Reference – Title 25 §71.31d)
_____			IX. Environmental Report (ER) generated from the Uniform Environmental Review Process (UER)

DEP Use Only	Indicate Page Topic Starts on in Plan	Indicate Section # in Plan	
_____	<u>7-12 & App. B</u>	<u>7.4.3</u>	A. Complete an ER as required by the UER process and as described in the DEP Technical Guidance 381-5511-111. Include this document as "Appendix A" to the Act 537 Plan Update Revision. Note: <i>An ER is required only for Wastewater projects proposing funding through any of the funding sources identified in the UER.</i>
	<u>6-1</u>	<u>6.1</u>	B. Cost-Effectiveness (Planning Phases)
DEP Use Only	Indicate Page #(s) in Plan	Item Required	

Appendix B
Uniform Environmental Report

REGIONAL CONVEYANCE FACILITIES OF THE INTERIM WET WEATHER PLAN



Uniform Environmental Report

March 2022



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- B Pennsylvania Historical Museum Commission Responses
- C Pennsylvania Natural Diversity Inventory Responses
- D Comprehensive Environmental Assessment
- E Documentation of Municipal and Public Outreach [to be added when complete]
- F Municipal Resolutions of Adoption and Related Municipal Correspondence
- G Documentation of Local Agency Reviews [to be added when complete]
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- I Public Comments and Responses [to be added when complete]

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Abbreviations and Acronyms

ACHD	Allegheny County Health Department
ALCOSAN	Allegheny County Sanitary Authority
ART	Allegheny River Tunnel
BODR	Basis of Design Report
CCT	Chartiers Creek Tunnel
CD	Consent Decree
CEA	Comprehensive Environmental Report
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CMAC	Customer Municipal Advisory Committee
CSO	Combined Sewer Overflow
CWA	Clean Water Act
CWP	Clean Water Plan
FEMA	Federal Emergency Management Agency
FWS	Fish and Wildlife Service
GAP	Great Allegheny Passage
HSCA	Hazardous Sites Cleanup Act
IWWP	Interim Measures Wet Weather Plan
MG	Million Gallons
MGD	Million Gallons per Day
MRT	Monongahela River Tunnel
N/A	Not Applicable
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resources Conservation Service
ORT	Ohio River Tunnel
PaDEP	Pennsylvania Department of Environmental Protection
PHMC	Pennsylvania Historical Museum Commission
PNDI	Pennsylvania Natural Diversity Inventory
RSG	Regional Stakeholder Group
SEMS	Superfund Enterprise Management System
SMRT	Saw Mill Run Tunnel
SSO	Sanitary Sewer Overflow
TBD	To be Determined
TBM	Tunnel Boring Machine
UER	Uniform Environmental Report
USEPA	United States Environmental Protection Agency
WWP	Wet Weather Plan
WWPS	Wet Weather Pump Station
WWTP	Wastewater Treatment Plant

1.0 PROJECT DESCRIPTION AND NEED

1.1 Purpose of and Need for Project

ALCOSAN provides wastewater conveyance and treatment services to the City of Pittsburgh and all or portions of 82 other customer municipalities shown on Figure 1-1. There are over 4,000 miles of wastewater collection sewers that are owned, operated, and maintained by the customer municipalities, or their designated municipal authorities. ALCOSAN’s regional interceptor sewer system consists of approximately 90 miles of interceptor sewer that convey wastewater from the municipalities to ALCOSAN’s 250 million gallon per day (MGD) Woods Run Wastewater Treatment Plant (WWTP) that is located at 3300 Preble Avenue in Pittsburgh, Pennsylvania along the Ohio River. There are over 300 regulator structures along the ALCOSAN interceptor system designed to protect the treatment system by controlling the quantity of flow diverted to the treatment plant during wet weather. In addition, there are over 140 municipal regulator structures located along municipal trunk sewers. These structures divert excess wet weather flow to local receiving waters at a rate of approximately 9 billion gallons per typical year and contribute to water quality impairments.

Pursuant to the Clean Water Act (CWA)¹⁻¹ and the Pennsylvania Clean Streams Law¹⁻², ALCOSAN has been working with the United States Environmental Protection Agency (USEPA), the Pennsylvania Department of Environmental Protection (PaDEP), the Allegheny County Health Department (ACHD) and the customer municipalities to control discharges of combined sewage and to eliminate sanitary sewer overflows from structures that were constructed under state and federal permits before the enactment of the CWA.

USEPA’s 1994 Combined Sewer Overflow (CSO) Control Policy¹⁻³ requires that overflow control plans of major permittees such as ALCOSAN be incorporated into an enforceable mechanism such as a federal consent decree. ALCOSAN entered into the original federal Consent Decree (CD) in 2008, submitted a Wet Weather Plan (WWP) to the regulatory agencies in 2013, and entered into a Modified CD in 2020 that requires implementation of an Interim Measures Wet Weather Plan (IWWP) by 2036 and Final Measures to be determined and implemented after post-construction monitoring of the IWWP.

Since issuing a draft of this Uniform Environmental Report in 2021, ALCOSAN received agency approval of its *Proposed Revisions to Interim Measures* report which proposed some modifications to the IWWP and an updated project schedule. While some intermediate dates have changed, the IWWP will still be completed by 2036. This Uniform Environmental Report has been updated to reflect the approved revisions.

¹⁻¹ 33 U.S.C. §§ 1251-1387

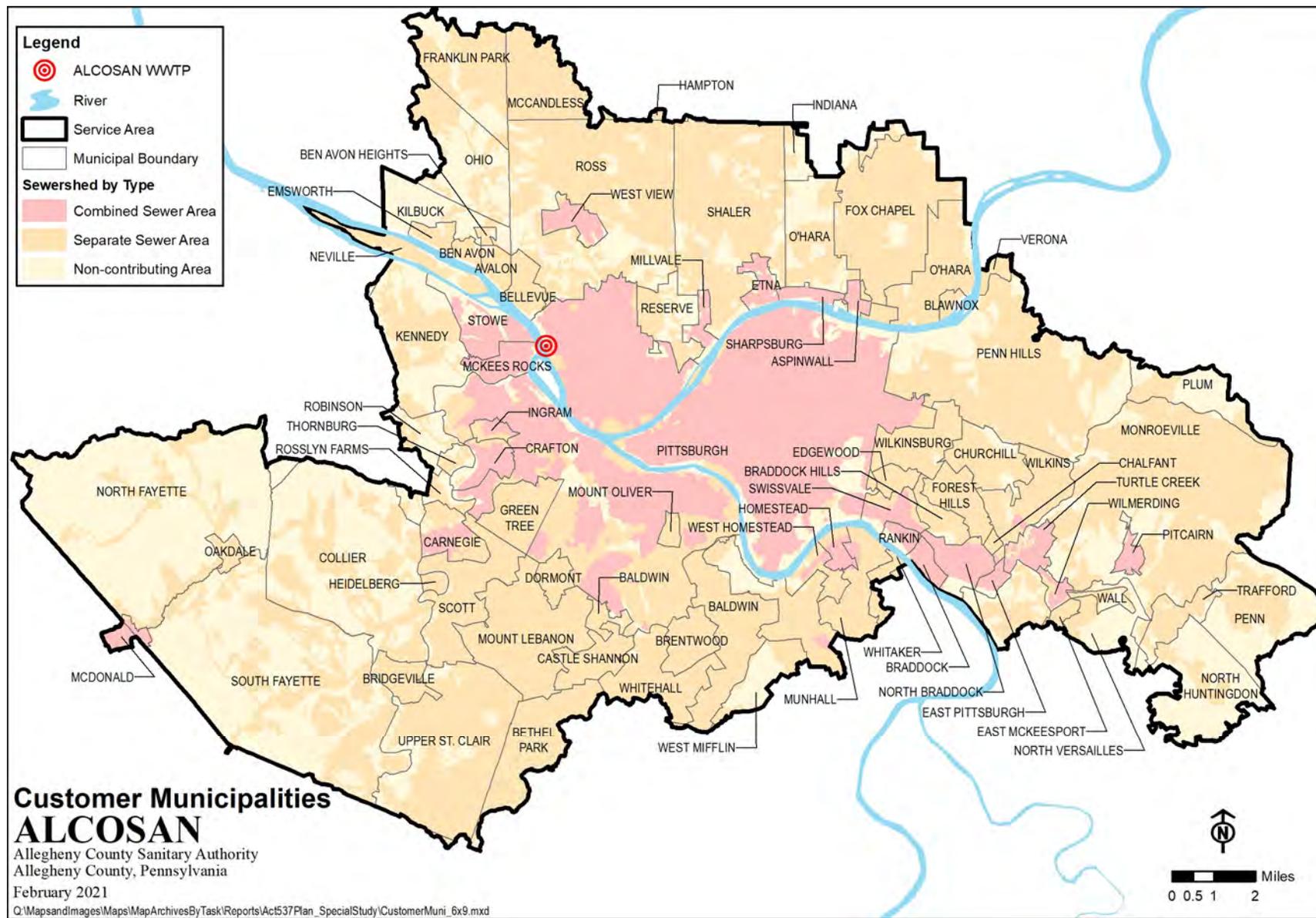
¹⁻² 35 P.C.S. 691.1 et seq.

¹⁻³ 59 F.R. 18688

Uniform Environmental Report - IWWP Regional Conveyance Facilities

Section 1 – Project Description and Need

Figure 1-1: ALCOSAN Service Area and Municipalities

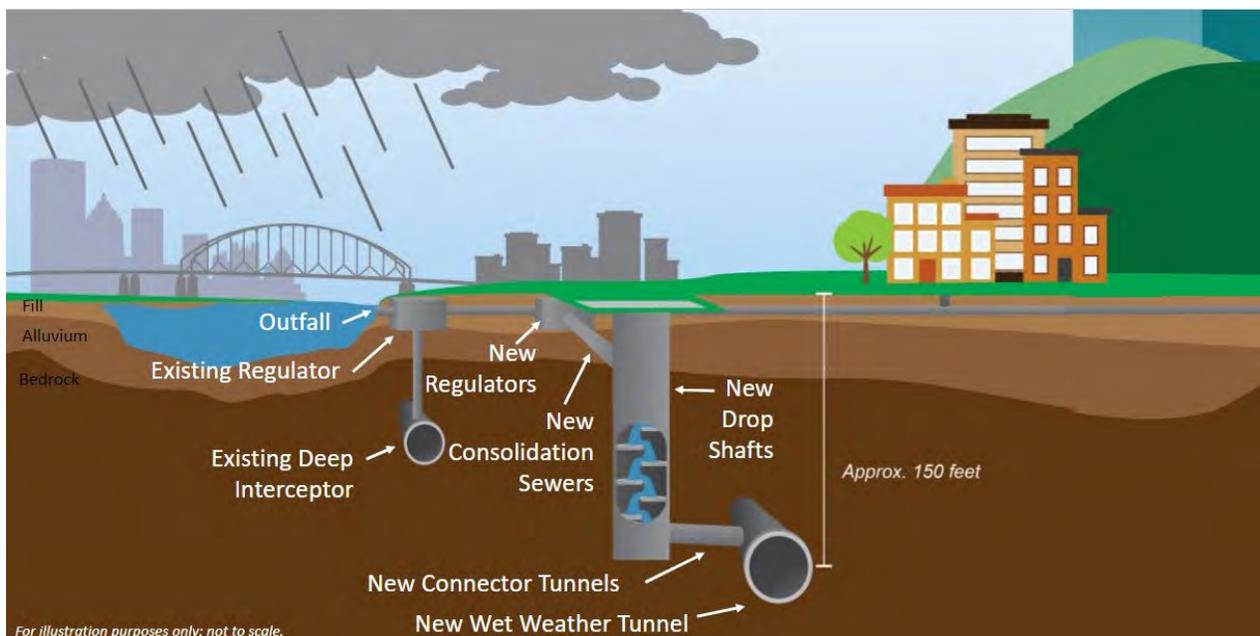


1.2 Project Description

This Uniform Environmental Report (UER) covers the proposed IWWP Regional Conveyance Facilities which will consist of a deep conveyance and storage tunnel system aligned along the Ohio, Allegheny and Monongahela Rivers and a 120 million gallons per day (MGD) wet weather pump station (to be constructed at or near the ALCOSAN’s Woods Run WWTP). The implementation of the Regional Conveyance Facilities coupled with expansion of wet weather treatment capacity to 600 MGD is projected to reduce the volume of untreated CSO discharges from 9,300 million gallons (MG) per typical year (projected future baseline conditions) to less than ALCOSAN’s 2,700 MG per typical year overflow volume remaining performance criteria.¹⁻⁴

The Regional Conveyance Facilities represent a major subset of ALCOSAN’s Selected Plan and will consist of conveyance and storage tunnels designed to capture wet weather flows that currently overflow from ALCOSAN’s existing regional conveyance system and convey them to ALCOSAN’s Woods Run WWTP for treatment. The proposed facilities consist of three major tunnel segments along the Ohio River, the Allegheny River and the Monongahela River ranging from 14-feet to 18-feet in diameter. Related facilities include consolidation sewers, drop shafts, regulator structures, modified outfalls and related appurtenances designed to optimize regional conveyance system flow capture and protect the system from surges during large events. A wet weather pump station (WWPS) is also proposed for pumping from the tunnel to ALCOSAN’s treatment system. A conceptual illustration of the tunnel system facilities, including near surface facilities, is shown in Figure 1-1 with example photographs from other cities shown on the following page.

Figure 1-2: Cross-Sectional Conceptual Diagram of Tunnel System Facilities



¹⁻⁴ Source: ALCOSAN Clean Water Plan Section 11.2.11 (pg. 11-45) <https://www.alcosan.org/our-plan/plan-documents/clean-water-plan>

Uniform Environmental Report - IWWP Regional Conveyance Facilities

Section 1 – Project Description and Need



Drop shaft during and after construction



Main tunnels are planned to be 16 to 18 feet in finished diameter and will be constructed an average of 150 feet below ground. They will primarily be constructed using large tunnel boring machines (TBMs) that will be lowered from the surface and later retrieved via construction shafts.

Connector tunnels (adits) are short tunnels that send combined sewage from the drop shafts to the main tunnel. Connector tunnels will typically be 8 feet in finished diameter and be located at similar depths as the main tunnel.

Construction shafts are deep, vertical structures used to lower a TBM into the main tunnel to launch it or to remove it. After construction, construction shafts are typically converted to drop shafts and/or access shafts.

Drop shafts are deep, vertical structures that convey combined sewage from near surface consolidation sewers to the deep level of the connector tunnel or main tunnel. Their design includes hydraulic structures to manage flow as it drops and to dissipate the energy generated to prevent damage to the drop shaft and the tunnels.

Access shafts are used for tunnel inspection and maintenance including the lowering of equipment and personnel into the tunnel if necessary.

Regulators divert combined sewage from municipal systems to downstream facilities. Dry weather flow is directed through the existing sewers to the treatment plant, while wet weather flows is directed to the new tunnels for conveyance to the treatment plant and some temporary storage. Flows that exceed design capacities will continue to discharge to receiving waters through permitted CSO outfalls as they do today.

Consolidation sewers convey combined sewage from regulators to drop shafts and are considered “near surface facilities” as they are built at similar depths as existing sewers. They are anticipated to range between 24-inches and 144-inches in diameter at depths of 10 to 50 feet below ground.

Uniform Environmental Report - IWWP Regional Conveyance Facilities
Section 1 – Project Description and Need

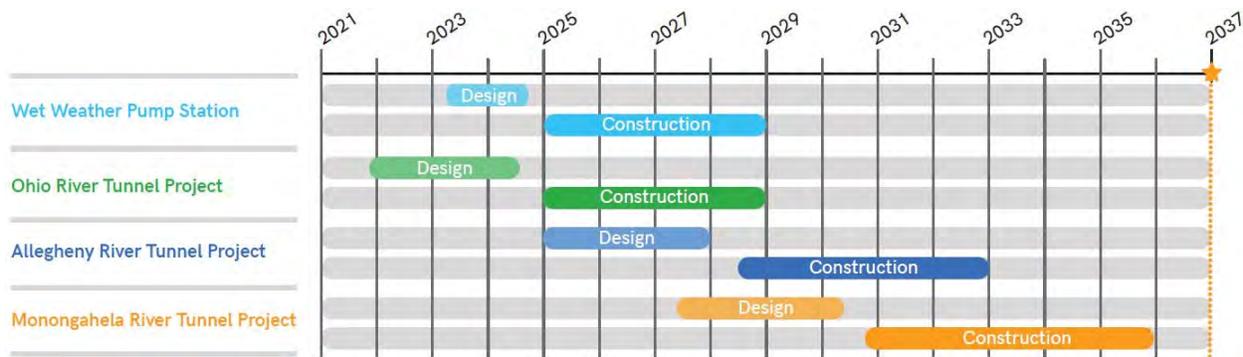
The Ohio River segment includes the Ohio River Tunnel (ORT), Chartiers Creek Tunnel (CCT) and the Saw Mill Run Tunnel (SMRT), a total of 9 drop shafts, 4 of which are planned to be constructed within tunnel boring machine (TBM) launch or retrieval shafts, 6 connector tunnels (adits¹⁻⁵) and near surface facilities associated with 10 points of connection. The ORT preliminary design is based on an 18-foot diameter tunnel that is approximately 24,200 lineal feet or 4.6 miles long with depths ranging from 130 to 190 feet below grade. The ORT includes 14-foot diameter tunnel segments crossing under the Ohio River to convey wet weather flows from the existing ALCOSAN Chartiers Creek and Saw Mill Run regional conveyance interceptor sewers.

The Allegheny River Tunnel (ART) segment preliminary design is based on an 18-foot diameter tunnel that is approximately 28,550 lineal feet, or 5.4 miles, a total of 11 drop shafts, 1 of which is planned to be constructed within a TBM retrieval shaft, 10 connector tunnels (adits) and near surface facilities associated with 20 points of connection. The depth of the ART varies from 100 to 200 feet below grade.

The Monongahela River Tunnel (MRT) segment preliminary design is based on an 18-foot diameter tunnel that is approximately 28,040 lineal feet or 5.30 miles. Although an 18-foot diameter tunnel is currently recommended, given the smaller inflows in the MRT, a 16-foot diameter or smaller tunnel should be evaluated during the adaptive management phases of the IWWP. The MRT includes a total of 8 drop shafts, 1 of which is planned to be constructed within a TBM launch shaft, 7 connector tunnels (adits) and near surface facilities associated with 11 points of connection. The depth of the MRT varies from 110 to 390 feet below grade.

The current design and construction schedule for the proposed IWWP Regional Conveyance Facilities is shown in Figure 1-2. The currently proposed regional conveyance facilities and tunnel alignments are shown in Figure 1-3.

Figure 1-3: Current Schedule for Proposed IWWP Regional Conveyance Facilities

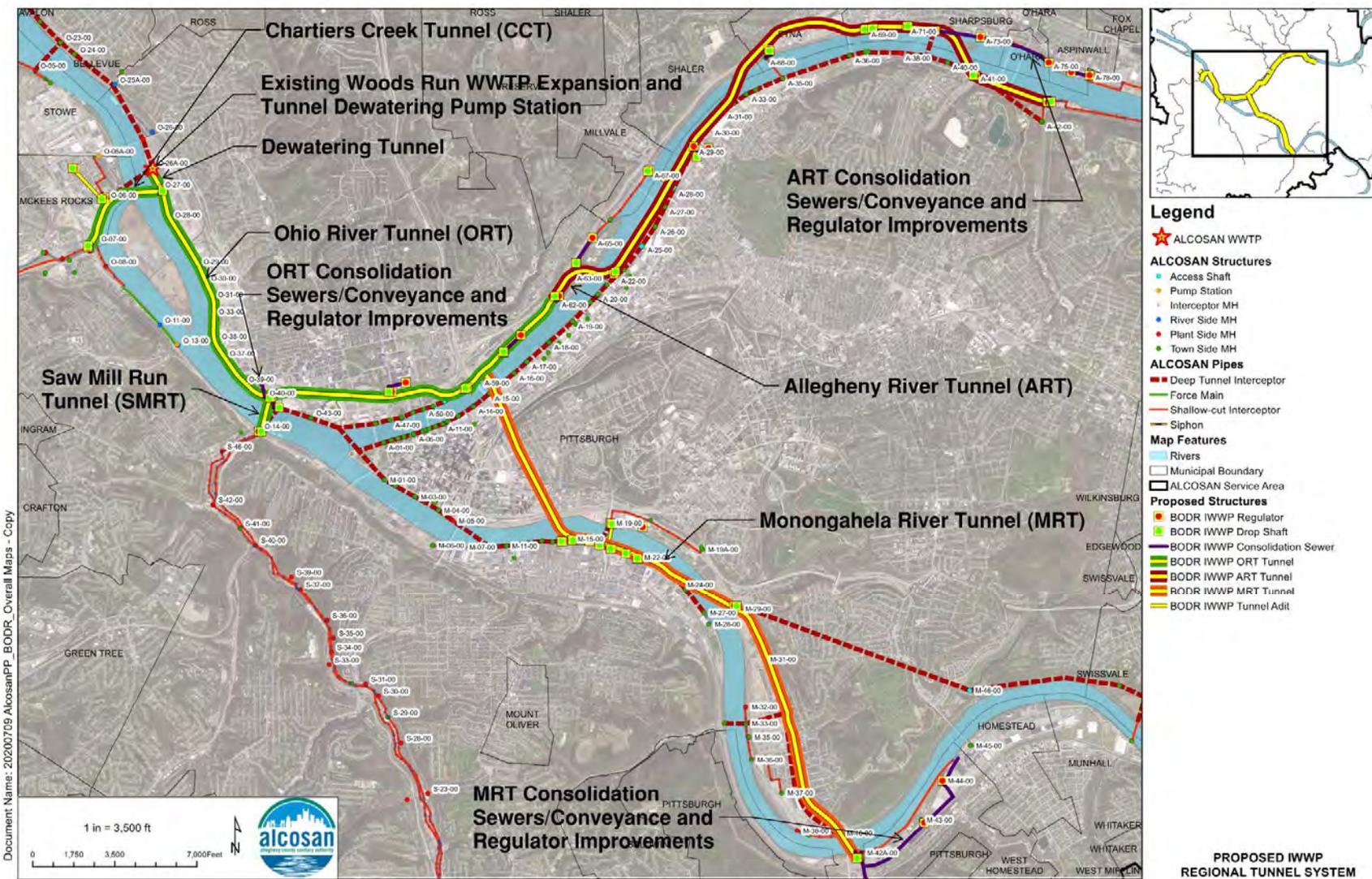


¹⁻⁵ An adit is a short pipe or tunnel segment connecting the new Regional Conveyance tunnel with drop shafts that will convey the wet weather combined sewage flow from the near-surface sewer pipes.

Uniform Environmental Report - IWWP Regional Conveyance Facilities

Section 1 – Project Description and Need

Figure 1-4: Proposed IWWP Regional Conveyance Facilities



Uniform Environmental Report - IWWP Regional Conveyance Facilities
Section 1 – Project Description and Need

The new tunnel system will terminate at a new 120 MGD WWPS to be located at or adjacent to ALCOSAN’s Woods Run WWTP. The WWPS will convey flows from the regional tunnel to the headworks for treatment during wet weather events and dewater the tunnel after wet weather events. This 120 MGD WWPS will augment the existing 480 MGD Main Pumping Station, producing a combined capacity of 600 MGD to match the planned future wet weather treatment capacity of the WWTP. While assumptions on the operational protocols and design criteria for the WWPS are included in the *IWWP Regional Conveyance Facilities BODR* in the context of operation and performance of the tunnels, preparation of a separate basis of design report for the WWPS is currently underway.

For each tunnel segment, near surface facilities are needed to collect and convey flows from the municipal collection system into the new tunnel. Near surface facilities include consolidation sewers, drop shafts, regulating structures, modified outfalls, and near surface cross-connections to the existing tunnel system. Table 1-1 identifies the proposed IWWP near surface facilities. A location map is provided as Figure 1-4. Both the table and figure reflect several site changes as reflected in ALCOSAN’s approved *Proposed Revisions to Interim Measures* report. Much of the work between these near surface facilities will be conducted with deep tunneling machines and will not include surface disturbance.

Table 1-1: Proposed IWWP Regional Conveyance Near-Surface Facilities

Site No.	Description of Near Surface Facilities	Location		
		Tunnel Segment	Municipality	Closest ALCOSAN Structure
1	Upstream terminus of Chartiers Creek Tunnel, drop shaft, consolidation sewer, potential new tunnel relief outfall nearby several existing outfalls (C-03 through C-09) which will remain, and cross-connection to existing system	Chartiers Creek	McKees Rocks	O-07
2	Possible work shaft for constructing connecting tunnel to Site 3.	Chartiers Creek	McKees Rocks	O-06
3	Drop shaft, regulator and consolidation sewer	Chartiers Creek	McKees Rocks	O-06A
4	Wet Weather Pump Station and force main	Ohio River	Pittsburgh	WWTP
5	Chartiers Creek Tunnel junction with the Ohio River Tunnel, drop shaft, regulator, consolidation sewer and potential new tunnel relief outfall located within 150 feet downstream of existing outfall which would remain (alternate site being explored)	Ohio River	Pittsburgh	O-27
6	Saw Mill Run Tunnel junction with the Ohio River Tunnel, drop shaft, regulator, consolidation sewer and potential relocation of existing CSO outfall to a new CSO outfall in same vicinity. Site has been reduced in size.	Ohio River	Pittsburgh	O-41

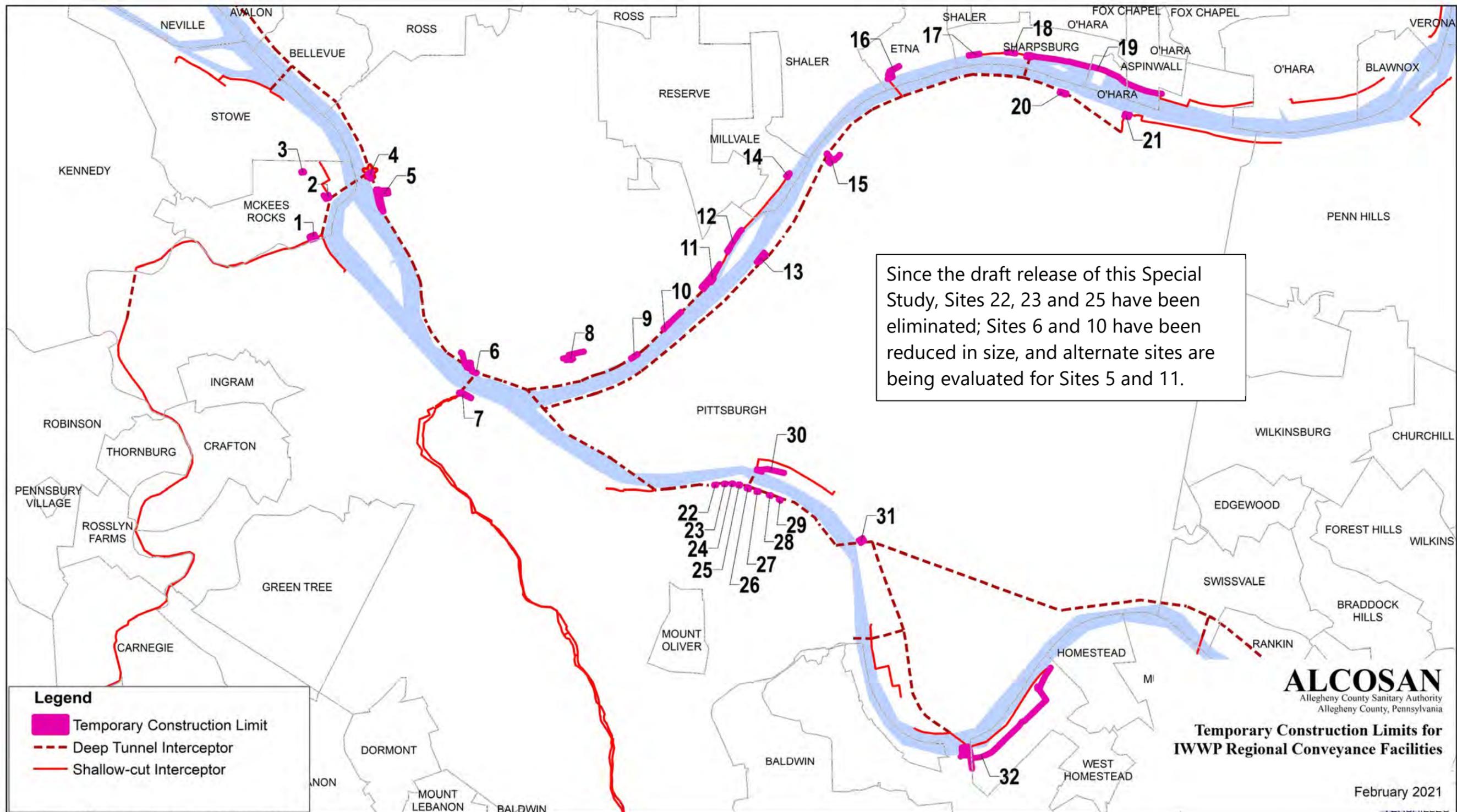
Uniform Environmental Report - IWWP Regional Conveyance Facilities
Section 1 – Project Description and Need

Site No.	Description of Near Surface Facilities	Location		
		Tunnel Segment	Municipality	Closest ALCOSAN Structure
7	Upstream terminus of Saw Mill Run Tunnel, drop shaft, 2 regulators and consolidation sewer	Saw Mill Run	Pittsburgh	O-14
8	Drop shaft, 2 regulators and consolidation sewer	Ohio River	Pittsburgh	A-48
9	Drop shaft, 2 regulators and consolidation sewer	Ohio River	Pittsburgh	A-58
10	Drop shaft, regulator and consolidation sewer. Site has been reduced in size.	Ohio River	Pittsburgh	A-60
11	Upstream terminus of Ohio River Tunnel with drop shaft, regulator and consolidation sewer; downstream terminus of Allegheny River Tunnel with launch shaft (alternate site being explored)	Ohio River	Pittsburgh	A-62
12	Drop shaft, 2 regulators and consolidation sewer	Allegheny River	Pittsburgh	A-64
13	Drop shaft, regulator and consolidation sewer	Allegheny River	Pittsburgh	A-22
14	Drop shaft, regulator and consolidation sewer	Allegheny River	Millvale	A-67
15	Drop shaft, 2 regulators and consolidation sewer	Allegheny River	Pittsburgh	A-29
16	Drop shaft, regulator and consolidation sewer	Allegheny River	Etna	A-68
17	2 drop shafts, 2 regulators and consolidation sewers	Allegheny River	Sharpsburg	A-69 & A-70
18	Drop shaft, regulator and consolidation sewer	Allegheny River	Sharpsburg	A-71
19	Drop shaft, 7 regulators, consolidation sewer, potential relocation of existing CSO outfall to a new CSO outfall in same vicinity and cross-connection to existing system	Allegheny River	Sharpsburg and Aspinwall	A-72
20	Drop shaft, 2 regulators and consolidation sewer	Allegheny River	Pittsburgh	A-41
21	Upstream terminus of the Allegheny River Tunnel, drop shaft, 2 regulators, consolidation sewer and potential new tunnel relief outfall located about 2,300 feet upstream of existing outfall which would remain	Allegheny River	Pittsburgh	A-42
22	Drop shaft eliminated. Site no longer required.	Monongahela River	Pittsburgh	M-15Z

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Section 1 – Project Description and Need

Site No.	Description of Near Surface Facilities	Location		
		Tunnel Segment	Municipality	Closest ALCOSAN Structure
23	Drop shaft eliminated. Site no longer required.	Monongahela River	Pittsburgh	M-15
24	Drop shaft, regulator and consolidation sewer	Monongahela River	Pittsburgh	M-16
25	Drop shaft eliminated. Site no longer required.	Monongahela River	Pittsburgh	M-17
26	Drop shaft, regulator and consolidation sewer	Monongahela River	Pittsburgh	M-18
27	Drop shaft, regulator and consolidation sewer	Monongahela River	Pittsburgh	M-20
28	Drop shaft, regulator and consolidation sewer	Monongahela River	Pittsburgh	M-21
29	Drop shaft, regulator and consolidation sewer	Monongahela River	Pittsburgh	M-22
30	Drop shaft, 2 regulators and consolidation sewer	Monongahela River	Pittsburgh	M-19
31	Drop shaft, regulator and consolidation sewer	Monongahela River	Pittsburgh	M-29
32	Upstream terminus of the Mon. River Tunnel, drop shaft, 3 regulators, consolidation sewer, potential new tunnel relief outfall and new CSO outfall both located about 200 feet downstream of the mouth of Streets Run (existing CSO outfall discharging to Streets Run would remain)	Monongahela River	West Homestead and Pittsburgh	M-42

Figure 1-5: IWWP Near-Surface Facilities Location Map



Angellja Q:\MapsandImages\Maps\MapArchivesByTask\TunnellSpecial537Study\TemporaryConstructionLimitsforIWWPRegionalConveyance_jpgLayout.mxd

2.0 SUMMARY OF REASONABLE ALTERNATIVES CONSIDERED

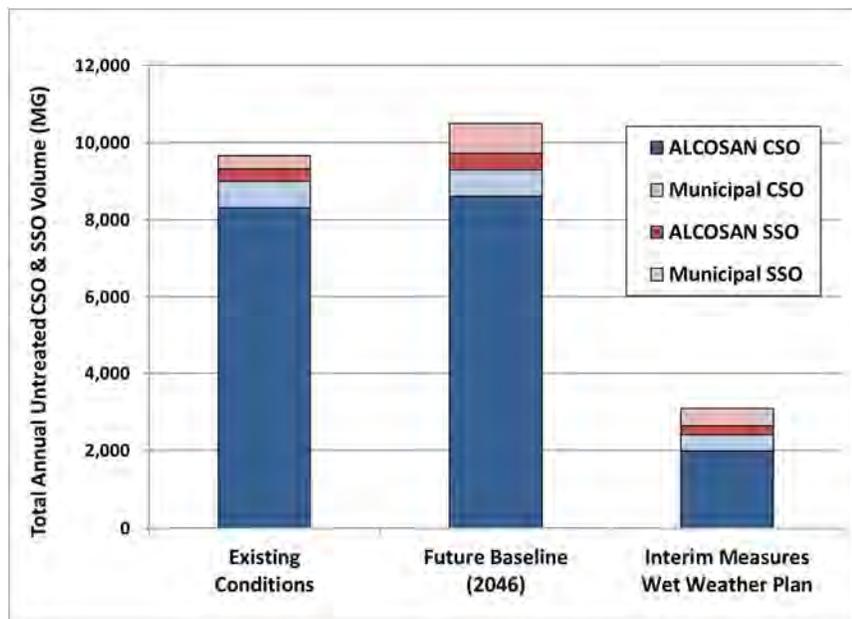
This section presents a summary of the alternatives considered during the development of ALCOSAN’s IWWP and the subsequent Preliminary Basis of Design Report concerning the new Regional Conveyance Facilities that are the subject of this UER.

2.1 No Action Alternative

2.1.1 Environmental Impacts

As shown in Figure 2-1, implementation of the proposed Regional Conveyance Facilities coupled with expansion of wet weather treatment capacity to 600 MGD is projected to reduce the volume of untreated CSO discharges from 9,300 MG per typical year (projected future baseline conditions) to less than ALCOSAN’s 2,700 MG per typical year overflow volume remaining performance criteria. In addition, the project will virtually eliminate overflows in the typical year for 15 outfalls located in Sensitive Areas as identified in ALCOSAN’s Modified CD.

Figure 2-1: Overflow Volume Reduction Under IWWP



Reducing the volume of overflows into the receiving rivers and streams will have significant positive short and long-term benefits in terms of enhanced river and waterfront recreational opportunities, public health, and the protection of public water supplies. Conversely, if the proposed Regional Conveyance Facilities are not implemented, the overflow volumes will be more than double than with the project implemented and the significant positive benefits of the project will not be realized.

2.1.2 Economic Impacts

The potential economic impacts of not implementing the proposed Regional Conveyance Facilities coupled with the wet weather capacity expansion described in Section 1 of this UER are significant. These include, but are not necessarily limited to:

- The Regional Conveyance Facilities described in this report coupled with the expansion of the wet weather treatment capacity at the Woods Run WWTP are foundational components of ALCOSAN’s IWWP;

Uniform Environmental Report - IWWP Regional Conveyance Facilities

Section 2 – Summary of Reasonable Alternatives Considered

- If ALCOSAN was precluded from implementing the Regional Conveyance Facilities described in this report, it and the customer municipalities would likely be unable to meet their respective wet weather control obligations under the CWA and the Pennsylvania Clean Streams Law. This could lead to the imposition of sewer-bans and other impediments to economic redevelopment and to unproductive compliance penalties;
- The strong waterfront based economic redevelopment and urban renewal which the City of Pittsburgh and other riverfront municipalities have experienced over the past years could be threatened by the perceived lack of local and state commitment to invest in the area's infrastructure and in the area's environmental assets.
- The delays in addressing the region's CSOs and sanitary sewer overflows (SSOs) resulting from the failure to implement the Regional Conveyance Facilities and the cascading impacts on the entire wet weather control strategy would result in additional cost burdens due to the impacts of construction inflation over time.

2.2 Overall Clean Water Plan Alternatives Considered

The genesis of the proposed regional conveyance was documented extensively in Section 9 (alternatives analysis) of ALCOSAN's Clean Water Plan (CWP) (<https://www.alcosan.org/our-plan/plan-documents/clean-water-plan>), including the development of detailed planning level capital, operating & maintenance and life cycle (present worth) cost estimates for twenty-six detailed system-wide alternatives. The system-wide alternatives were developed based on the analysis of many more basin level alternatives with control strategies ranging from local to regional focused projects. Preferred basin alternatives were combined into a series of basin-based, regional-based, and hybrid system-wide alternatives aimed towards identifying the most cost-effective means of achieving water quality objectives for the region as described below.

1. Basin-based control strategies focused on utilizing wet weather control facilities located within the seven planning basins, including source controls, storage, and local treatment technologies.
2. Regional-based control strategies focused on utilizing regional conveyance and storage with local consolidation sewers to capture and route wet weather flows to a new regional tunnel for conveyance to the Woods Run WWTP.
3. Hybrid control strategies included a mix of technologies with some basins utilizing a new regional storage and conveyance tunnel and others utilizing satellite facilities.

The twenty-six system-wide alternatives described in Section 9 of the CWP are summarized in Table 2-1. Based upon the extensive analyses presented in Section 9 of the CWP, ALCOSAN selected a regional-based control strategy utilizing a new tunnel storage and conveyance system to deliver captured wet weather flow to an expanded Woods Run WWTP using a new 120 MGD wet weather pump station. This control strategy was subsequently endorsed by the PaDEP, USEPA and the ACHD approval of the CWP.

ALCOSAN's 2018 Act 537 Special Study provided the basis for the amendment of ALCOSAN's 1996 Act 537 Plan concerning the expansion of the Woods Run WWTP. In 2021, ALCOSAN conducted a second Act 537 Special Study covering the IWWP Regional Conveyance Facilities which will provide the basis for a second amendment to the 1996 Act 537 Plan.

Uniform Environmental Report - IWWP Regional Conveyance Facilities
Section 2 – Summary of Reasonable Alternatives Considered

Table 2-1: Summary of System-Wide Control Alternatives Evaluated (Source: CWP Section 9.5 Tables 9-68 and 9-69)

Alt. #	Description	ALCOSAN Control Level		WWTP Influent Pumping Capacity (MGD)		Treatment Capacity (MGD)		Clean Water Plan Cost Estimates (in millions of 2010 dollars)			
		CSO (Overflows/ Year)	SSO (Design Storm)	Main P.S.	WWPS	Primary	Secondary	Capital	O&M	R&R	Present Worth
Basin-Based Control Strategy											
1	Basin-Based Control Strategy	0	2-Year	480	120	600	295	\$7,604	\$283	\$55	\$7,940
1	Basin-Based Control Strategy	1-3	2-Year	480	120	600	295	\$6,613	\$254	\$48	\$6,915
1	Basin-Based Control Strategy	4-6	2-Year	480	120	600	295	\$5,590	\$223	\$44	\$5,855
1	Basin-Based Control Strategy	7-12	2-Year	480	120	600	295	\$4,982	\$203	\$41	\$5,226
1	Basin-Based Control Strategy	13-20	2-Year	480	120	600	295	\$3,896	\$165	\$36	\$4,097
5	85% CSO Capture by Receiving Stream with Remote CSO Treatment & Storage	85% Capture	2-Year	480	—	480	295	\$2,529	\$130	\$28	\$2,688
Regional-Based Control Strategy											
2	Regional-Based Control Strategy	0	2-Year	400	200	600	295	\$4,933	\$133	\$33	\$5,098
2	Regional-Based Control Strategy	1-3	2-Year	400	200	600	295	\$4,463	\$133	\$48	\$4,644
2	Regional-Based Control Strategy	4-6	2-Year	400	200	600	295	\$4,206	\$127	\$37	\$4,370
2	Regional-Based Control Strategy	7-12	2-Year	400	200	600	295	\$3,811	\$123	\$36	\$3,969
2	Regional-Based Control Strategy	13-20	2-Year	400	200	600	295	\$3,560	\$124	\$34	\$3,717
4	Complete Sewer Separation and SSO Conveyance / Storage	0	2-Year	--	--	Not Determined	Not Determined	\$9,794	\$125	\$14	\$9,933
Preliminary Hybrid Alternatives for Evaluating Satellite Sewage Treatment and Regional Tunnel Extents											
3	Regional Tunnel w/Remote CSO Treatment and Storage (Tunnel from WWTP to A-42 and M-29)	4-6	2-Year	480	120	600	295	\$4,200	\$146	\$37	\$4,383

Uniform Environmental Report - IWWP Regional Conveyance Facilities
Section 2 – Summary of Reasonable Alternatives Considered

Table 2-1: Summary of System-Wide Control Alternatives Evaluated (Source: CWP Section 9.5 Tables 9-68 and 9-69)

Alt. #	Description	ALCOSAN Control Level		WWTP Influent Pumping Capacity (MGD)		Treatment Capacity (MGD)		Clean Water Plan Cost Estimates (in millions of 2010 dollars)			
		CSO (Overflows/ Year)	SSO (Design Storm)	Main P.S.	WWPS	Primary	Secondary	Capital	O&M	R&R	Present Worth
3c	Same as Alt. 3 except Satellite WWTP Serving M-30 and Upstream	4-6	2-Year	480 WWTP	120 WWTP	600 WWTP	275 WWTP	\$4,267	\$233	\$50	\$4,550
				125 Satellite		125 Satellite					
3d	Same as Alt. 3 except Tunnel along Allegheny stops around A-35	4-6	2-Year	480	120	600	295	\$4,214	\$152	\$37	\$4,403
3e	Same as Alt. 3 except tunnel along Monongahela stops at around M-42	4-6	2-Year	480	120	600	295	\$3,988	\$141	\$37	\$4,166
3f- Prelim	Same as Alt.3 except tunnel along Monongahela stops at around M-59	4-6	2-Year	480	120	600	295	\$3,891	\$137	\$37	\$4,065
3g	Same as Alt 3. except tunnel along Monongahela stops at around T-04	4-6	2-Year	480	120	600	295	\$3,903	\$129	\$37	\$4,069
Hybrid Alternatives for Evaluating SSO Level of Control											
3f	Same as Alt. 3f-Prelim except tunnel end moved from M-59 to M-51	4-6	2-Year	480	120	600	295	\$4,071	\$130	\$35	\$4,236
3h	Same as Alt. 3f except 10-year SSO control	4-6	10-Year	480	120	600	295	\$4,076	\$131	\$35	\$4,242
3i	Same as Alt. 3f except typical year SSO control	4-6	Typical Year	480	120	600	295	\$3,932	\$129	\$34	\$4,094
Additional Hybrid Alternatives for Evaluating Presumption and Demonstration Approaches											
3j	Same as Alt. 3f except tunnel diameter reduced	4-6	2-Year	480	120	600	295	\$3,996	\$129	\$35	\$4,160
8a	Alt. 3 tunnel extent with diameter reduced	13-15 (4-6 in Sensitive areas)	2-Year	480	120	600	295	\$3,645	\$133	\$34	\$3,811

Uniform Environmental Report - IWWP Regional Conveyance Facilities
Section 2 – Summary of Reasonable Alternatives Considered

Table 2-1: Summary of System-Wide Control Alternatives Evaluated (Source: CWP Section 9.5 Tables 9-68 and 9-69)

Alt. #	Description	ALCOSAN Control Level		WWTP Influent Pumping Capacity (MGD)		Treatment Capacity (MGD)		Clean Water Plan Cost Estimates (in millions of 2010 dollars)			
		CSO (Overflows/ Year)	SSO (Design Storm)	Main P.S.	WWPS	Primary	Secondary	Capital	O&M	R&R	Present Worth
3m	Same as Alt.8a except upper Monongahela served by regional tunnel (same tunnel extent as Alt. 3f)	13-15 (4-6 in Sensitive areas)	2-Year	480	120	600	295	\$3,680	\$128	\$34	\$3,841
3f-mod	Same as Alt. 3f except higher level of CSO control for outfalls in Sensitive areas	4-6 (0 in Sensitive areas)	2-Year	480	120	600	295	\$4,216	\$126	\$34	\$4,386
3f-mod-10pct	Same as Alt. 3f-mod except small volume overflows not connected to new conveyance	Varies	2-Year	480	120	600	295	\$3,550	\$146	\$87	\$3,780

2.3 Regional Conveyance Facilities Alternatives Considered

The performance results of the regional-based control alternatives included cost-benefit analyses using the knee-of-the curve approach as shown in Figure 2-2. While the knee-of-the curve analyses evaluated arguably the two most important criteria (cost and performance) for each of the system-wide alternatives, they did not account for other considerations such as public factors, operational impacts, and implementation concerns. As a result, a system-wide alternatives ranking analysis was conducted to take those criteria into account.

Input was solicited from each of the seven Basin Planning Committees, the Customer Municipality Advisory Committees (CMAC), and the Regional Stakeholders Group (RSG) and were finalized based on incorporating recommendations made by ALCOSAN department representatives. The system-wide alternative scoring was based upon a potential maximum total score of 100 points. Information was collected for the various ranking criteria from hydrologic and hydraulic modeling results, alternative costing tool summaries, and the basin alternative ranking results. Using these data, an alternatives ranking software program was developed and used to assign scoring to the various cost and non-cost criteria. Figure 2-3 summarizes the results, with additional details documented in Section 9.5.7: System-Wide Alternatives Ranking Analysis of ALCOSAN’s CWP.

Figure 2-2: System-Wide Alternatives Knee of the Curve Analysis Results

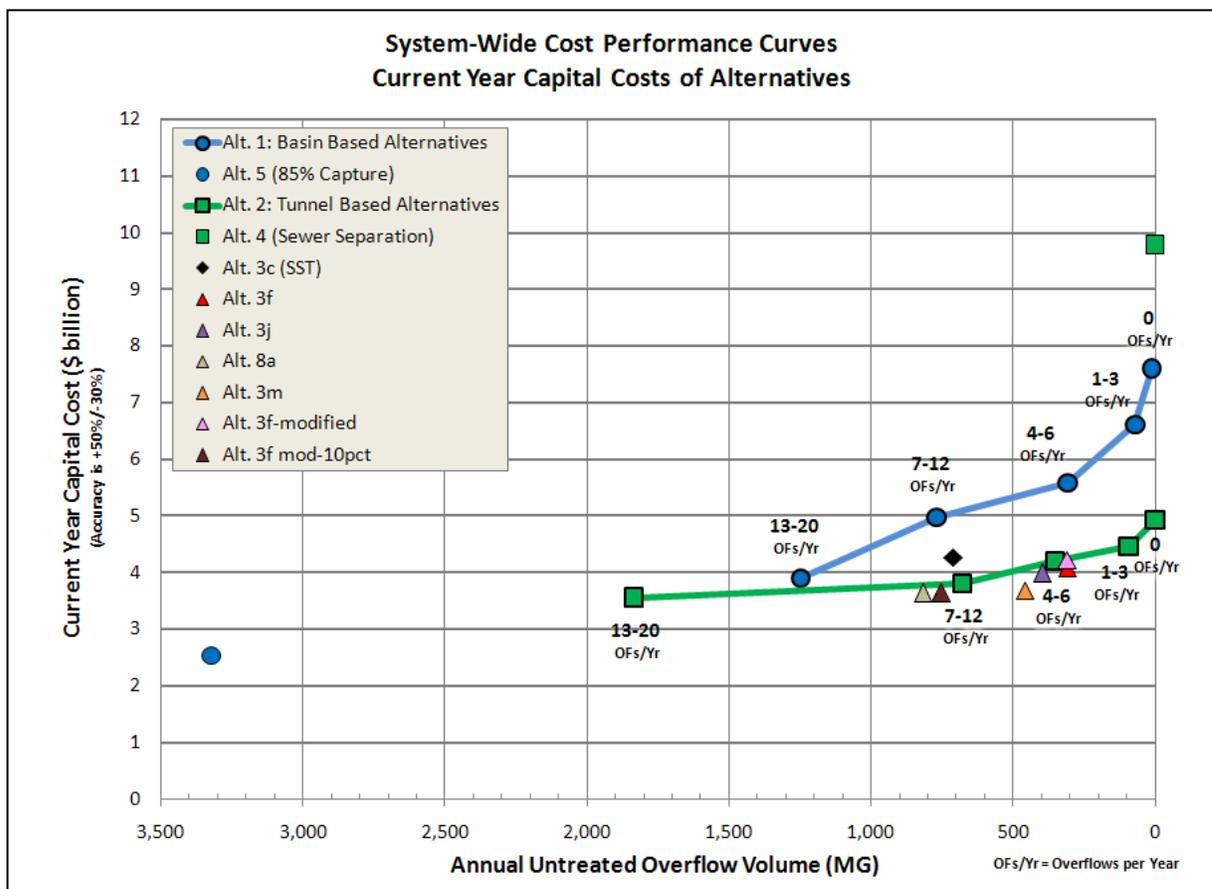
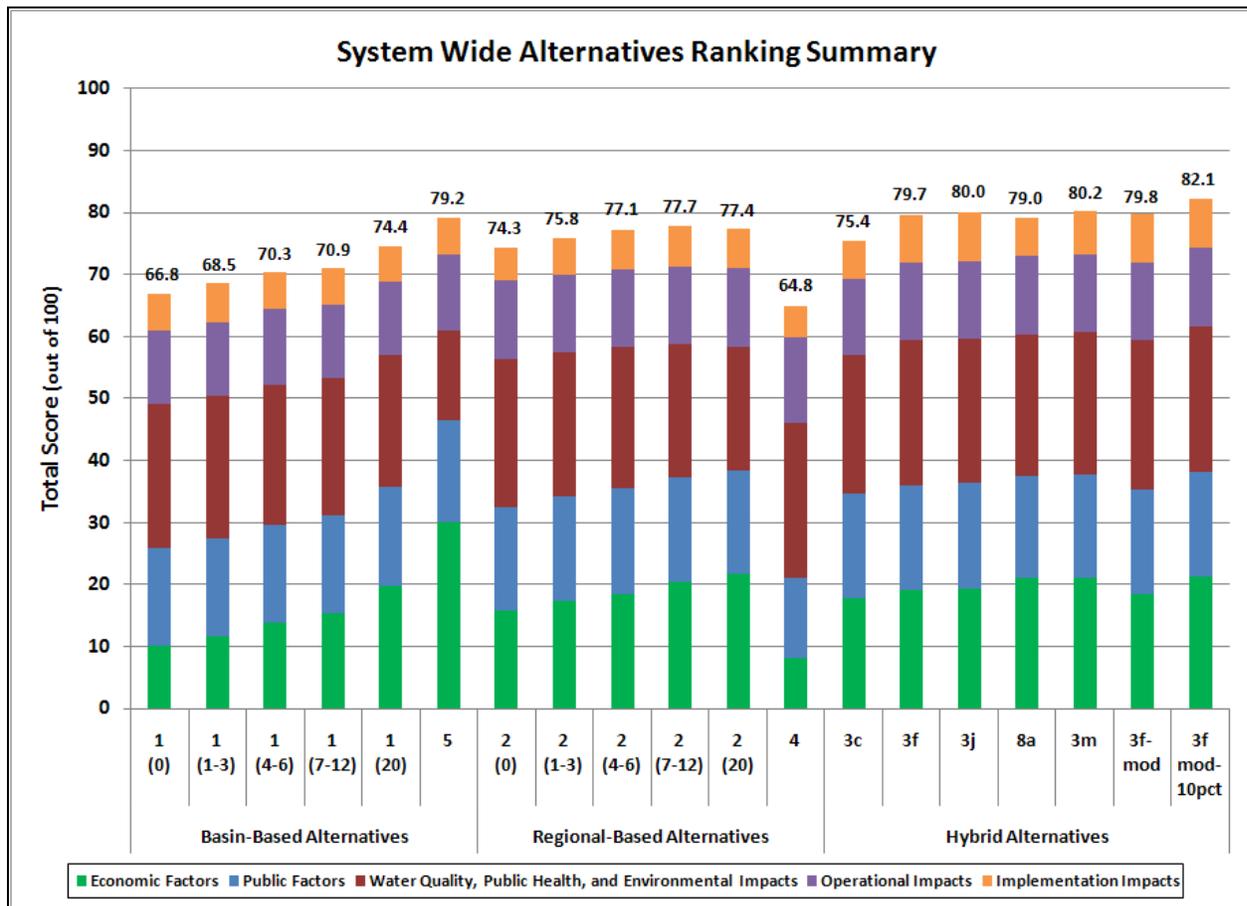


Figure 2-3: System-Wide Alternatives Cost and Non-Cost Factor Scoring Results



System-wide alternative 3f-modified-10pct was chosen as ALCOSAN’s Selected Plan based on the knee-of the curve analysis, the alternatives ranking analyses, and the following considerations:

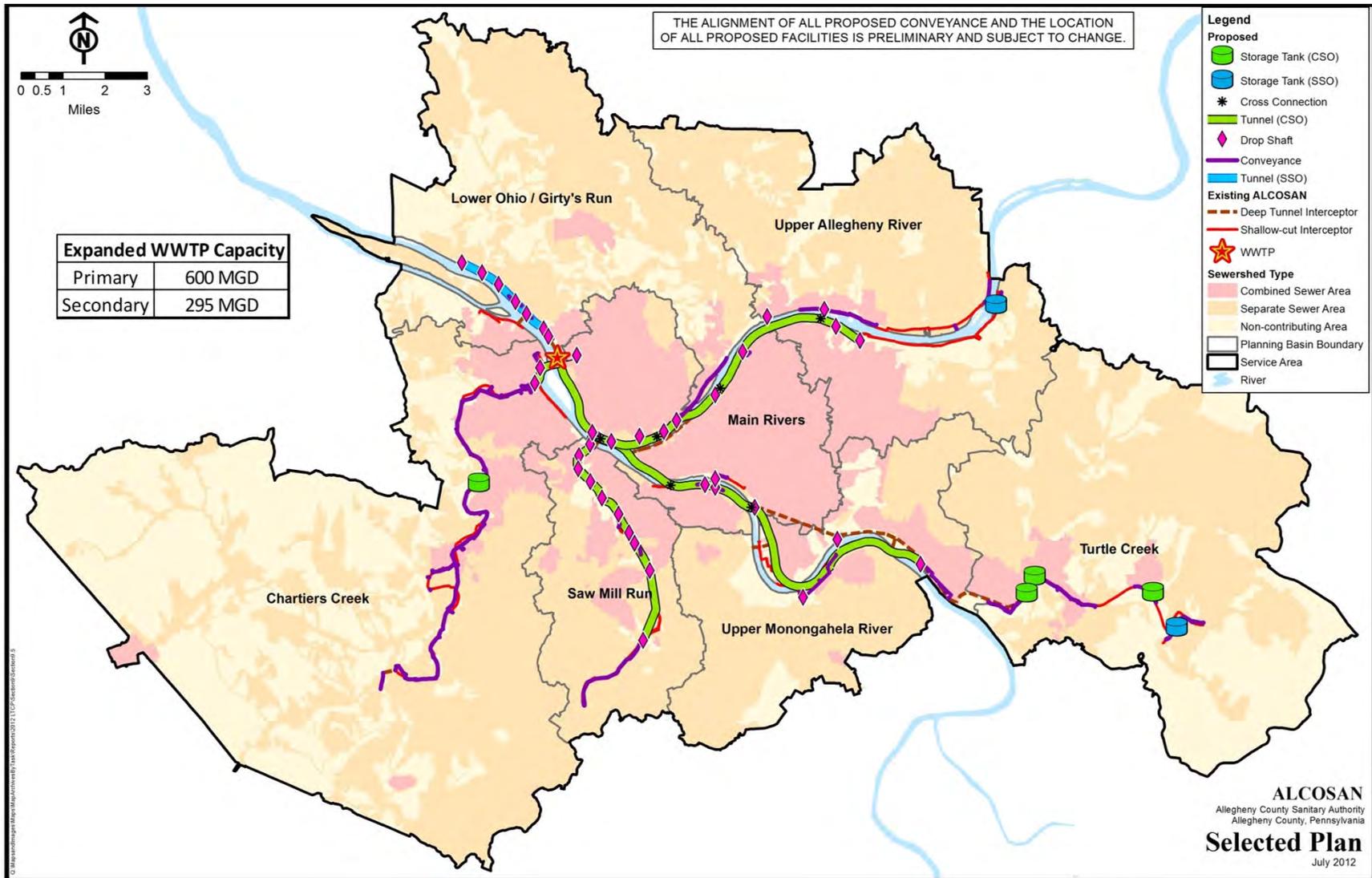
- Meets all compliance requirements
- Highest ranked system-wide alternative
- Provides enhanced control to sensitive areas
- Best water quality benefit / cost performance
- Increased ability to expand capacity
- Overall most cost-effective system-wide solution
- Municipal and public participation influenced decision for Selected Plan

This alternative represented the most cost-effective system-wide solution to achieving compliance with ALCOSAN’s CD and the National CSO Control Policy and is based on expanded treatment capacity at the Wood’s Run plant, new regional conveyance/storage tunnels, and several remote storage facilities. A map of the preliminary locations/alignments of the ALCOSAN facilities, as envisioned in 2012, is shown on Figure 2-4.

Uniform Environmental Report - IWWP Regional Conveyance Facilities

Section 2 – Summary of Reasonable Alternatives Considered

Figure 2-4: ALCOSAN's Selected Plan



Uniform Environmental Report - IWWP Regional Conveyance Facilities

Section 2 – Summary of Reasonable Alternatives Considered

Since the \$3.6 billion Selected Plan was determined to be unaffordable, ALCOSAN and the regulatory agencies negotiated a more affordable IWWP as a part of a Modified CD. The \$2 billion (2010 dollars) IWWP generally represented a subset of the projects included in the Selected Plan, targeting those projects that provided the most cost-effective overflow volume reduction and water quality benefit.

While finalizing the Modified CD, ALCOSAN advanced planning and design of IWWP projects to meet agreed to completion deadlines. ALCOSAN conducted more refined alternatives analyses for the regional conveyance and storage components of the IWWP using new information generated from geotechnical investigations, property acquisition assessments, hydrologic and hydraulic modeling, environmental assessments, and municipal flow reduction progress. The refined alternatives analyses focused on alignments for the new tunnels and optimization of consolidation sewers, drop shafts, and other near surface facilities that convey flow to the tunnels.

Alternative horizontal and vertical alignment analyses determined that there would be no benefit to revising the vertical alignment of the tunnel system. However, horizontal alignment optimization opportunities were identified and resulted in proposed refinements to IWWP facilities. The driving factors used to develop the alternative horizontal alignments included:

- Identifying appropriate tunnel launch/retrieval sites
- Optimizing lengths of tunnels and connector tunnels (adits) to minimize cost
- Minimum radius of curvature of 1,000 feet for constructability purposes
- Keeping in the right-of-way to minimize private property easements
- Adjusting tunnel alignment to optimize the extent of connector tunnels (adits) and surface connections
- Avoiding large zones of claystone²⁻¹
- Qualitative screening factors such as environmental, constructability, public factors, redevelopment, differential costs, property, etc.

The refined tunnel horizontal alignment generally follows the major drop structures which convey flow to the tunnel to minimize the distance between the tunnels and preferred drop shaft locations and passes through preferred tunnel launch/retrieval shaft sites identified during the alternative analysis.

The consolidation sewer and drop shaft optimization process included revisiting the groupings of outfalls, or flow groups, controlled by conveying flow through consolidation sewers to a single drop shaft. During the analysis of preferred tunnel alignments, it was determined that some consolidated flow groupings could be more cost-effectively controlled with individual connections to the tunnels. This increased the number of drop shafts, reduced the length of consolidation sewers, and reduced surface disruption. For outfalls no longer requiring control via a new consolidation sewer, these refinements presented opportunities to consider control through system optimization. The optimization process considered several different alternate control measures including green infrastructure, maximizing conveyance to the existing interceptor and WWTP through modifying existing regulators and/or the improved hydraulic grade line from the WWTP expansion, and extending the new tunnel in lieu of a remote retention treatment basin.

²⁻¹ Claystone is a fine-grained rock comprised of lithified clay sediments (majority of particles are less than 1/256 mm in size). Claystone has the texture and composition of shale, but it lacks the laminations and is less fissile than shale. Claystone generally has a blocky, thick to massive appearance. Source: Ohio Department of Natural Resources.

Uniform Environmental Report - IWWP Regional Conveyance Facilities

Section 2 – Summary of Reasonable Alternatives Considered

All recommended refinements to IWWP facilities were documented in the *Preliminary Basis of Design Report (BODR)* submitted to PaDEP and USEPA in October 2020. The BODR refined and revised the regional conveyance facilities as they were originally envisioned in the approved CWP and constitutes a 20% level of design for the IWWP Regional Conveyance Facilities as summarized in Section 1.2 of this UER. Proposed revisions to the IWWP facilities were submitted to the regulatory agencies in November 2020 and were approved in March 2021.

2.4 Source Flow Reduction Alternatives

For more than 20 years, ALCOSAN and its customer municipalities have partnered to implement source reduction projects across the service area through green stormwater infrastructure, stream daylighting and restoration and projects to eliminate excessive inflow and infiltration into the customer municipalities' collection sewer systems. Source flow reduction alternatives have also been considered throughout the development of ALCOSAN's CWP and in the Preliminary BODR for the IWWP Regional Conveyance Facilities.

The source flow reduction alternatives considered in the CWP are summarized in Section 10 (Starting at the Source: How Our Region Can Work Together for Clean Water) of ALCOSAN's CWP (<https://www.alcosan.org/our-plan/plan-documents/clean-water-plan>). Source flow reduction progress in recent years and the source flow reduction alternatives considered in developing the Preliminary BODR for the IWWP Regional Conveyance Facilities are described in Section 6.3 of the 2022 Act 537 Special Study, with the conclusions summarized below.

While the flow reduction progress described above is significant, the varied objectives and geographic spread of these projects has resulted in widely distributed dry and wet weather flow reduction benefits. While wide-spread flow reduction provides meaningful benefits, reducing the size of a particular element of ALCOSAN's IWWP Regional Conveyance Facilities would require more targeted wet weather flow reduction. Since the currently proposed source reduction projects are not concentrated in any point of connection (POC) sewershed directly tributary to the proposed regional tunnel, the systemwide inflow reductions achieved by these completed and proposed projects are not expected to be sufficient to eliminate or reduce the tunnels in the IWWP.

Conversely, some of the best opportunities to reduce grey infrastructure components of the Regional Conveyance Facilities described in this UER would be to target green stormwater infrastructure or sewer separation in the POC sewersheds directly tributary to the proposed regional tunnel, as there may be potential to eliminate certain consolidation sewers or drop shafts.

ALCOSAN's modified CD recognizes the overflow reduction potential of source controls and allows for revisions to the Regional Conveyance Facilities detailed in this UER, if they can be shown to provide equivalent or better performance. Therefore, some of the facilities covered in this UER may be eliminated based on the results of ongoing source reduction efforts.

3.0 ENVIRONMENTAL CONSEQUENCES OF THE PROJECT

This section of the Uniform Environmental Report describes and documents the environmental effects of the proposed Regional Conveyance Facilities of ALCOSAN's Interim Wet Weather Plan as described in Section 1.2.

3.1 Land Considerations

The potential environmental consequences of the Regional Conveyance Facilities are summarized in Table 3-1 in terms of:

- Consistency with local zoning & land use planning;
- Agricultural lands (important farmlands);
- National or State Parks, Forests or Trails;
- Registered and eligible national monuments and landmarks; and
- Other trails.

One state park, Point State Park, is located in the ALCOSAN service area at the confluence of the Allegheny and Monongahela Rivers and the start of the Ohio River and is within one mile of four of the project sites. There are no other national or state parks, forest and trails within the ALCOSAN service area. There are no national monuments but there are six national historic landmarks within one mile of one or more project sites. The locations of the national historic landmarks and Point State Park in relation to the project sites are shown in Exhibit A and also noted in Table 3-1. Three of the 32 original project sites have since been eliminated with approval of ALCOSAN's *Proposed Revisions to Interim Measures* report.

There are no important farmlands within the ALCOSAN service area and no prime agricultural soils have been identified in the areas to be affected by the IWWP Regional Conveyance Facilities. Based on NRCS soil data there is no prime agricultural land within the 32 sites where near surface construction is proposed.

Some of the proposed ALCOSAN regional conveyance facilities will be located along the regional riverside trail system. Beyond temporary construction access detours, these facilities will not impinge on the following trails that are adjacent to the rivers:

- Chateau Trail which parallels the north shore of the Ohio River in Pittsburgh from Westhall Street west to approximately the West End bridge where it becomes the North Shore Trail.
- The North Shore Trail parallels the Ohio River and the Allegheny River for approximately 10 miles upstream from the Chateau Trail to the Millvale Riverfront Park in Millvale Borough.
- The Great Allegheny Passage Trail runs for around 150 miles from Point State Park in Pittsburgh to Cumberland Maryland where it connects to the B&O Canal Trail. Within the ALCOSAN service area it runs along the north shore of the Monongahela River until crossing the river via the Hot Metal Bridge and then parallels the south shore of the Monongahela.
- The Hazelwood Trail extends for around two miles along the north shore of the Monongahela River from the Hot Metal Bridge to the Eliza Furnace historical site and connects to the Three Rivers Heritage, and Great Allegheny Passage trails.

Uniform Environmental Report - IWWP Regional Conveyance Facilities
Section 3 – Environmental Consequences of the Project

Table 3-1: Summary of Land Considerations

Site No.	Municipality	Land Use / Zoning	Important Farmland	National or State Parks, Forests, Trails; National Monuments; or National Historic Landmarks (within 1 Mile)	Other Trails
1	McKees Rocks	C-1 Commercial	No	No	No
2	McKees Rocks	I-1 Industrial / C-O Conservation	No	No	No
3	McKees Rocks	C-1 Commercial / R-1 Residential / R-2 Residential	No	No	No
4	Pittsburgh	Riverfront Industrial Mixed Use (RIV_IMU)	No	No	Chateau Bike Trail
5 ¹	Pittsburgh	RIV-IMU	No	No	Chateau Bike Trail
6	Pittsburgh	RIV-IMU/Urban Neighborhood Commercial (UNC)	No	1 or more sites within a mile of Point State Park and one or more historic landmarks: 1) Forks of the Ohio; 2) Chatham Village; 3) Emmanuel Episcopal Church; 4) Smithfield Street Bridge; and 5) Allegheny County Courthouse	North Shore Trail
7	Pittsburgh	RIV-IMU	No		North Shore Trail
8	Pittsburgh	RIV-IMU/UNC/Park (P)	No		North Shore Trail
9	Pittsburgh	RIV-IMU	No		North Shore Trail
10	Pittsburgh	RIV-IMU	No	No	North Shore Trail
11 ¹	Pittsburgh	RIV-IMU	No	No	North Shore Trail
12	Pittsburgh	Riverfront Mixed Use (Riv-MU)	No	No	North Shore Trail
13	Pittsburgh	RIV-IMU	No	No	No
14	Millvale	RA, RB River District	No	No	Millvale Trail
15	Pittsburgh	RIV-IMU	No	No	No
16	Etna	Industrial – River Overlay	No	No	No
17	Sharpsburg	Industrial	No	No	No
18	Sharpsburg	Industrial – Riverfront Overlay	No	No	No
19	Sharpsburg	Industrial – River Overlay	No	No	No

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Site No.	Municipality	Land Use / Zoning	Important Farmland	National or State Parks, Forests, Trails; National Monuments; or National Historic Landmarks (within 1 Mile)	Other Trails
	and Aspinwall	AI-1 (limited industrial west of railroad bridge) + A-CD (conservation east of railroad bridge)			
20	Pittsburgh	RIV-MU	No	No	No
21	Pittsburgh	RIV-IMU	No	No	No
22	Drop shaft eliminated. Site no longer required.				
23	Drop shaft eliminated. Site no longer required.				
24	Pittsburgh	RIV-MU	No	No	Southside Trail/ GAP
25	Drop shaft eliminated. Site no longer required.				
26	Pittsburgh	RIV-MU	No	No	Southside Trail/ GAP
27	Pittsburgh	RIV-IMU	No	No	Southside Trail/ GAP
28	Pittsburgh	RIV-IMU	No	No	Southside Trail/ GAP
29	Pittsburgh	RIV-IMU/Southside Works (SP-5)	No	No	Southside Trail/ GAP
30	Pittsburgh	Riverfront General Industrial (RIV-GI)/Pittsburgh Technology Center (SP-1)	No	No	Eliza Furnace Trail
31	Pittsburgh	Almono (SP-10)	No	No	Junction Hollow and Eliza Furnace Trails
32	West Homestead and Pittsburgh	RIV-GI/General Industrial (GI)/	No	Bost Building (historic landmark)	GAP

1. Alternate site being explored.

3.2 Formally Classified Floodplains

Chapter 105 Permits under the PaDEP are required for any construction activity that changes, expands, or diminishes, the course, current, or cross-section of any watercourse, floodway, or body of water. Work in navigable waters of the United States are not eligible for coverage under these General Permits. During review of the General Permit application, PaDEP determines if a Submerged Land License Agreement is required.

Joint Permits, administered by both the PaDEP and the United States Army Corps of Engineers, are required for all permanent obstructions to waterways of the United States/Commonwealth. The Joint Permit Application is an extensive permit application that includes components of previously discussed permits including the Pennsylvania Natural Diversity Inventory (PNDI) review, the National Pollution Discharge Elimination System (NPDES) permit and approval, flood plain clearances, etc. Certain disturbances may be eligible for coverage under the Pennsylvania State Programmatic General Permit, rather than requiring a Joint Permit.

Chapter 106 Permits, under the PaDEP, are required for the placement of fill or structures within the floodplain or floodway. If surface obstructions (i.e. above-grade structures) are planned, these permits may require a detailed hydrologic analysis to evaluate the potential impacts of proposed structures in the floodplain or floodway. The Chapter 106 permitting is included in the Joint Permit Application.

The proposed project may also be subject to some local floodplain ordinances or regulations. For example, the City of Pittsburgh requires a Construction and/or Development in the Floodplain Permit.

A Federal Emergency Management Agency (FEMA) Flood Hazard map is provided in Figure 3-1. The map shows the 32 surface facility locations required to construct the Regional Conveyance Facilities with anticipated temporary construction site limits. Based on the preliminary planning completed to date, 20 of the 32 surface facility sites are partially or fully within the 100-year floodplain as listed in Table 3-2. Some sites will also involve construction in the floodway such as for proposed tunnel relief outfalls. These preliminary findings will be verified during final design. The design will comply with applicable regulations and required permits will be obtained.

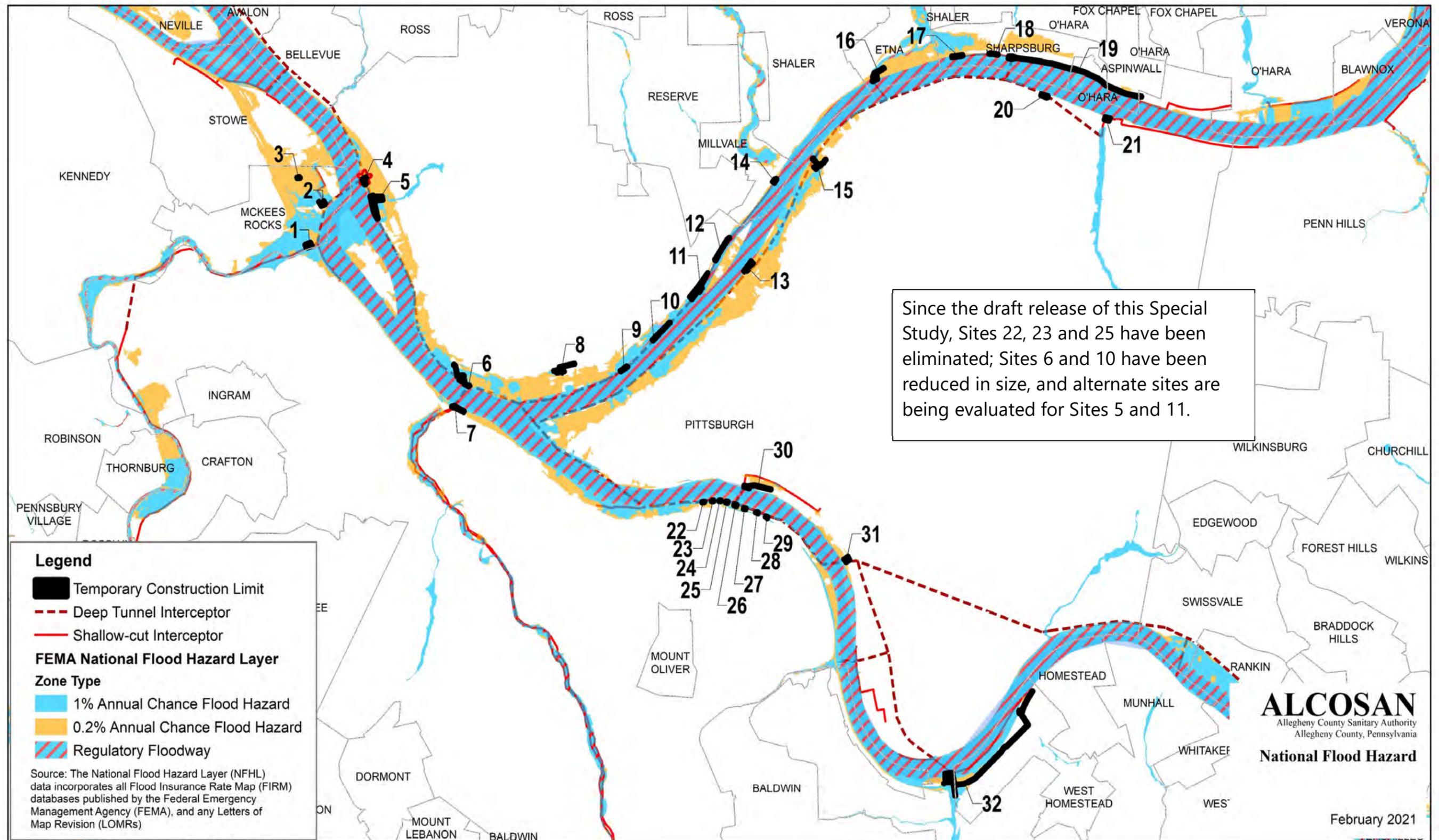
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Table 3-2: Proposed Regional Conveyance Facilities within the Floodplain

Site No.	Tunnel Segment	Closest ALCOSAN Structure
1	Chartiers Creek	O-07
2	Chartiers Creek	O-06
5 ¹	Ohio River	O-27
6	Ohio River	O-41
7	Saw Mill Run	O-14
9	Ohio River	A-58
10	Ohio River	A-60
11 ¹	Ohio River	A-62
12	Allegheny River	A-64
14	Allegheny River	A-67
15	Allegheny River	A-29
17	Allegheny River	A-69 & A-70
18	Allegheny River	A-71
19	Allegheny River	A-72
24	Monongahela River	M-16
26	Monongahela River	M-18
32	Monongahela River	M-42

1. Alternate site being explored.

Figure 3-1: IWWP Regional Conveyance Near-Surface Facilities - Flood Hazard Map



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3.3 Wetlands

Wetlands possess three essential characteristics: 1) hydric soils; 2) wetland hydrology; and 3) hydrophytic vegetation. All characteristics must be fulfilled for an area to be classified as a wetland.⁷⁻¹ The U. S. Fish and Wildlife Service (FWS) has identified wetlands throughout the United States primarily by stereoscopic analysis of high-altitude aerial photographs. Wetlands were identified on the photographs based on vegetation, visible hydrology and geography by Classification of Wetlands and Deep Water Habitats of the United States.³⁻² These wetlands are depicted on their National Wetland Inventory mapping.

A map of wetlands in the FWS National Wetlands Inventory located within the study area is provided as Figure 3-2. Portions of the proposed Regional Conveyance Facilities will parallel or be adjacent to the Ohio, Allegheny and Monongahela Rivers which are classified as riverine wetlands. However, based upon current planning as documented in the Regional Conveyance Facilities BODR submitted to PaDEP on October 1, 2020, none of the 32 surface facility sites or their temporary construction limits is anticipated to encroach on wetlands in this inventory. Impacts to riverine wetlands (the rivers) is anticipated to be limited to outfall structures and will be determined during the finalization of the tunnel designs.

Hydric soils can also be an indicator of potential wetlands. Hydric soils information for Allegheny County is provided by the U. S. Department of Agriculture's Natural Resources Conservation Service (NRCS). The NRCS has identified those soils, within each county, with the potential of containing hydric components. Those soils with inclusions of hydric components have the potential for being classified as hydric soils and must be field checked for an actual determination.

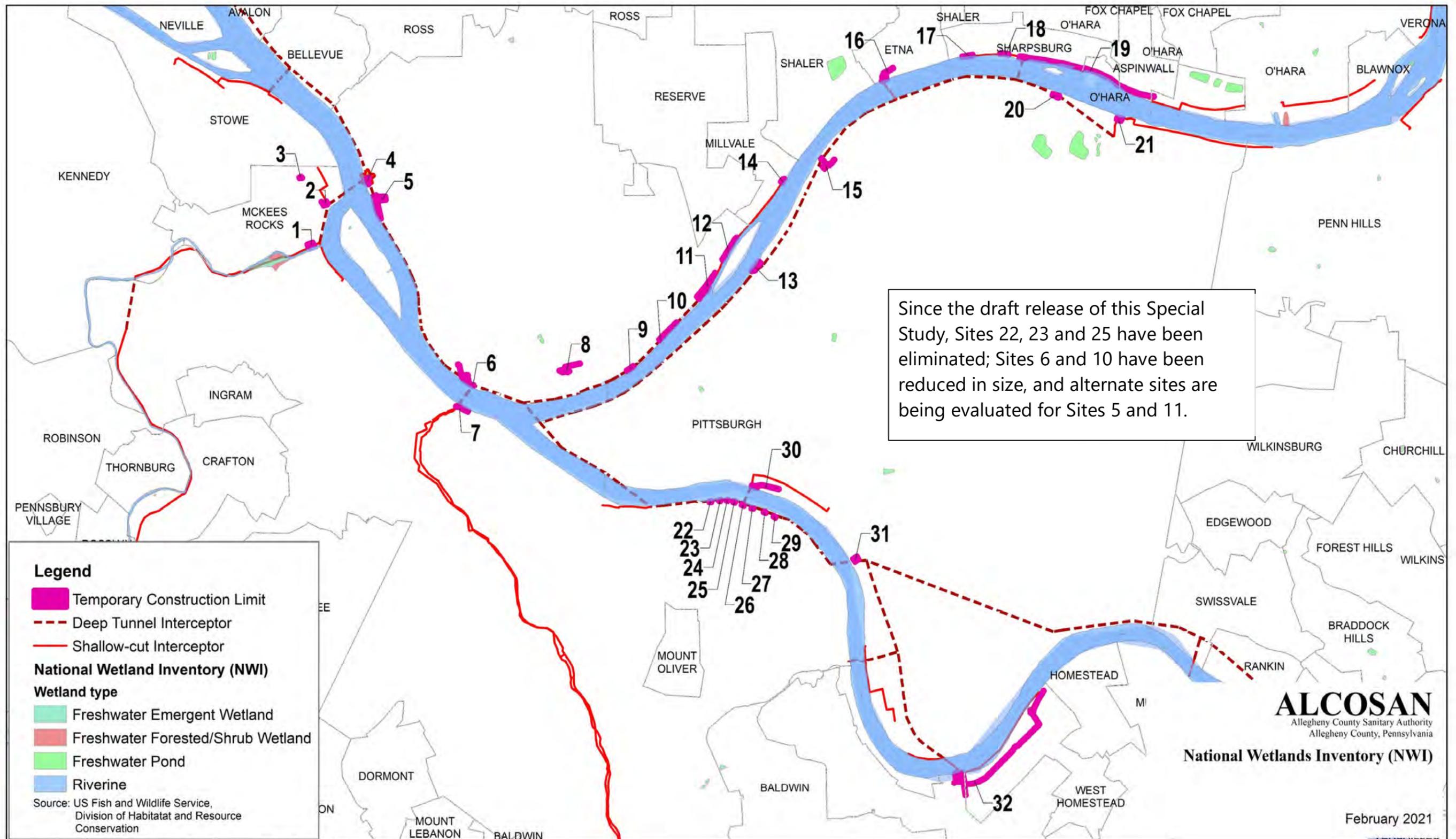
Based on soils information provided by the NRCS, almost all sites that will be impacted by the proposed construction are characterized as UB – Urban Land indicative of disturbed, urban areas. The other soil types are: GQF – Gilpin-Upshur complex, very steep; UCD – Urban land – Culleoka complex, moderately steep; and URB – Urban land – Guernsey complex, moderately steep. The URB soil type is the only soil identified by NRCS as having the potential to be classified as a hydric soil, and this soil type only occurs at Site 8 as shown on Figure 3-3.

Site specific wetland identification will be performed during final design of the proposed facilities and will consider the findings described above.

³⁻¹ USEPA/USCOE Field Guide for Determining Wetlands, 1989.

³⁻² FWB/OBS 79/31

Figure 3-2: IWWP Regional Conveyance Near-Surface Facilities - Wetlands Map



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3.4 Historic and Archaeological Resources

In February 2021 ALCOSAN requested a project review for the surface areas and structures to be impacted by the proposed construction of the Regional Conveyance Facilities from the Pennsylvania Historical Museum Commission (PHMC) for archeological and historical significance. The requested review was for all 32 sites of anticipated construction impacts during the building of the Regional Conveyance Facilities. Of these 32 sites, 25 do not currently have any structures. There are seven sites that will involve the demolition of one or more buildings if the properties are acquired by ALCOSAN.

Exhibit B contains the responses to date to ALCOSAN's request for project reviews by the PHMC. A summary of the PHMC review comments and the status of resolution as of February 2022 is captured in the following bullets:

- Site 5 contains existing structures that PHMC identified as being eligible for listing in the National Register of Historic Places (NRHP). ALCOSAN has since eliminated this site from consideration and is now exploring an alternate site.
- Additional information was requested about existing structures at Site 21 and it was noted the site might be considered a federal undertaking under Section 106 of the National Historic Preservation Act. After ALCOSAN supplied additional photographs and documentation, PHMC indicated no further information or documentation is needed.
- PHMC requested more information on the potential to affect historic properties. ALCOSAN responded by explaining that as the project's sites for each tunnel segment are finalized and design advances, a zone of influence for construction vibration will be identified. A survey will be completed within that zone of influence to identify NRHP-listed or NRHP-eligible resources as well as other properties over 50 years of age that have the potential to be eligible for the NRHP. The results of this survey for each phase (Reconnaissance Identification Survey) will be provided to PHMC for review. Should it be determined that any historic structure within the zone of influence will potentially be adversely affected by the project, that structure will be included in a monitoring and condition survey program.
- Since the project is located in an urban area and near some previously recorded archaeological sites, PHMC requested a Phase IA archaeological study to assess the site's potential for NRHP significant archaeological resources, including historic background research and a geomorphology assessment. Due to the nature of the comments ALCOSAN contracted with an archaeological survey firm and prepared the requested Phase IA Archaeological Survey, submitting it in February 2022. The survey excluded two sites for which alternate sites are being explored, but these will be surveyed in an addenda when the alternate sites are finalized. The survey cleared six sites and recommended further investigations at the remaining sites.
- PHMC responded to the Phase IA survey in March 2022. For the Archaeological Resources Review the PHMC fully concurred with the findings and the recommended additional investigations. For the Above Ground Resources Review, the PHMC requested a separate follow up submission with additional documentation on the

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elimination of three of the original sites and the reduction in the limits of disturbance for two of the original sites. ALCOSAN will be preparing a response shortly.

- Based on the PHMC response, ALCOSAN is beginning plans to conduct a geomorphology assessment and/or Phase IB Archaeological Survey at selected sites to support the design of the Ohio River Tunnel (where recommended in the Phase IA survey).

3.5 Sensitive Biological Resources

In December 2020 ALCOSAN submitted a request for a Pennsylvania Natural Heritage Program, PNHI search of the 32 sites that will be impacted by the construction of the proposed Regional Conveyance Facilities. As of February 18, 2022 comments were received from the following agencies:

- Pennsylvania Department of Conservation & Natural Resources – Bureau of Forestry. The Bureau of Forestry indicated that no impact is anticipated on species and resources under the Pennsylvania Department of Conservation & Natural Resource’s responsibility.
- Pennsylvania Game Commission – has indicated that no impact is anticipated on the species and resources of concern under the Game Commission’s responsibility.
- In a February 2021 comment letter, the US Fish and Wildlife Service identified federally listed and proposed endangered and threatened species within the project area and requested additional information relating to the new tunnel relief outfalls that may be constructed under the IWWP. The letter acknowledges that the proposed project is adjacent to the Allegheny, Ohio and Monongahela Rivers. The Allegheny and Ohio River may be inhabited by the following federally listed, endangered mussel species: northern riffleshell (*Epioblasma torulosa rangiana*), clubshell (*Pleurobema clava*), and rayed bean (*Villosa fabalis*). Additional specific information including proposed erosion and sediment controls and effluent limits will need to be provided to the USFWS as the design progresses.

The project is also within the range of the federally endangered Indiana bat (*Myotis sodalis*), and the northern long-eared bat (*Myotis septentrionalis*), federally listed as threatened. Because the proposed project includes less than ten acres of tree removal, the USFWS does not anticipate adverse impacts to the Indiana bat. There are no known hibernacula or nesting sites of the northern long-eared bat therefore, incidental takings would be permitted during the construction.

Bald Eagles were identified as nesting within 0.5 miles of the proposed project. The USFWS recommended that the proposed construction near nesting areas be evaluated with regards to the *National Bald Eagle Management Guidelines*. Their preferred alternative is to avoid nesting areas. Permitting and documentation will be required for construction sites near nesting sites and will be provided as part of the design process.

In April 2021, ALCOSAN sent a response to the US Fish and Wildlife Service addressing the species identified and provided the requested additional information about the tunnel relief outfalls which may be constructed. The response included a discussion of the effluent limits potentially impacting mussels stating that ALCOSAN will be in

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compliance with the requirements of the Clean Water Act and their modified Consent Decree.

- On August 31, 2021, the Pennsylvania Fish and Boat Commission provided a preliminary response to the initial PNDI request. They responded that rare and protected fish and mussel species are known from the vicinity of the project site. They required additional information to allow for a more thorough evaluation of potential adverse impacts from the proposed project. ALCOSAN responded on December 9, 2021 by providing information on the sites that had direct potential impacts to waterways. The information included drawings, proposed design details, information on tunneling practices and a brochure discussing ALCOSAN’s Regional Tunnel System. A follow up conference call was held on February 9th to discuss this information and address additional questions. ALCOSAN is waiting for a written response from the meeting and is preparing a requested table of additional information for six sites with potential new/modified outfalls. It is anticipated that aquatic habitat assessments and mussel surveys may need to be conducted as the tunnel designs progress.

Copies of the PNDI responses are provided as Exhibit C. The sites for which site-specific issues were identified through the PNDI review are summarized on Table 3-3. Impacts to bat hibernaculum are not anticipated. Potential impacts to Bald Eagles will be evaluated as design progresses.

Table 3-3: Regional Conveyance Facilities – PNDI Issues and Mitigation

Site No.	Location		Issues Identified Through PNDI	Anticipated Mitigation Steps
	Tunnel Segment	Municipality		
1	Chartiers Creek	McKees Rocks	Potential impact to mussels (PFBC)	Conduct habitat assessment to determine if additional mitigative steps are required
5 ¹	Ohio River	Pittsburgh	Potential impact to mussels (PFBC, USFWS ²)	Conduct habitat assessment to determine if additional mitigative steps are required
19	Allegheny River	Sharpsburg and Aspinwall	Potential impact to mussels (PFBC)	Conduct habitat assessment to determine if additional mitigative steps are required
21	Allegheny River	Pittsburgh	Potential impact to mussels (PFBC, USFWS ²)	Conduct habitat assessment and mussel study. Additional measures determined with final designs.
32	Monongahela River	West Homestead and Pittsburgh	Potential impact to mussels (PFBC)	Conduct habitat assessment to determine if additional mitigative steps are required

- Alternate site being explored.
- The USFWS has identified potential impacts to mussels that were addressed by ALCOSAN in a letter dated April 23, 2021 that is included in Exhibit C.

3.6 Water Quality

3.6.1 Direct Water Quality Benefits

The sewage overflow controls being implemented through ALCOSAN's CWP and concomitant municipal efforts are all intended to address current water quality issues in the Pittsburgh region's rivers and streams that are in part caused by or contributed to by wet weather sewage overflows.

Reducing the volume of overflows into the receiving rivers and streams will have significant positive short and long-term benefits in terms of enhanced river and waterfront recreational opportunities, public health and the protection of public water supplies. As shown in Figure 2-1, implementation of the proposed IWWP Regional Conveyance Facilities coupled with expansion of wet weather treatment capacity to 600 MGD is projected to reduce the volume of untreated CSO discharges from 9,300 MG per typical year (projected future baseline conditions) to less than ALCOSAN's 2,700 MG overflow volume remaining performance criteria³⁻³. In addition, the project will virtually eliminate overflows in the typical year for 15 outfalls located in Sensitive Areas as identified in ALCOSAN's Modified Consent Decree.

Implementing the Regional Conveyance Facilities along with the expansion of wet weather treatment capacity as outlined in this study will enable ALCOSAN to continue complying with current and future NPDES discharge limits, its approved IWWP and Modified CD. In addition, the wet-weather treatment strategy enabled by the Regional Conveyance Facilities is in keeping with USEPA's CSO Control Policy (April 1994) which encourages permittees to maximize the use of available treatment facilities for wet weather flows thereby ensuring that combined sewer flows receive primary treatment and disinfection prior to discharge.

3.6.2 Public Water Supply Impacts

Surface Water Supplies

In addition to direct receiving water quality benefits, ALCOSAN's IWWP will provide public water supply benefits. By enabling a significant reduction in combined sewage overflows into the Allegheny, Monongahela and Ohio Rivers the proposed IWWP will improve the quality of surface water supplies within the Pittsburgh region and is therefore in conformance with the Pennsylvania State Water Plan for the Ohio Watershed Region.

Ground Water Supplies

The Pittsburgh region is not located within a USEPA designated sole source aquifer and the Regional Conveyance Facilities are not expected to impact public groundwater supplies. The October 2020 *Preliminary Basis of Design Report* notes that the proposed alignment of the ART will veer north of the well field to reduce the risk of adverse impacts on the nearby Hampton Shaler Water Authority potable water wellfield.³⁻⁴ Coordination with the Hampton Shaler Water Authority is ongoing. ALCOSAN first met with the Hampton Shaler Water Authority in 2019 and prepared a memo with several alternative alignments for the Allegheny River Tunnel that would reduce the risk of adverse impacts on the well field. The BODR reflects one such alignment. ALCOSAN met with Hampton

³⁻³ Source: ALCOSAN Clean Water Plan Section 11.2.11 (pg. 11-45) and 11.3.3 (pg. 11-59)

³⁻⁴ Preliminary Basis of Design Report pg. 11-39

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Shaler Water Authority staff and the Board of Directors in October 2021 to discuss outstanding concerns and recently provided them with a requested existing conditions memorandum to further discussions. In a March 7, 2022 letter the Hampton Shaler Water Authority recognized the necessity of the Allegheny River Tunnel and expressed conditional support to the extent that their aquifer would remain uncompromised. A copy of this letter is provided in Exhibit F of Appendix B. The tunnel alignment in question has no impact on the Ohio River Tunnel currently under design. Design of the Allegheny River Tunnel is not scheduled to begin until 2025, allowing ample time for further coordination on an alignment satisfactory to both parties.

3.6.3 Indirect Water Quality Benefits

Section 208 of the Clean Water Act calls for the development of plans for the identification of treatment works necessary to meet the anticipated municipal and industrial waste treatment needs of an area over a 20-year period. ALCOSAN's IWWP includes the expansion of full secondary treatment to 295 MGD and the expansion of wet weather treatment capacity to 600 MGD at the Woods Run WWTP. This will provide adequate capacity for projected population growth and economic redevelopment activities. Given the highly developed nature of the City of Pittsburgh and many of ALCOSAN's suburban customer municipalities, the projected population growth will occur primarily through redevelopment. Moreover, the primary purpose of the proposed Regional Conveyance Facilities and WWTP expansion is to address wet weather overflows. Improving the wastewater infrastructure and water quality within the established areas of Pittsburgh and the other municipalities should further stimulate redevelopment and reduce the rate of suburban sprawl.

3.6.4 Stormwater Management Impacts

Stormwater management at the regional conveyance system near surface facilities such as consolidation sewers, drop shafts and regulator chambers is regulated under the Pennsylvania Clean Streams Law, the Allegheny County Subdivision and Land Development Ordinance and local municipal stormwater requirements. At a site scale, the stormwater runoff characteristics of these structures will be designed to conform with local ordinances and requirements. At a regional scale, these facilities will be consistent with the applicable requirements of Allegheny County's 2018 Act 167 Stormwater Management Plan. These facilities will reduce the peak flow rate of stormwater (in CSO discharges) entering the receiving streams within the project area and ALCOSAN service area by capturing, storing, treating and gradually releasing the captured and treated combined sewage flows back into the Ohio River through the Woods Run WWTP. Stormwater Management Plans will also be developed for surface features that are required to support the tunnel designs.

During the project design, ALCOSAN will coordinate with the Allegheny County Conservation District as to the need for an Earth Disturbance Permit (NPDES for Stormwater Discharges Associated with Construction Activities).

3.6.5 Waterway Obstruction Impacts

To create a usable footprint for expanding the treatment capacity at ALCOSAN's existing Woods Run WWTP, ALCOSAN obtained a PaDEP Water Obstruction and Encroachment Permit in May 2020. Since the expansion is part of a phased project that includes the IWWP regional conveyance facilities, obtaining this permit required preparation and approval of a

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Comprehensive Environmental Assessment (CEA) for WWTP expansion and the IWWP Regional Conveyance Facilities as defined at the time of the permit application.

The CEA was approved with the issuance of the permit which is included in Exhibit D along with the CEA. The permit only authorizes the construction of the water obstructions and encroachments that are associated with the current phase (WWTP expansion) of the overall project, as listed in the permit.

Additional authorization may be required for future water obstructions and/or encroachments as part of the IWWP Regional Conveyance Facilities. As part of any such future/additional authorizations, the CEA will need to be updated with each subsequent application for a Water Obstruction & Encroachment Permit. The permit also stipulates that care should be taken during the design of future phases of the overall project to avoid or minimize impacts to regulated waters of the commonwealth or other significant adverse impacts on the environment, to the extent practicable.

3.6.6 Construction Related Temporary Dewatering

Pending final design, it is assumed that all new sewers auxiliary to the actual tunnels that are to be constructed for the Regional Conveyance Facilities will be constructed using open-cut excavation or trenchless technologies. It is anticipated that all excavations for open-cut consolidation sewers and near surface structures will be below the prevailing groundwater levels with excavation depths typically around 25 to 30 feet.³⁻⁵

Dewatering will be required. The site-specific potential for contaminated soil, rock and groundwater will be evaluated during final design. Water pumped from the excavation sites will be discharged in accordance with applicable regulations.

3.7 Coastal Resources

Allegheny County is not subject to the Coastal Zone Management Program. This program is limited in applicability to Bucks, Delaware, Erie and Philadelphia Counties in Pennsylvania.

3.8 Socio-Economic Assessment

The implementation of the IWWP is not anticipated to impose any disproportionate adverse affects on minority and disadvantaged populations. This conclusion is based on an evaluation of the physical locations of project sites in the context of residential neighborhoods and data/mapping provided by USEPA, as detailed below.

3.8.1 Impacts on Housing and Residential Neighborhoods

Based on proposed revisions to the IWWP Regional Conveyance Facilities that were approved in March 2021, it is currently anticipated that no residences will be taken or displaced. The lack of impact from the Regional Conveyance Facilities is due in large part to the nature of the IWWP. ALCOSAN's improvements will be made at the WWTP and in proximity to its existing interceptor system, such that most surface construction and associated disruption will occur on industrial or commercial sites along the three rivers.

³⁻⁵ Preliminary Basis of Design Report Page 10-23.

3.8.2 Census Block-Group Level Economic and Demographic Characteristics

The original 32 Regional Conveyance Facilities sites are located within 26 U.S. Census block groups. Census block groups are the smallest geographic delineations for which household income data are available and are large relative to the size of the IWWP project sites. The project sites, as numbered in Table 1-1, are also shown in Figures 3-3, 3-4 and 3-5 in relation to Census block group data for minority populations and low-income populations.³⁻⁶ Consistent with USEPA mapping information, Census block groups with larger minority populations, larger low-income populations or higher demographic index values (in excess of the 80th, 90th and 95th percentiles) are colored in yellow, orange and red respectively.

- One of the 32 sites (approximately 3%) lies partially within a Census block group with larger minority populations.
- Eight of the 32 sites (approximately 25%) lie within or partially within Census block groups with larger low-income populations.
- Four of the 32 sites (approximately 12.5%) lie within or partially within Census block groups with higher demographic index values (based on low-income and “people of color” populations).
- Of the 14 sites with greater than one acre of impact, only one impacts an area with larger minority populations, only two impact s areas with a larger low-income population and only three impact areas with a higher demographic index.
- The total area of temporary impact for the one site with larger minority populations is 6.86 acres and the eight sites in areas with larger low-income populations is 17.85 acres, while the total area for all 32 surface locations is 61.69 acres. Therefore, the 32 surface locations will have a temporary impact on 11% of the larger minority population areas and 29% of the larger low-income population areas.

These comparisons make clear that neither the number of sites nor the extent of impacts in potential EJ areas are disproportionately higher than the number of sites and extent of impacts in locations that are not identified as potential EJ areas.

Summary demographic characteristics for the seven municipalities and Census block groups in which the 32 near-surface IWWP project sites will be located are provided on Table 3-4.

- The total ALCOSAN service population in the seven municipalities is approximately 321,100. The minority population is around 106,600 or 33%.
- The total population in the Census block groups in which IWWP project sites will be located is around 17,500, with the minority population approximately 3,700 or 21%.
- The percentages of residents identifying as minority is lower when assessed at the more refined Census block group level compared to the municipality level in five of the seven municipalities.

Through its preliminary planning for the Regional Conveyance Facilities ALCOSAN has evaluated alternatives for every project site and considered numerous factors including economic, environmental, public factors, operations and maintenance, implementation and construction, and property/easement acquisition. As shown in Table 3-5, this planning has resulted in a significant reduction in public impact and disruption in the sites which have larger low-income populations. A remote pump station has been eliminated, a remote retention

³⁻⁶ Source: US Environmental Protection Agency 2020 data

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treatment basin has been eliminated, and the consolidation sewer length has decreased by approximately 25%. While the number of shafts has increased from five to eight, most of the shafts have a small footprint and the disruption from the increased number of shafts will be more than offset by the eliminated disruption from facilities and some consolidation sewers.

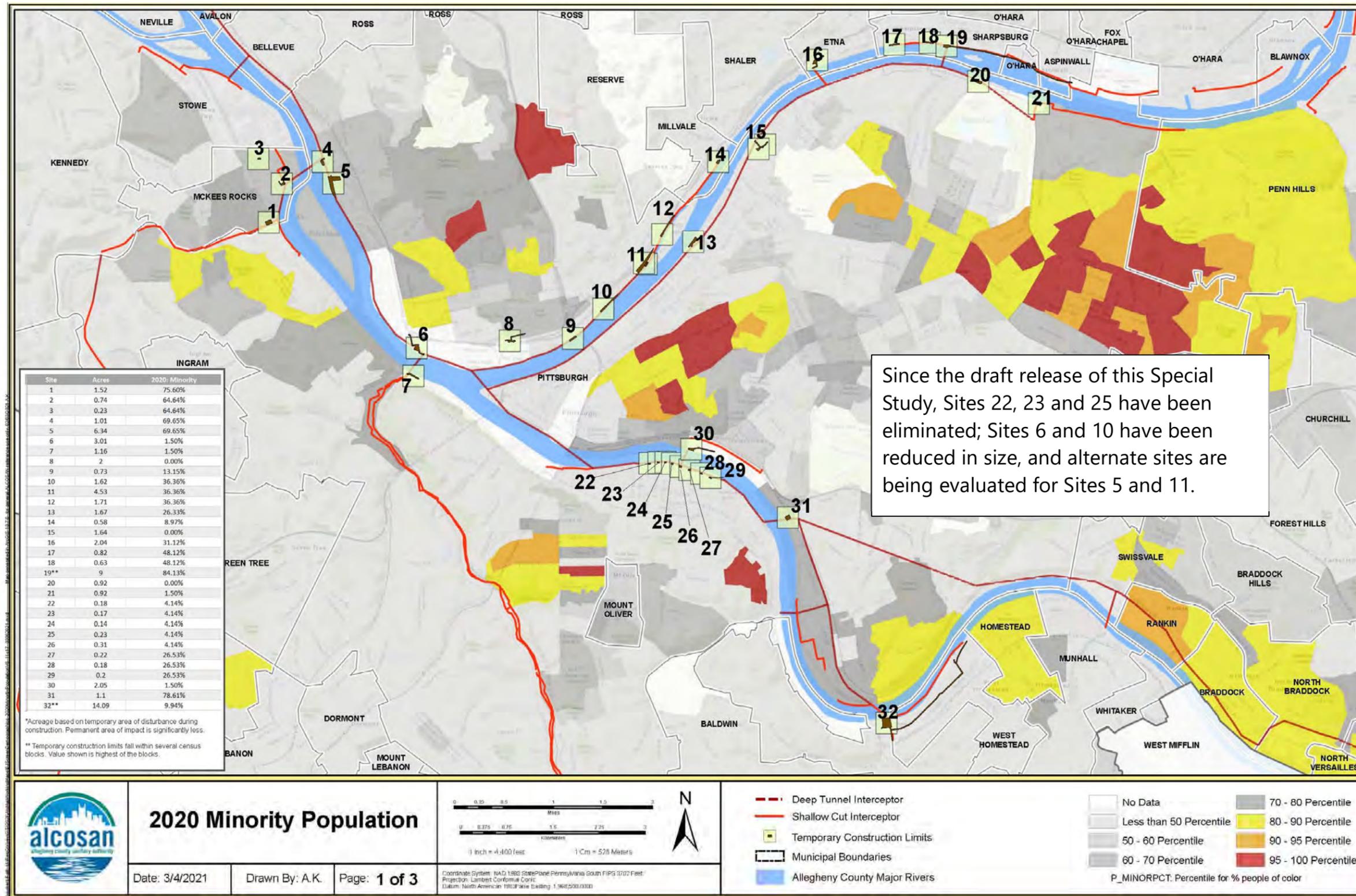
Table 3-4: Economic and Demographic Characteristics of Census Block Groups in Which IWWP Regional Conveyance Facilities will be Located

Municipality	Population		Minority			
	Municipality	Census Block Groups	Municipality		Census Block Groups	
Aspinwall Borough	2,724	1,067	330	12%	53	5%
Etna Borough	3,350	662	243	7%	93	14%
McKees Rocks Borough	5,919	2,261	2,635	45%	1,269	56%
Millvale Borough	3,706	885	486	13%	35	4%
Pittsburgh City	300,281	10,116	102,122	34%	1,703	17%
Sharpsburg Borough	3,358	770	420	13%	223	29%
West Homestead Borough	1,782	1,778	349	20%	302	17%
Total Affected Census BG	321,120	17,539	106,585	33%	3,678	21%
Entire ALCOSAN Service Area	836,556					

Table 3-5: Reduction of Community Impact for Proposed Near Surface Facilities In Census Blocks with Larger Low-Income Populations

Basis	Facilities	Drop Shafts	Consolidation Sewers (miles)
Original IWWP Per Clean Water Plan	2 (pump station and retention treatment basin)	5	1.88
Revised IWWP with Latest Approved Revisions	0	8	1.40

Figure 3-3: Location of IWWP Near Surface Facilities Relative to Minority Populations



Since the draft release of this Special Study, Sites 22, 23 and 25 have been eliminated; Sites 6 and 10 have been reduced in size, and alternate sites are being evaluated for Sites 5 and 11.

Figure 3-4: Location of IWWP Near Surface Facilities Relative to Low-income Populations

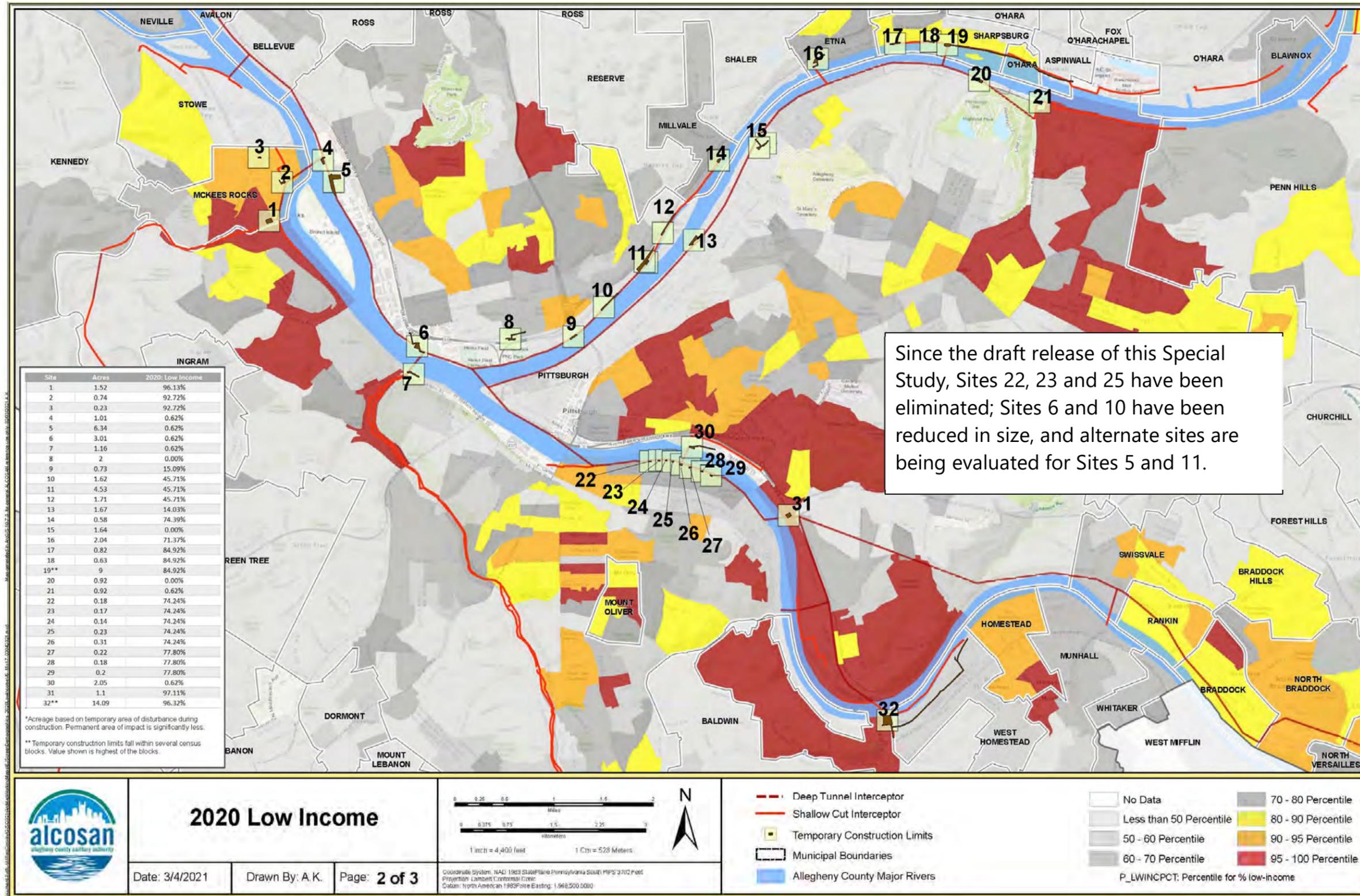
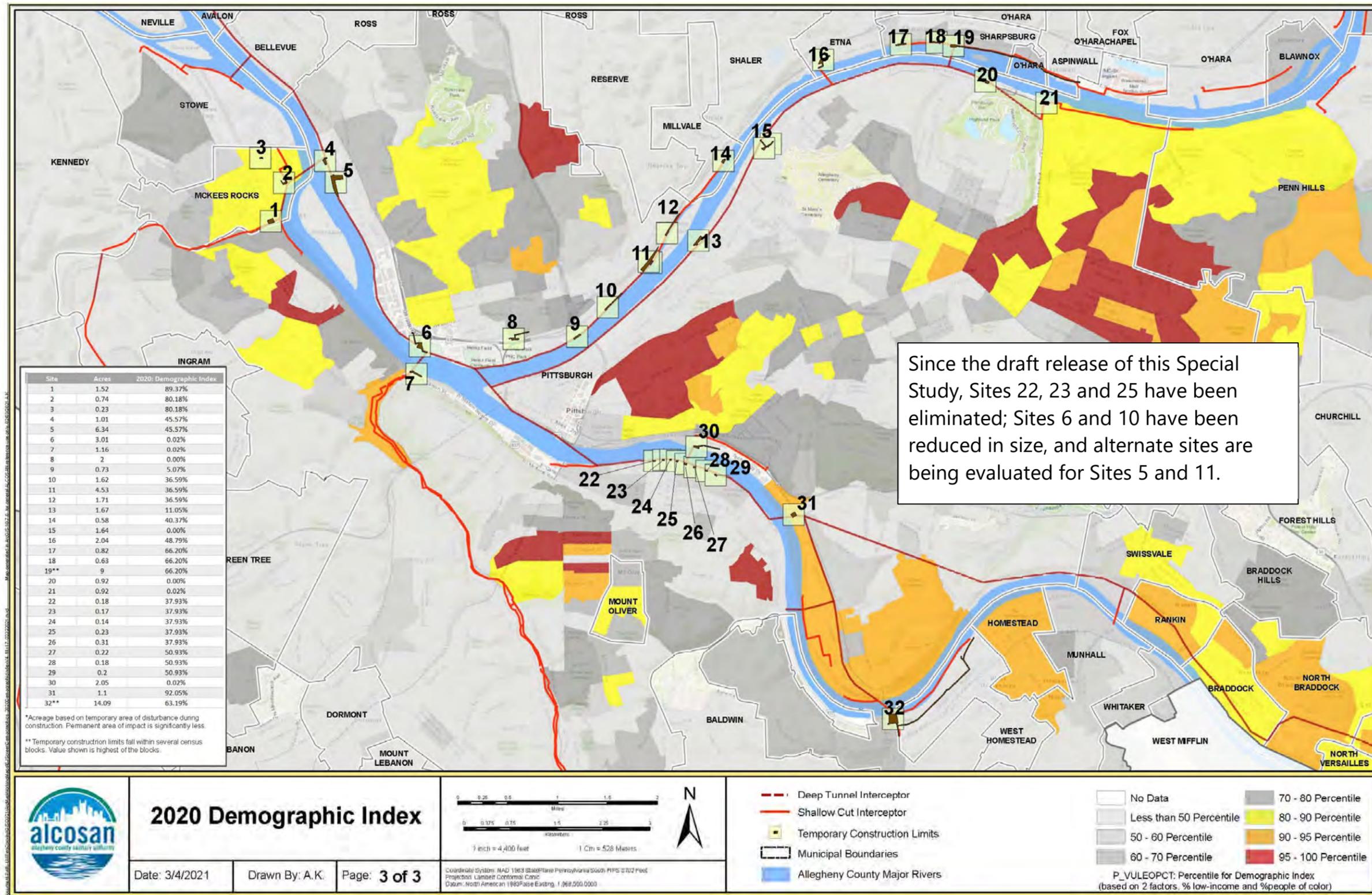


Figure 3-5: Location of IWWP Near Surface Facilities Relative to Demographic Index



Since the draft release of this Special Study, Sites 22, 23 and 25 have been eliminated; Sites 6 and 10 have been reduced in size, and alternate sites are being evaluated for Sites 5 and 11.

3.9 Air Quality

3.9.1 Temporary Construction Related

Potential temporary construction-related air quality impacts will include excavation related dust and exhaust emissions from heavy trucks and construction equipment. Site-specific air quality mitigation plan(s) will be developed for each construction area as part of the design packages.³⁻⁷

3.9.2 Odors During Operation

The proposed Regional Conveyance Facilities will not receive dry weather sewage flow during normal operations. Because the tributary combined sewer system first flush during wet weather will be directed first to the existing ALCOSAN interceptor sewer system, the sewage concentration of flow tributary to the proposed regional tunnels will be relatively dilute. As a result, air escape during tunnel filling is not expected to be odorous. Ventilation grates are recommended at all tunnel shafts to accommodate peak air flow rates projected at each location. The final tunnel designs will further consider potential odor control needs.³⁻⁸

3.10 Transportation & 3.11 Noise and Vibration

Impacts to the community regarding noise, vibration, and traffic disruption during construction have been evaluated for the proposed Regional Conveyance Facilities and are described generally as follows:

- **Road/Lane/Trail Closures:** Construction of the near surface facilities is anticipated to require the closure or restriction of several roads and trails as discussed below. These closures are not expected to impact the traffic flow of the community as a whole, but have the potential to particularly impact the residents and community resources adjacent to the road/lane closure, bus, and light rail routes for Port Authority Transit riders and nearby schools, and area emergency services (police/fire/emergency medical technicians).
- **Traffic Delays:** In addition to the traffic delays anticipated by the road/lane closures, movements of trucks and other equipment are anticipated to affect traffic flow and/or patterns during construction. For example, trucks hauling spoils from shaft sites will be traveling to and from the construction sites, adding more traffic on the surrounding streets, which may lead to traffic delays. These delays pose a particular impact to the same residents and community resources identified in the road/lane closure impact, though traffic delays are expected to be a lesser impact.
- **Business and Parking Disruption:** Construction of the near surface facilities is anticipated to impact the traffic flow to businesses as well as disrupt parking.

³⁻⁷ Preliminary Basis of Design Report Page 15-8.

³⁻⁸ Preliminary Basis of Design Report page 3-42

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- **Vibrations:** Vibrations may be perceptible but can be restricted to limits that do not cause damage to nearby properties when blasting is used to construct shafts, connector tunnels (adits) and tunnels.
- **Noise:** Noise levels in the area will increase during construction, particularly during excavations.

Potential site-specific transportation impacts for the construction sites required for the Regional Conveyance Facilities are provided on Table 3-6. The table reflects several site changes as reflected in ALCOSAN’s approved *Proposed Revisions to Interim Measures* report. These potential impacts and appropriate mitigation steps, such as the preparation of Maintenance and Protection of Traffic Plans, will be further evaluated during the final design phase for the Regional Conveyance Facilities.

Table 3-6: Potential Regional Conveyance Facilities Traffic Impacts³⁻⁹

Site No.	Structure	Location	Road Closure Impacts	Trail Closure Impacts
1	CCT-007-DS	Chartiers Avenue	Anticipated to be impacted by increased truck traffic.	NA
2	CCT-006-DS	Robb Street	Anticipated to be impacted by increased truck traffic.	NA
3	CCT-006A-DS	Ella Street	Anticipated to be closed between Olivia and Helen Streets for construction of the regulator and consolidation sewers. Detour assumed from Helen Street, along Catherine Street to Shingiss Street.	NA
		Olivia Street	Anticipated to be closed between Ella and Washington Streets during construction of the regulator and consolidation sewers. No detour anticipated.	
4	Wet Weather Pump Station	ALCOSAN WWTP	NA	NA
5 ¹	ORT-027-DS	Westhall Street	Anticipated to be closed for a significant duration from the intersection with Preble Avenue to terminus. No detour is anticipated.	Chateau Trail is anticipated to be closed between Doerr and Westhall. No detour is needed as the trail end is at Westhall.
		Doerr Street	Anticipated to be impacted by increased truck traffic and trail access.	
6	ORT-041-DS	N. Point Drive	Anticipated to be restricted to one lane for construction of the consolidation sewers. Local traffic impacts are anticipated due to construction. Access to the parking lots will be provided during construction activities.	Chateau Trail is anticipated to be detoured during construction of the outfall sewer along Belmont Street.
		Belmont Street	Anticipated to be closed for construction of the outfall sewer. No detour is anticipated.	

³⁻⁹ Source: Preliminary Basis of Design Report Tables 10-19, 11-20 and 12-21

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Site No.	Structure	Location	Road Closure Impacts	Trail Closure Impacts
7	SMRT-014-DS	Riverside Avenue	Anticipated to be closed near the drop shaft site. No detour anticipated.	NA
		Musk Way	Anticipated to be impacted by increased truck traffic.	
8	ORT-A48-DS	Federal Street	Anticipated to be restricted by one lane for construction of consolidation sewers.	NA
		S Commons Way	Anticipated to be restricted by one lane for construction of consolidation sewers.	
		Crema Street	Street and ALCO parking lot are anticipated to be closed for a significant duration to construct the proposed drop shaft, regulator, and consolidation sewer in the area near the Clark bar. No detour is needed.	
9	ORT-A58-DS	River Avenue	Anticipated to be closed between Voegtly and Progress Streets for construction of regulators and the initial stages of the drop shaft construction. No detour is anticipated.	Northshore Trail is anticipated to be detoured around the construction between Voegtly and Progress Streets.
10	ORT-A60-DS	River Avenue	Anticipated to be closed between Heinz and 31st Streets for construction of regulators and the initial stages of the drop shaft construction. No detour is anticipated.	Northshore Trail is anticipated to be detoured around the construction.
11 ¹	ORT-A62-DS	River Avenue	Anticipated to be closed between Heinz and 31st Streets for construction of regulators and the initial stages of drop shaft construction. No detour is anticipated.	Northshore Trail is anticipated to be detoured around the construction.
12	ART-A64-DS	River Avenue	Local traffic impacts are anticipated due to construction.	Northshore Trail is anticipated to be detoured around the construction.
		River Front Drive	Local traffic impacts are anticipated due to construction. Access to the parking lots will be provided during construction activities.	
13	ART-A22-DS	32nd Street	Anticipated to be closed for a significant duration at the terminus. No detour is anticipated.	NA
14	ART-A67-DS	River Front Drive	Local traffic impacts are anticipated due to construction. Access to the parking lots will be provided during construction activities.	North Shore Trail is anticipated to be terminated in the parking lot adjacent to the construction site during construction activities.
15	ART-A29-DS	48th Street	Local traffic impacts are anticipated due to construction. Access to the parking lots will be provided during construction activities.	NA
16	ART-A68-DS	Poplar Street	Local traffic impacts are anticipated due to construction. Access to the parking lots will be provided during construction activities.	NA
17	ART-A-69-DS & ART-A70-DS	NA (river access)	NA	NA

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Site No.	Structure	Location	Road Closure Impacts	Trail Closure Impacts
18	ART-A71-DS	13th Street	Local traffic impacts are anticipated due to construction. Access to the marina and parking lot will be provided during construction activities.	NA
19	ART-A72-DS	19th Street	Local traffic impacts are anticipated due to construction. Access to the development site and marina (if required) will be provided during construction activities.	NA
		River Avenue	Local traffic impacts are anticipated due to construction. Access to the park, parking lot, and marina will be provided during construction activities.	
20	ART-A41-DS	Butler Street	Local traffic impacts are anticipated due to construction. Access to the hot dog shop and parking lot will be provided during construction activities.	NA
21	ART-A42-DS	Butler Street	Anticipated to be impacted by increased truck traffic.	NA
		Lockway	Local traffic impacts are anticipated due to construction. Access to the lock and dam, local stock yard, and PWSA pump station will be provided during construction activities.	
		Washington Boulevard	Anticipated to be impacted by increased truck traffic.	
22, 23, 25	Drop shaft eliminated. Site no longer required.			
24, 26- 29	MRT-M-16-DS & MRT-M18-DS through MRT-M22-DS	River Front Park	Local traffic impacts are anticipated due to construction activities. Access to the boat launch and parking lots will be provided during construction activities.	Great Allegheny Passage Trail is anticipated to be impacted and detoured if necessary, around construction site during construction activities.
30	MRT-M19-DS	Technology Drive	Local traffic impacts are anticipated due to construction activities. Access to the parking lots will be provided during construction activities.	NA
31	MRT-M29-DS	Second Avenue	Local traffic impacts are anticipated due to construction activities.	Hazelwood Trail is anticipated to be impacted during construction activities.
		Blair Street	Local traffic impacts are anticipated due to construction activities.	
32	MRT-M42-DS	Baldwin Road	Local traffic impacts are anticipated due to construction activities. Access to the parking lots will be provided during construction activities.	Great Allegheny Passage Trail and Steel Valley Trail are anticipated to be impacted and detoured if necessary, around construction site during construction activities.

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Site No.	Structure	Location	Road Closure Impacts	Trail Closure Impacts
		Sandcastle Drive	Anticipated to be closed during construction activities. Construction anticipated to occur during the off season of the waterpark, no detour anticipated.	
		Waterfront Drive	Local traffic impacts are anticipated due to construction activities. Access to the parking lots will be provided during construction activities.	

1. Alternate site being explored.

Mitigation measures, such as restricting work hours and limiting construction methods at the shaft sites, will be specified during construction to reduce these impacts.³⁻¹⁰

3.12 Wild and Scenic Rivers

There are no Wild and Scenic River segments designated in the Pittsburgh region. Portions of the Allegheny River between Franklin, PA and the Kinzua Dam are so designated.

3.13 Miscellaneous Environmental Considerations

3.13.1 Biosolids Generation, Treatment and Disposal

The proposed tunnel system is not intended to convey dry weather sewage flow on a routine basis during normal operation. For this reason, features associated with enhanced solids transport, such as low flow channels, were not included in the new tunnel preliminary design.³⁻¹¹ However, the tunnel system will be configured to be able to deliver dry weather flow from the proposed pick up points to allow for operation and maintenance activities such as sediment inspection and cleaning in ALCOSAN’s existing regional conveyance deep tunnel system. Therefore, the wet weather pump station will be configured to handle these dry weather flows during short periods of operation and maintenance activities.

The previous expansion of biosolids handling capacity at ALCOSAN’s Woods Run WWTP will accommodate incremental biosolids quantities that will be captured and conveyed by the proposed project for treatment.

3.13.2 Impacts on Local Landfills

As detailed in Section 3.4 there will be 32 construction sites relating to the Regional Conveyance Facilities; of which seven have existing structures that will require demolition. Phase I and Phase II environmental site assessments will be performed, as necessary, to ascertain the nature of the soil, groundwater, and of the construction and demolition wastes at each site. Excavated materials requiring landfill disposal will be disposed of at appropriate local facilities pursuant to PaDEP (and local regulations).³⁻¹²

³⁻¹⁰ Preliminary Basis of Design Report page 10-48

³⁻¹¹ Preliminary Basis of Design Report page 3-49

³⁻¹² Preliminary Basis of Design Report page 15-8

3.13.3 Impacts of the Project on or from Superfund/HSCA Sites

The Hazardous Sites Cleanup Act (HSCA) provides PaDEP with the funding and authority to conduct cleanup actions at sites where hazardous substances have been released. Per the PaDEP website, none of the listed or de-listed HSCA remedial sites are located within the ALCOSAN service area and therefore will not be impacted by or have an impact on the Regional Conveyance Facilities.

ALCOSAN conducted an environmental screening during the preliminary planning for the Regional Conveyance Facilities.³⁻¹³ The objective of the environmental screening was to identify Recognized Environmental Conditions deemed important to consider during design; both along the project corridor, as well as potential Recognized Environmental Conditions from offsite sources that may adversely affect the project area and require additional investigation or study. A Recognized Environmental Condition is defined by ASTM Practice E 1527-13 as:

“The presence or likely presence of any hazardous substances or petroleum products on a property under conditions that indicate an existing release, a past release, or material threat of a release of any hazardous substances or petroleum products into structures on the property or into the ground, groundwater, or surface water of the property. The term is not intended to include de minimis conditions that generally do not present a threat to human health or the environment and that generally would not be the subject of an enforcement action if brought to the attention of appropriate governmental agencies.”³¹⁴

The project area encompasses a wide variety of existing land uses, primarily industrial and commercial, followed by transportation and recreational uses, with residential use representing less than 10%. Significant amounts of industrial facilities, commercial warehouses, and retail businesses, as well as several auto repair facilities, and residential developments are located within the project area.

The majority of the Recognized Environmental Condition sites identified are adjacent to or in the areas of a proposed intrusive, excavation type activity (e.g., drop shaft locations). Based on the increased amount of subsurface disturbance anticipated during these activities, a greater likelihood of encountering subsurface contamination exists. Sites that are not in an area of proposed intrusive activity were generally not carried forward as sites of concern. If surface ground disturbance is required in other areas, the project area may need to be reevaluated for additional sites of concern.

The Superfund Enterprise Management System (SEMS) database is a compilation of facilities that the USEPA has investigated or is currently investigating for a release or threatened release of hazardous substances pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). Furthermore, the SEMS Archive database was created by USEPA to document sites that have been removed and archived from the USEPA’s inventory of CERCLA sites and which have no further interest under the Federal Superfund Program based on available information.³⁻¹⁵ The environmental screening performed during preliminary planning identified five sites in the vicinity of proposed drop shafts which are

³⁻¹³ Preliminary Basis of Design Report Section 5 and Appendix G

³⁻¹⁴ Preliminary Basis of Design Report page 5-3

³⁻¹⁵ Preliminary Basis of Design Report, Appendix G, Table 2

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Section 3 – Environmental Consequences of the Project

listed in the SEMS Archive database.³⁻¹⁶ Therefore no active Superfund sites will have an impact on or will be impacted by the Regional Conveyance Facilities.

As noted above, Phase I and Phase II environmental site assessments will be performed, as necessary, at the 32 sites related to the construction of the Regional Conveyance Facilities either prior to property acquisition or during the design phase of the project.

As the program advances into final design, the environmental screening may be reevaluated, or subsequent ASTM-compliant Phase I and Phase II environmental site assessments will be completed for specific sites prior to property acquisition. Site-specific environmental site assessment investigations or file reviews should be planned when exact boundaries and site plans are developed in advanced design activities to better understand specific environmental issues that would impact the constructability and/or cost of the improvement.

As the program moves into construction, final design documents will contain language to address how construction would be impacted in the event that potentially hazardous materials are encountered, an odor is identified, or significantly stained soil is visible. Documents will reference and/or follow all applicable regulations regarding discovery and response for hazardous materials encountered during the construction process.

3.13.4 Hazardous Operations - Explosive or Flammable in Nature

Not applicable.

3.13.5 Toxic Chemicals and Radioactive Materials

Not applicable barring the discovery of such materials. If discovered during the environmental site assessments that will occur prior to property acquisition or during the design phase, alternate sites may be investigated. As the program moves into construction, final design documents are recommended to contain language to address how construction would be impacted in the event that potentially hazardous materials are encountered, an odor is identified, or significantly-stained soil is visible. Documents should reference and/or follow all applicable regulations regarding discovery and response for hazardous materials encountered during the construction process.³⁻¹⁷

³⁻¹⁶ Preliminary Basis of Design Report, Table 5-1

³⁻¹⁷ Preliminary Basis of Design Report page 1-9

4.0 SUMMARY OF MITIGATION

Based on the environmental consequences detailed in Section 3 of this report, this section summarizes the potential adverse environmental impacts of the IWWP Regional Conveyance Facilities and the methods by which those impacts will be mitigated. This information is presented on Table 4-1 which starts on the following page. This summary does not discuss impacts and mitigating actions that will be normally addressed as part of routine compliance with DEP permits (for example, compliance with NPDES permit discharge limits to protect receiving stream uses).

Uniform Environmental Report - IWWP Regional Conveyance Facilities
Section 4 – Summary of Mitigation

Table 4-1: Summary of Potential Adverse Environmental Impacts and Mitigation

UER Section No.	UER Section Name	Potential Adverse Environmental Impacts	Method(s) of Mitigation
3.1	Land Considerations	<ul style="list-style-type: none"> No permanent impacts to the river trail system, likely temporary access limitations during construction in some locations. 	<ul style="list-style-type: none"> Trail detours will be posted where feasible. Any incidental impacts to trails will be repaired.
3.2	Flood Plain	<ul style="list-style-type: none"> 17 of 32 near-surface project sites are partially or fully within the 100-year floodplain. Some of the Regional Conveyance Facilities will also involve construction in the floodways. 	<p>These preliminary findings will be verified during final design. The designs will comply with applicable regulations and required permits will be obtained.</p>
3.3	Wetlands	<p>Based on the National Wetlands Inventory (NWI), none of the 32 sites associated with the regional conveyance facilities will encroach on wetlands.</p>	<ul style="list-style-type: none"> Site specific wetland identification will be performed during final design of the proposed facilities.
3.4	Historic and Archaeological Resources	<p>A PHMC review of the 32 project sites indicated that:</p> <ul style="list-style-type: none"> Site 5 contains existing structures that may be eligible for listing in the NRHP. At some sites the project has potential to impact historic properties. To assess the site's potential for NRHP significant archaeological resources which have the potential to be impacted, the PHMC requested a Phase 1A archaeological study. <p>ALCOSAN submitted a Phase IA Archaeological Survey to PHMC in February 2022. PHMC concurred with the archaeological resources findings in March 2022 and requested additional documentation for the above ground review.</p>	<ul style="list-style-type: none"> ALCOSAN has eliminated Site 5 from consideration and is now exploring an alternate site. Should it be determined that a historic structure within the zone of influence will potentially be adversely affected by the project, that structure will be included in a monitoring and condition survey during construction. A Phase IA Archaeological Survey will be conducted at new/alternate sites once identified. Phase IB Archaeological Investigations and Geomorphologic Investigations will be conducted at selected sites (where recommended) as the designs progress.

Uniform Environmental Report - IWWP Regional Conveyance Facilities
Section 4 – Summary of Mitigation

UER Section No.	UER Section Name	Potential Adverse Environmental Impacts	Method(s) of Mitigation
3.5	Sensitive Biological Resources	<ul style="list-style-type: none"> • Based on a PNDI review of the 32 sites, all were cleared by the Pennsylvania Game Commission and the Department of Conservation and Natural Resources. • Additional details will need to be provided to the Pennsylvania Fish and Boat Commission and the US Fish and Wildlife Service as the designs progress. • Potential impacts to mussels may need to be considered at five sites. • Potential impacts to Bald Eagles and bat hibernaculum were identified but are not anticipated. 	<ul style="list-style-type: none"> • Site specific habitat assessments will be conducted as needed during design phases. • A mussel study and Mitigation Plans will be developed if required by reviewing agencies. • The <i>National Bald Eagle Management Guidelines</i> will be considered as the design of the project progresses.
3.6	Water Quality	<p>No negative water quality impacts have been identified (project is to reduce sewer overflows).</p>	<p>Any potential adverse impacts will be mitigated per methods required by applicable permits:</p> <ul style="list-style-type: none"> • ALCOSAN will coordinate with the Allegheny County Conservation District as to the need for an Earth Disturbance Permit (NPDES for Stormwater Discharges Associated with Construction Activities). • An approved Soil Erosion and Sediment Control Plan will be followed during construction. • Impacts to regulated waters will be minimized, but a PaDEP Water Obstruction and Encroachment Permit will be obtained if required. • The site-specific potential for contaminated soil, rock and groundwater will be evaluated during final design. Water pumped from the excavation sites will be discharged in accordance with applicable regulations.

Uniform Environmental Report - IWWP Regional Conveyance Facilities
Section 4 – Summary of Mitigation

UER Section No.	UER Section Name	Potential Adverse Environmental Impacts	Method(s) of Mitigation
3.9	Air Quality	<ul style="list-style-type: none"> Impacts will be temporary and limited to construction related vehicles and activities. The Regional Conveyance Facilities are not expected to be a source of odors during operation. 	<ul style="list-style-type: none"> Site-specific air quality mitigation plan(s) will be developed for each construction area as part of the design packages. Construction dust control steps will be implemented. The potential for odor generation and the need for control will be further evaluated during final design.
3.10	Transportation	<ul style="list-style-type: none"> Temporary street and trail closings will be required at some project sites. 	These potential impacts and appropriate mitigation steps, such as the preparation of Maintenance and Protection of Traffic Plans, will be further evaluated during final design.
3.11	Noise Abatement & Control	<ul style="list-style-type: none"> Noise impacts are expected to be limited to construction activities (machinery, etc.) Little or no noise impacts are expected during the operation of the Regional Conveyance Facilities which do not include large pump stations, compressor stations, etc. 	<ul style="list-style-type: none"> Mitigation measures, such as restricting work hours and limiting construction methods at the shaft sites, will be specified during construction to reduce these impacts Construction activities will primarily occur in non-residential areas. Construction activities typically will be limited to daytime.
3.13.2	Impacts on Local Landfills	<ul style="list-style-type: none"> May be a temporary increase in disposal due to construction. 	<ul style="list-style-type: none"> Excavated materials requiring landfill disposal will be disposed of at appropriate local facilities pursuant to PaDEP and local regulations
3.13.3	Impacts of the Project on or from Superfund/HSCA Sites	<ul style="list-style-type: none"> Not applicable per current understanding. 	<ul style="list-style-type: none"> Environmental site assessments will occur before ALCOSAN acquires the properties needed Alternative sites will be investigated and utilized as feasible Final design documents will contain language to address how construction would be impacted if potentially hazardous materials are encountered

5.0 PUBLIC AND STAKEHOLDER PARTICIPATION

[This section will be updated once all public and stakeholder participation is completed.]

5.1 Public Information and Participation Activities

5.1.1 Clean Water Plan Public Input

During the development of the Clean Water Plan, ALCOSAN sponsored numerous public outreach and stakeholder coordination opportunities; including seven Basin Planning Committees, a Customer Municipality Advisory Committee, a Regional Stakeholder Workgroup, and a myriad of annual public outreach forums fostering awareness and encouraging public involvement in the development of the CWP. ALCOSAN also participated in various 3 Rivers Wet Weather working group forums.

The 2008 consent decree required ALCOSAN to solicit comments on the Draft CWP no later than six months prior to the January 30, 2013 due date. On June 15, 2012, ALCOSAN issued a formal public notice that the Draft CWP was available for review through legal advertisement, through e-mail and surface mail distribution lists, and through its website.

ALCOSAN's Draft CWP was released for public comment on July 31st, 2012. The public comment period began with the Plan's release and ended 80 days later on October 19, 2012. ALCOSAN conducted an extensive effort to educate and engage the public about the Draft CWP and to solicit feedback.

In response to the public and municipal comments received by ALCOSAN, there have been a number of changes made to the Draft CWP since its release for public and municipal review on July 31st, 2012 and submission to the regulatory agencies during January 2013. Principal among these was an expanded focus of the CWP on wet weather source reduction through green stormwater infrastructure and the reduction of inflow and infiltration through municipal collection system rehabilitation. This approach was documented in the 2015 ALCOSAN document *Starting at the Source* and was formulized in 2017 revisions to the plan that resulted in the current Clean Water Plan. Additional details as to the public, stakeholder and municipal participation in the development of the CWP is provided in Section 2 of the Clean Water Plan.

5.1.2 Public Participation and Municipal Coordination for Proposed Revisions to the IWWP

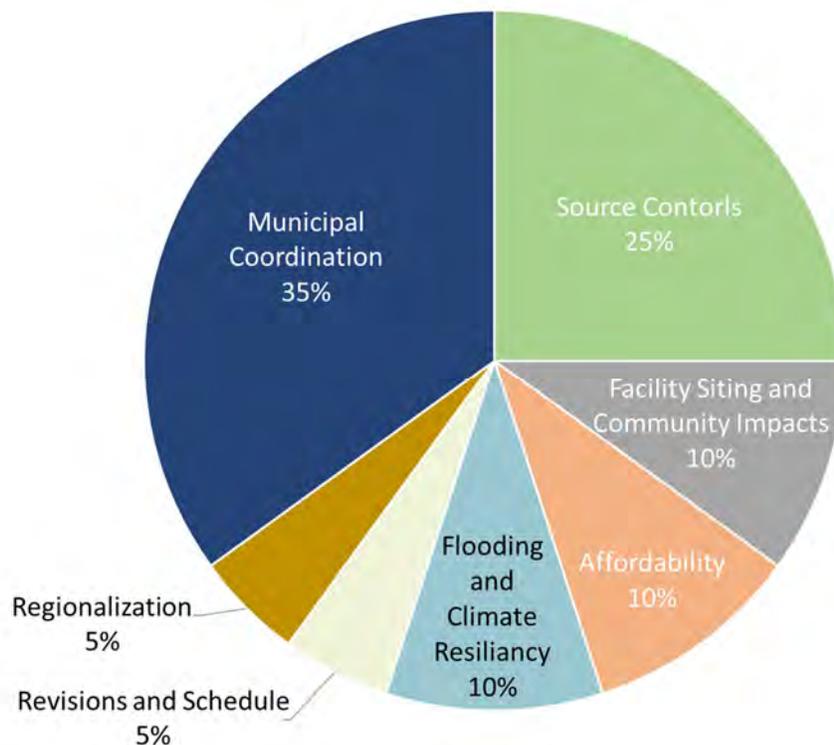
The Modified Consent Decree allows ALCOSAN to propose revisions to the CWP at any time, but also stipulates certain municipal coordination and public participation requirements as part of the revisions process. In November 2020 ALCOSAN submitted a *Proposed Revisions to Interim Measures* report for agency review and approval which described proposed revisions to the IWWP Regional Conveyance Facilities. That report was subsequently approved. In the process of developing that report, ALCOSAN coordinated with its municipal customers and provided an opportunity for public participation as follows.

In July 2020 ALCOSAN sent a Clean Water Plan Update email and fact sheet to all its customer municipalities which summarized six proposed changes to the CWP. The municipal notification was also posted to ALCOSAN's secure municipal web site.

ALCOSAN’s original intent was to also present the proposed changes at a July meeting of the ALCOSAN Advisory Committee, which is comprised of municipal representatives. Unfortunately, the committee elected to cancel its July meeting due to COVID-19 concerns. As a result, ALCOSAN instead reached out to all of the ALCOSAN Advisory Committee members via phone.

Due to COVID-19 concerns, ALCOSAN elected to conduct the public meeting as a virtual public meeting. The meeting was advertised on ALCOSAN’s public web site and was held on August 12th, 2020. The audience of approximately 45 were invited to submit questions and comments via chat during the presentation. Following the presentation, each question and comment was read and responded to. A total of 14 questions were addressed, covering several subject categories as summarized in Figure 5-1. Some questions addressed multiple subjects each of which are represented in the chart.

Figure 5-1: Public Meeting Question Categories



5.1.3 Additional Public Participation in the Act 537 Special Study and Uniform Environmental Report

ALCOSAN has provided draft copies of this Special Study and Uniform Environmental Report to the municipalities identified in Section 5.2 as well as the Pittsburgh Water and Sewer Authority and the Hampton Shaler Water Authority. This public release Special Study and Uniform Environmental Report is being provided to the local agencies identified in Section 5.3 and to each of the ALCOSAN customer municipalities for review and comment. The final Special

Study will reflect comments received and ALCOSAN’s responses.

ALCOSAN will hold two virtual public meetings on the Special Study on March 30, 2022. ALCOSAN has also prepared a summary companion document and is sending copies of the public release Special Study to public libraries within the vicinity of the proposed project. Documentation of ALCOSAN’s municipal and public outreach will be added as Exhibit E of this document in the final Special Study.

5.2 Municipal Commitments

ALCOSAN will implement the IWWP Regional Conveyance Facilities on behalf of its 83 customer municipalities. The municipalities have adopted ALCOSAN’s 1996 537 Plan as their respective municipalities’ official municipal Act 537 plans; some of which have been amended subsequently to reflect evolving local conditions.

In ALCOSAN’s 2020 discussions with PaDEP they indicated that formal municipal adoption of this Special Study via resolutions will not be required for all 83 municipalities. Adoption will be required by those municipalities through which the tunnel alignment passes and those locations where surface construction is proposed. Based on the plans reflected in the *IWWP Regional Conveyance Facilities BODR*, formal adoption of the Special Study is required from nine municipalities:

1. Aspinwall Borough
2. City of Pittsburgh
3. Etna Borough
4. McKees Rocks Borough
5. Millvale Borough
6. O’Hara Township
7. Shaler Township
8. Sharpsburg Borough
9. West Homestead Borough

In late 2021 and early 2022 ALCOSAN briefed the councils of eight of these municipalities and provided each with a draft of this Special Study and Uniform Environmental Report. ALCOSAN has offered a briefing to the ninth municipality in March and is waiting a reply. The municipalities were invited to provide comments and encouraged to share a copy of the Special Study and Uniform Environmental Report with their respective planning commissions. To date, Etna Borough, West Homestead Borough, Millvale Borough and O’Hara Township have accepted this Special Study as an amendment to the 1996 Act 537 Plan through a municipal resolution. A copy of these resolutions is included in Exhibit F of this document. The remaining municipalities are expected to pass resolutions in the near future and these resolutions will be included in the final Special Study and Uniform Environmental Report submitted to PaDEP for approval.

5.3 Agency Reviews

Review copies of this public release Special Study and Uniform Environmental Report are being sent to the following agencies:

- Allegheny County Health Department;
- Allegheny County Department of Economic Development;
- Southwestern Pennsylvania Commission;
- City of Pittsburgh Department of City Planning;
- The planning commissions for the other municipalities listed above in Section 5.2;
- Pennsylvania Department of Environmental Protection;
- Pennsylvania Department of Conservation and Natural Resources (since some project sites are within one mile of Point State Park); and
- U. S. National Park Service (since some project sites are within one mile of national historic landmarks).

Courtesy copies will also be sent to the Pittsburgh Water and Sewer Authority and the Hampton Shaler Water Authority for their review and comment. Coordination with the Hampton Shaler Water Authority is ongoing. ALCOSAN first met with the Hampton Shaler Water Authority in 2019 and prepared a memo with several alternative alignments for the Allegheny River Tunnel that would reduce the risk of adverse impacts on the well field. The BODR reflects one such alignment. ALCOSAN met with Hampton-Shaler Water Authority staff and the Board of Directors in October 2021 to discuss outstanding concerns and recently provided them with a requested existing conditions memorandum to further discussions. In a March 7, 2022 letter the Hampton Shaler Water Authority recognized the necessity of the Allegheny River Tunnel and expressed conditional support to the extent that their aquifer would remain uncompromised. A copy of this letter is provided in Exhibit F of Appendix B. The alignment in question has no impact on the Ohio River Tunnel currently under design. The October 2020 *Preliminary Basis of Design Report* notes that the proposed Allegheny River Tunnel alignment will veer north of the well field to reduce the risk of adverse impacts on the well field. Design of the Allegheny River Tunnel is not scheduled to begin until 2025, allowing ample time for further coordination on an alignment satisfactory to both parties.

Copies of ALCOSAN's letters of transmittal, local agency comments received during the 60-day local agency comment period and ALCOSAN's responses to these comments will be provided in Exhibit G of the final Special Study and Uniform Environmental Report.

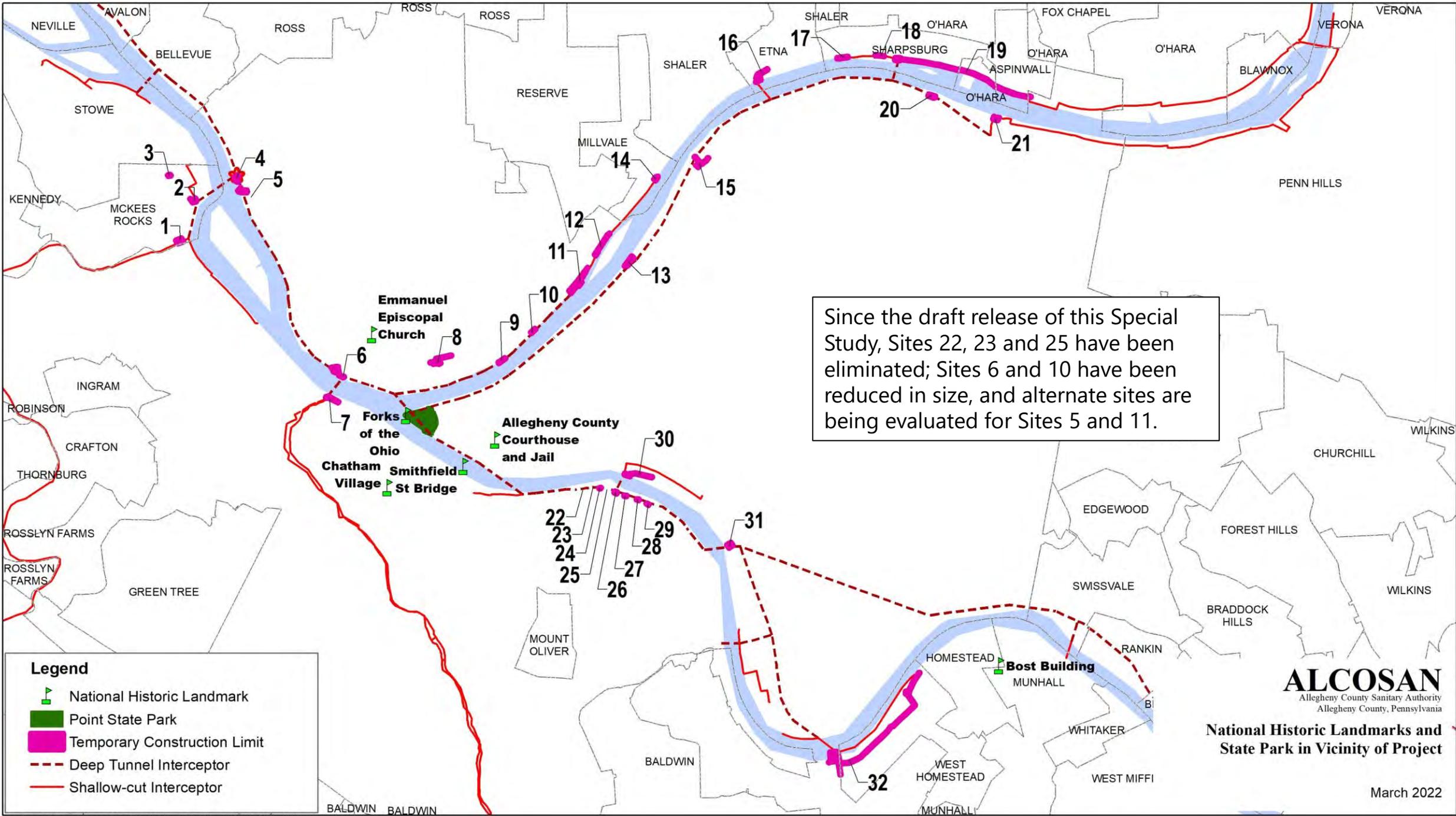
5.4 Documentation of Public Notices

Public notices as to the draft document's availability for review and comment will be published in the Pittsburgh Post-Gazette and the New Pittsburgh Courier. In addition, public notice will be provided via notices on ALCOSAN's web site and social media accounts, as well as being sent out via ALCOSAN's direct marketing email service. The documentation will be provided in Exhibit H of the final Special Study and Uniform Environmental Report.

5.5 Public Comments and Responses

Documentation of public comments received during the 30-day public comment period and ALCOSAN's responses to these comments will be provided in Exhibit I of the final Special Study and Uniform Environmental Report.

Exhibit A
Project Location Map



Since the draft release of this Special Study, Sites 22, 23 and 25 have been eliminated; Sites 6 and 10 have been reduced in size, and alternate sites are being evaluated for Sites 5 and 11.

Legend

-  National Historic Landmark
-  Point State Park
-  Temporary Construction Limit
-  Deep Tunnel Interceptor
-  Shallow-cut Interceptor

ALCOSAN
 Allegheny County Sanitary Authority
 Allegheny County, Pennsylvania

National Historic Landmarks and State Park in Vicinity of Project

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Exhibit B

Pennsylvania Historical Museum Commission Responses

Comments from Cheryl Nagle (Above Ground Review) #2021PRO3178.001

1. The project narrative states that the West Lock Way building is owned by the United States as coastline. Is this referring to the Corps of Engineers or the Coast Guard as the federal property owner. Federal involvement in a proposed “undertaking” may constitute Section 106 consultation for the project.
2. Western State Penitentiary is eligible for listing in the National Register per Criterion A, for its exemplification of a variety of penological reforms which led to Pennsylvania’s approach to the treatment of prisoners and design of modern prisons during the 19th century. It is also eligible for Criterion C as a significant example of a Victorian-era penitentiary that combined historical architectural forms and methods of construction with modern advances in infrastructure, utilities, sanitation, and features of prison design influenced by the industrial revolution. The period of significance begins in 1878 and extends to the 50-years from present mark (2018). The proposed project is the demolition of historic age buildings (within the period of significance). Why are the buildings being proposed for demolition? What alternatives to demolition are there? What other potential areas on the site are feasible for the project?
3. For the multiple site submission – Provide more information regarding the potential to affect historic resources (buildings mainly – in regard to vibration impacts of tunneling. In particular: Site 3 – identify the age of the church, provide photographs, and potential vibration impact. Site 8, Site 10, Site 15 and Site 32 – all of which have known historic resources. Vibration from heavy equipment operation, or in this case – tunneling – have potential to have a vibrational impact on nearby buildings. Other factors that affect the potential for physical impacts to building include the building materials. If there is trenching, there may be the potential to result in subsidence of soils and effects to nearby building foundations.
4. For the project area (two buildings located at 7779 Lock Way East and one shed located at West Lock Way, the Negley Site). Data enter the abbreviated form information for the “West Lock Way”. Provide better photographs. Determine the date of construction. Determine the historic function/use. Determine what it is historically associated with (railroad? Lock/dam? Industry?) Provide historic aerials, Sanborn maps, etc. Is that a park or planned garden next to it? Is that part of its history?
5. For the project area (two buildings located at 7779 Lock Way East and one shed located at West Lock Way, the Negley site). Data enter the abbreviated form information for the Building #2 – Provide better photographs. Determine the date of construction. Determine the historic function/use. Determine what it is historically associated with (railroad? Lock/dam? Industry? Provide historic aerials, Sanborn maps, etc.

Comments from Kimberly Sebestyen (Archaeological Review) #2021PRO3178.002

6. Previously recorded archaeological sites, listed below, are located within or adjacent to your project area. These resources could be adversely affected by project activities and have not been evaluated for their eligibility for listing on the National Register of Historic Places. It is our opinion that a Phase I archaeological survey to relocate these known sites and locate other potentially significant sites within the project area should be conducted. Guidelines and instruction for conducting all phases of archaeological survey in Pennsylvania are available on our website:
<http://www.phmc.pa.gov/Preservation/About/Documents/SHPO-Guidelines-Archaeological-investigation.pdf> P.A.S.S. (*Pennsylvania Archaeologic Site Survey (my comment)*) #36AL0370, 36AL0487, 36AL0488, 36AL0489, 36AL0506, 36AL0278.
7. As this project area is located wholly or partially within an urban area, it is our opinion that a Phase 1A archaeological study should be undertaken to assess this property's potential for National Register significant archaeological resources. This study should consist of a thorough review of available historic through recent maps and other documentary sources which may provide information on past land use within the project area. A geomorphological assessment of the project area is recommended at this stage as it will provide useful information on the total depth and the integrity of potential archaeological deposits. If this research suggests that potentially significant archaeological resources may be present, it will be our opinion that a Phase I archaeological plan should be developed to identify such resources. Guidelines are available on our website at:
<http://www.phmc.pa.gov/Preservation/About/Documents/SHPO-Guidelines-Archaeological-investigation.pdf>



Pennsylvania State Historic Preservation Office

PENNSYLVANIA HISTORICAL AND MUSEUM COMMISSION

October 21, 2021

Cindy Zuch
Collective Efforts LLC
463 Perry Highway
Pittsburgh PA 15229

RE: ER Project # 2021PR03178.004, ALCOSAN Regional Conveyance Facilities-- Multiple Locations, Department of Environmental Protection, West Homestead Borough, Allegheny County

Dear Cindy Zuch:

Thank you for submitting information concerning the above referenced project. The Pennsylvania State Historic Preservation Office (PA SHPO) reviews projects in accordance with state and federal laws. Section 106 of the National Historic Preservation Act of 1966, and the implementing regulations (36 CFR Part 800) of the Advisory Council on Historic Preservation, is the primary federal legislation. The Environmental Rights amendment, Article 1, Section 27 of the Pennsylvania Constitution and the Pennsylvania History Code, 37 Pa. Cons. Stat. Section 500 et seq. (1988) is the primary state legislation. These laws include consideration of the project's potential effects on both historic and archaeological resources.

Above Ground Resources

For questions concerning above ground resources, please contact Cheryl Nagle at chnagle@pa.gov.

Sincerely,

Andrea MacDonald
Director, State Historic Preservation Office



Pennsylvania State Historic Preservation Office

PENNSYLVANIA HISTORICAL AND MUSEUM COMMISSION

October 21, 2021

Cindy Zuch
Collective Efforts LLC
463 Perry Highway
Pittsburgh PA 15229

RE: ER Project # 2021PR03178.003, ALCOSAN Regional Conveyance Facilities-- Multiple Locations, Department of Environmental Protection, West Homestead Borough, Allegheny County

Dear Cindy Zuch:

Thank you for submitting information concerning the above referenced project. The Pennsylvania State Historic Preservation Office (PA SHPO) reviews projects in accordance with state and federal laws. Section 106 of the National Historic Preservation Act of 1966, and the implementing regulations (36 CFR Part 800) of the Advisory Council on Historic Preservation, is the primary federal legislation. The Environmental Rights amendment, Article 1, Section 27 of the Pennsylvania Constitution and the Pennsylvania History Code, 37 Pa. Cons. Stat. Section 500 et seq. (1988) is the primary state legislation. These laws include consideration of the project's potential effects on both historic and archaeological resources.

Above Ground Resources

SHPO Sends Comments - Environmental Review - SHPO Sends Above Ground Comments

The PA SHPO and the consultants have a phone call on October 27, 2021 to discuss this and other requests. So there is no review comment for this posting.

For questions concerning above ground resources, please contact Cheryl Nagle at chnagle@pa.gov.

Sincerely,

Andrea MacDonald
Director, State Historic Preservation Office



October 22, 2021

Cindy Zuch
Collective Efforts LLC
463 Perry Highway
Pittsburgh PA 15229

RE: ER Project # 2021PR03178.005, ALCOSAN Regional Conveyance Facilities-- Multiple Locations, Department of Environmental Protection, West Homestead Borough, Allegheny County

Dear Cindy Zuch:

Thank you for submitting information concerning the above referenced project. The Pennsylvania State Historic Preservation Office (PA SHPO) reviews projects in accordance with state and federal laws. Section 106 of the National Historic Preservation Act of 1966, and the implementing regulations (36 CFR Part 800) of the Advisory Council on Historic Preservation, is the primary federal legislation. The Environmental Rights amendment, Article 1, Section 27 of the Pennsylvania Constitution and the Pennsylvania History Code, 37 Pa. Cons. Stat. Section 500 et seq. (1988) is the primary state legislation. These laws include consideration of the project's potential effects on both historic and archaeological resources.

Above Ground Resources

SHPO Sends Comments - Environmental Review - SHPO Sends Above Ground Comments

The PA SHPO concurs that no further information or documentation is needed for : 1. Two buildings located at 7779 Lock Way East and one shed located at West Lock Way, the Negley Site - as they are not associated with the Lock & Dam nor are they of a historic age or function. 2. The facility located at 7776 East Lock Way is located partially within LOD Area 21 on a tax parcel owned by the City of Pittsburgh: Tax Parcel 122-K-50 (East Lock Way) - as they are not over 50 years of age.

SHPO Sends Comments - Environmental Review - SHPO Sends Above Ground Comments

The PA SHPO, project sponsor, consultants, etc. are having a meeting on October 27th to discuss this proposed project, the documentation received thus far, and any further studies, documentation, consultation, etc. Therefore, this response is: we acknowledge that alternatives, studies, etc. are being considered and consultation will continue. If there are different approaches discussed during the meeting they will be provided to the PA SHPO for review and comment.

For questions concerning above ground resources, please contact Cheryl Nagle at chnagle@pa.gov.

Archaeological Resources

SHPO Sends Comments - Environmental Review - SHPO Sends Archaeo Comments

Thank you for the status update on the previous request by our office for a Phase IA archaeological survey. Please note that the recommendation previously made by our office was to include both historic background research and a geomorphological assessment as part of the Phase IA archaeological survey.

For questions concerning archaeological resources, please contact Justin McKeel at jusmckeel@pa.gov.

Sincerely,

A handwritten signature in blue ink that reads "Andrea MacDonald". The signature is written in a cursive style with a large initial 'A'.

Andrea MacDonald
Director, State Historic Preservation Office



Pennsylvania State Historic Preservation Office

PENNSYLVANIA HISTORICAL AND MUSEUM COMMISSION

March 8, 2022

Cindy Zuch
Collective Efforts LLC
463 Perry Highway
Pittsburgh PA 15229

RE: ER Project # 2021PR03178.007, ALCOSAN Regional Conveyance Facilities-- Multiple Locations, Department of Environmental Protection, West Homestead Borough, Allegheny County

Dear Cindy Zuch,

Thank you for submitting information concerning the above referenced project. The Pennsylvania State Historic Preservation Office (PA SHPO) reviews projects in accordance with state and federal laws. Section 106 of the National Historic Preservation Act of 1966, and the implementing regulations (36 CFR Part 800) of the Advisory Council on Historic Preservation, is the primary federal legislation. The Environmental Rights amendment, Article 1, Section 27 of the Pennsylvania Constitution and the Pennsylvania History Code, 37 Pa. Cons. Stat. Section 500 et seq. (1988) is the primary state legislation. These laws include consideration of the project's potential effects on both historic and archaeological resources.

Archaeological Resources

Thank you for the clear and thorough Phase IA Archaeological Survey Report. The PA SHPO concurs with the proposed recommendation for geomorphological and Phase IB archaeological investigations for Areas 1, 2, 6, 13 through 17, 19, 21, 24, 26 through 30, and 32. The PA SHPO also concurs with the proposed recommendation for Phase IB archaeological survey for Areas 7, 8, 20, and 31. Guidelines and instructions for conducting all phases of archaeological survey in Pennsylvania are available on our website.

We understand that the Phase IA survey for Areas 5A and 11/11A will be conducted as soon as ALCOSAN has determined the location of these areas. Please submit the addendum report to our office for review and comment once completed. As conveyed in this submission, Areas 22, 23, and 25 are no longer required for the project. We also understand that given the nature of the project, future addendum Phase IA reports will likely be needed as the project design changes. We look forward to continued consultation and coordination as the project progresses. As noted below, please submit these changes to the project design as a separate submission for our review and comment, including these recent changes documented in this report.

Based on the information received and available within our files, it is our opinion that there are no archaeological historic properties (resources listed in or eligible for listing in the National Register) present within the presently defined boundaries of Areas 3, 4, 9, 10, 12, and 18. We agree that no further archaeological investigations are necessary in these areas.

More Information Requested - New Attachment

Please attach documentation of the project design changes as a separate submission for above ground resources review and comment (i.e., the changes discussed for Areas 6, 10, 22, 23, and 25).

ER Project #2021PR03178.007

Page 2 of 2

Please submit the requested materials to the PA SHPO through PA-SHARE using the link under SHPO Requests More Information on the Response screen.

For questions concerning archaeological review, please contact Justin McKeel at jusmckeel@pa.gov.

Sincerely,

A handwritten signature in cursive script that reads "Emma Diehl".

Emma Diehl

Environmental Review Division Manager

Exhibit C

Pennsylvania Natural Diversity Inventory Responses

BUREAU OF FORESTRY

December 21, 2020

PNDI Number: 723633
Version: Manual_1; 12/15/20

Coreen Casadei
Collective Efforts, LLC
462 Perry Hwy
Pittsburgh, PA 15229
Email: ccasadei@collectiveefforts.com (hard copy will not follow)

Re: ALCOSAN Regional Conveyance Facilities
Allegheny County, PA

Dear Ms. Casadei,

Thank you for the submission of the Pennsylvania Natural Diversity Inventory (PNDI) Environmental Review Receipt Number **723633 (Manual_1)** for review. PA Department of Conservation and Natural Resources screened this project for potential impacts to species and resources under DCNR's responsibility, which includes plants, terrestrial invertebrates, natural communities, and geologic features only.

No Impact Anticipated

PNDI records indicate species or resources under DCNR's jurisdiction are located in the vicinity of the project. However, based on the information you submitted concerning the nature of the project, the immediate location, and our detailed resource information, DCNR has determined that no impact is likely. No further coordination with our agency is needed for this project.

This response represents the most up-to-date review of the PNDI data files and is valid for two (2) years only. If project plans change or more information on listed or proposed species becomes available, our determination may be reconsidered. Should the proposed work continue beyond the period covered by this letter and a permit has not been acquired, please resubmit the project to this agency as an "Update" (including an updated PNDI receipt, project narrative, description of project changes and accurate map). As a reminder, this finding applies to potential impacts under DCNR's jurisdiction only. Visit the PNHP website for directions on contacting the Commonwealth's other resource agencies for environmental review.

Should you have any questions or concerns, please contact Jason Ryndock, Ecological Information Specialist, by phone (717-705-2822) or via email (c-jryndock@pa.gov).

Sincerely



Greg Podnieszinski, Section Chief
Natural Heritage Section



February 10, 2020

Ms. Coreen Casadei
Collective Efforts, LLC
462 Perry Highway
Pittsburgh, PA 15229

PNDI Manual Project Submission
Re: Allegheny County Sanitary Authority (ALCOSAN)
McKees Rocks, Pittsburgh, Millvale, Etna, Sharpsburg, Aspinwall Township, and West
Homestead Township/Municipality(s), Allegheny County, PA

Dear Ms. Casadei,

Thank you for submitting the Allegheny County Sanitary Authority (ALCOSAN) project to the Pennsylvania Natural Diversity Inventory (PNDI) for review. The Pennsylvania Game Commission (PGC) screened this project for potential impacts to species and resources of concern under PGC responsibility, which includes birds and mammals only.

No Impact Anticipated

PNDI records indicate species or resources of concern are located in the vicinity of the project. However, based on the information you submitted concerning the nature of the project, the immediate location, and our detailed resource information, the PGC has determined that no impact is likely. Therefore, no further coordination with the PGC will be necessary for this project at this time.

This response represents the most up-to-date summary of the PNDI data files and is valid for two (2) years from the date of this letter. An absence of recorded information does not necessarily imply actual conditions on site. Should project plans change or additional information on listed or proposed species become available, this determination may be reconsidered.

Should the proposed work continue beyond the period covered by this letter, please resubmit the project to this agency as an "Update" (including an updated PNDI receipt, project narrative and accurate map). If the proposed work has not changed and no additional information concerning listed species is found, the project will be cleared for PNDI requirements under this agency for two additional years.

This finding applies to impacts to birds and mammals only. To complete your review of state and federally-listed threatened and endangered species and species of special concern, please be sure that the U.S. Fish and Wildlife Service, the PA Department of Conservation and Natural

Resources, and/or the PA Fish and Boat Commission have been contacted regarding this project as directed by the online PNDI ER Tool found at www.naturalheritage.state.pa.us.

Sincerely,



Tracey Librandi Mumma
Division of Environmental Planning & Habitat Protection
Bureau of Wildlife Habitat Management
Phone: 717-787-4250, Extension 73614
Fax: 717-787-6957
E-mail: tlibrandi@pa.gov

A PNHP Partner



TLM/tlm



United States Department of the Interior



FISH AND WILDLIFE SERVICE
Pennsylvania Field Office
110 Radnor Road, Suite 101
State College, Pennsylvania 16801-4850

February 25, 2021

Coreen Casadei
Collective Efforts, LLC
462 Perry Highway
Pittsburgh, PA 15229

RE: USFWS Project #2017-0718

Dear Ms. Casadei:

This responds to your correspondence of December 9, 2020, requesting information about federally listed and proposed endangered and threatened species within the area affected by the proposed Allegheny County Sanitary Authority (ALCOSAN) Regional Conveyance Systems project located in Allegheny County, Pennsylvania. Your proposed project is adjacent to the Allegheny, Ohio and Monongahela Rivers. The Allegheny and Ohio River may be inhabited by the following federally listed, endangered mussel species: northern riffleshell (*Epioblasma torulosa rangiana*), clubshell (*Pleurobema clava*), and rayed bean (*Villosa fabalis*). Your project is also within the range of the federally endangered Indiana bat (*Myotis sodalis*), and the northern long-eared bat (*Myotis septentrionalis*), federally listed as threatened. The following comments are provided pursuant to the Endangered Species Act of 1973 (87 Stat. 884, as amended; 16 U.S.C. 1531 *et seq.*) to ensure the protection of endangered and threatened species, and the Bald and Golden Eagle Protection Act (54 Stat. 250, as amended; 16 U.S.C. 668-668d) to ensure the protection of eagles.

Your project includes phased expansion of wet weather conveyance and treatment capacity using tunnel segments that will be associated with consolidation sewers, related surface facilities such as regulator structures and drop shafts, and a tunnel dewatering pump station to be located at the ALCOSAN Woods Run Wastewater Treatment Plant. You provided additional information via e-mail on December 31, 2020; January 8, 2021; February 10, 2021; and February 23, 2021.

Endangered and Threatened Freshwater Mussels

Freshwater mussels are sedentary filter-feeders, and as such, they are vulnerable to substrate disturbance, silt deposition, scouring, water quality degradation, changes in channel morphology, and alterations of river hydrology.

Ammonia, chloride, nickel and zinc at concentrations below current water quality standards may adversely affect clubshell, northern riffleshell and rayed bean by killing or injuring adult or juvenile mussels. Therefore, to determine whether the proposed project will affect these endangered mussel species, we will need additional project information, including proposed effluent limits for the two new outfalls for ammonia, chloride, nickel and zinc that will be constructed in the Ohio and Allegheny Rivers. In addition, please provide information on the erosion and sedimentation controls that will be implemented for the construction activities adjacent to the Allegheny and Ohio Rivers.

Northern long-eared bat

The northern long-eared bat hibernates in caves and abandoned mines during the winter months (November through March), uses a variety of upland, wetland and riparian habitats during the spring, summer and fall, and usually roosts in dead or living trees with exfoliating bark, crevices or cavities.

Service promulgated a Final 4(d) Rule in 2016 establishing measures that were determined to be necessary and advisable for the conservation of the northern long-eared bat. We reviewed your project, and determined it is not located within 0.25 mile of a known northern long-eared bat hibernaculum or within 150 feet from a known, occupied maternity roost tree; therefore, any incidental take that may occur is in accordance with the Final 4(d) Rule and is not in violation of the Act.

For projects authorized, funded, or carried out by a Federal Agency, the Service created a framework to streamline section 7 consultations when Federal or designated non-Federal representative actions may affect the northern long-eared bat, but do not cause prohibited take. For many projects, you may complete section 7 consultation under the streamlined consultation process by using the Determination Key that is available through our Information for Planning and Consultation (IPaC) website. More information about the framework and instructions for use of the online Determination Key are available here:

<https://www.fws.gov/midwest/endangered/mammals/nleb/s7.html>

Indiana bat

Less than 10-acres of tree removal is anticipated to complete your project. Based on this as well as the location of your project, the Service does not anticipate adverse effects to Indiana bats.

Bald Eagles

Bald eagles (*Haliaeetus leucocephalus*) are known to nest in the vicinity of the project area, with one nest being located within 0.5 mile of the project site. Consequently, we recommend that you evaluate the project type, size, location and layout in light of the *National Bald Eagle Management Guidelines* to determine whether or not bald eagles might be disturbed as a direct or indirect result of this project. If it appears that disturbance may occur, we recommend that you consider modifying your project consistent with the *Guidelines*. These guidelines, as well as

additional eagle information, are available at <http://www.fws.gov/northeast/EcologicalServices/eagle.html>. To assist you in making a decision regarding impacts to bald eagles, a screening form can be found at https://www.fws.gov/northeast/pafo/bald_eagle_map.html.

If you have additional questions regarding eagle permits, please contact Thomas Wittig, Northeast Regional Bald and Golden Eagle Coordinator at 413-253-8577 or Thomas_Wittig@fws.gov.

This response is based on the information submitted to this office and our knowledge of federally listed species distribution and habitat needs. No field inspection of the project area has been conducted by this office. This correspondence does not authorize take under the Endangered Species Act or any other Authorities.

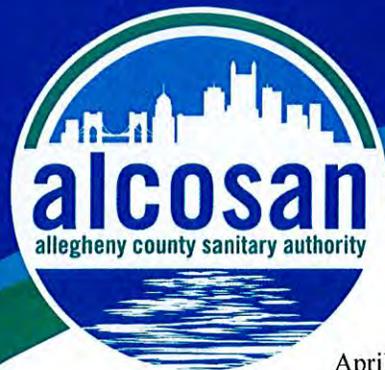
To avoid potential delays in reviewing your project, please use the above-referenced USFWS project tracking number in any future correspondence regarding this project.

If you have any questions regarding this matter, please contact Nicole Ranalli of my staff at 814-234-4090 x7455.

Sincerely,

A handwritten signature in black ink that reads "Sonja Jahrsdoerfer". The signature is written in a cursive style with a large, looped "S" at the beginning.

Sonja Jahrsdoerfer
Project Leader



April 23, 2021

Members of the Board

Corey O'Connor
Chair Person

Rep. Harry Readshaw

Sylvia C. Wilson

Shannah Tharp-Gilliam, Ph.D.

Jack Shea

John Weinstein

Arletta Scott Williams
Executive Director

Karen Fantoni, CPA, CGMA
*Director
Finance & Administration*

Jan M. Oliver
*Director
Regional Conveyance*

Douglas A. Jackson, P.E.
*Director
Operations & Maintenance*

Kimberly N. Kennedy, P.E.
*Director
Engineering & Construction*

Michelle M. Buys, P.E.
*Director
Environmental Compliance*

Jeanne K. Clark
*Director
Governmental Affairs*

Joseph Vallarian
*Director
Communications*

Sonja Jahrsdoerfer
Project Leader
United States Department of the Interior
Fish and Wildlife Service
Pennsylvania Field Office
110 Radnor Road, Suite 101
State College, Pennsylvania 16801-4850

Subject: ALCOSAN Regional Tunnel System PNDI Review

Dear Sonja:

Thank you for your February 25th letter responding to ALCOSAN's PNDI submission regarding ALCOSAN's future plans for a Regional Tunnel System. We are writing to respond to two requests and a recommendation made in the letter. The letter has been included in ALCOSAN's Draft Act 537 Special Study recently submitted to the PADEP.

ALCOSAN's planning for the tunnel system is in the early stages and will continue to be refined as ALCOSAN seeks to acquire the needed properties, conducts further geotechnical investigations, coordinates with stakeholders, and advances multiple design packages. The design of the first tunnel segment is slated to begin in the latter half of 2021 with completion in 2024. The design of the other tunnel segments is scheduled through 2030.

Proposed Effluent Limits

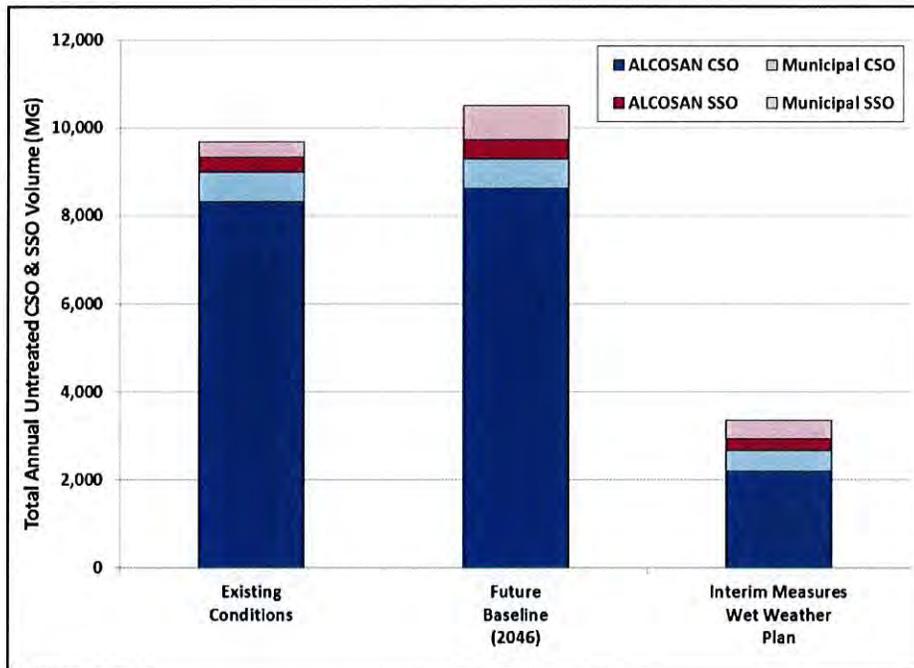
The letter states the US Fish and Wildlife Service (USFWS) "will need additional project information, including proposed effluent limits for the two new outfalls for ammonia, chloride, nickel and zinc that will be constructed in the Ohio and Allegheny Rivers."

ALCOSAN's tunnel project is a mandated element of ALCOSAN's federal consent decree to improve water quality by controlling wet weather sewer overflows. The project was approved by the EPA and the Pennsylvania Department of Environmental Protection (PADEP). Discharges from the tunnels are expected to meet the requirements of the Clean Water Act consistent with the EPA's CSO Policy and ALCOSAN's Modified Consent Decree. ALCOSAN is also undertaking an expansion of its wastewater treatment plant. The NPDES permit Amendment No.1, reflecting the conditions of discharge from the expanded plant, was issued by the PADEP and effective on July 23, 2020. The implementation of the proposed Regional Conveyance Facilities coupled with expansion of wet weather treatment capacity to 600 MGD is projected to decrease the volume of combined sewer overflow (CSO) discharges from 9.3 billion gallons per typical year (projected future baseline conditions) to 2.7 billion gallons as shown in the figure which follows.

The two new tunnel relief outfalls along the Ohio and Allegheny Rivers (O-27 at Site 5 and A-42 at Site 21) will be designed for mitigation of surge. These outfalls are for emergency relief only and are each expected to discharge less than two hours per year based on the

latest planning. The new outfalls are a required safety and infrastructure protection measure for a facility designed to achieve substantial reductions in the discharge of pollutants to local waterways.

The PADEP is a party to ALCOSAN’s consent decree and ALCOSAN will continue working closely with the PADEP to complete this project, including coordination regarding permitting the new outfalls. ALCOSAN anticipates that these outfalls will be permitted similarly to existing regional conveyance system combined sewer overflows (CSOs) in its current NPDES permit, which, among other things, are required to comply with the PADEP’s Chapter 93 Water Quality Standards and the EPA’s Nine Minimum Controls and Long-Term Control Plan. Additional project information will be provided, as required, when the construction of the outfalls (which is several years away) draws closer.



Soil Erosion and Sedimentation Controls

The letter also states “In addition, please provide information on the erosion and sedimentation controls that will be implemented for the construction activities adjacent to the Allegheny and Ohio Rivers.”

Based on the project schedule, it will likely be more than two years before soil erosion and sedimentation control plans are available for the first tunnel segment. ALCOSAN intends to resubmit the PNDI request when the construction route and design of the first tunnel segment, and each subsequent tunnel segment, are near final and will provide more site-specific information on soil erosion and sedimentation controls at that time.

During the design of each segment, ALCOSAN will prepare the permit applications required as part of the design and construction approval process. ALCOSAN will develop Erosion and Sedimentation Control Plans that will be reviewed by the PADEP and the Allegheny County Conservation District along with the design packages. The identified soil erosion and sedimentation controls will comply with 25 Pa. Code Chapter 102 and applicable PADEP erosion and sedimentation control guidelines.

Bald Eagles

Due to known bald eagle nesting in the vicinity of one project site, the letter states “Consequently, we recommend that you evaluate the project type, size, location and layout in light of the National Bald Eagle

Management Guidelines to determine whether or not bald eagles might be disturbed as a direct or indirect result of this project. If it appears that disturbance may occur, we recommend that you consider modifying your project consistent with the Guidelines.”

ALCOSAN has reviewed the guidelines. We have not identified any anticipated disturbance to the bald eagles as a result of the project; however, we will continue to consider these management guidelines during the design process. For the project site in the vicinity of a known bald eagle nest, the design process is not scheduled to begin until 2027. ALCOSAN will submit another PNDI request during that design process when project sites are finalized.

Northern Long Eared Bat

Regarding the Northern Long Eared Bat, the letter states “For many projects, you may complete section 7 consultation under the streamlined consultation process by using the Determination Key that is available through our Information for Planning and Consultation (IPaC) website.”

ALCOSAN will submit additional PNDI requests during the design of each tunnel segment as the sites and routes are being finalized. Should the individual construction sites reveal critical habitat for the Northern Long Eared Bat, or other threatened species identified during the PNDI, ALCOSAN will complete the section 7 consultation as part of the design process for each tunnel segment.

If you have any questions on these responses or need further information at this time, please contact Kim Kennedy at 412-734-6254.

Sincerely,

ALLEGHENY COUNTY SANITARY AUTHORITY



Arletta Scott Williams
Executive Director

cc: Thomas Flanagan, PADEP
Chris Kriley, PADEP
K. Kennedy
M. Buys
M. Lichte



Pennsylvania Fish & Boat Commission

Division of Environmental Services
Natural Diversity Section
595 E Rolling Ridge Dr.
Bellefonte, PA 16823
814-359-5237

August 31, 2021

IN REPLY REFER TO
SIR# 53849

Allegheny County Sanitary Authority
Coreen Casadei
462 Perry Hwy
Pittsburgh, Pennsylvania 15229

**RE: Species Impact Review (SIR) – Rare, Candidate, Threatened and Endangered Species
PNDI Search No.
ALCOSAN Regional Conveyance Facilities
ALLEGHENY County:**

Dear Coreen Casadei:

This responds to your inquiry about a Pennsylvania Natural Diversity Inventory (PNDI) Internet Database search “potential conflict” or a threatened and endangered species impact review. These projects are screened for potential conflicts with rare, candidate, threatened or endangered species under Pennsylvania Fish & Boat Commission jurisdiction (fish, reptiles, amphibians, aquatic invertebrates only) using the Pennsylvania Natural Diversity Inventory (PNDI) database and our own files. These species of special concern are listed under the Endangered Species Act of 1973, the Wild Resource Conservation Act, and the Pennsylvania Fish & Boat Code (Chapter 75), or the Wildlife Code.

Rare and protected fish and mussel species are known from the vicinity of the project site. Given the status and sensitivity of the species of concern, we will need more information to allow for a more thorough evaluation of potential adverse impacts from the proposed project. Items such as a detailed narrative accurately describing the project including possible instream work, stream crossings, types of construction, sequence of activities, basic site plans and map, aerial maps of the general area, project alternatives, stream characterizations, wetlands/waterways and acreage to be impacted, general habitat descriptions or onsite color photographs (keyed to a site map) would expedite our review process. Follow-up information may be uploaded to the PA Conservation Explorer site PNDI project file. Pending the review of this information a survey for the species of concern may be warranted.

This response represents the most up-to-date summary of the PNDI data and our files and is valid for two (2) years from the date of this letter. An absence of recorded species information does not necessarily imply species absence. Our data files and the PNDI system are continuously being updated with species occurrence information. Should project plans change or additional information on listed or

Our Mission:

www.fish.state.pa.us

To protect, conserve and enhance the Commonwealth's aquatic resources and provide fishing and boating opportunities.

proposed species become available, this determination may be reconsidered, and consultation shall be re-initiated.

If you have any questions regarding this review, please contact Doug Fischer at 814-359-5195 and refer to the SIR # 53849. Thank you for your cooperation and attention to this important matter of species conservation and habitat protection.

Sincerely,

A handwritten signature in black ink that reads "Christopher A. Urban". The signature is written in a cursive style with a large, prominent initial "C".

Christopher A. Urban, Chief
Natural Diversity Section

CAU/DF/dn

Exhibit D
Comprehensive Environmental Assessment

COMPREHENSIVE ENVIRONMENTAL ASSESSMENT

for the

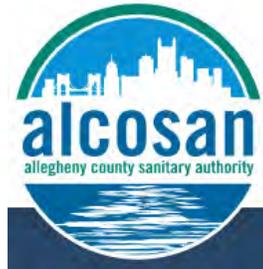
ALCOSAN WET WEATHER PLANT EXPANSION PROJECT

located in

ALLEGHENY COUNTY, PENNSYLVANIA

May 8, 2020

Prepared for:



ALCOSAN

Pittsburgh, Pennsylvania

Prepared by:



Arcadis

Pittsburgh, Pennsylvania



Collective Efforts, LLC

Pittsburgh, Pennsylvania



Pittsburgh, Pennsylvania

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Comprehensive Environmental Assessment

1.0 Project Summary

In 2013, ALCOSAN completed their Clean Water Plan (formerly referred to as the Wet Weather Plan <https://www.alcosan.org/our-plan/plan-documents/clean-water-plan>), which details improvements in the ALCOSAN system to meet the requirements of a Consent Decree (CD). This plan is a comprehensive, long-term plan to significantly reduce the combined sewer overflow discharges to local rivers and streams. The major components of this plan include the expansion of the existing sewage treatment plant, increasing sewage storage and conveyance capacity with tunnels, assuming ownership and maintenance of regional multi-municipal sewers, and removing stormwater from the system through the implementation of green projects throughout the ALCOSAN service area. The Clean Water Plan identifies the proposed tunnels, piping, drop shafts and structures associated with the plan. Affordability was also considered in the Clean Water Plan and the selected measures to be implemented (called the Interim Measures Wet Weather Plan [IWWP] in the Clean Water Plan) are estimated to cost two billion dollars.

The first step in the implementation of the Clean Water Plan is the expansion of the existing Woods Run Wastewater Treatment Plant (WWTP). The existing plant is located in an industrial area of the City of Pittsburgh and is bordered by the Ohio River, City streets, and active rail lines and has a limited area on which to expand. The design of the plant expansion includes the installation of a retaining wall along the Ohio River to shore the existing riverfront property and allow the construction of additional water treatment facilities. A river wall-focused Environmental Assessment is included in Section 10 of the Joint Permit Application.

The remaining sections of this Comprehensive EA discuss the need for the Clean Water Plan, an Alternatives Analysis that summarizes the many alternative that were reviewed as part of the Clean Water Plan, the Project Phasing which presents the implementation schedule in the CD, proposed structures, summaries of resources, land use, impacts, mitigation, antidegradation, and conclusions.

2.0 Background

The ALCOSAN CD, entered on January 23, 2008, called for the submittal of ALCOSAN's Wet Weather Plan (WWP) to the United States Environmental Protection Agency (USEPA), the Pennsylvania Department of Environmental Protection (PADEP), and the Allegheny County Health Department (ACHD) by January 30, 2013. The purpose of the WWP was to identify wastewater collection and treatment system improvements needed to meet CD requirements and to recommend an implementation plan. The CD requirements are predicated by the objectives of the Clean Water Act (CWA) and associated Combined Sewer Overflow Control Policy (CSO Policy). These collective regulations, by which ALCOSAN must comply, describe fundamental water quality improvement goals and requirements for developing a WWP. In an effort to emphasize the beneficial regional outcomes of the plan, ALCOSAN is now referring to the WWP as the Clean Water Plan (CWP).

The two primary objectives of the CWP include:

- Elimination of Sanitary Sewer Overflows (SSOs) and

- Control of Combined Sewer Overflows (CSOs).

In accomplishing these key objectives, the CWP is intended to:

- Identify wastewater infrastructure needs through 2046;
- Improve water quality in the rivers and streams; and
- Help protect designated waterway uses such as recreation, aquatic life, and drinking water supplies.

The CWP also aims to:

- Employ an inclusive and collaborative stakeholder involvement process;
- Recommend cost effective, affordable, and equitable solutions;
- Achieve broad-based public and municipal support;
- Achieve regulatory compliance and support for the compliance strategy; and
- Support the subsequent development of a regional Pennsylvania Sewage Facilities Act (Act 537) Plan.

A comprehensive wet weather planning approach was established to develop the CWP that integrated municipal and regional control activities into a long-term solution for the ALCOSAN service area. ALCOSAN's approach in developing the CWP included dividing the service area into seven planning basins (as shown on Figure 2-1) to help assure the appropriate level of municipal coordination and attention to local conditions and priorities. Planning basin teams, comprised of national and local engineering firms, were procured to develop wet weather control alternatives and facilities plans for each of the planning basins in coordination with the respective municipalities. In addition, ALCOSAN procured the services of a Program Manager that directed the planning process, evaluated system-wide alternatives, conducted a water quality benefits analysis, and prepared the CWP.

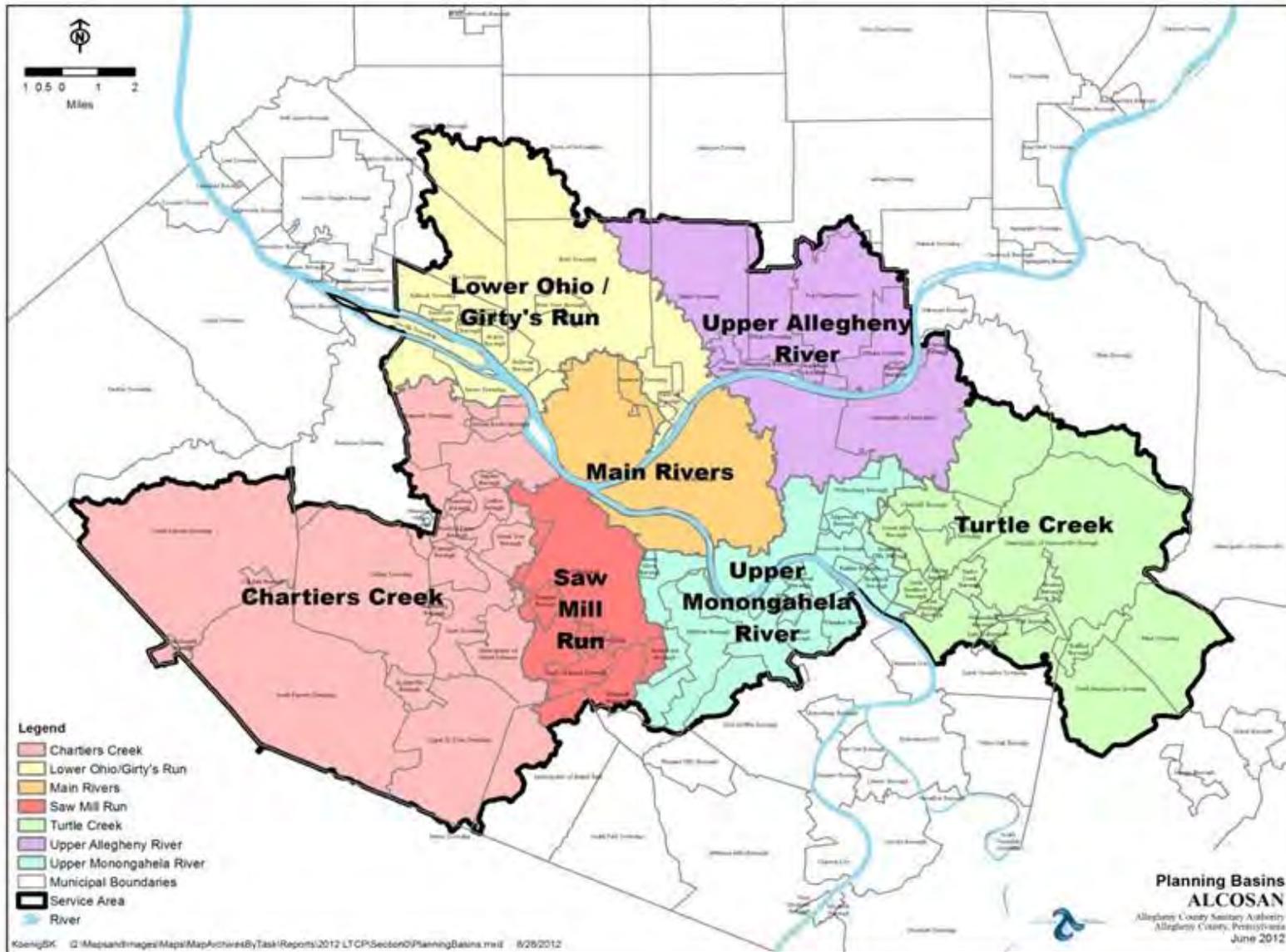


Figure 2-1: ALCOSAN Service Area and Planning Basins

ALCOSAN's Draft CWP was released for public and municipal comment on July 31, 2012. Overall, the most prevalent comments received related to the potential for utilizing green stormwater infrastructure (GSI) and other flow reduction measures as an alternative to the grey infrastructure (pipes, tanks and tunnels) proposed in the Draft CWP.

Following submission of the Draft CWP to the regulatory agencies in January 2013, ALCOSAN and the agencies began negotiating a Modified CD that fully embraces the use of GSI and inflow/infiltration (I/I) reduction and recognizes the financial infeasibility of completing all CD requirements by 2026, as required by the 2008 CD. Through these discussions, the regulatory agencies required a compliance strategy to proceed with the design and construction of an IWWP that provides opportunities to integrate GSI and other source reduction practices, while prioritizing the regionalization of inter-municipal trunk sewers and key grey infrastructure projects, where cost effective. Figure 2-2 shows the IWWP grey infrastructure projects. Upon completion of the IWWP, post-construction monitoring and modeling will be conducted to assess the need for additional controls (Final Measures) to meet the full requirements of the CD.

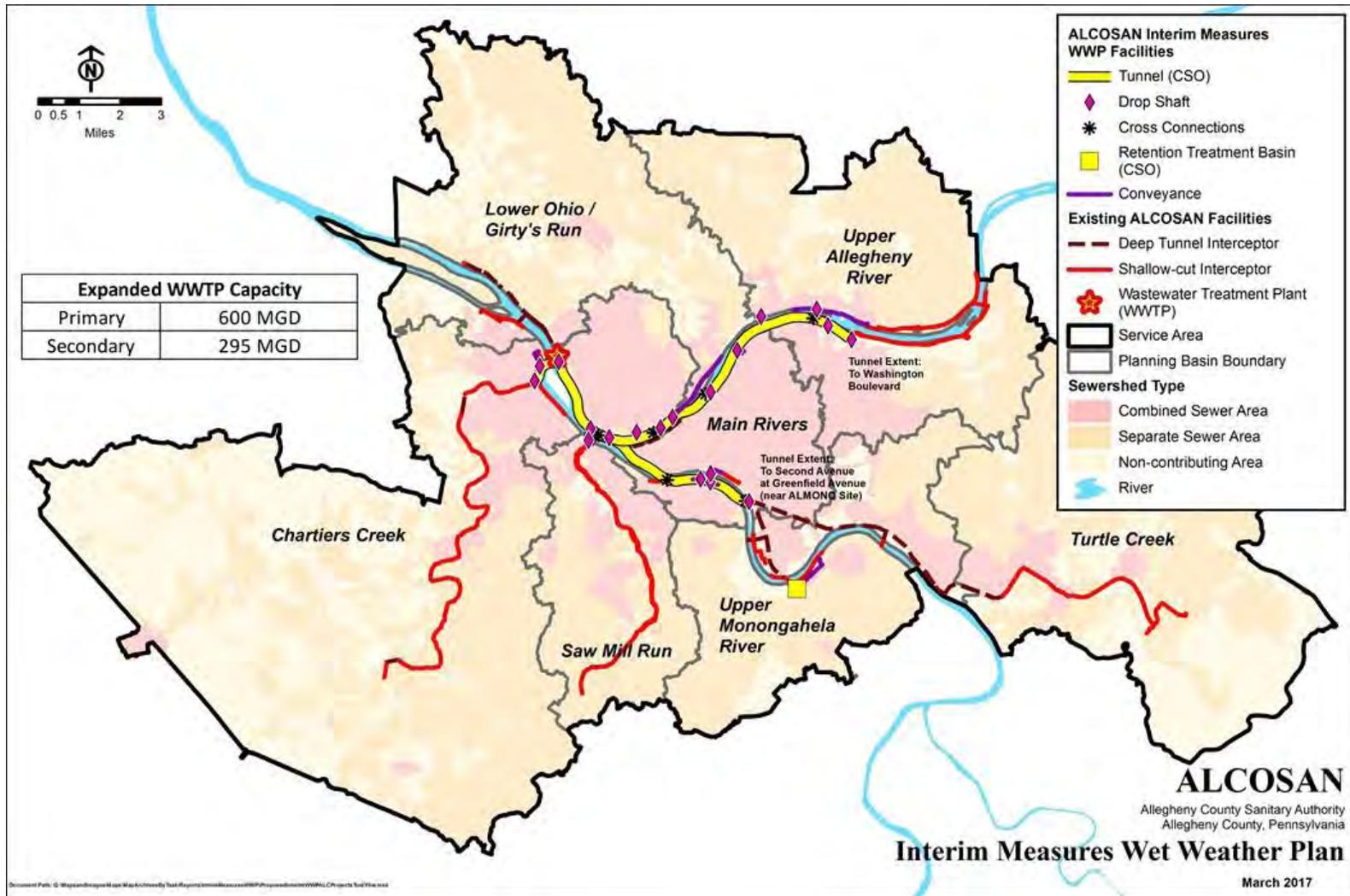


Figure 2-2: Interim Measures Wet Weather Plan Grey Infrastructure Projects

The project phasing of these IWWP grey infrastructure projects is provided in Section 5 of this Comprehensive Environmental Assessment while Section 4 provides brief descriptions of these IWWP projects. Additional details can be found in Section 11 of ALCOSAN's CWP (<https://www.alcosan.org/our-plan/plan-documents/clean-water-plan>) as well as Appendix Z of ALCOSAN's Modified CD, which is included as an Appendix A to this document.

3.0 Alternatives Analyses Summary

An Alternatives Analysis prepared for the JPA, located in Section 16, provides a summary of the factors that ALCOSAN considered to arrive at their preferred alternative. Additional information regarding ALCOSAN's review of alternatives can be found in Section 9 of their Clean Water Plan. The following paragraphs provide a summary of the Alternatives Analysis process that ALCOSAN used to arrive at the preferred alternative for complying with the CD.

3.1 Introduction

The ALCOSAN Wet Weather Plan dated January 2013 provides a detailed alternatives analysis for the WWTP and the entire service area. ALCOSAN has a service area of 309 square miles and provides regional wastewater conveyance and treatment for the City of Pittsburgh and all, or portions of, 82 other municipal communities. This section summarizes the WWP alternatives analysis, the WWTP expansion alternatives analysis which was part of the WWP, and the Plant Programming alternatives analysis which took place after the WWP.

In September 2019, ALCOSAN received conditional agency approval of a revised Wet Weather Plan, now referred to as the Clean Water Plan (CWP), and made the full plan available at <https://www.alcosan.org/our-plan/plan-documents/clean-water-plan>. Section 9 of this plan contains extensive information on the WWP and WWTP alternatives analysis which is summarized in the following sections. Section 11 of the CWP describes all the grey infrastructure projects that comprise the IWWP.

3.2 Wet Weather Plan Alternative Analysis

The BPs developed and evaluated control technologies and sites, which formed the basis for the development of over 190 Site Alternatives. From there, the BPs arrayed and sized viable Site Alternatives to formulate over 260 Basin Alternatives. The Program Manager (PM) integrated the alternatives from all seven planning basins with complementary regional alternatives to form 26 system-wide alternatives as shown in Table 1. Each system-wide alternative represented a complete plan to control ALCOSAN and municipal CSOs and SSOs to a selected level of control. As prescribed by the National CSO Policy, a range of CSO levels of control were evaluated, including alternatives targeting Presumption and Demonstration Approach criteria. A range of SSO control levels were also considered, including the 2-year and 10-year level of control as indicated in ALCOSAN's Consent Decree (CD). A series of system-wide alternatives analyses were conducted that supported the decision making as to how ALCOSAN proposes to eliminate sanitary sewer overflows from the ALCOSAN system and to control combined sewer overflows in compliance with the Clean Water Act (CWA), consistent with the National CSO Policy.

ALCOSAN determined that the most cost-effective means of complying with the CD and CSO Policy requirements is via Demonstration Approach System-Wide Alternative 3f modified-10pct (see Table 1). This alternative is based on expanded treatment capacity at the Wood's Run WWTP, new regional conveyance, and several remote storage facilities. This recommended alternative became known as the "Selected Plan."

Table 1: Summary of System-Wide Alternatives Evaluated

Alternative	Description	ALCOSAN CSO Control Level ¹ (OFs/yr)	ALCOSAN SSO Control Level (Design Storm)	WWTP Influent Pumping Capacity		Treatment Capacity		Municipal Flows Assumption	Basis for Consolidation Sewer and Regulator Sizing
				Main Pump Station (MGD)	Wet Weather Pump Station (MGD)	Primary (MGD)	Secondary (MGD)		
Basin-Based Control Strategy									
1	Basin-Based Control Strategy	0	2-year	480	120	600	295	Convey all flows to ALCOSAN	Selected by BPs
1	Basin-Based Control Strategy	1-3	2-year	480	120	600	295	Convey all flows to ALCOSAN	Selected by BPs
1	Basin-Based Control Strategy	4-6	2-year	480	120	600	295	Convey all flows to ALCOSAN	Selected by BPs
1	Basin-Based Control Strategy	7-12	2-year	480	120	600	295	Convey all flows to ALCOSAN	Selected by BPs
1	Basin-Based Control Strategy	13-20	2-year	480	120	600	295	Convey all flows to ALCOSAN	Selected by BPs
5	85% CSO Capture by Receiving Stream w/ Remote CSO Treatment & Storage	85% Capture	2-year	480	---	480	295	Convey all flows to ALCOSAN	5th largest storm in typical year in terms of peak flow
Regional-Based Control Strategy									
2	Regional-Based Control Strategy	0	2-year	400	200	600	295	Convey all flows to ALCOSAN	Selected by BPs
2	Regional-Based Control Strategy	1-3	2-year	400	200	600	295	Convey all flows to ALCOSAN	Selected by BPs

Table 1: Summary of System-Wide Alternatives Evaluated

Alternative	Description	ALCOSAN CSO Control Level ¹ (OFs/yr)	ALCOSAN SSO Control Level (Design Storm)	WWTP Influent Pumping Capacity		Treatment Capacity		Municipal Flows Assumption	Basis for Consolidation Sewer and Regulator Sizing
				Main Pump Station (MGD)	Wet Weather Pump Station (MGD)	Primary (MGD)	Secondary (MGD)		
2	Regional-Based Control Strategy	4-6	2-year	400	200	600	295	Convey all flows to ALCOSAN	Selected by BPs
2	Regional-Based Control Strategy	7-12	2-year	400	200	600	295	Convey all flows to ALCOSAN	Selected by BPs
2	Regional-Based Control Strategy	13-20	2-year	400	200	600	295	Convey all flows to ALCOSAN	Selected by BPs
4	Complete Sewer Separation and SSO Storage/Conveyance	0	2-year	---	---	Not determined	Not determined	Convey all flows to ALCOSAN	Not determined
Preliminary Hybrid Alternatives for Evaluating Satellite Sewage Treatment and Regional Tunnel Extents									
3	Regional Tunnel w/ Remote CSO Treatment and Storage (Tunnel from WWTP to A-42 and M-29)	4-6	2-year	480	120	600	295	Convey all flows to ALCOSAN	Selected by BPs
3c	Same as Alt. 3 Except Satellite WWTP Serving M-30 and Upstream	4-6	2-year	480 Woods Run 125 Satellite	120 Woods Run	600 Woods Run 125 Satellite	275 Woods Run 125 Satellite	Convey all flows to ALCOSAN	Selected by BPs
3d	Same as Alt. 3 Except Tunnel along Allegheny stops around A-35	4-6	2-year	480	120	600	295	Convey all flows to ALCOSAN	Selected by BPs

Table 1: Summary of System-Wide Alternatives Evaluated

Alternative	Description	ALCOSAN CSO Control Level ¹ (OFs/yr)	ALCOSAN SSO Control Level (Design Storm)	WWTP Influent Pumping Capacity		Treatment Capacity		Municipal Flows Assumption	Basis for Consolidation Sewer and Regulator Sizing
				Main Pump Station (MGD)	Wet Weather Pump Station (MGD)	Primary (MGD)	Secondary (MGD)		
3e	Same as Alt. 3 Except Tunnel along Monongahela stops around M-42	4-6	2-year	480	120	600	295	Convey all flows to ALCOSAN	Selected by BPs
3f-prelim	Same as Alt. 3 Except Tunnel along Monongahela stops around M-59	4-6	2-year	480	120	600	295	Convey all flows to ALCOSAN	Selected by BPs
3g	Same as Alt. 3 Except Tunnel along Monongahela stops around T-04	4-6	2-year	480	120	600	295	Convey all flows to ALCOSAN	Selected by BPs
Hybrid Alternatives for Evaluating SSO Level of Control									
3f	Same as Alt. 3f-prelim except tunnel end moved from M-59 to M-51	4-6	2-year	480	120	600	295	Limited municipal planning info incorporated	Peak flow in typical year
3h	Same as Alt. 3f Except 10-year SSO control	4-6	10-year	480	120	600	295	Limited municipal planning info incorporated	Peak flow in typical year
3i	Same as Alt. 3f Except Typical Year SSO control	4-6	Typical Year	480	120	600	295	Limited municipal planning info incorporated	Peak flow in typical year

Table 1: Summary of System-Wide Alternatives Evaluated

Alternative	Description	ALCOSAN CSO Control Level ¹ (OFs/yr)	ALCOSAN SSO Control Level (Design Storm)	WWTP Influent Pumping Capacity		Treatment Capacity		Municipal Flows Assumption	Basis for Consolidation Sewer and Regulator Sizing
				Main Pump Station (MGD)	Wet Weather Pump Station (MGD)	Primary (MGD)	Secondary (MGD)		
Additional Hybrid Alternatives for Evaluating Presumption and Demonstration Approaches									
3j	Same as Alt. 3f Except Tunnel Diameter Reduced	4-6	2-year	480	120	600	295	Limited municipal planning info incorporated	Peak flow in typical year
8a	Alt 3 Tunnel Extent with Diameter Reduced	13-15 (4-6 for sensitive areas)	2-year	480	120	600	295	Limited municipal planning info incorporated	5th largest storm in typical year in terms of peak flow ²
3m	Same as Alt. 8a Except UM Served by Regional Tunnel (same tunnel extent as Alt. 3f)	13-15 (4-6 for sensitive areas)	2-year	480	120	600	295	Limited municipal planning info incorporated	5th largest storm in typical year in terms of peak flow ²
3f-mod	Same as Alt. 3f Except Higher Level of CSO Control for Outfalls in Sensitive Areas	4-6 (0 for sensitive areas)	2-year	480	120	600	295	Latest municipal planning info incorporated	Peak flow in typical year
Alt. 3f-mod-10pct.	Same as Alt 3f-mod Except Small Volume Overflows Not Connected to New Conveyance	Varies	2-year	480	120	600	295	Latest municipal planning info incorporated	Peak Flow in Typical Year

Note 1: For the first four categories of system-wide alternatives, the CSO control levels reflect the stated number of overflow events allowed at each regulator. For the last two categories, the CSO control levels indicate the number of unique overflow events for an entire facility such as the regional tunnel or group of outfalls served by a single storage facility.

Note 2: Except used peak flow in typical year for sensitive areas

Common to all system-wide alternatives was maximizing wet weather flows treated at the Woods Run WWTP. The CWA and National CSO Policy recommend this approach and provide guidelines on acceptable practices for increasing wet weather capacity that includes utilizing available capacity in primary treatment above downstream secondary treatment capacity, when available.

Beginning in 2004, ALCOSAN launched efforts to reevaluate the initially proposed wet weather flow management strategy at the WWTP, considering the passing of over ten years since the completion of the Act 537 Plan. In addition, execution of the ALCOSAN CD and further development of regional conveyance planning influenced the objectives for WWTP expansion. The results of this preliminary evaluation were shared with EPA, DEP and ACHD in the *Draft Bypass Justification Report* (April 2010).

It was concluded that expansion of secondary treatment capacity from 250 mgd to 295 mgd was achievable. It was also determined that through upgrades and expansion of pumping capacity, preliminary and primary treatment facilities, and disinfection facilities, an ultimate wet weather peak flow capacity of 600 mgd was achievable. Thus, during wet weather, 295 mgd of flow would receive full treatment through the expanded secondary treatment and disinfection facilities, and up to an additional 305 mgd of flow would receive partial treatment (preliminary treatment, primary treatment and disinfection) before discharge into the Ohio River. ALCOSAN is now obligated to implement this WWTP expansion concept as part of its IWWP in accordance with Appendix Z of the proposed Modified Consent Decree.

The evaluation of WWTP expansion alternatives performed for the WWP, and more recently evaluated through the Plant Programming Alternatives, is described below.

3.3 Waste Water Treatment Plan Expansion Alternative Analysis

Two ALCOSAN CD requirements relevant to the proposed wet weather plan include:

- Provide secondary treatment to all Core Flow received from the collection system
- Analyze alternatives to eliminate bypassing any portion of the WWTP treatment process and demonstrate there are no feasible alternatives.

3.4 Alternatives Analysis Conclusions

Through extensive investigations, system characterization, hydraulic and hydrologic computer modeling, municipal collaboration, alternatives evaluation, and reports performed over two decades, ALCOSAN has strived to meet the guidelines and requirements of the CWA, National CSO Policy, Pennsylvania CSO Policy, and their Consent Decree. The Selected Plan proposed in the WWP and the negotiated first phase of that plan mandated by the proposed Modified Consent Decree (the Interim Measures Wet Weather Plan), will lead to significant water quality benefits and achieve regulatory compliance, while remaining within the affordability criteria for the region and reducing environmental impacts.

The elements of the WWTP expansion that are in the Joint Permit jurisdiction make a major contribution to the reduction of environmental impacts of the WWP for the following reasons:

- The proposed river wall will provide the additional land space to construct facilities (final settling tanks and final effluent disinfection) that allow for an increase in secondary treatment capacity to 295 mgd.
- The location of the new final settling tanks and final disinfection have been optimized on site through the evaluation of alternatives to minimize the length of the river wall and the area of river shoreline impacted. This optimization considered these key factors: constructability, safety, maintenance accessibility, connecting conduit requirements, underground utility conflicts, pipe and tank sizes, and required set-backs.
- The new outfall for final effluent provides the hydraulic conditions to permit 295 mgd to be discharged without impact on the upstream treatment process for limited river flooding conditions that is not achievable via the existing disinfection and outfall facilities.
- The new outfall for the wet weather disinfection facility will provide the 305 mgd peak flow capacity proposed and achieve the hydraulic conditions necessary to control the bypass flows by gravity, thereby eliminating the need for an effluent pumping station.
- The river wall will also remove all 13 barge moorings along the east side of the Ohio river, which will reduce riverbed disturbance associated with barge activities.
- The selection of chemical disinfection over the alternative UV disinfection has a significantly lower carbon footprint considering much higher electrical power demand for UV disinfection.
- Value Engineering recommendations completed subsequent to development of the Selected Plan were implemented to reduce the impact of the river wall construction.

4.0 Proposed Structures

As part of ALCOSAN's IWWP, ALCOSAN will expand their Woods Run WWTP wet weather treatment capacity to 600 million gallons per day (mgd) with a secondary treatment capacity of 295 mgd from its currently permitted full treatment capacity of 250 mgd. As proposed, peak wet weather flows in excess of 295 mgd, up to an additional 305 mgd, would receive primary treatment and disinfection prior to discharge. Phase 1 includes expanding the primary (and total) wet weather treatment capacity to 480 mgd by upgrading the existing main pump station, expanding the headworks capacity, and increasing disinfection capacity. During Phase 2, a separate wet weather pump station will be added with a capacity of up to 120 mgd, producing a total wet weather pumping capacity of 600 mgd. Expansion of secondary treatment capacity to 295 mgd is Phase 3 of the WWTP expansion. To complete this proposed build-out of plant facilities, a river wall along the Ohio River at the plant location is proposed. Two additional outfalls, which are outside of the proposed footprint of the river wall will also be constructed.

There are currently 13 barge mooring cells in the Ohio River adjacent to the WWTP. These mooring cells are proposed for demolition during the plant expansion. These structures are discussed in detail in Section 10 of the Joint Permit Application.

The IWWP also includes a deep regional CSO conveyance/storage tunnel with associated structures, and consolidation sewers. The tunnel design is still subject to modification as part of preliminary planning but, as it stands, the Allegheny River tunnel segment, as shown on Figures 4-1 and 4-2, would begin at Washington Boulevard and would convey inflow to a new junction shaft at the upstream end of the Ohio tunnel segment near the West End Bridge. As shown on Figure 4-3, the Monongahela River tunnel segment would begin near Second Ave at Greenfield (ALMONO site) and would convey inflow to this same junction shaft near the West End Bridge. The Ohio River tunnel segment, as shown on Figure 4-4, conveys flows from the two upstream tunnel segments and other inflows to a proposed junction shaft at the Woods Run WWTP. The Ohio River tunnel segment also includes tunnel crossings under the Ohio River to convey flows from existing sewers near the mouth of Chartiers Creek and near the mouth of Saw Mill Run. The proposed tunnel would convey/store excess wet weather combined sewage to a tunnel dewatering pump station that pumps flows to treatment during and after wet weather events.

The proposed regional tunnel structures will include:

- A main tunnel and smaller connector tunnels constructed in rock with a tunnel boring machine, mostly at depths of 100 to 200 feet below ground.
- A wet weather pump station at the downstream end of the tunnel at the ALCOSAN Woods Run WWTP.
- Several vertical shafts used to construct the tunnel and provide permanent access to the deep tunnel.
- Multiple vertical drop shafts that will allow wet weather flow (combined sewage) to drop into the deep tunnel. Some will also serve as permanent access to the deep tunnel.
- Regulator structures built along existing sewers that will convey wet weather flow from one or more existing sewers through a new consolidation sewer to one of the vertical drop shafts.
- Several new tunnel relief outfalls that would allow captured flows to discharge into rivers if the tunnel water level ever approaches levels that could cause flooding in the existing sewer collection system. In all but extreme events, flows that exceed the capacity of the tunnel will discharge to the river through the many existing combined sewer outfalls which exist today.
- One or more underground cross-connections between the existing tunnel and the proposed tunnel.

Phase 3 facilities also include a CSO retention treatment basin (RTB) in the Upper Monongahela planning basin near POC M-42, as shown on Figure 4-5. The RTB will provide screening, settling, floatables control via fixed baffles, and disinfection of combined sewage. For small storm events

which do not fill the RTB, captured flow and solids which remain in the RTB after the event will be pumped back to the existing interceptor when the basin is dewatered after an event. For larger storm events that fill the RTB, the basin will begin operating in a flow through treatment mode and will discharge disinfected effluent to the Monongahela River through a new outfall.

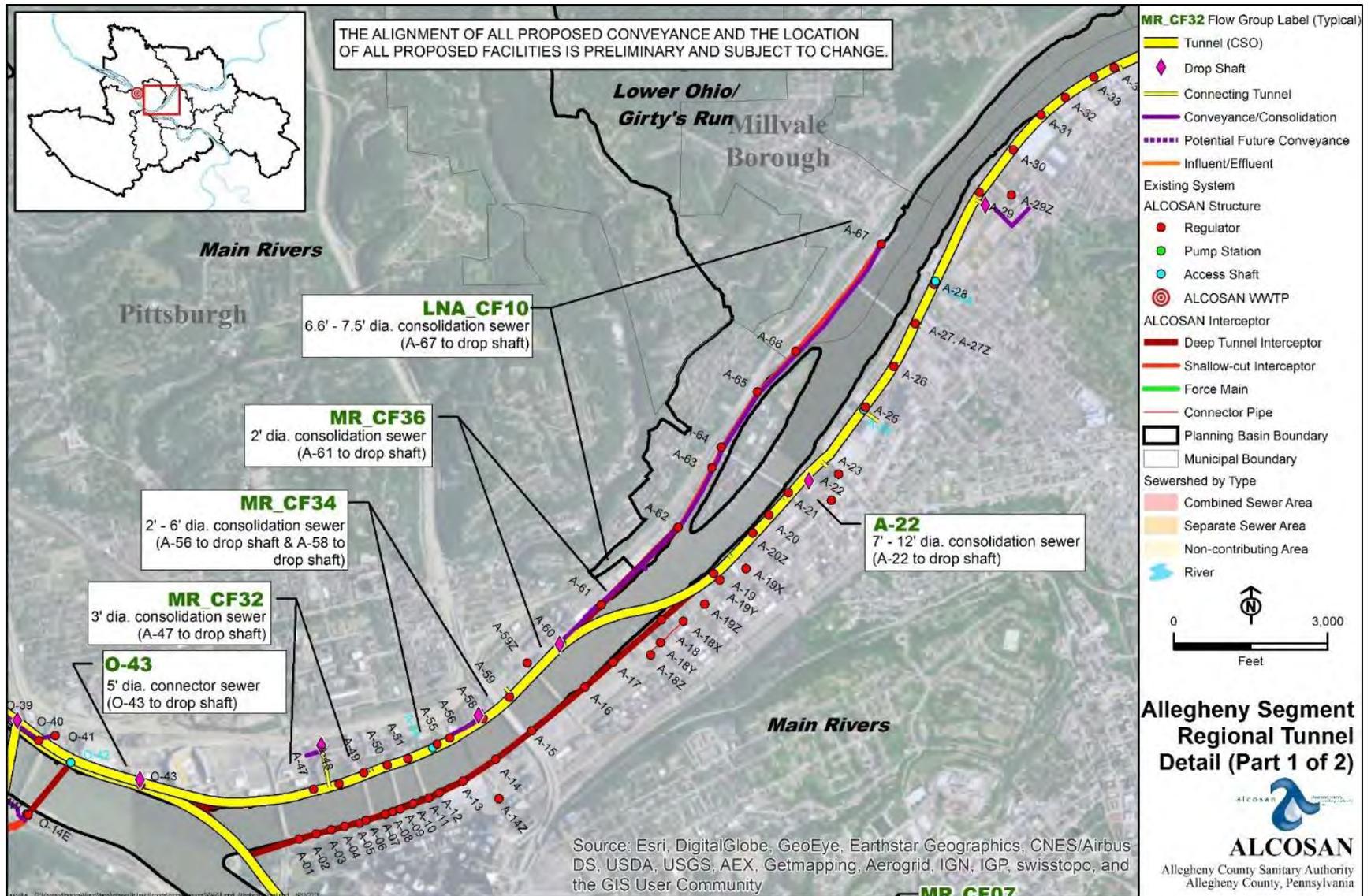


Figure 4-1: Allegheny River Tunnel Segment, Part 1 of 2

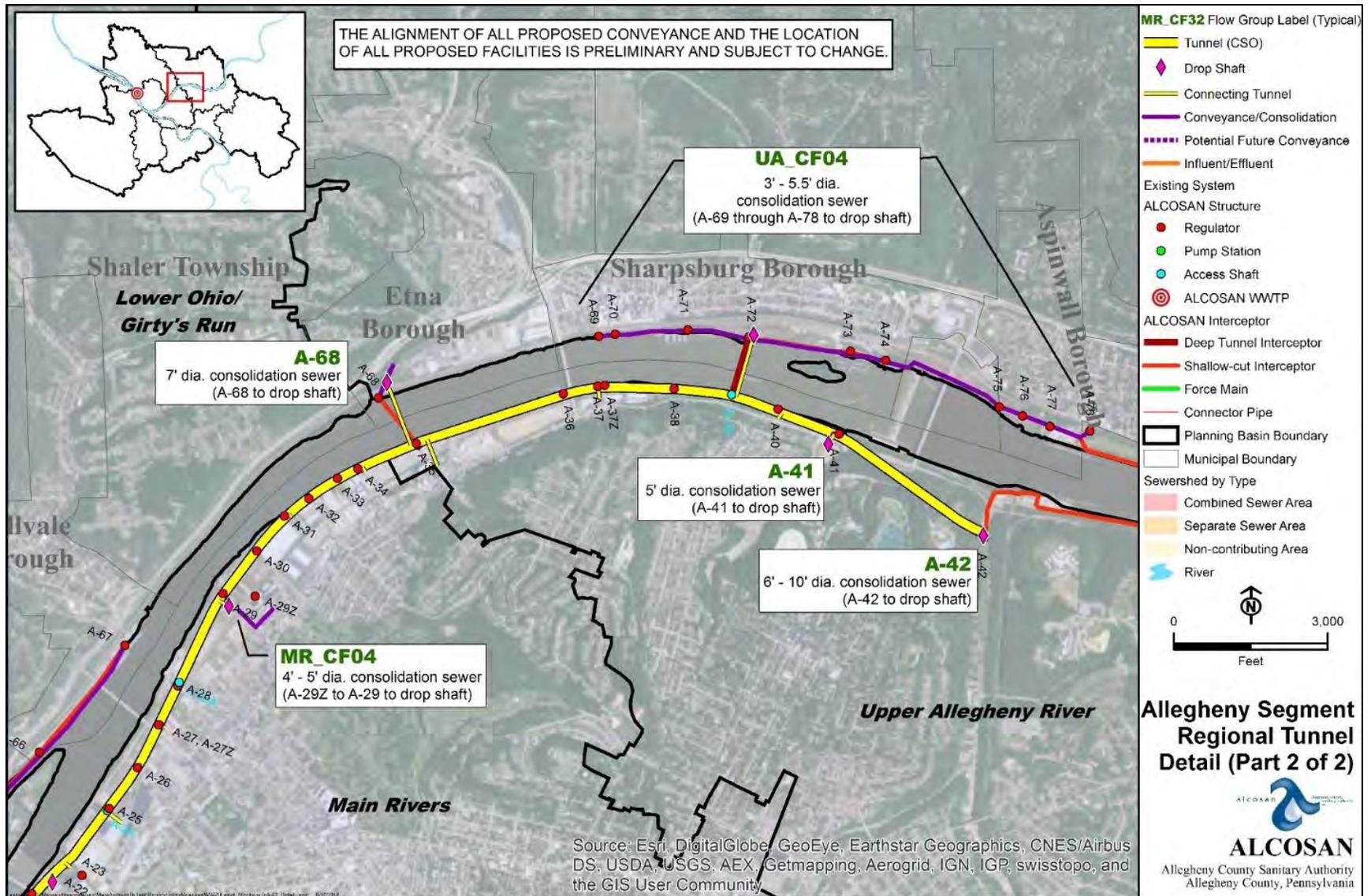


Figure 4-2: Allegheny River Tunnel Segment, Part 2 of 2

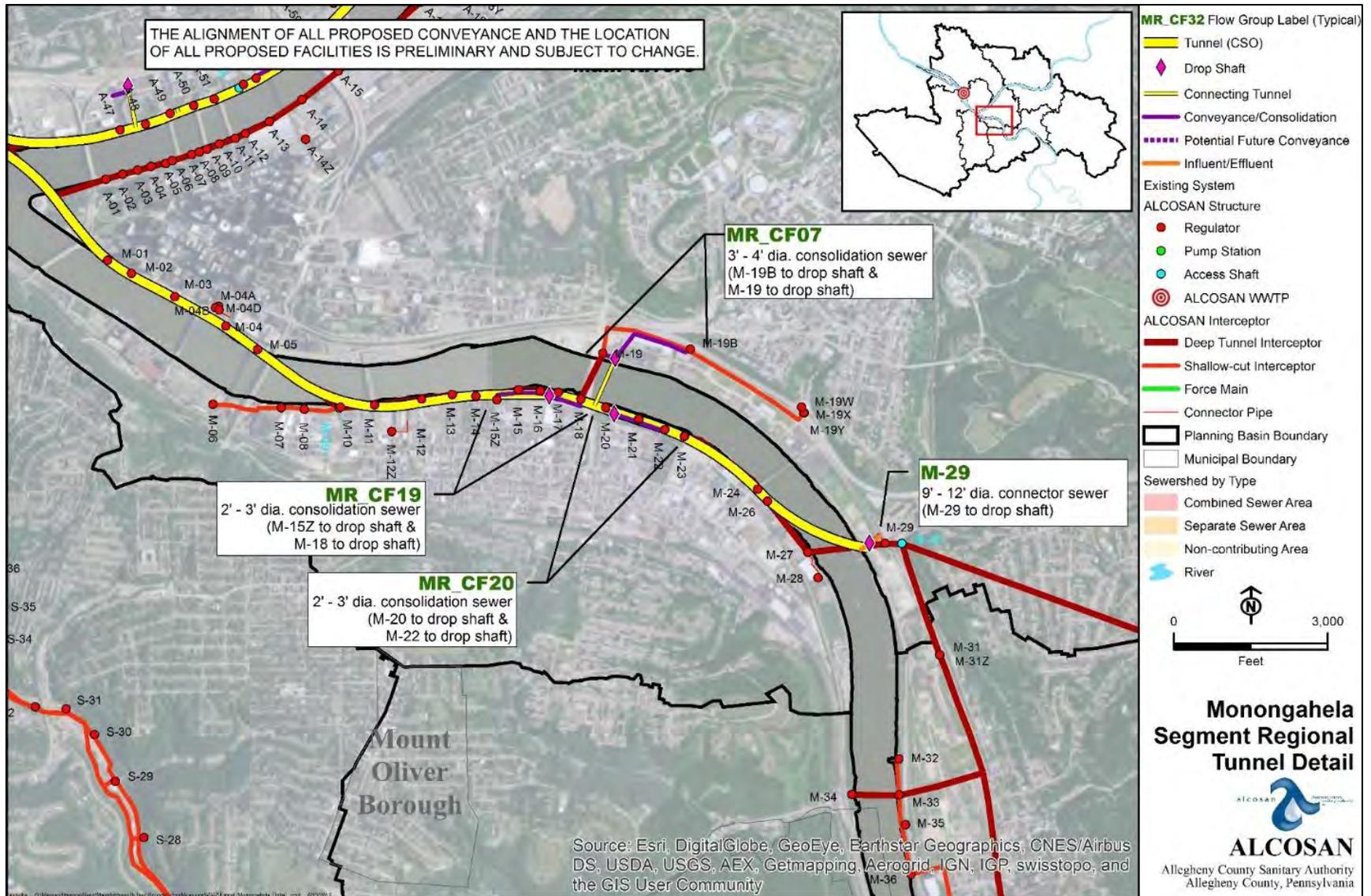


Figure 4-3: Monongahela River Tunnel Segment

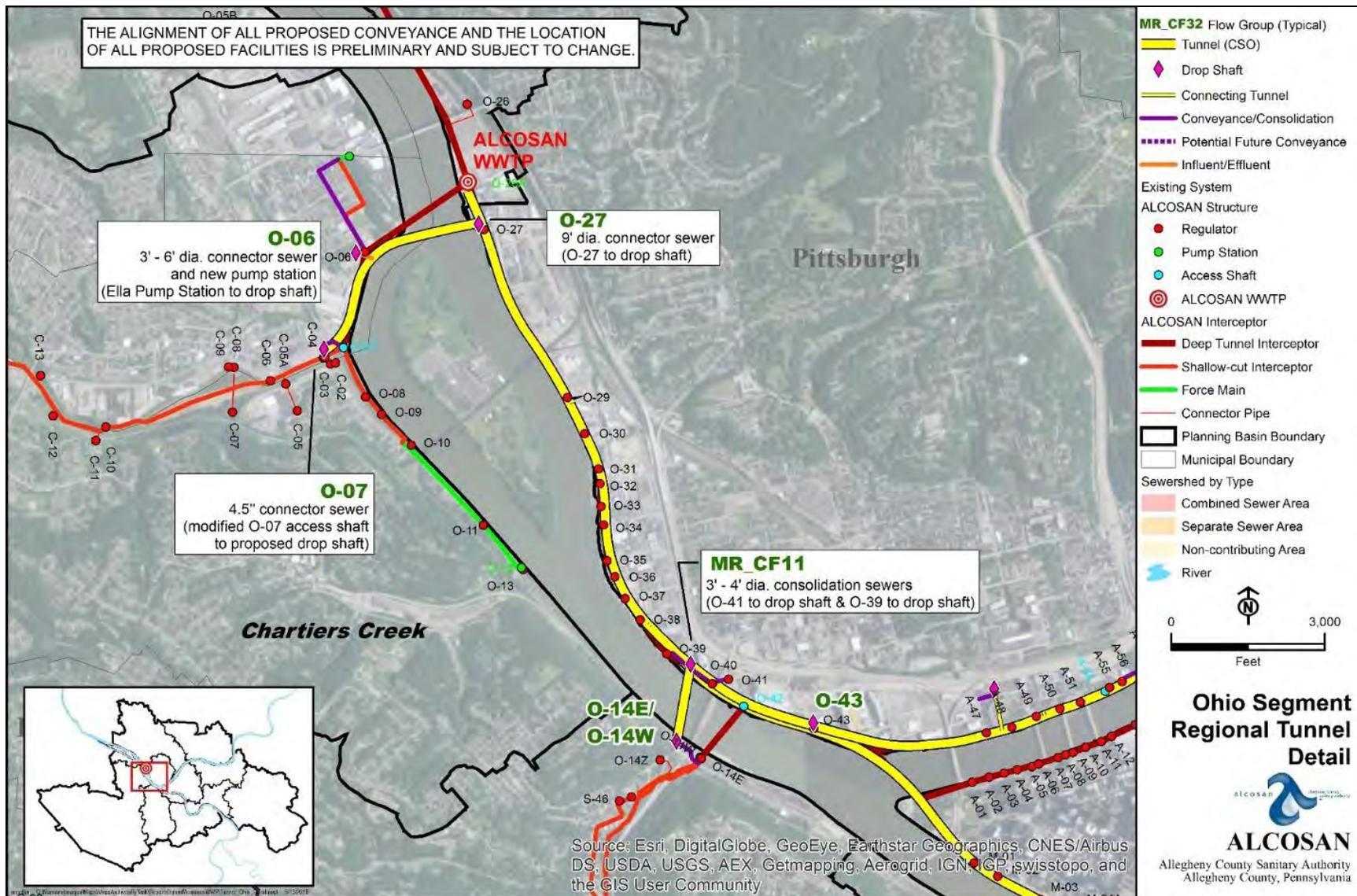


Figure 4-4: Ohio River Tunnel Segment

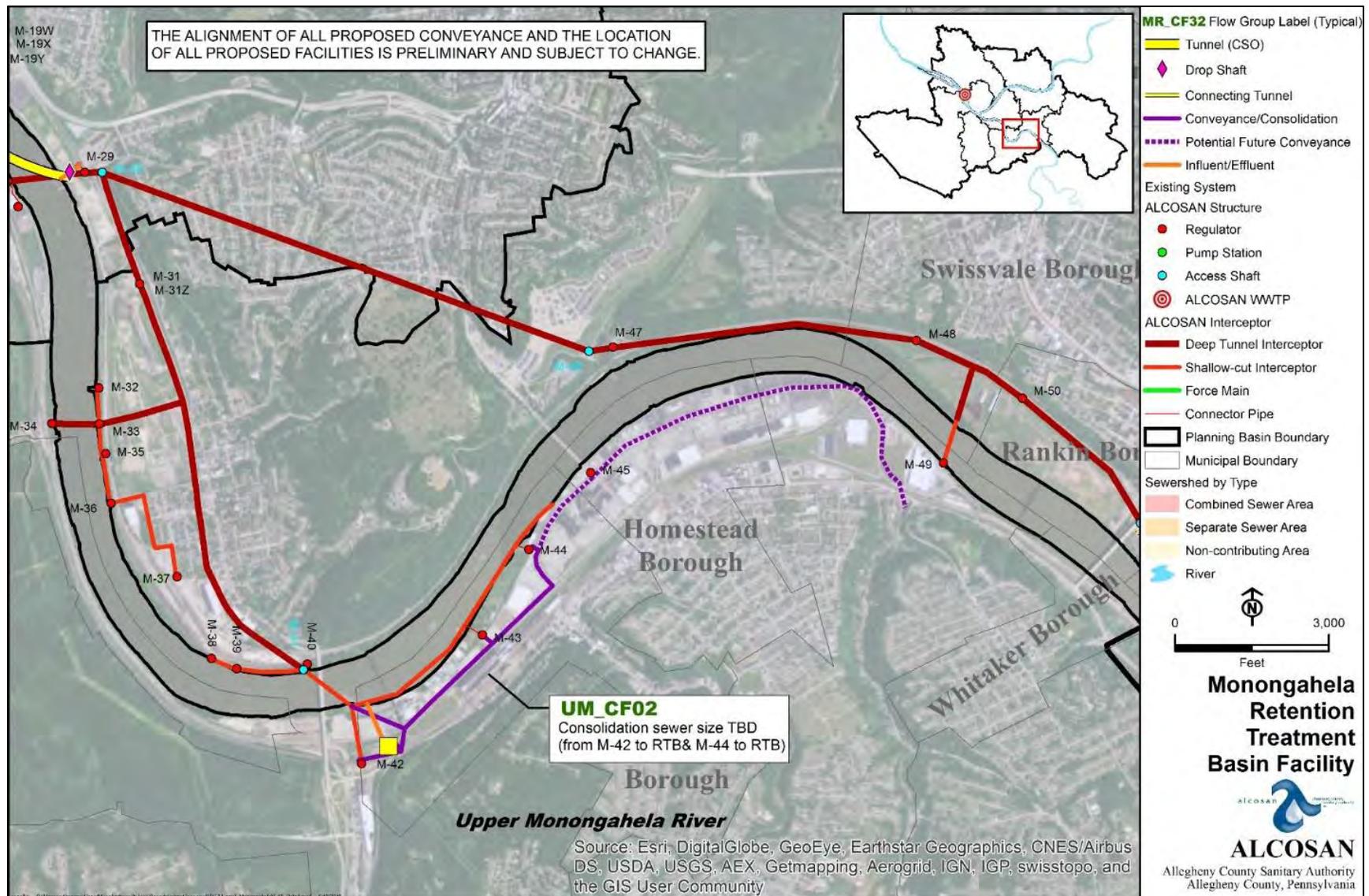


Figure 4-5: Monongahela Retention Treatment Basin Facility

5.0 Project Phasing

The grey infrastructure projects associated with ALCOSAN’s IWWP include expansion of the Woods Run WWTP, a new conveyance/storage tunnel with associated structures, consolidation sewers, and a combined sewer overflow retention treatment basin in the Upper Monongahela planning basin.

The phased approach and construction schedule associated with these projects is illustrated in Figure 5-1 below, while Section 4 briefly summarized these projects. Additional details regarding the project phasing and schedule can be found in Appendix Z of ALCOSAN’s Modified Consent Decree (CD), which is included as an Appendix A to this Comprehensive Environmental Assessment.

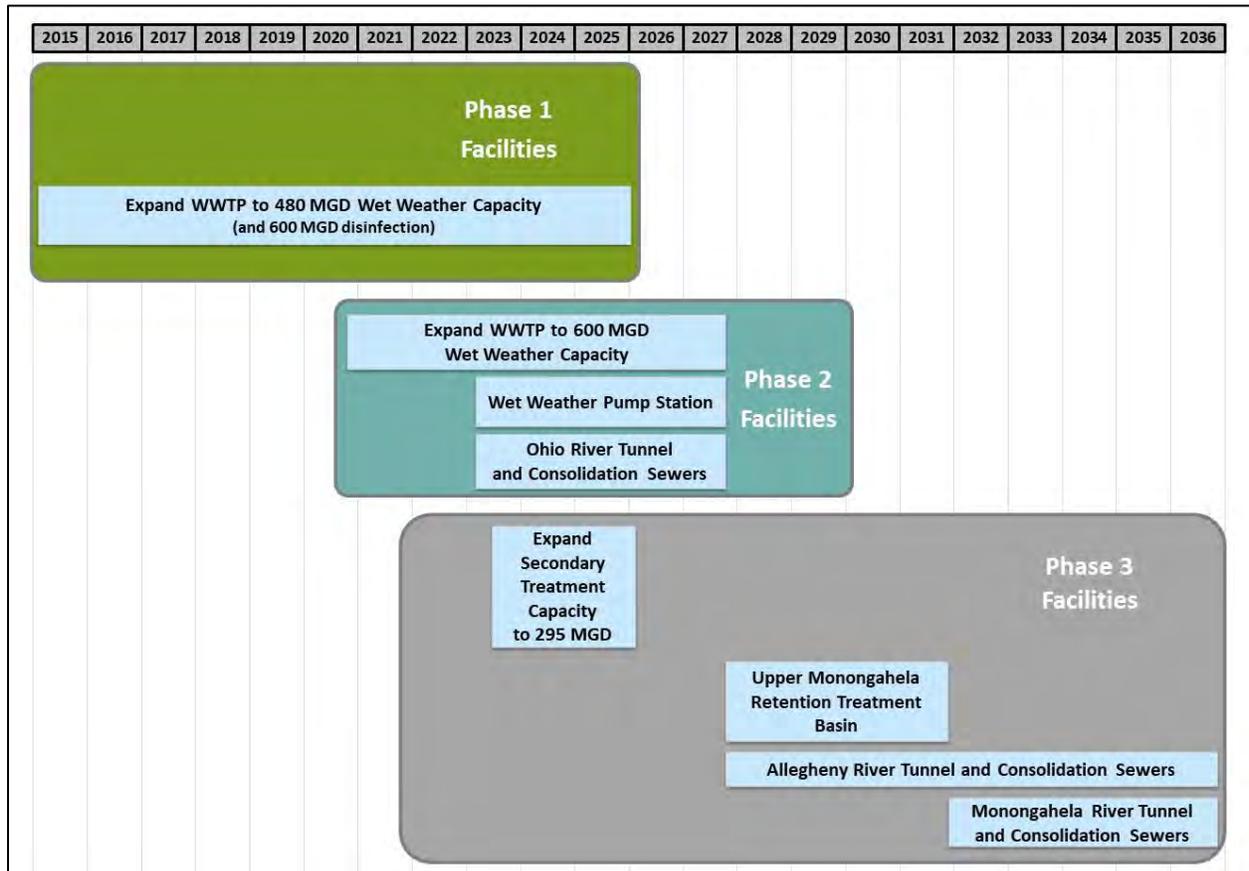


Figure 5-1: IWWP Project Phasing

6.0 Standard Resource Summary

The areas surrounding the ALCOSAN plant and ALCOSAN’s service area is a predominantly urban section of Allegheny County. There are no prime farmlands, game lands, sanctuaries, local landmarks, local natural landmarks, wild and scenic rivers, or Federal wilderness areas in the areas that could be impacted by future proposed construction.

A number of parks exist along the rivers. These parks are typical of urban parks and contain green space, walking trails, bike trails, and boat launches. The parks that are in areas that are included in the Clean Water Plan are included in the list below and shown on Figure 6.1.

- Clemente Park – City of Pittsburgh park
- Allegheny Landing Park – City of Pittsburgh park
- 57th Street Playground – City of Pittsburgh park
- 13th Street Riverside Access Park – Neighborhood park
- Millvale Riverfront park – Community park
- Highland Park – City of Pittsburgh park
- Allegheny Riverfront Park – City of Pittsburgh park
- North Shore Riverfront Park – City of Pittsburgh park
- Point State Park – State Park
- Southshore Riverfront Park – Neighborhood park



Map Source: ESRI - Scale: 1" =3,000'



Collective Efforts, LLC
Civil and Environmental Engineers

Potential Resource Impact Map - Parks
Allegheny County Sanitary Authority
Allegheny County, Pennsylvania

Drawn By:
AJM

Chkd By:
CMC

Date: March 2020
Project No. 16-14214

Figure 6.1

A number of “Rails to Trails” Bike Trails are also located along the rivers and are in the areas potentially identified for construction during the implementation of the Clean Water Plan. These bike trails are listed below with a brief description.

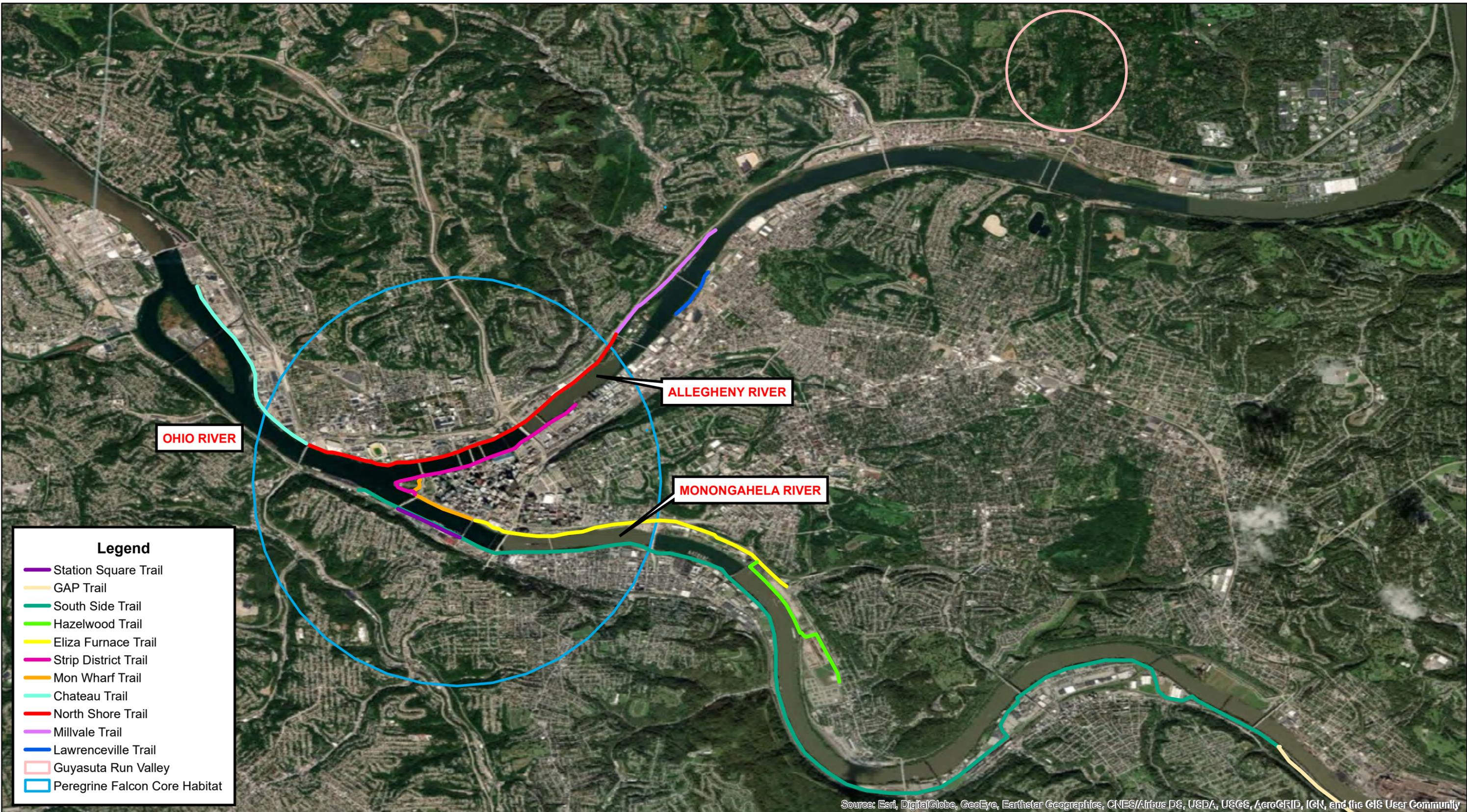
- Chateau Trail – northeast side of Ohio River from the ALCOSAN WWTP to the West End Bridge
- North Shore Trail – the north side of the Ohio and Allegheny Rivers from the West End Bridge to the 31st Street Bridge
- Millvale Trail – the north side of the Allegheny River from the 31st Street Bridge to Etna
- Lawrenceville Trail – the south side of the Allegheny River in the Lawrenceville neighborhood of the City of Pittsburgh
- Strip District Trail – the south side of the Allegheny River from 24th Street to Point State Park
- Mon Wharf Trail – the north side of the Monongahela River from Point State Park to First Avenue
- Eliza Furnace Trail – north side of the Monongahela River from First Avenue to a parking area on Greenfield Avenue
- Hazelwood Trail - north side of the Monongahela River parallel to the Eliza Furnace Trail in Hazelwood
- Great Allegheny Passage (GAP) Trail – south side of the Monongahela River, part of a 150-mile trail connecting Pittsburgh to the C&O Canal Towpath.
- South Side Trail – south side of the Monongahela River from the GAP trail to 4th Street on the Southside neighborhood of the City of Pittsburgh.
- Station Square Trail - south side of the Monongahela River from the Smithfield Street Bridge to the Duquesne Incline in the Southside neighborhood of the City of Pittsburgh.

Several core habitats exist in or near the proposed buildout of the components of the Clean Water Plan. They are discussed in the following bulleted listing.

- Ohio River – The Ohio River is a recovering river system that provides habitat for numerous species of concern.
- Allegheny River – The Allegheny River is also a recovering river system that provides habitat for numerous species of concern.

- Peregrine Falcon – The area is an urban habitat for the Peregrine Falcon.
- Guyasuta Run Valley – This area represents a small valley with a mature Dry-Mesic Acidic Central Forest and a Northern Hardwood Forest community.

The trails and core habitats are shown on Figure 6.2. The majority of the ALCOSAN service area is listed as a Natural Heritage Area: Supporting Landscape. This indicates that the rivers and their associated upland habitats have the potential to provide habitat for species of concern. Pennsylvania Natural Diversity Index (PNDI) clearances will be obtained as part of the design progression for future proposed construction.



Map Source: FEMA Flood Zone Mapping - Scale: 1"= 5,000'



Collective Efforts, LLC
Civil and Environmental Engineers

Potential Resource Impact Map - Rails to Trails & Core Habitat
Allegheny County Sanitary Authority
Allegheny County, Pennsylvania

Drawn By:
AJM

Checked By:
CMC

Date: March 2020
Project No. 16-14214

Figure 6.2

7.0 Aquatic Resources Summary

Due to the urban nature of the property under which the ALCOSAN conveyance structures are to be constructed, there are very few open stream channels remaining in this area. The proposed tunnels, conveyance piping and storage structures will be located along major waterways in the ALCOSAN service area. The following table presents the aquatic resources, including their Chapter 93 designation, near areas of proposed ALCOSAN structures.

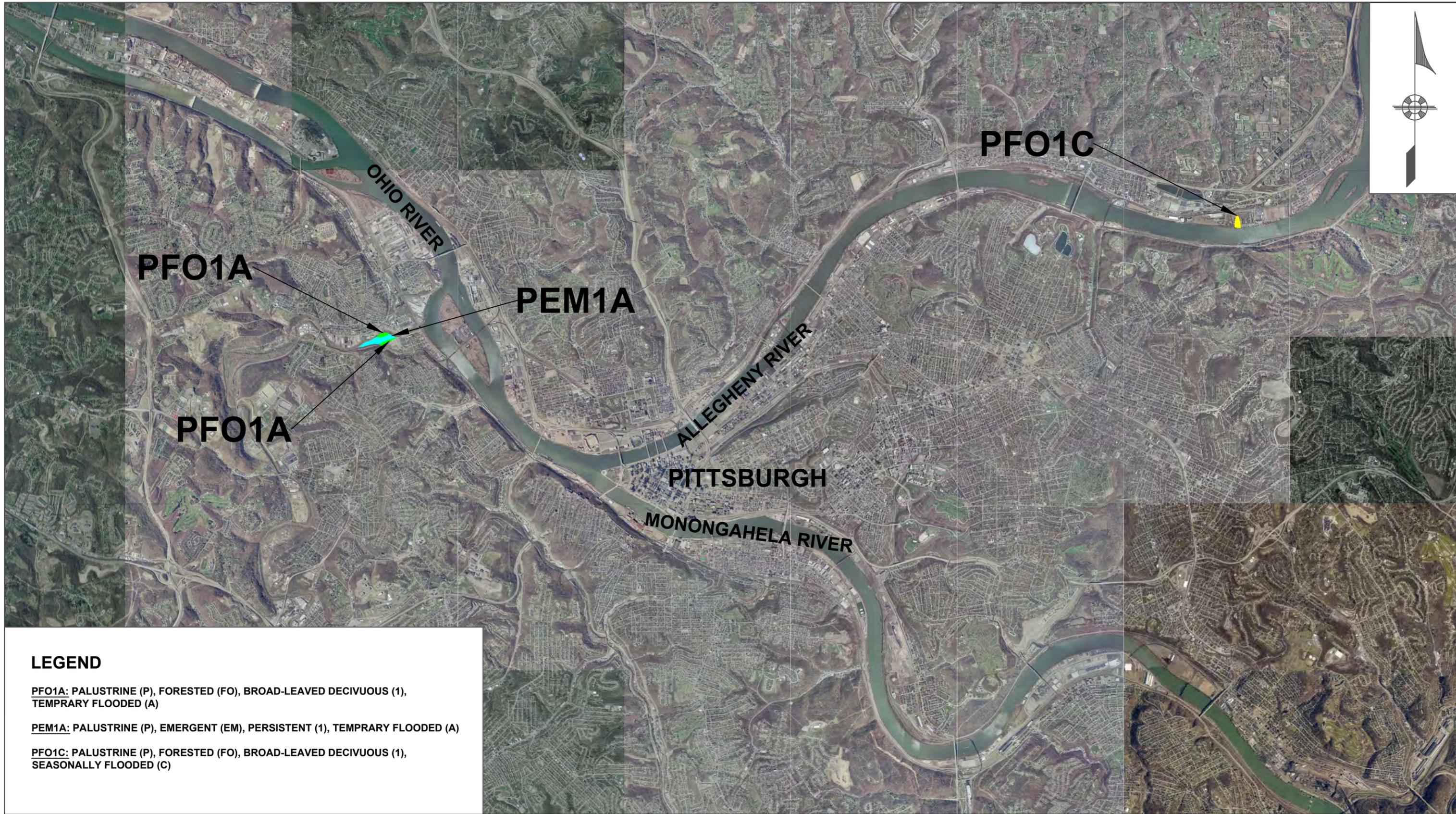
Table 7-1 Streams in the Vicinity of Proposed Construction Areas

Streams	Chapter 93 Designation
Ohio River	Warm Water Fishes (WWF)
Chartiers Creek	Warm Water Fishes (WWF)
Saw Mill Run	Warm Water Fishes (WWF)
Jacks Run	Warm Water Fishes (WWF)
Allegheny River	Warm Water Fishes (WWF)
Shades Run	Warm Water Fishes (WWF)
Girtys Run	Warm Water Fishes (WWF)
Pine Creek	Trout Stream Fishery (TSF)
Guyasuta Run	Warm Water Fishes (WWF)
Squaw Run	High Quality Warm Water Fishes (HQ-WWF)
Monongahela River	Warm Water Fishes (WWF)
4-Mile Run	Warm Water Fishes (WWF)
Becks Run	Warm Water Fishes (WWF)
Streets Run	Warm Water Fishes (WWF)
West Run	Warm Water Fishes (WWF)
Homestead Run	Warm Water Fishes (WWF)

As shown on Table 7-1, the designated use of the majority of the streams is warm water fishes, which indicates that these streams should be protected for the maintenance and propagation of fish, flora and fauna that are native to warm water habitats. Pine Creek is a trout stocked stream and Squaw Run is considered a high-quality warm water fishery.

The National Wetland Inventory (NWI) Mapping for the area was reviewed, Figure 7.1. As with the streams, due to the urban nature of this area, there are few wetlands identified on NWI mapping. A large forested (PFO1A) and emergent (PEM1A) wetland was identified on the south

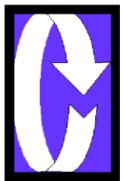
side of Chartiers Creek in McKees Rocks. A forested wetland (PFO1C) was identified on the north side of the Allegheny River in O'Hara Township where Squaw Run enters the Allegheny River.



LEGEND

- PFO1A:** PALUSTRINE (P), FORESTED (FO), BROAD-LEAVED DECIVUOUS (1), TEMPRARY FLOODED (A)
- PEM1A:** PALUSTRINE (P), EMERGENT (EM), PERSISTENT (1), TEMPRARY FLOODED (A)
- PFO1C:** PALUSTRINE (P), FORESTED (FO), BROAD-LEAVED DECIVUOUS (1), SEASONALLY FLOODED (C)

Map sources: PASDA, NWI Mapping - Scale: 1"=1 mi.



Collective Efforts, LLC
Civil and Environmental Engineers

Potential Resource Impact Map - NWI
Allegheny County Sanitary Authority
Allegheny County, Pennsylvania

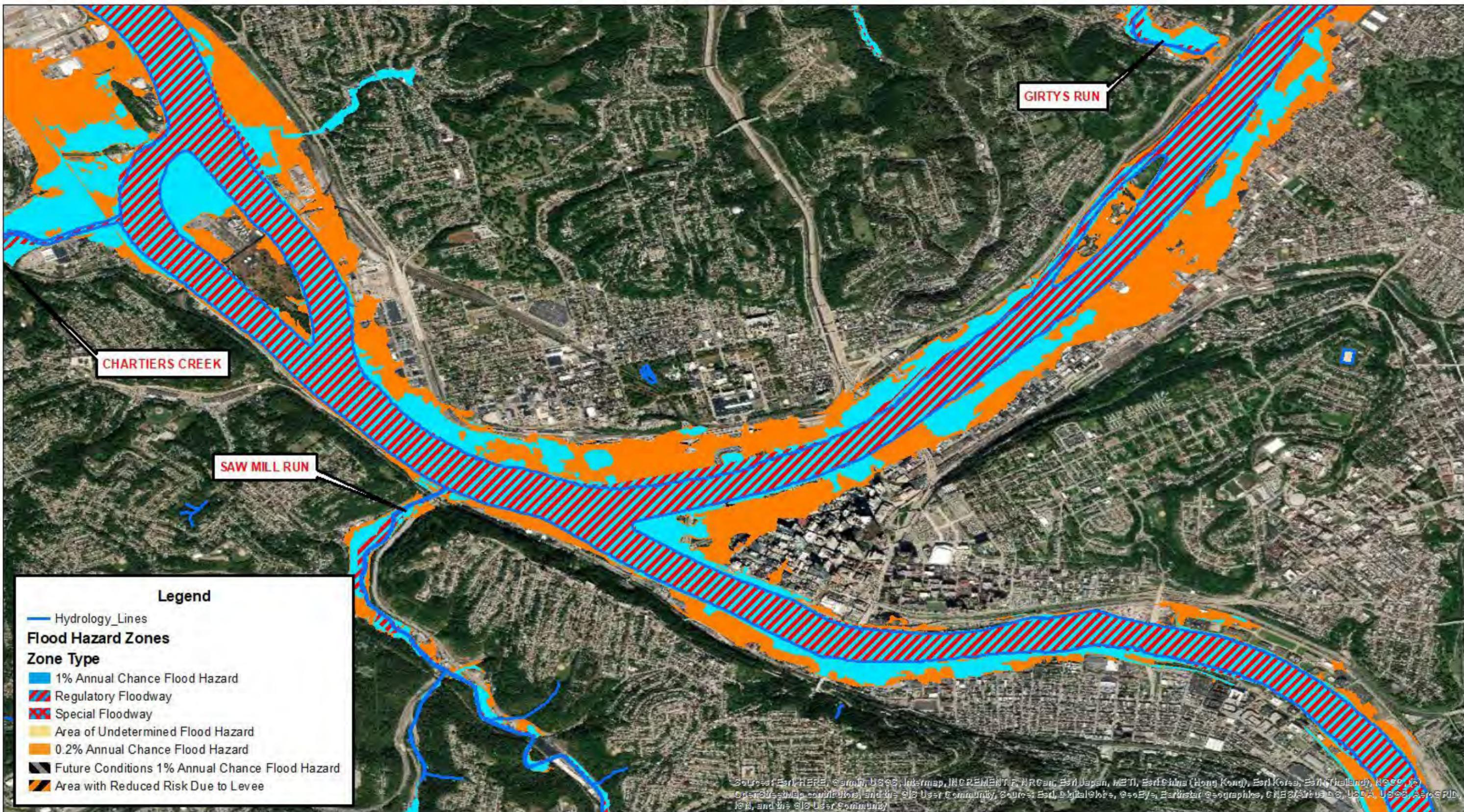
Drawn By:
MWH

Chkd By:
CMC

Date: MARCH 2020
Project No. 16-14214

Figure 7.1

Floodplains and floodways are adjacent to the rivers and streams discussed earlier in this section. Figures 7.2 and 7.3 show the extents of the floodplains and floodways.



Collective Efforts, LLC
Civil and Environmental Engineers

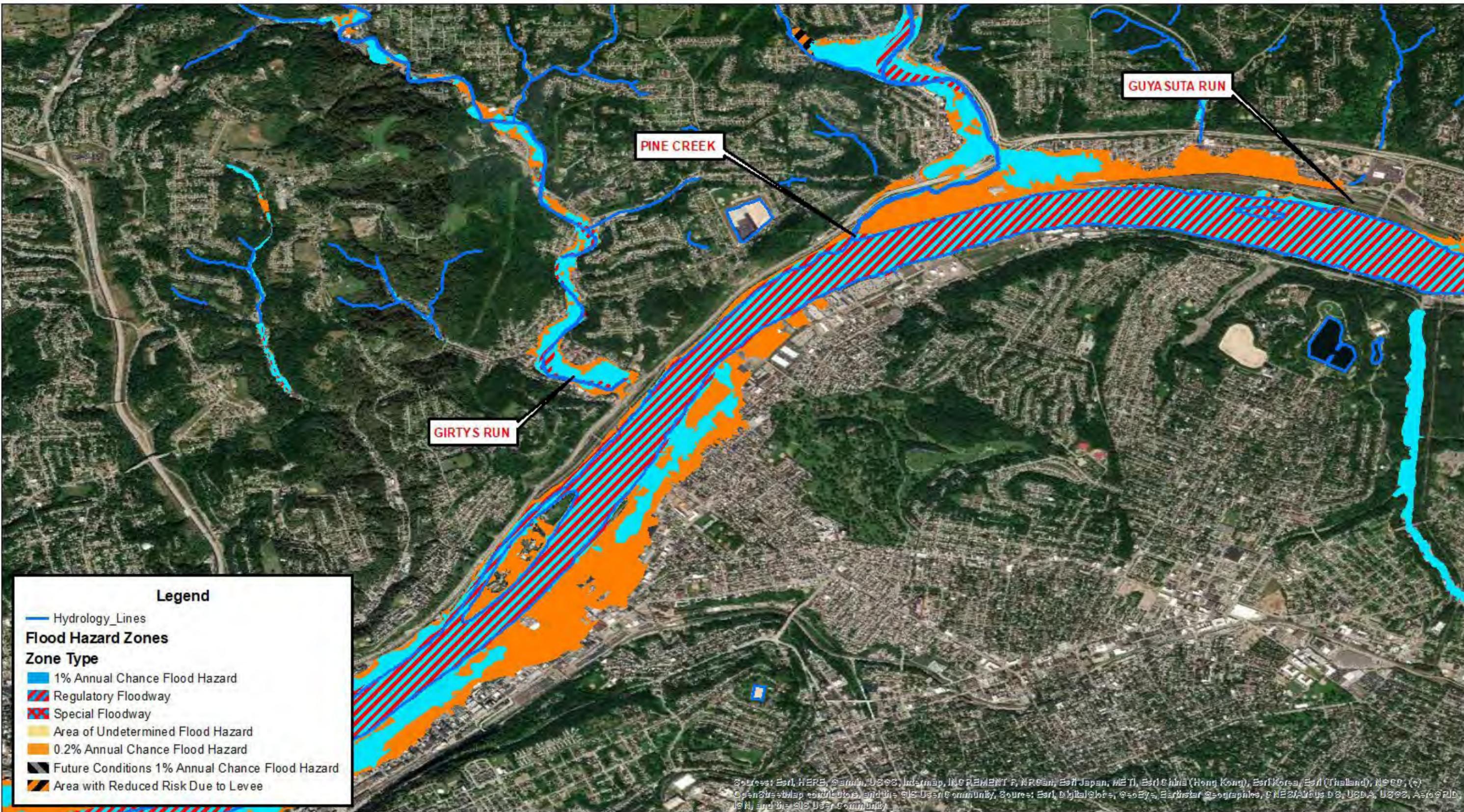
Potential Resource Impact Map - Floodplains and Floodways
Allegheny County Sanitary Authority
Allegheny County, Pennsylvania

Drawn By:
AJM

Checked By:
CMC

Date: March 2020
Project No. 16-14214

Figure 7.2



Map Source: FEMA Flood Zone Mapping - Scale: 1"= 2,500'



Collective Efforts, LLC
Civil and Environmental Engineers

Potential Resource Impact Map - Floodplains and Floodways
Allegheny County Sanitary Authority
Allegheny County, Pennsylvania

Drawn By:
AJM

Checked By:
CMC

Date: March 2020
Project No. 16-14214

Figure 7.3

8.0 Threatened and Endangered Species

As the design for conveyance and storage structures progresses, ALCOSAN will utilize the Pennsylvania Conservation Explorer, which hosts the PNDI review, to identify threatened and endangered species at or near the proposed projects. PNDI clearances will be obtained early in the design phases to avoid conflicts with threatened or endangered species.

One threatened or endangered species was identified in the project area for the WWTP expansion: the peregrine falcon. Follow up correspondence with Ms. Olivia Braun, an environmental planner with the Pennsylvania Game Commission (PGC), was required to address concerns with the Peregrine Falcon (*Falco Peregrines*) known to nest on the McKees Rocks Bridge. Additional information was provided to Ms. Braun and she concluded the following.

A total of six construction areas are located within close proximity to the peregrine falcon nest. Of these six areas, the PGC has determined that work may occur within the following areas during the nesting season:

- Modifications to the existing primary effluent channel to create a CSO-Related Bypass Control Structure
- Construction of proposed Final Settling Tank WFS-9 and River Wall
- Extension of the existing RAS piping and construction of a new RAS pump station
- Extension of the existing mixed liquor channel

However, to avoid impacts to the nesting pair all work related to the following construction areas should be completed outside of peregrine falcon nesting season (between August 1 and February 14). No work related to the following construction areas should occur during nesting season, February 15 to July 31.

- Modifications to the existing Disinfection Tank to allow it to function as a Wet Weather Disinfection Tank
- Construction of a new outfall to the river at the north end of the Wet Weather Disinfection Tank designated "Outfall-002."

9.0 Land Use

The areas shown for proposed future construction of the plant expansion, tunnels, conveyance and storage facilities are located in a predominantly urban environment. A significant portion of the proposed work will be in the City of Pittsburgh along the Ohio, Allegheny and Monongahela Rivers. PADEP's eMapPA website designates the areas identified for future construction as an "Urbanized Area 2010". The land uses include commercial, industrial, residential and green space. These urban areas have large impervious footprints comprised of developed riverfronts, transportation infrastructure, industrial buildings, parking lots, commercial and residential areas. Within ALCOSAN's service area, approximately one-third of each acre is wooded with the wooded areas typically confined to steep slopes. Detailed information regarding land use can be found in Section 5 of the Clean Water Plan.

10.0 Sensitive Areas

As part of ALCOSAN’s preliminary studies and the development of their Consent Decree, sensitive areas were identified. These areas are discussed in Appendix C of the Consent Decree and are summarized in the following table, Table 10-1.

Table 10-1: Sensitive Areas per Consent Decree (Appendix C)

Area name	Mile Point	Descending Bank	Description
Allegheny River			
Wilkinsburg-Penn Joint Water Authority	9.0	Left	Drinking Water Intake (DWI)
City of Pittsburgh	8.0	Right	DWI
Allegheny River Area No. 1	3.4 to 2.0	Right	Park and Marina
Monongahela River			
PA American Water Company	4.5	Left	DWI
Monongahela River Area No. 1	2.3	Left	Boat Ramp
Monongahela River Area No. 2	6.2	Left	Park
Ohio River			
West View Water Authority	5.0	Upstream End of Neville Island	DWI
Municipal Authority of Robinson Township	8.6	Left; back channel of Emsworth Dam	DWI
Ohio River Area No. 1	0.0 to 1.0	Right	Parks
*Descending bank is referenced as moving downstream			

11.0 Anticipated Impacts

This section provides a summary of the anticipated impacts of the implementation of the Clean Water Plan on water resources in the ALCOSAN service area. Please note that the planning and design of improvements to the ALCOSAN Conveyance and Treatment System are in its early stages and the information in this section is based upon the concepts ALCOSAN has presented in their approved Clean Water Plan. Updates to this Comprehensive Environmental Assessment and its accompanying support materials will be submitted as ALCOSAN continues to implement its approved Clean Water Plan.

Permanent and temporary impacts are summarized on Table 11-1 “Summary of Permanent and Temporary Impacts to Water Resources.” This table provides detailed information, by water body, of the proposed structures and the anticipated impacts to water resources. Permanent impacts are defined as impacts to water resource that will be affected by a water obstruction or

encroachment into that body of water. Temporary impacts are defined as impacts to water resources that occur during the construction of a permanent impact. Supporting information that was used to provide the data in Table 11-1 including total quantified impacts; easement assumptions; and calculations for impacts due to deep tunnels, connecting tunnels, conveyance/consolidation sewers, drop shafts and facilities are found in Appendix B of this CEA.

The total proposed permanent direct impacts, total proposed temporary direct impacts, total proposed permanent indirect impacts and total proposed temporary indirect impacts for the overall project are discussed in the remaining paragraphs of this section.

Table 11-1 Summary of Permanent and Temporary Impacts to Water Resources

Streams	Proposed Structures	Permanent Impacts Proposed	Discussion	Permanent Area of Impact (sq ft or acres)	Temporary Area of Impact (sq ft or acres)	Mitigation
Ohio River	WWTP Expansion - North End Facilities Project	1154' river wall at the ALCOSAN WWTP, two outfalls, and removal of barge mooring cells	Details of the permanent direct impacts, as well as the Mitigation Plan to offset these impacts are included in Sections 10 and 17 of the Joint Permit Application.	Watercourses - 78,436 sq ft Floodway - 0 Wetlands - 0 (per Aquatic Resources Impact Table)	Watercourses - 2,170 sq ft Floodway - 0 Wetlands - 0 (per Aquatic Resources Impact Table)	12,109 sq ft mitigation area (See Mitigation Plan)
Ohio River	Ohio River Deep CSO Tunnel, including 2 crossings to southwest side of Ohio River (Figure 4-4)	3 miles of 16' diameter tunnel in and along the Ohio River with possible tunnel relief outfall.	Tunnels and conveyance structures will be constructed using deep tunneling methods and will not impact the ground surface except at drop shaft locations. Drop shaft locations will be selected to minimize impacts to surface water resources. No filling, draining or conversion of the water resource is currently anticipated for the tunnels and conveyance structures. A possible tunnel relief outfall may also be required and other existing outfalls may need to be modified or supplemented with new outfalls. The need for new/modified outfalls is in the preliminary, conceptual phase and have not been designed. Once the design process progresses and the particulars of any new/modified outfall are known, appropriate permitting will be developed and submitted for review and approval.	Floodway - 3.6 acres Floodplain - 4.4 acres Streams - 3.2 acres Wetlands - 0	Floodway - 0 Floodplain - 5 acres Streams - 0 Wetlands - 0	no mitigation; no direct impact on the river
Ohio River	Portion of Allegheny River Deep CSO Tunnel (Figure 4-4)	0.7 miles of 16' diameter tunnel in and along the Ohio River.	See discussion of full Allegheny River CSO Tunnel in Allegheny River portion of table.	Floodway - 0 Floodplain - 2 acres Streams - 0 Wetlands - 0	Floodway - 0 Floodplain - 0 ¹ Streams - 0 Wetlands - 0	no mitigation; no direct impact on the river
Ohio River	Portion of Monongahela River Deep CSO Tunnel (Figure 4-4)	1.3 miles of 16' diameter tunnel in and along the Ohio River.	See discussion of full Monongahela River CSO Tunnel in Monongahela River portion of table.	Floodway - 0 Floodplain - 2.1 acres Streams - 0 Wetlands - 0	Floodway - 0 Floodplain - 0 ¹ Streams - 0 Wetlands - 0	no mitigation; no direct impact on the river
Ohio River	Connecting tunnels for Ohio River CSO Tunnel including 2 crossings to southwest side of Ohio River - associated with drop shafts for O-06, O-27 & MR_CF11 (Figure 4-4)	3 connecting tunnels, 10' diameter, total length of 340 ft	deep tunnels under the river	Floodway - 0.007 acres Floodplain - 0.028 acres Streams - 0 Wetlands - 0	0	no mitigation no direct impact to the river
Ohio River	Connecting tunnel for portion of Allegheny River CSO Tunnel - associated with drop shafts for O-43 (Figure 4-1 & 4-4)	1 connecting tunnel, 10' diameter, total length of 50 ft	deep tunnels under the river	Floodway - 0 acres Floodplain - 0.033 acres Streams - 0 Wetlands - 0	0	no mitigation no direct impact to the river

Table 11-1 Summary of Permanent and Temporary Impacts to Water Resources

Streams	Proposed Structures	Permanent Impacts Proposed	Discussion	Permanent Area of Impact (sq ft or acres)	Temporary Area of Impact (sq ft or acres)	Mitigation
Ohio River	Conveyance/consolidation sewers for Ohio River CSO Tunnel including 2 crossings to southwest side of Ohio River - associated with drop shafts for O-06, O-27 & MR_CF11 (Figure 4-4)	6' diameter pipe, 70' long (O-06) 3' diameter pipe, 910' long (MR_CF11) 4' diameter pipe, 440' long (MR_CF11)	trenchless construction	Floodway - 0 acres Floodplain - 0.62 acres Streams - 0 Wetlands - 0	Floodway - 0 Floodplain - 0.54 acres Streams - 0 Wetlands - 0	no mitigation no direct impact to the river
	Conveyance/consolidation sewers for Ohio River CSO Tunnel including 2 crossings to southwest side of Ohio River - associated with drop shafts for O-06, O-27 & MR_CF11 (Figure 4-4)	3' diameter pipe, 560' long (O-06) 6' diameter pipe, 1,800' long (O-06) 9' diameter pipe, 180' long (O-27) 3' diameter pipe, 10' long (MR_CF11)	open cut construction	Floodway - 0 acres Floodplain - 0.59 acres Streams - 0 Wetlands - 0	Floodway - 0 acres Floodplain - 0.59 acres Streams - 0 Wetlands - 0	restore to original grade
Ohio River	Conveyance/consolidation sewers for portion of Allegheny River CSO Tunnel - associated with drop shaft for O-43 (Figure 4-1 & 4-4)	5' diameter pipe, 50' long (O-43)	open cut construction	Floodway - 0 acres Floodplain - 0.024 acres Streams - 0 Wetlands - 0	Floodway - 0 acres Floodplain - 0.024 acres Streams - 0 Wetlands - 0	restore to original grade
Ohio River	Drop shafts for Ohio River CSO Tunnel including 2 crossings to southwest side of Ohio River - O-06, O-14E/O-14W, O-27 & MR_CF11 (Figure 4-4)	4 shafts, each 10' diameter	10' diameter shafts from the tunnel to match the ground surface	Floodway - 0 Floodplain - 1.5 acres Streams - 0 Wetlands - 0	Floodway - 0 Floodplain - 1.5 acres Streams - 0 Wetlands - 0	restore to original grade
Ohio River	Drop shaft for portion of Allegheny River CSO Tunnel - O-43 (Figure 4-1 & 4-4)	1 shaft, 10' diameter	10' diameter shafts from the tunnel to match the ground surface	Floodway - 0 Floodplain - 0.5 acres Streams - 0 Wetlands - 0	Floodway - 0 Floodplain - 0.5 acres Streams - 0 Wetlands - 0	restore to original grade
Ohio River	Wet Weather Pump Station located at Woods Runs WWTP	90' diameter pump station 60' x 90' electrical building	New pump station will discharge to new plant expansion facilities which have already received a WQM Part 2 permit.	Floodway - 0 Floodplain - 0 Streams - 0 Wetlands - 0	Floodway - 0 Floodplain - 0 Streams - 0 Wetlands - 0	no mitigation; no direct impact on the river
Ohio River	New O-06 Pump Station (Figure 4-4)	30' x 50' pump station	to replace two existing pump stations (Ella St and Robb St.)	Floodway - 0 Floodplain - 0 Streams - 0 Wetlands - 0	Floodway - 0 Floodplain - 0 Streams - 0 Wetlands - 0	no mitigation; no direct impact on the river

Table 11-1 Summary of Permanent and Temporary Impacts to Water Resources

Streams	Proposed Structures	Permanent Impacts Proposed	Discussion	Permanent Area of Impact (sq ft or acres)	Temporary Area of Impact (sq ft or acres)	Mitigation
Chartiers Creek	Portion of Ohio River Deep CSO Tunnel (Figure 4-4)	0.1 miles of 16' diameter tunnel in and along Chartiers Creek	Work is anticipated to be deep tunneling and not intrusive to the surface water. No filling, draining or conversion of the water resource is currently anticipated. See discussion of full Ohio River CSO Tunnel in Ohio River portion of table above.	Floodway - 0 Floodplain - 0.2 acres Streams - 0 Wetlands - 0	Floodway - 0 Floodplain - 0 ¹ Streams - 0 Wetlands - 0	no mitigation; no direct impact on the river
Chartiers Creek	Connecting tunnel for portion of Ohio River CSO Tunnel - associated with drop shaft for O-07 (Figure 4-4)	1 connecting tunnel, 10' diameter, total length of 40 ft	deep tunnels under the river	Floodway - 0 acres Floodplain - 0.026 acres Streams - 0 Wetlands - 0	0	no mitigation no direct impact to the river
Chartiers Creek	Conveyance/consolidation sewers for portion of Ohio River CSO Tunnel - associated with drop shaft for O-07 (Figure 4-4)	4.5' diameter pipe, 390' long (O-07)	trenchless construction	Floodway - 0 acres Floodplain - 0.049 acres Streams - 0 Wetlands - 0	Floodway - 0 acres Floodplain - 0.042 acres Streams - 0 Wetlands - 0	restore to original grade
Chartiers Creek	Drop shaft for portion of Ohio River CSO Tunnel - O-07 (Figure 4-4)	1 shaft, 10' diameter	shafts from the tunnel to match the ground surface	Floodway - 0 Floodplain - 0.5 acres Streams - 0 Wetlands - 0	Floodway - 0 Floodplain - 0.5 acres Streams - 0 Wetlands - 0	restore to original grade
Saw Mill Run	Conveyance/consolidation sewers for portion of Ohio River CSO Tunnel - associated with drop shaft for O-14E/O-14W (Figure 4-4)	3' diameter pipe, 750' long (O-14W/O-14E)	Work is anticipated to be a trenchless crossing under the enclosed portion of Saw Mill Run and not intrusive to the surface water. Floodway impact is estimated based on 50 feet from either side of enclosed stream. No filling, draining or conversion of the water resource is currently anticipated.	Floodway - 0.078 acres Floodplain - 0 Streams - 0.078 acres Wetlands - 0	Floodway - 0.068 acres Floodplain - 0 Streams - 0.068 acres Wetlands - 0	no mitigation; no direct impact on the river
Jacks Run	none	none	Stream is outside of limits of CWP construction. No impacts are anticipated.	not impacted	not impacted	no mitigation; no direct impact on the river
Allegheny River	Allegheny River Deep CSO Tunnel (Figure 4-1 & 4-2)	7.2 miles of 16' diameter tunnel in and along the Allegheny River with possible tunnel relief outfall.	Tunnels and conveyance structures will be constructed using deep tunneling methods and will not impact the ground surface except at drop shaft locations. Drop shaft locations will be selected to minimize impacts to surface water resources. No filling, draining or conversion of the water resource is currently anticipated for the tunnels and conveyance structures. A possible tunnel relief outfall may also be required and other existing outfalls may need to be modified or supplemented with new outfalls. The need for new/modified outfalls is in the preliminary, conceptual phase and have not been designed. Once the design process progresses and the particulars of any new/modified outfall are known, appropriate permitting will be developed and submitted for review and approval.	Floodway - 8.5 acres Floodplain - 4.8 acres Streams - 4.0 acres Wetlands - 0	Floodway - 0 Floodplain - 5 acres Streams - 0 Wetlands - 0	no mitigation; no direct impact on the river

Table 11-1 Summary of Permanent and Temporary Impacts to Water Resources

Streams	Proposed Structures	Permanent Impacts Proposed	Discussion	Permanent Area of Impact (sq ft or acres)	Temporary Area of Impact (sq ft or acres)	Mitigation
Allegheny River	Portion of Monongahela River Deep CSO Tunnel (Figure 4-1 & 4-3)	0.5 miles of 16' diameter tunnel in and along the Allegheny River.	See discussion of full Monongahela River CSO Tunnel in Monongahela River portion of table.	Floodway - 0.2 acres Floodplain - 0.74 acres Streams - 1.3 acres Wetlands - 0	Floodway - 0 Floodplain - 0 ¹ Streams - 0 Wetlands - 0	no mitigation; no direct impact on the river
Allegheny River	Connecting tunnels for portion of Allegheny River CSO Tunnel associated with drop shafts MR_CF32, MR_CF24, MR_CF36, LNA_CF10 & A-22 (Figure 4-1)	4 connecting tunnels, 3 @ 10' diameter and 1 @ 13' diameter, total length of 1,100 ft	deep tunnels under the river	Floodway - 0.18 acres Floodplain - 0.22 acres Streams - 0 Wetlands - 0	0	no mitigation no direct impact to the river
Allegheny River	Connecting tunnels for portion of Allegheny River CSO Tunnel associated with drop shafts MR_CF04, A-68, UA_CF04, A-41 & A-42 (Figure 4-2)	5 connecting tunnels, 2 @ 10' diameter, 2 @ 13' diameter and 1 @ 16' diameter, total length of 3,100 ft	deep tunnels under the river	Floodway - 0.13 acres Floodplain - 0.055 acres Streams - 1.55 acres Wetlands - 0	0	no mitigation no direct impact to the river
Allegheny River	Conveyance/consolidation sewers for portion of Allegheny River CSO Tunnel associated with drop shafts MR_CF32, MR_CF24, MR_CF36, LNA_CF10 & A-22 (Figure 4-1)	3' diameter pipe, 190' long (MR_CF32) 6.5' diameter pipe, 110' long (LNA_CF10) 7.5' diameter pipe, 3,200' (LNA_CF10)	trenchless construction	Floodway - 0.54 acres Floodplain - 0.98 acre Streams - 0 Wetlands - 0	Floodway - 0.47 acres Floodplain - 0.85 acres Streams - 0 Wetlands - 0	no mitigation no direct impact to the river
Allegheny River	Conveyance/consolidation sewers for portion of Allegheny River CSO Tunnel associated with drop shafts MR_CF32, MR_CF34, MR_CF36, LNA_CF10 & A-22 (Figure 4-1)	3' diameter pipe, 330' long (MR_CF32) 2' diameter pipe, 610' long (MR_CF34) 4' diameter pipe, 100' long (MR_CF34) 6' diameter pipe, 120' long (MR_CF34) 2' diameter pipe, 1,100' long (MR_CF36) 6.5' diameter pipe, 3,700' long (LNA_CF10) 7' diameter pipe, 2,900' long (LNA_CF10) 7.5' diameter pipe, 180' long (LNA_CF10) 7' diameter pipe, 90' long (A-22)	open cut construction	Floodway - 2.9 acres Floodplain - 0.5 acres Streams - 0 Wetlands - 0	Floodway - 2.9 acres Floodplain - 0.5 acres Streams - 0 Wetlands - 0	restore to original grade

Table 11-1 Summary of Permanent and Temporary Impacts to Water Resources

Streams	Proposed Structures	Permanent Impacts Proposed	Discussion	Permanent Area of Impact (sq ft or acres)	Temporary Area of Impact (sq ft or acres)	Mitigation
Allegheny River	Conveyance/consolidation sewers for portion of Allegheny River CSO Tunnel associated with drop shafts MR_CF04, portion of A-68, UA_CF04, A-41 & A-42 (Figure 4-2)	4' diameter pipe, 1,100' long (MR_CF04) 5' diameter pipe, 230' long (MR_CF04) 5' diameter pipe, 3,300' long (UA_CF04) 7' diameter pipe, half of 400' length (A-68) 5' diameter pipe, 70' long (A-41)	trenchless construction	Floodway - 0.31 acres Floodplain - 0.071 acres Streams - 0 Wetlands - 0	Floodway - 0.27 acres Floodplain - 0.062 acres Streams - 0 Wetlands - 0	no mitigation no direct impact to the river
Allegheny River	Conveyance/consolidation sewers for portion of Allegheny River CSO Tunnel associated with drop shafts MR_CF04, portion of A-68, UA_CF04, A-41 & A-42 (Figure 4-2)	5' diameter pipe, 40' long (MR_CF04) 3' diameter pipe, 220' long (UA_CF04) 5' diameter pipe, 3,500' long (UA_CF04) 5.5' diameter pipe, 3,200' long (UA_CF04) 6' diameter pipe, 20' long (A-42) 10' diameter pipe, 30' long (A-42)	open cut construction	Floodway - 2.1 acres Floodplain - 0.56 acres Streams - 0 Wetlands - 0	Floodway - 2.1 acres Floodplain - 0.56 acres Streams - 0 Wetlands - 0	restore to original grade
Allegheny River	Drop shafts for portion of Allegheny River CSO Tunnel - MR_CF32, MR_CF24, MR_CF36, LNA_CF10 & A-22 (Figure 4-1)	4 shafts, 3 @ 10' diameter and 1 @ 13' diameter	shafts from the tunnel to match the ground surface	Floodway - 0.5 acres Floodplain - 0.5 acres Streams - 0 Wetlands - 0	Floodway - 0.5 acres Floodplain - 0.5 acres Streams - 0 Wetlands - 0	restore to original grade
Allegheny River	Drop shaft for portion of Allegheny River CSO Tunnel - MR_CF04, A-68, UA_CF04, A-41 & A-42 (Figure 4-2)	5 shafts, 2 @ 10' diameter, 2 @ 13' diameter and 1 @ 17' diameter	shafts from the tunnel to match the ground surface	Floodway - 0 Floodplain - 0.5 acres Streams - 0 Wetlands - 0	Floodway - 0 Floodplain - 0.5 acres Streams - 0 Wetlands - 0	restore to original grade
Shades Run	none	none	Stream is outside of limits of CWP construction. No impacts are anticipated.	not impacted	not impacted	no mitigation; no direct impact on the river
Girtys Run	none	none	Stream is outside of limits of CWP construction - approximately 800 feet up the Ohio River from the proposed work. No impacts are anticipated.	not impacted	not impacted	no mitigation; no direct impact on the river
Pine Creek	Pine Creek - Conveyance/consolidation sewers for portion of Allegheny River CSO Tunnel associated with drop shafts - portion of A-68 (Figure 4-2)	7' diameter pipe, half of 400' length (A-68)	trenchless construction	Floodway - 0.038 acres Floodplain - 0 Streams - 0 Wetlands - 0	Floodway - 0.038 acres Floodplain - 0 Streams - 0 Wetlands - 0	restore to original grade

Table 11-1 Summary of Permanent and Temporary Impacts to Water Resources

Streams	Proposed Structures	Permanent Impacts Proposed	Discussion	Permanent Area of Impact (sq ft or acres)	Temporary Area of Impact (sq ft or acres)	Mitigation
Guyasuta Run	Guyasuta Run - Conveyance/consolidation sewers for portion of Allegheny River CSO Tunnel associated with drop shafts - portion of UA_CF04 (Figure 4-2)	5' diameter pipe, 70' long (UA_CF04)	trenchless construction	Floodway - 0.032 acres Floodplain - 0 Streams - 0 Wetlands - 0	Floodway - 0.028 acres Floodplain - 0 Streams - 0 Wetlands - 0	no mitigation; no direct impact on the river
Squaw Run	none	none	Stream is outside of limits of CWP construction. No impacts are anticipated.	not impacted	not impacted	no mitigation; no direct impact on the river
Monongahela River	Monongahela River Deep CSO Tunnel (Figure 4-3)	2.7 miles of 16' diameter tunnel in and along the Monongahela River with possible tunnel relief outfall.	Tunnels and conveyance structures will be constructed using deep tunneling methods and will not impact the ground surface except at drop shaft locations. Drop shaft locations will be selected to minimize impacts to surface water resources. No filling, draining or conversion of the water resource is currently anticipated for the tunnels and conveyance structures. A possible tunnel relief outfall may also be required and other existing outfalls may need to be modified or supplemented with new outfalls. The need for new/modified outfalls is in the preliminary, conceptual phase and have not been designed. Once the design process progresses and the particulars of any new/modified outfall are known, appropriate permitting will be developed and submitted for review and approval.	Floodway - 2.6 acres Floodplain - 6.7 acres Streams - 3.8 acres Wetlands - 0	Floodway - 0 Floodplain - 5 acres Streams - 0 Wetlands - 0	no mitigation; no direct impact on the river
Monongahela River	Connecting tunnels for portion of Monongahela River CSO Tunnel associated with drop shafts MR_CF19, MR_CF20, MR_CF07 & M-29 (Figure 4-3)	4 connecting tunnels, 3 @ 10' diameter and 1 @ 13' diameter, total length of 1,100 ft	deep tunnels under the river	Floodway - 0 acres Floodplain - 0.06 acres Streams - 0.54 acres Wetlands - 0	0	no mitigation no direct impact to the river
Monongahela River	Conveyance/consolidation sewers for portion of Monongahela River CSO Tunnel associated with drop shafts MR_CF19, MR_CF20, MR_CF07 (Figure 4-3)	2' diameter pipe, 170' long (MR_CF19) 3' diameter pipe, 610' long (MR_CF19) 4' diameter pipe, 1200' long (MR_CF07)	trenchless construction	Floodway - 0 Floodplain - 0.37 acres Streams - 0 Wetlands - 0	Floodway - 0 Floodplain - 0.32 acre Streams - 0 Wetlands - 0	no mitigation no direct impact to the river

Table 11-1 Summary of Permanent and Temporary Impacts to Water Resources

Streams	Proposed Structures	Permanent Impacts Proposed	Discussion	Permanent Area of Impact (sq ft or acres)	Temporary Area of Impact (sq ft or acres)	Mitigation
Monongahela River	Conveyance/consolidation sewers for portion of Monongahela River CSO Tunnel associated with drop shafts MR_CF19, MR_CF20, MR_CF07 (Figure 4-3)	2' diameter pipe, 880' long (MR_CF19) 2' diameter pipe, 190' long (MR_CF20) 3' diameter pipe, 1000' long (MR_CF20) 4' diameter pipe, 820' long (MR_CF07)	open cut construction	Floodway - 0 Floodplain - 0.34 acres Streams - 0 Wetlands - 0	Floodway - 0 Floodplain - 0.34 acres Streams - 0 Wetlands - 0	restore to original grade
Monongahela River	Drop shafts for portion of Monongahela River CSO Tunnel - MR_CF19, MR_CF20, MR_CF07 & M-29 (Figure 4-3)	4 shafts, 3 @ 10' diameter and 1 @ 13' diameter	shafts from the tunnel to match the ground surface	Floodway - 0 Floodplain - 0.5 acres Streams - 0 Wetlands - 0	Floodway - 0 Floodplain - 0.5 acres Streams - 0 Wetlands - 0	restore to original grade
Monongahela River	Portion of CSO Retention Treatment Basin (RTB) outfall (Figure 4-5)	9' diameter outfall, half of 800' length - open cut	A new outfall may be required for the RTB described below under Streets Run. The outfall is in the preliminary, conceptual phase and has not been designed. Once the design process progresses and the particulars of the outfall are known, appropriate permitting will be developed and submitted for review and approval.	Floodway - 0.062 acres Floodplain - 0.062 acres Streams - 0 Wetlands - 0	Floodway - 0.062 acres Floodplain - 0.062 acres Streams - 0 Wetlands - 0	restore to original grade
Monongahela River	Portion of Conveyance/consolidation sewers for retention treatment basin serving flow group UM_CF02 (Figure 4-5)	1.5' diameter pipe, 1,100' long (UM_CF02) 10' diameter pipe, 5500' long (UM_CF02)	trenchless construction	Floodway - 0.11 acres Floodplain - 0.52 acres Streams - 0 Wetlands - 0	Floodway - 0.1 acres Floodplain - 0.45 acres Streams - 0 Wetlands - 0	no mitigation no direct impact to the river
4-Mile Run	Portion of conveyance/consolidation sewers for portion of Monongahela River CSO Tunnel associated with drop shaft M-29 (Figure 4-3)	12' diameter pipe, 220' long (M-29)	Work is anticipated to be deep tunneling and trenchless construction that connects to the enclosed portion of 4-Mile Run. Floodway impact is estimated based on 50 feet from either side of enclosed stream. No filling, draining or conversion of the water resource is currently anticipated.	Floodway - 0.099 acres Floodplain - 0 Streams - 0 Wetlands - 0	Floodway - 0.086 acres Floodplain - 0 Streams - 0 Wetlands - 0	no mitigation; no direct impact on the river
Becks Run	none	none	Stream is outside of limits of CWP construction. No impacts are anticipated.	not impacted	not impacted	no mitigation; no direct impact on the river
Streets Run	CSO Retention Treatment Basin (RTB) with pump station (Figure 4-5)	200' x 280' RTB 90' x 90' pump station	An RTB is proposed in the area of the confluence of Streets Run and the Monongahela River and will involve near surface work. No permanent filling, draining or conversion of the water resource is currently anticipated. The pump station is not located in the floodplain. A portion of the RTB could be located in the floodplain but is expected to be below grade.	Floodway - 0 Floodplain - 1.29 acres Streams - 0 Wetlands - 0	Floodway - 0 Floodplain - 0.64 acres Streams - 0 Wetlands - 0	restore to original grade

Table 11-1 Summary of Permanent and Temporary Impacts to Water Resources

Streams	Proposed Structures	Permanent Impacts Proposed	Discussion	Permanent Area of Impact (sq ft or acres)	Temporary Area of Impact (sq ft or acres)	Mitigation
Streets Run	Portion of CSO Retention Treatment Basin (RTB) outfall (Figure 4-5)	9' diameter outfall, half of 800' length - open cut	A new outfall may also be required for the RTB described above. The outfall is in the preliminary, conceptual phase and has not been designed. Once the design process progresses and the particulars of the outfall are known, appropriate permitting will be developed and submitted for review and approval.	Floodway - 0 Floodplain - 0.13 acres Streams - 0 Wetlands - 0	Floodway - 0 Floodplain - 0.13 acres Streams - 0 Wetlands - 0	restore to original grade
Streets Run	Portion of conveyance/consolidation sewers for retention treatment basin serving flow group UM_CF02 (Figure 4-5)	3.5' diameter pipe, 960' long (UM_CF02)	open cut construction	Floodway - 0 Floodplain - 0.27 acres Streams - 0 Wetlands - 0	Floodway - 0 Floodplain - 0.27 acres Streams - 0 Wetlands - 0	restore to original grade
West Run	Portion of Conveyance/consolidation sewers for retention treatment basin serving flow group UM_CF02 (Figure 4-5)	10' diameter pipe, 120' long (UM_CF02)	Work is anticipated to be trenchless construction that connects to the enclosed portion of West Run. Floodway impact is estimated based on 50 feet from either side of enclosed stream. No filling, draining or conversion of the water resource is currently anticipated.	Floodway - 0.055 acres Floodplain - 0 Streams - 0 Wetlands - 0	Floodway - 0.048 acres Floodplain - 0 Streams - 0 Wetlands - 0	no mitigation; no direct impact on the river
Homestead Run	none	none	Stream is outside of limits of CWP construction. No impacts are anticipated.	not impacted	not impacted	no mitigation; no direct impact on the river

Footnotes

1. This portion of the deep tunnel is assumed to be constructed using one of three work shaft sites (5 acres each) which are accounted for as a temporary impact in the other deep tunnel rows of this table.
2. Floodway and floodplain areas outside the WWTP are based on FEMA mapping available through PASDA. Areas within floodplain as reported above are based on areas within the "1% Annual Chance Flood Hazard" zone but excluding areas already counted under floodways. Watercourses, floodway and wetlands areas associated with the WWTP expansion are based on the Aquatic Resources Impact Table.

Total Proposed Permanent Direct Impacts

A number of structures are proposed, as part of the Clean Water Plan, to store or convey wastewater or to provide facilities that will support the expanded capacity of the ALCOSAN system. These structures and facilities include the plant expansion, deep tunnels, connecting tunnels, conveyance/consolidation sewers, drop shafts and supporting facilities. Appendix B (Tables B-1 through B-7) contains summary tables of the impacts per proposed structures and the assumptions that were made in preparing the calculations for all work other than the WWTP expansion. A brief discussion of each of the structures follows.

- *Plant Expansion/River Wall.* The anticipated impacts due to the plant expansion are detailed in the EA of the JPA. A summary of the impacts is shown on Table B-1.
- *Deep Tunnels.* Deep tunnels are proposed along the Ohio, Allegheny, and Monongahela rivers and a very small segment along Chartiers Creek. The deep tunnels will be bored with surface disturbance at the access shafts. The deep tunnels are assumed to have an inside diameter of 16 feet and an outside diameter of 20 feet. Table B-3 provides a summary of the deep tunnel lengths and impacts.
- *Connecting Tunnels.* Connecting tunnels are proposed along the Ohio, Allegheny, and Monongahela rivers and Chartiers Creek. The connecting tunnels will be bored. There is no anticipated surface disturbance beyond that accounted for with the drop shafts below, as the tunnels will be constructed from the drop shafts to the deep tunnels. The inside diameters of the connecting tunnels range from 10 feet to 16 feet and the outside diameters range from 14 feet to 20 feet. Details of the connecting tunnels are shown in Table B-4 located in Appendix B.
- *Conveyance/Consolidation Sewers.* The conveyance/consolidation sewers will be constructed by both open cut and trenchless methods. The sewers range from two feet to nine feet in diameter. The lengths of open cut and trenchless sewers and supporting calculations are shown in Table B-5 located in Appendix B.
- *Drop Shafts.* Drop shafts will be installed along each of the deep tunnels proposed in the Clean Water Plan. The drop shafts range from 10 feet to 17 feet in diameter. The assumed permanent easement required for each drop shaft is estimated to be one half of an acre, with the temporary easement impacting an additional half of an acre. The estimated impacts are summarized in Table B-6 located in Appendix B.
- *Facilities.* The facilities proposed as part of the Clean Water Plan include a wet weather pump station and supporting electrical building at the Woods Run facility, a pump station on the Ohio River, a retention treatment basin, pump station, and an outfall on the Monongahela River. The estimated impacts from each of these facilities is summarized in Table B-7 in Appendix B.

Total Proposed Temporary Direct Impacts

- There are no proposed temporary direct impacts anticipated for the implementation of ALCOSAN's Clean Water Plan. There is currently no proposed temporary filling, draining or conversion of water resources planned for the implementation of the Clean Water Plan.

Total Proposed Permanent Indirect Impacts

There are no proposed permanent indirect impacts anticipated for the implementation of ALCOSAN's Clean Water Plan. There are no proposed alterations to the chemical, physical or biological components of water resources in the future proposed construction areas that would change the function of the water resource. Rather, the water quality of the surface water should improve substantially upon implementation of this Clean Water Plan.

Total Proposed Temporary Indirect Impacts

Minor temporary indirect impacts are expected during the implementation of the Clean Water Plan. The temporary indirect impacts would result from removal of barge mooring cells in the Ohio River adjacent to the ALCOSAN Woods Run facility and other proposed construction near water resources. The impacts due to construction activities will be minimized by the implementation of regulatory-approved Erosion and Sediment Control Plans and the associated installation and maintenance of erosion and sediment control best management practices. Temporary indirect impacts will be restored to pre-existing conditions upon completion of construction.

Summary of Impacts

Table 11-2 "Total Impact to Water Resources Outside of the WWTP" provides a summary of the anticipated permanent and temporary impacts by structure and stream for all proposed work other than the WWTP expansion. Impacts for the plant expansion are described in detail in the EA and in the associated Aquatic Resources Impact Table. For the areas in the Clean Water Plan outside of the Woods Run Facility, impacts were evaluated to the floodway, floodplain, streams and wetlands. The impacts to each of the water resource categories are discussed in the following paragraphs.

Table 11-2 Total Quantified Impact to Water Resources Outside of WWTP*

*see Table B-1 for impacts related to the WWTP expansion project.

Streams	Proposed Structures	Permanent Area of Impact (acres)				Temporary Area of Impact (acres)			
		Floodway	Floodplain	Streams	Wetlands	Floodway	Floodplain	Streams	Wetlands
Deep Tunnels									
Ohio River	Ohio River Deep CSO Tunnel	3.645	4.426	3.216	0.000	0.000	5.000	0.000	0.000
Ohio River	Portion of Allegheny River Deep CSO Tunnel	0.000	2.017	0.000	0.000	0.000	0.000	0.000	0.000
Ohio River	Portion of Monongahela River Deep CSO Tunnel	0.000	2.117	0.000	0.000	0.000	0.000	0.000	0.000
Chartiers Creek	Portion of Ohio River Deep CSO Tunnel	0.000	0.228	0.000	0.000	0.000	0.000	0.000	0.000
Allegheny River	Allegheny River Deep CSO Tunnel	8.484	4.769	3.961	0.000	0.000	5.000	0.000	0.000
Allegheny River	Portion of Monongahela River Deep CSO Tunnel	0.201	0.741	1.309	0.000	0.000	0.000	0.000	0.000
Monongahela River	Monongahela River Deep CSO Tunnel	2.570	6.648	3.843	0.000	0.000	5.000	0.000	0.000
TOTALS		14.90	20.94	12.33	0.00	0.00	15.00	0.00	0.00
Connecting Tunnels									
Ohio River	Connecting tunnels for Ohio River CSO Tunnel	0.007	0.028	0.000	0.000	0.000	0.000	0.000	0.000
Ohio River	Connecting tunnel for portion of Allegheny River CSO Tunnel	0.000	0.033	0.000	0.000	0.000	0.000	0.000	0.000
Chartiers Creek	Connecting tunnel for portion of Ohio River CSO Tunnel	0.000	0.026	0.000	0.000	0.000	0.000	0.000	0.000
Allegheny River	Connecting tunnels for portion of Allegheny River CSO Tunnel	0.181	0.219	0.000	0.000	0.000	0.000	0.000	0.000
Allegheny River	Connecting tunnels for portion of Allegheny River CSO Tunnel	0.128	0.055	1.550	0.000	0.000	0.000	0.000	0.000
Monongahela River	Connecting tunnels for portion of Monongahela River CSO Tunnel	0.000	0.060	0.541	0.000	0.000	0.000	0.000	0.000
TOTALS		0.32	0.42	2.09	0.00	0.00	0.00	0.00	0.00
Conveyance/consolidation sewers - Trenchless									
Ohio River	Conveyance/consolidation sewers for Ohio River CSO Tunnel - trenchless	0.000	0.618	0.000	0.000	0.000	0.539	0.000	0.000
Chartiers Creek	Conveyance/consolidation sewers for portion of Ohio River CSO Tunnel - trenchless	0.000	0.049	0.000	0.000	0.000	0.042	0.000	0.000
Saw Mill Run	Conveyance/consolidation sewers for portion of Ohio River CSO Tunnel - trenchless	0.078	0.000	0.078	0.000	0.068	0.000	0.068	0.000
Allegheny River	Conveyance/consolidation sewers for portion of Allegheny River CSO Tunnel - trenchless	0.541	0.979	0.000	0.000	0.471	0.853	0.000	0.000
Allegheny River	Conveyance/consolidation sewers for portion of Allegheny River CSO Tunnel - trenchless	0.314	0.071	0.000	0.000	0.274	0.062	0.000	0.000
Pine Creek	Conveyance/consolidation sewers for portion of Allegheny River CSO Tunnel - trenchless	0.038	0.000	0.000	0.000	0.038	0.000	0.000	0.000
Guyasuta Run	Conveyance/consolidation sewers for portion of Allegheny River CSO Tunnel - trenchless	0.032	0.000	0.000	0.000	0.028	0.000	0.000	0.000
Monongahela River	Conveyance/consolidation sewers for portion of Monongahela River CSO Tunnel - trenchless	0.000	0.371	0.000	0.000	0.000	0.324	0.000	0.000
Monongahela River	Portion of conveyance/consolidation sewers for retention treatment basin - trenchless	0.114	0.516	0.000	0.000	0.100	0.450	0.000	0.000
4-Mile Run	Portion of conveyance/consolidation sewers for portion of Monongahela River CSO Tunnel - trenchless	0.099	0.000	0.000	0.000	0.086	0.000	0.000	0.000
West Run	Portion of conveyance/consolidation sewers for retention treatment basin - trenchless	0.055	0.000	0.000	0.000	0.048	0.000	0.000	0.000
TOTALS		1.27	2.60	0.078	0.00	1.11	2.27	0.07	0.00

Table 11-2 Total Quantified Impact to Water Resources Outside of WWTP*

*see Table B-1 for impacts related to the WWTP expansion project.

		Permanent Area of Impact (acres)				Temporary Area of Impact (acres)			
		Floodway	Floodplain	Floodway	Floodplain	Floodway	Floodplain	Floodway	Floodplain
Conveyance/consolidation sewers - Open Cut									
Ohio River	Conveyance/consolidation sewers for Ohio River CSO Tunnel - open cut	0.000	0.586	0.000	0.000	0.000	0.586	0.000	0.000
Ohio River	Conveyance/consolidation sewers for portion of Allegheny River CSO Tunnel - open cut	0.000	0.024	0.000	0.000	0.000	0.024	0.000	0.000
Allegheny River	Conveyance/consolidation sewers for portion of Allegheny River CSO Tunnel - open cut	2.898	0.499	0.000	0.000	2.898	0.499	0.000	0.000
Allegheny River	Conveyance/consolidation sewers for portion of Allegheny River CSO Tunnel - open cut	2.114	0.559	0.000	0.000	2.114	0.559	0.000	0.000
Monongahela River	Conveyance/consolidation sewers for portion of Monongahela River CSO Tunnel - open cut	0.000	0.341	0.000	0.000	0.000	0.341	0.000	0.000
Streets Run	Portion of conveyance/consolidation sewers for retention treatment basin - open cut	0.000	0.270	0.000	0.000	0.000	0.270	0.000	0.000
TOTALS		5.01	2.28	0.00	0.00	5.01	2.28	0.00	0.00
Drop Shafts									
Ohio River	Drop shafts for Ohio River CSO Tunnel	0.000	1.500	0.000	0.000	0.000	1.500	0.000	0.000
Ohio River	Drop shaft for portion of Allegheny River CSO Tunnel	0.000	0.500	0.000	0.000	0.000	0.500	0.000	0.000
Chartiers Creek	Drop shaft for portion of Ohio River CSO Tunnel	0.000	0.500	0.000	0.000	0.000	0.500	0.000	0.000
Allegheny River	Drop shafts for portion of Allegheny River CSO Tunnel	0.500	0.500	0.000	0.000	0.500	0.500	0.000	0.000
Allegheny River	Drop shaft for portion of Allegheny River CSO Tunnel	0.000	0.500	0.000	0.000	0.000	0.500	0.000	0.000
Monongahela River	Drop shafts for portion of Monongahela River CSO Tunnel	0.000	0.500	0.000	0.000	0.000	0.500	0.000	0.000
TOTALS		0.50	4.00	0.00	0.00	0.50	4.00	0.00	0.00
Facilities									
Ohio River	Wet Weather Pump Station located at Woods Run WWTP	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Ohio River	New O-06 Pump Station	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Streets Run	CSO Retention Treatment Basin (RTB) with pump station	0.000	1.286	0.000	0.000	0.000	0.643	0.000	0.000
Streets Run	Portion of CSO Retention Treatment Basin (RTB) outfall	0.000	0.126	0.000	0.000	0.000	0.126	0.000	0.000
Monongahela River	Portion of CSO Retention Treatment Basin (RTB) outfall	0.062	0.062	0.000	0.000	0.062	0.062	0.000	0.000
TOTALS		0.06	1.47	0.00	0.00	0.06	0.83	0.00	0.00
No Impact									
Jacks Run	none	0	0	not impacted	0	0	0	not impacted	0
Shades Run	none	0	0	not impacted	0	0	0	not impacted	0
Girtys Run	none	0	0	not impacted	0	0	0	not impacted	0
Squaw Run	none	0	0	not impacted	0	0	0	not impacted	0
Becks Run	none	0	0	not impacted	0	0	0	not impacted	0
Homestead Run	none	0	0	not impacted	0	0	0	not impacted	0
Grand Total		22.1	31.7	14.5	0.0	6.7	24.4	0.068	0.0

Floodways

There were both temporary and permanent impacts to the floodways. The permanent impacts totaled about 22.1 acres of impacts associated with the floodways. The majority of these impacts are due to the large diameter deep tunnels that will be adjacent to and under the three major rivers and Chartiers Creek (14.9 acres). Approximately 0.32 acres of floodway will be impacted by connecting tunnels in the Ohio, Allegheny and Monongahela Rivers. The trenchless conveyance/consolidation sewers proposed in the Allegheny and Monongahela River floodways, as well as very small areas of the Pine Creek, Guyasuta Run, Saw Mill Run, 4-Mile Run and West Run floodways are anticipated to impact 1.27 acres of floodway. Open cut conveyance/consolidation sewers are anticipated to impact about five acres in the Allegheny River floodway. Drop shafts are anticipated to impact 0.5 acres along the Allegheny River. Facilities will have a minimal impact to the floodway with 0.06 acres of impact due to the proposed CSO retention treatment basin outfall in the Monongahela floodway.

Temporary impacts are also expected in the floodways with the most significant impacts (approximately five acres) due to the open cut conveyance/consolidation sewers along the Allegheny River. Minimal temporary impacts are anticipated from the trenchless conveyance/consolidation sewer along the Allegheny, Monongahela, Pine Creek, Guyasuta Run, Saw Mill Run, 4-Mile Run and West Run floodways (1.1 acres) and dropshaft for the Allegheny River CSO tunnel (0.5 acres). Facilities will also have a minimal impact to the floodway with approximately 0.06 acres of impact due to the CSO retention treatment basin outfall. The total temporary impacts are 6.7 acres.

Floodplains Floodplains

(Please note that areas where there was a stream confluence with a river, unless the floodplain impact could be clearly to a river or stream, the floodplain impact was split between the river and the stream.)

There were both permanent and temporary impacts to the floodplains of the rivers and streams due to the implementation of the Clean Water Plan. The permanent impacts were 31.7 acres with the majority of the impacts (approximately 21 acres) due to the proposed deep tunnels in the Ohio, Allegheny, and Monongahela Rivers and Chartiers Creek. These impacts are not anticipated to be surface impacts but will be permanent structures under the floodplains for these waterways. The connecting tunnels are expected to have minimum impacts to the floodplains (0.42 acres) in the Ohio, Allegheny, Monongahela and Chartiers Creek floodplains. These impacts will again not be surface impacts but are measured as permanent structures under the floodplains. Additional permanent impacts to the floodplains will occur with the implementation of the trenchless conveyance/consolidation sewers (2.60 acres) in the floodplains of the Ohio, Allegheny and Monongahela rivers as well as Chartiers Creek. The open cut conveyance/consolidation sewers potentially impact 2.28 acres in the floodplains of the Ohio, Allegheny and Monongahela rivers as well as a small portion of Streets Run. The drop shafts are anticipated to impact about four acres in the floodplains of the three rivers and Chartiers Creek. The retention basin, pump station and outfall are expected to cause 1.47 acres of impacts in the Monongahela and Streets Run floodplains.

Temporary impacts to the floodplains are approximately 24.4 acres with 15 acres attributed to the installation of the deep tunnels along the three rivers. No temporary floodplain impacts are anticipated from the installation of the connecting tunnels. An additional 2.27 acres of temporary impacts are expected from the trenchless conveyance/consolidation sewers in the floodplains of the Ohio, Allegheny, and Monongahela rivers and Chartiers Creek. There are approximately 2.28 acres of impacts from the open cut conveyance/consolidation sewers in the three rivers and Streets Run floodplains. Four acres of temporary impacts were calculated due to the installation of the drop shafts in the Ohio, Allegheny, and Monongahela rivers and Chartiers Creek, and 0.83 acres of temporary floodplain impacts are anticipated with the build out of the pump station and outfall in the Monongahela River and Streets Run.

Streams

The impacts to the Ohio River associated with the WWTP plant expansion have been summarized in the EA and the Aquatic Resources Impact Table. For ease of review, these impacts have also been summarized on Table B-1. Additional permanent and temporary stream impacts are anticipated with the implementation of the Clean Water Plan. Approximately 12.33 acres of streams will be permanently impacted by the installation of deep tunnels. These impacted streams include the Ohio, Allegheny and Monongahela Rivers. Installation of the connecting tunnels will permanently impact approximately 2.09 acres of streams (Allegheny River: 1.55 acres, Monongahela River: 0.541 acres). Finally, minimal permanent impacts are anticipated in Saw Mill Run due to the trenchless conveyance/consolidation sewers (0.078 acres).

Temporary impacts to streams are anticipated from the installation of the trenchless conveyance/consolidation sewers with for Saw Mill Run (0.068 acres). No additional temporary impacts are anticipated at this time, but will be re-evaluated as the Clean Water Plan implementation progresses.

Wetlands

No wetlands, as identified by the NWI mapping or PADEP wetland layers on PASDA mapping will be impacted by the implementation of the Clean Water Plan.

Assumptions Made in Calculating the Impacts

A number of assumptions were made in preparing Table 11-1 and 11-2 and calculating the impacts. These assumptions are discussed in the following bulleted list.

- A floodway is defined by FEMA as “the channel of a river or other watercourse and the adjacent land areas that must be reserved in order to discharge the base flood without cumulatively increasing the water surface elevation more than a designated height”. Floodway areas are based on FEMA mapping available through PASDA but excluding areas already counted under floodways. For watercourses not mapped by FEMA, the floodway was assumed to be 50 feet from the top of each stream bank.
- The floodplain is the 100-year floodplain defined by FEMA as areas with a 1 percent annual chance of shallow flooding, usually in the form of a pond, with an average depth ranging from 1 to 3 feet. Floodplain areas are based on FEMA mapping available through PASDA. Areas

within the floodplain as reported herein are based on areas within the "1% Annual Chance Flood Hazard" zone area as mapped but excluding areas already counted under floodways.

- A stream is defined, for the purposes of this CEA, as a flowing water body as shown on PADEP's eMap website.
- A wetland is defined as a surface water that is not a river or stream and is shown on the NWI mapping as a wetland.
- For calculating impact areas, easement assumptions were made (i.e., deep tunnel easements will be two times the outside diameter of the tunnel, etc.). These assumptions are summarized in Appendix B on Table B-2 "Summary of Easement Assumptions for Estimating Resource Impacts." The assumptions were based on previous ALCOSAN construction projects or experience with similar types of projects.
- Where potential floodplain impacts could be attributed to both a river and a stream (i.e., floodplain impacts at the confluence of a river and a stream), the floodplain impacts were divided between the two waterbodies using best professional judgment.
- Jacking pits and intermediate work pits for the trenchless sewers will be within the permanent easement. Additional area was assumed for contractor staging (0.2 acres per 500 feet of pipe).
- Additional calculation assumptions are provided at the tops of Tables B-3 through B-7 located in Appendix B.

12.0 Mitigation

Currently there are no mitigation plans for the proposed work to construct the improvements documented in the Clean Water Plan other than that already documented in the Joint Permit Application for the construction of a river wall at the Woods Run Water Treatment Plant. As the design packages progress, ALCOSAN will identify and attempt to avoid water resources to the greatest extent possible. Sites proposed for construction will be evaluated for environmental impacts and measures will be taken to minimize these impacts. Avoidance measures could include relocating drop shaft locations, minimizing open cut trench excavation, limiting construction times to avoid impacts to species, and other considerations. ALCOSAN will work with regulatory agencies on a project-specific basis to ensure that the forthcoming implementation projects are compliant with applicable regulations. At this time, no mitigation other than surface restoration is proposed.

13.0 Antidegradation

Under the IWWP, ALCOSAN and municipal CSO discharge volume is projected to decrease from 9.3 billion gallons per typical year (projected future baseline conditions) to 2.7 billion gallons. Figure 13-1 presents the substantial overflow reduction progress that will be accomplished, showing total annual untreated CSO and SSO volume discharged from ALCOSAN and municipal outfalls combined.

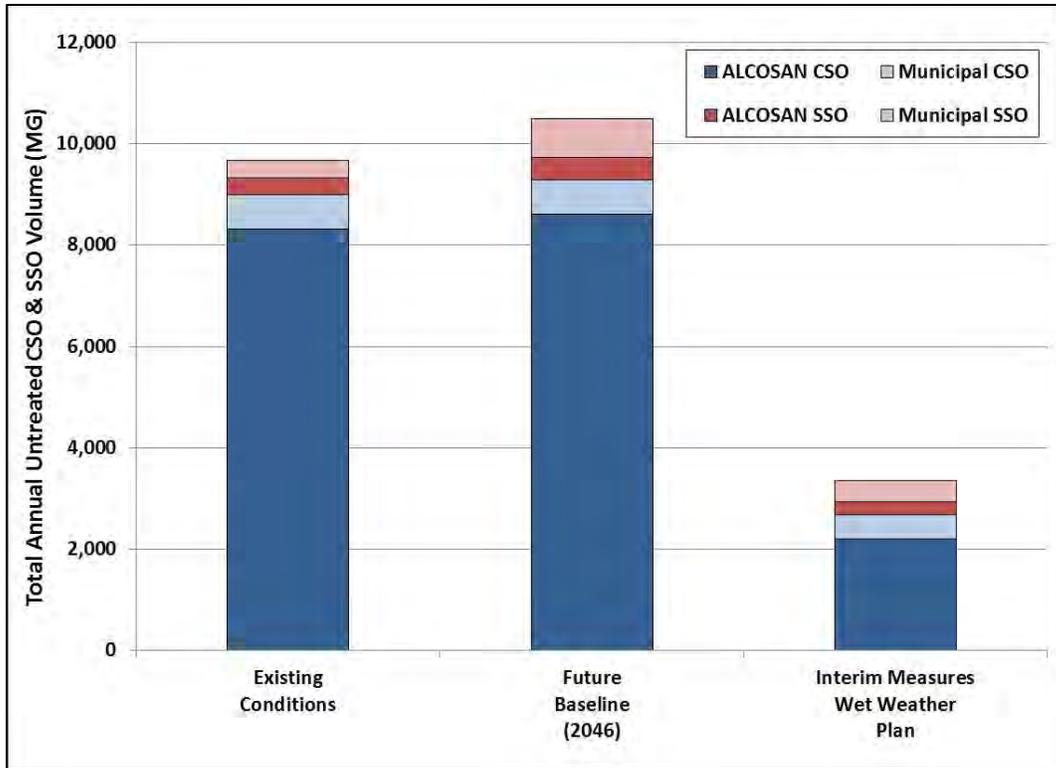


Figure 13-1: Overflow Volume Reduction Comparison for Interim Measures Wet Weather Plan

The IWWP provides a higher level of control to fifteen CSOs that discharge directly to sensitive areas. CSOs discharging to these areas are controlled to zero overflows per typical year or are re-located downstream of the sensitive area. Figure 13-2 shows the outfalls which directly impact sensitive areas and the volume of overflow associated with these outfalls for the typical year.

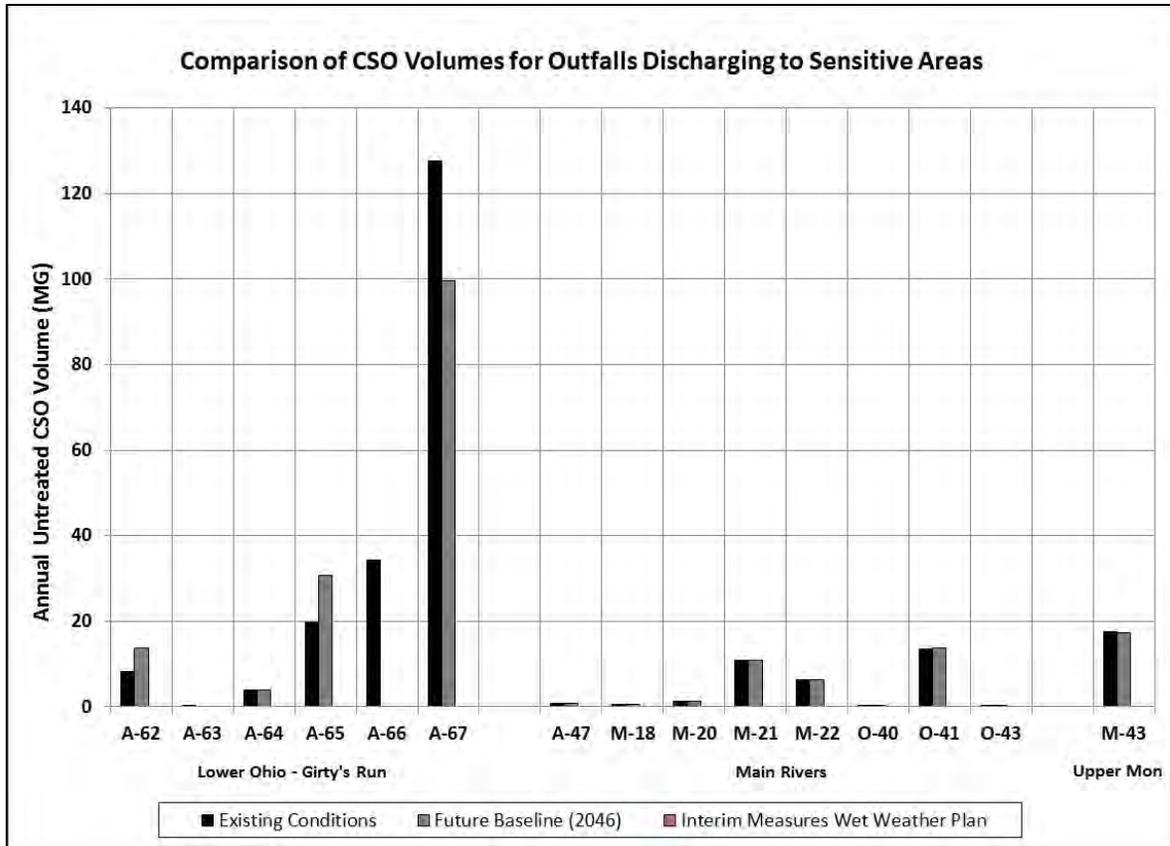


Figure 13-2: Sensitive Area CSO Volume Analysis for Interim Measures Wet Weather Plan

As the performance results presented within this sub-section show, the IWWP will achieve significant overflow reduction and initiates a long-term implementation strategy focused on cost effective and adaptive compliance with CD requirements. Since municipal flow reduction and regionalization impacts have not yet been integrated into the regional WWP, the IWWP is premised on adaptive implementation. ALCOSAN’s phased and adaptive implementation framework will provide the flexibility necessary to integrate green infrastructure and other source controls into the IWWP and subsequent phases of the Clean Water Plan. In summary, the overall quality of the surface waters is expected to significantly improve due to the implementation of the Clean Water Plan.

No high quality or exceptional value surface waters or wetlands are anticipated to be negatively impacted as the majority of tunnel work will minimally disturb the ground surface. Proposed construction of tunnel access points may temporarily disturb ground surfaces, but erosion and sediment control best management practices will be implemented and regularly monitored at all construction sites in accordance with state regulations. ALCOSAN will pre-screen sites that are proposed for disturbance for surface water impacts, wetlands, threatened and endangered species, and other site features that could impact construction, with avoidance of impacts as a first measure.

There are no new pollutants anticipated with the implementation of the Clean Water Plan. Discharge characteristics from the expanded plant will comply with the requirements established in the permit. Water quality will improve as the Clean Water Plan moves from concept to reality.

Clean water is a public need. ALCOSAN's Clean Water Plan doubles the amount of wastewater treated, allows for storage and better conveyance of wastewater to the treatment plant and implements a grant program to member municipalities for projects that will remove excess flows from the ALCOSAN collection system. By significantly reducing the amount of untreated wastewater discharged to the local waterways, the number of sewer overflow advisories will be significantly reduced, and the water quality will improve. Residents that use the waterways for transportation, boating, drinking water and fishing will have an improved experience when using the waterways. Businesses that use the rivers, directly or indirectly, will also have an improved experience.

The Implementation of the Clean Water Plan will require a skilled workforce to design and build the projects. No effect on tax revenues is anticipated from this project, other than an increase in earned income tax from additional construction and plant personnel employed for the implementation of the plan. To the extent that real estate development / redevelopment is contingent upon adequate sewage facilities, current and future growth within the service area will be impeded by regulation without implementation of the Clean Water Plan. In such event, tax revenues could stagnate or decline.

14.0 Other Existing Permanent Project Impacts

A review of projects planned for Pittsburgh and Allegheny County was performed. The results of this review are summarized on Table 14-1. The anticipated impacts to ALCOSAN projects are also summarized on the table.

Table 14-1: Existing Project Permanent Impacts

Existing Impacts	Anticipated Impacts
Port Authority of Allegheny County Bus Rapid Transit Project	No anticipated impacts.
Pittsburgh Water and Sewer Authority (PWSA) Small and Large Water Main Replacements	No anticipated impacts. Construction and utility conflicts will be coordinated with PWSA.
PWSA Four Mile Run Stormwater Infrastructure Improvements	No anticipated impacts. Construction and utility conflicts will be coordinated with PWSA.
PWSA Woods Run Stream Removal and Stormwater Infrastructure Improvements	No anticipated impacts. Construction and utility conflicts will be coordinated with PWSA.
PWSA Saw Mill Run Stream Bank Restoration Stormwater Infrastructure Improvements	No anticipated impacts. Construction and utility conflicts will be coordinated with PWSA.
Allegheny Airport Authority Terminal Modernization Program	No anticipated impacts.
McKees Rocks Bridge Improvements	No anticipated impacts. PennDOT and ALCOSAN have been meeting to discuss the impacts of the plant expansion concurrent with the bridge improvements.

15.0 Other Potential Projects Proposing Permanent Impacts

Potential projects that could overlap with the work proposed in the implementation of the Clean Water Plan and the anticipated impacts are discussed in Table 15-1.

Table 15-1: Potential Project Permanent Impacts

Potential Project	Anticipated Impacts
Army Corps of Engineers: Locks and Dams Improvements	No anticipated impacts. Construction and utility conflicts will be coordinated with the Army Corps.
Carrie Furnace Redevelopment	No anticipated impacts.
Pennsylvania Turnpike Authority: Mon-Fayette Expressway Expansion	No anticipated impacts.
Hazelwood Green Development	No anticipated impacts.

16.0 Conclusions

The implementation of the Clean Water Plan will significantly improve the region’s water quality. Though the overall plan is still in the early phases of design, the first phase of the plan, the Wood Run WWTP expansion, will enable ALCOSAN to double the amount of wastewater that they treat. The relatively small permanent impacts from the proposed plant expansion (river wall, new outfalls and barge mooring cell removal) on the Ohio River and the temporary impacts during construction of individual projects throughout the region will be small in comparison to the water quality benefits to the general public. Overall, the benefits of cleaner water will be substantial to the region’s residents, businesses and those that enjoy our rivers and streams.

Please note that the planning and design of the improvements to the conveyance system are in the very early stages and the information in this Comprehensive Environmental Assessment is based upon the concepts that ALCOSAN has prepared for their Clean Water Plan. Updates to this Comprehensive Environmental Assessment and its accompanying support materials will be submitted as ALCOSAN continues to implement its approved Clean Water Plan.

**APPENDIX A – MODIFIED CONSENT DECREE,
APPENDIX Z**

APPENDIX Z

Construction Projects and Activities Included in the Interim Measures

The Interim Measures is divided into three phases designed to support the adaptive management framework. Table 1 summarizes ALCOSAN's approach for phasing expansion of the plant's treatment capacities through Phase 3 of the Interim Measures. Additional details on the expansion of the treatment plant and construction projects to be completed during each Phase of the Interim Measures are included below.

Table 1: Phasing the Woods Run Wastewater Treatment Plant (WWTP) Expansion

Phase	Primary Treatment Capacity (MGD)	Secondary Treatment Capacity and Disinfection (MGD)	Total Wet Weather Treatment Capacity (MGD)
Interim Measures Phase 1	480		480
Interim Measures Phase 2	600		600
Interim Measures Phase 3		295	

Interim Measures PHASE 1

1. Preliminary Planning

The Preliminary Planning will determine the means of obtaining 600 MGD of sustained wet weather treatment capacity at the WWTP from the sewer collection system. ALCOSAN shall include in the Preliminary Planning:

- a geotechnical investigation and assessment,
- property evaluation and assessment,
- a hydraulic and surge analysis,
- the development of flow management and operational strategies,
- new and existing tunnel O&M and dual tunnel system optimization strategies,
- a geotechnical data report,
- a basis of design report, and
- a consolidation sewer and tunnel project schedule,
- the locations and capacities of any needed tunnel cross-connections,
- cost effective improvements to optimize the existing tunnel storage and conveyance, and
- proposals for solids and floatables controls at consolidation sewer CSO outfall locations.

During Preliminary Planning, ALCOSAN shall take into consideration the flow reduction plans submitted by the Customer Municipalities to determine whether the proposed tunnel system

could be eliminated or reduced in size. ALCOSAN shall submit any proposed adjustments to the tunnel specifications and schedule for review and approval in accordance with Paragraph 67 of the Consent Decree.

ALCOSAN shall comply with the following deadlines.

- a. On or before August 30, 2017, Procure a Preliminary Planner
- b. On or before October 1, 2020, request copies of any source reduction studies and any other relevant information regarding flow reduction from Customer Municipalities for Preliminary Planning and development of the Preliminary Basis of Design Report.
- c. On or before October 1, 2020, request from all Customer Municipalities all flow monitoring data collected by the Customer Municipalities since 2010 for use in the Preliminary Planning and development of the Preliminary Basis of Design Report.
- d. On or before March 1, 2020, request from the Customer Municipalities all mapping updates available for Preliminary Planning and for development of the Preliminary Basis of Design Report.
- e. Completion of Preliminary Planning and submission of a Preliminary Basis of Design Report, including tunnel and consolidation sewer construction schedule for review and approval: October 1, 2020
- f. On an annual basis from 2019 through 2025, request information from the Customer Municipalities from the previous 12 months on any newly collected flow data or mapping changes regarding Municipal Source Reduction Measures. By December 31st of each year, ALCOSAN shall submit an analysis of the information to determine if the Municipal Source Reduction Measures are reducing the volume or rate of flow to the Conveyance and Treatment System.
- g. ALCOSAN shall make available to all the Customer Municipalities all information or a compilation of all information collected under Paragraphs 1.a through 1.f, above, on an annual basis for the years 2021 through 2025. ALCOSAN shall make this information or compilation available by July 1 of the year following the reporting year: July 1, 2022 through July 1, 2025.

2. Woods Run Wastewater Treatment Plant Expansion

Description: Phase 1 of the Interim Measures includes initially expanding wet weather treatment capacity to 480 million gallons per day (MGD) and wet weather headworks and disinfection capacity to 600 MGD. Achieving up to 600 MGD in primary and wet weather treatment capacity via a conventional bypass of secondary treatment will be evaluated as a part of Preliminary Planning. The WWTP process unit expansion includes the following projects:

Main Pumping Station - Replacement of the six raw sewage pumps shall provide a minimum sustained pumping capacity of 480 MGD. This work is complete. ALCOSAN has:

- a. Submitted a Complete Water Quality Management (WQM) Permit Application(s): March 29, 2011

- b. Began Construction: July 1, 2012
- c. Placed in Operation: December 31, 2016

Wet Weather Headworks - Expand the headworks capacity, including screenings and grit removal process equipment, to provide a wet weather preliminary treatment sustained capacity of up to 600 MGD. The proposed process units shall provide greater redundancy and operational flexibility to handle peak flows of up to 600 MGD between the existing headworks and expanded wet weather headworks at the completion of the Interim Measures. ALCOSAN shall:

- a. Submit a Complete Water Quality Management (WQM) Permit Application(s): July 1, 2018
- b. Begin Construction: January 1, 2021
- c. Place in Operation: June 30, 2025

Disinfection - New secondary effluent disinfection facilities shall provide a sustained peak treatment capacity of 295 MGD. The disinfection facilities will be followed by post-aeration and discharge via a new plant outfall. Ultraviolet disinfection is being considered as an alternative to continuing chlorine disinfection. ALCOSAN shall:

- a. Submit a Complete WQM Permit Application(s): July 1, 2018
- b. Begin Construction: January 1, 2021
- c. Place in Operation: January 1, 2024

Wet Weather Disinfection – Upon completion of Phase II of the Interim Measures, primary treated effluent flows exceeding secondary treatment capacity will be routed to the existing chlorine contact tanks which will be modified for wet weather disinfection. The existing chlorination/dechlorination processes shall be modified to provide up to 305 MGD capacity for wet weather flows, followed by post aeration and discharge at a new outfall. The existing disinfection and wet weather disinfection systems together shall provide a sustained peak disinfection capacity of 600 MGD. ALCOSAN shall:

- a. Submit a Complete WQM Permit Application(s): April 1, 2023
- b. Begin Construction: January 1, 2024
- c. Place in Operation: December 30, 2025

3. Existing Infrastructure Inspection/Rehabilitation

Description: ALCOSAN shall evaluate its past inspections of its deep tunnels, shallow cut interceptors, river crossings and sewer pipes and provide an assessment of the flow and storage capacity of each as well as submit a schedule for future inspections, maintenance and rehabilitation to maximize flow capacity.

a. By March 31, 2019, ALCOSAN shall submit to the Plaintiffs an Infrastructure Assessment Update that includes the following:

1. A description of the conditions of each deep tunnel and a summary of the design and estimate of current flow conveyance and storage capacity of each deep tunnel conveyance as of December 31, 2016.
2. A description of the conditions of each shallow cut interceptor and a summary of the design and estimate of current flow conveyance and storage capacity of each shallow cut interceptor as of December 31, 2016.
3. A description of the conditions of each river crossing and a summary of the design and estimate of current flow conveyance and storage capacity of each river crossing as of December 31, 2016.

b. By March 31, 2019, ALCOSAN shall submit for review and approval in accordance with Section VIII (Review and Approval of Submittals) a revised schedule for additional inspections, maintenance and rehabilitation of the deep tunnel interceptors, shallow cut interceptors and river crossings to maximize the flow conveyance and flow storage of all.

Interim Measures PHASE 2

1. Woods Run Wastewater Treatment Plant Expansion

Description: Phase 2 of the Interim Measures includes increasing the Primary Treatment and total sustained wet weather pumping capacity to 600 MGD via the construction of additional primary sedimentation basins and a wet weather pump station as follows:

Wet Weather Pump Station - The construction of a new Wet Weather Pump Station will increase the total raw wastewater pumping capacity to facilitate the ultimate sustained wet weather treatment capacity of 600 MGD. The new pump station shall pump from the existing or new regional tunnel so that combined with the Main Pumping Station upgrade the total influent pumping capacity can achieve the planned sustained capacity of 600 MGD.

If the pumping concept is a dewatering pump station for the new regional tunnel, ALCOSAN shall:

- a. Submit a Complete WQM Permit Application(s): January 1, 2022
- b. Begin Construction: March 1, 2023

c. Place in Operation: December 31, 2027

If ALCOSAN wishes to propose any other pumping concept, it shall submit a proposed revision to the Wet Weather Plan in accordance with Paragraph 67 of the Consent Decree, including a schedule for design, construction and placing in operation of the new pump station with the Preliminary Planning Basis of Design Report: October 1, 2020.

Primary Treatment Sedimentation Basins – Two primary sedimentation tanks will be added to the existing nine tanks to provide a sustained peak flow capacity of 600 MGD with 10 of the 11 tanks in service.

a. Submit a Complete WQM Permit Application(s): January 1, 2022

b. Begin Construction: March 1, 2023

c. Place in Operation: December 31, 2027

2. Ohio River Tunnel Segments

Description: Table 2 summarizes the preliminary regional tunnel characteristics for the Ohio River tunnel segments. Based upon its review of any source reduction studies and any other technically reliable information received from the Customer Municipalities on December 1, 2017, ALCOSAN may propose eliminating or changing the design of the regional tunnels during its Preliminary Planning phase in accordance with Paragraph 67 of the Consent Decree. ALCOSAN shall include any proposed revisions to Regional Tunnel System characteristics in the Preliminary Planning, “Preliminary Basis of Design” report due October 1, 2020. Preliminary Planning and tunnel segment design will be based on 2046 flow projections.

Table 2: Preliminary Ohio River Tunnel Characteristics

Tunnel Segment	Diameter (feet)	Length (miles)	Volume (MG)
Ohio	14	1.9	12
River Crossing to Chartiers Creek Basin	14	0.8	5
River Crossing to Saw Mill Run Basin	14	0.3	2

Ohio River/Chartiers/Saw Mill Tunnel Segments

ALCOSAN shall:

a. Submit a Complete WQM Permit Application(s): January 1, 2022

b. Begin Construction: March 1, 2023

c. Place Facilities in Operation: December 31, 2027

d. Within six (6) months after placing the facilities into operation, ALCOSAN shall amend all applicable portions of submissions and databases required by the Appendices referenced in Section VI.F of the Amended Consent Decree to reflect substitutions or additions to the construction, operation and maintenance of the facilities.

3. Ohio River Tunnel Segments Consolidation Sewers/Conveyance Improvements

Description: The “Existing Sewer Consolidation/ Conveyance Improvement” projects consist of new consolidation/connector sewers and new regulators required to convey flow to new Ohio River tunnel segment drop shafts, as well as modifications to existing sewers and regulators. The scope and general locations for these projects shall be included in the regional tunnel Preliminary Basis of Design report and shall include proposals for solids and floatables controls at consolidation sewer CSO outfall locations. ALCOSAN shall:

- a. Submittal of the Preliminary Basis of Design Report: October 1, 2020
 1. Submit “Existing Sewer Consolidation/Conveyance System Improvement” report for review and approval: October 1, 2020
- b. Submit a Complete WQM Permit Application(s): January 1, 2023
- c. Begin Construction: March 1, 2025
- d. Complete Construction and Place Facilities in Operation: December 31, 2027
- e. Within six (6) months after placing the facilities into operation, ALCOSAN shall amend all applicable portions of submissions and databases required by the Appendices referenced in Section VI.F of the Amended Consent Decree to reflect substitutions or additions to the construction, operation and maintenance of the facilities.

Interim Measures PHASE 3

1. Woods Run Wastewater Treatment Plant Expansion

Description: Phase 3 of the Interim Measures will include expanding secondary treatment capacity to 295 MGD as follows:

Secondary Treatment - Two final settling tanks including plant conveyance modifications and a new return activated sludge (RAS) pumping station shall provide a sustained secondary treatment capacity of 295 MGD. ALCOSAN shall:

- a. Submit a Complete WQM Permit Application(s): July 1, 2022
- b. Begin Construction: July 1, 2023
- c. Place in Operation: December 31, 2025

2. Regional Tunnels

Description: Table 3 summarizes the preliminary regional tunnel characteristics for the Allegheny and Monongahela Rivers. ALCOSAN may propose eliminating or changing the design of the regional tunnels during its Preliminary Planning phase in accordance with Paragraph 67 of the Consent Decree.

Table 3: Preliminary Allegheny and Monongahela Tunnel Characteristics

Tunnel Segment	Diameter (feet)	Length (miles)	Volume (MG)
Allegheny	14	7.9	48
Monongahela	14	4.5	28

Allegheny River Tunnel Segment

ALCOSAN shall:

- a. Submit a Complete WQM Permit Application(s): November 1, 2026
- b. Begin Construction: January 1, 2028
- c. Place Facilities in Operation: December 31, 2034
- d. Within six (6) months after placing the facilities into operation, ALCOSAN shall amend all applicable portions of submissions and databases required by the Appendices referenced in Section VI.F of the Amended Consent Decree to reflect substitutions or additions to the construction, operation and maintenance of the facilities.

Monongahela River Tunnel Segment

ALCOSAN shall:

- a. Submit a Complete WQM Permit Application(s): November 1, 2030
- b. Begin Construction: January 1, 2032
- c. Place Facilities in Operation: December 31, 2036
- d. Within six (6) months after placing the facilities into operation, ALCOSAN shall amend all applicable portions of submissions and databases required by the Appendices referenced in Section VI.F of the Amended Consent Decree to reflect substitutions or additions to the construction, operation and maintenance of the facilities.

3. Allegheny/Monongahela River Tunnel Segments Consolidation Sewers/Conveyance Improvements

Description: The “Existing Sewer Consolidation/ Conveyance Improvement” projects consist of new consolidation/connector sewers and new regulators required to convey flow to new regional tunnel drop shafts, as well as modifications to existing sewers and regulators. The scope and general locations for these projects shall be included in the regional tunnel Basis of Design report and shall include discussions and proposals for solids and floatables controls at consolidation sewer CSO outfall locations. ALCOSAN shall:

- a. Submit the Preliminary Basis of Design Report and an “Existing Sewer Consolidation/Conveyance System Improvement” report for review and approval: October 1, 2020
- b. Submit a Complete WQM Permit Application(s): January 1, 2032
- c. Begin Construction: March 1, 2033
- d. Complete Construction and Place Facilities in Operation: December 31, 2036
- e. Within six (6) months after placing the facilities into operation, ALCOSAN shall amend all applicable portions of submissions and databases required by the Appendices referenced in Section VI.F of the Amended Consent Decree to reflect substitutions or additions to the construction, operation and maintenance of the facilities.

4. Upper Monongahela Retention Treatment Basin

Description: The Upper Monongahela Retention Treatment Basin (RTB) project includes a consolidation sewer and retention treatment basin sized to control the M-42, M-43 and M-44 CSOs (“Preliminary Sizing”). It may also be sized to accommodate future control of the M-45 and M-49 CSOs via an extension of the consolidation sewer beyond M-44.

The RTB will provide screening, settling, floatables control via fixed baffles, and disinfection of combined sewage. Coarse screens located upstream of the influent pumps for the storage basin will remove the larger solids and debris from the flow stream. ALCOSAN shall provide a preliminary basis of design for this structure as part of the preliminary basis of design report due October 1, 2020.

For small storm events which do not fill the RTB, captured flow and solids which remain in the RTB after the event shall be pumped back to the existing interceptor when the basin is dewatered. For larger storm events that fill the RTB, the basin shall begin operating in a flow through treatment mode and will discharge treated effluent to the Monongahela River through a new outfall. As with smaller events, captured flow and solids which remain in the RTB after the event shall be pumped back to the existing interceptor after the event.

The Preliminary Sizing described above assumes all upstream Municipal Source Reduction Measures are not constructed. The need for this project and its sizing may change significantly before proceeding with preliminary design depending on municipal flow reduction efforts and regionalization.

- a. ALCOSAN shall provide its recommendations for construction and final design in

accordance with Paragraph 67 of the Consent Decree and:

- b. Submit a Complete WQM Permit Application(s): January 1, 2027
- c. Award Contract for Construction & Begin Construction: March 1, 2028
- d. Place in Operation: December 31, 2031
- e. Within six (6) months after placing the facilities into operation, ALCOSAN shall amend all applicable portions of submission and databases required by the Appendices referenced in Section VI.F of the Amended Consent Decree to reflect substitutions or additions to the construction, operation and maintenance of the facilities.

**APPENDIX B – SUPPORTING IMPACT
CALCULATIONS**

Table B-1 Calculations for WWTP Impacts

Temporary and Permanent Impacts are per the Aquatic Resource Impact Table for the Wet Weather Plant Expansion Program - River Wall and Outfalls.

Structure / Activity unique identifier	Aquatic Resource Type	Waters Name	Work Proposed	DEP Impact Type temp / perm	Watercourse Impact Top of Bank to Top of Bank			Floodway Impact Top of Bank Landward			Wetland Impact Dimensions		
					Length in feet	Width in feet	Area in sq feet	Length in feet	Width in feet	Area in sq feet	Length in feet	Width in feet	Area in sq feet
Temporary Impacts													
MC-9	Watercourse Perennial	Ohio River	Remove Mooring Cell MC-9	Temp	MC =13.5 ft dia + 5 ft buffer (434 SF)		434	None	None	None	N/A	N/A	N/A
MC-10	Watercourse Perennial	Ohio River	Remove Mooring Cell MC-10	Temp	MC =13.5 ft dia + 5 ft buffer (434 SF)		434	None	None	None	N/A	N/A	N/A
MC-11	Watercourse Perennial	Ohio River	Remove Mooring Cell MC-11	Temp	MC =13.5 ft dia + 5 ft buffer (434 SF)		434	None	None	None	N/A	N/A	N/A
MC-12	Watercourse Perennial	Ohio River	Remove Mooring Cell MC-12	Temp	MC =13.5 ft dia + 5 ft buffer (434 SF)		434	None	None	None	N/A	N/A	N/A
MC-13	Watercourse Perennial	Ohio River	Remove Mooring Cell MC-13	Temp	MC =13.5 ft dia + 5 ft buffer (434 SF)		434	None	None	None	N/A	N/A	N/A
Grand Total							2,170	0	0	0	0	0	0
Permanent Impacts													
OR-1	Watercourse Perennial	Ohio River	River Wall with Clean Fill	Perm	1154	varies	9,838	None	None	None	N/A	N/A	N/A
OR-1	Watercourse Perennial	Ohio River	Revetment Placement for River Wall Stabilization and Habitat Enhancement	Perm	1154	25	28,850	None	None	None	N/A	N/A	N/A
OR-1	Watercourse Perennial	Ohio River	Mitigation Area	Perm	None	None	12,109	None	None	None	N/A	N/A	N/A
OR-1	Watercourse Perennial	Ohio River	Floodplain fill	Perm			26,564	None	None	None	N/A	N/A	N/A
OUTFL-1	Watercourse Perennial	Ohio River	Outfall (Outfall 001)	Perm			Included with wall	None	None	None	N/A	N/A	N/A
OUTFL-2	Watercourse Perennial	Ohio River	Outfall (Outfall 002)	Perm	25	39	975	None	None	None	N/A	N/A	N/A
OUTFL-3	Watercourse Perennial	Ohio River	Outfall (CSO-026)	Perm	10	10	100	None	None	None	N/A	N/A	N/A
Grand Total							78,436	0	0	0	0	0	0
OUTFL-4	Watercourse Perennial	Ohio River	Outfall (SW-2)	None – above OHWM			Included with wall, but above OHWM	None	None	None	N/A	N/A	N/A

Table B-2 Summary of Easement Assumptions for Estimating Resource Impacts*

*as used on Tables B-3 through B-7

Type of Proposed Structures	Permanent Easement Assumptions	Temporary Easement Assumptions (additional area needed beyond permanent easement)
Deep Tunnel	2 x the tunnel outside diameter	Additional area needed during construction is a 5 acre site for each of 3 tunnel working shafts yet be sited.
Connecting Tunnels	2 x the tunnel outside diameter	None required. Connecting tunnels will be constructed from drop shaft sites to main tunnel whose impacts are quantified in those categories.
Conveyance/Consolidation Sewers - open cut	20 ft	20 ft in addition to the permanent easement
Conveyance/Consolidation Sewers - trenchless	20 ft	Assume jacking pits and intermediate work pits for trenchless sewers will fall within the permanent easement, so the only additional temporary easement will be a contractor staging area. Assume the needed area is 0.2 acres per 500 ft of pipe.
Drop Shafts	0.5 acres per drop shaft	0.5 acres per drop shaft in addition to the permanent easement
Facilities	2 x the size of the facility footprint	1 x the size of the facility footprint, in addition to the permanent easement
Outfall for Retention Treatment Basin - open cut	20 ft	20 ft in addition to the permanent easement

Table B-3 Calculations for Deep Tunnels

Assumptions:

1. Assume deep tunnel outside diameter is 4 ft greater than inside diameter.
2. Assume permanent easement is 2 times the tunnel outside diameter.

Calculation Approach

1. Permanent area of impact is calculated as (Pipe O.D. x 2) x length within the resource, then divided by 43,560 to convert to acres.
2. Temporary impact is the additional area needed during construction, which is a 5 acre site for 3 tunnel working shafts yet be sited. One will be assigned to each of 3 major tunnel segments. These sites will not be in the floodway, streams or wetlands. Assume worst case that these sites are completely in the floodplain, but would try to avoid that.

Inside Dia. (ft)	Outside Dia. (ft)	Length (ft)	Length (miles)	Deep Tunnel Lengths Within Resources from GIS/Mapping (ft)				Permanent Area of Impact (acres)				Temporary Area of Impact (acres)			
				Floodway	100 year Floodplain (excluding Floodway)	Streams	Wetlands	Floodway	100 year Floodplain (excluding Floodway)	Streams	Wetlands	Floodway	100 year Floodplain (excluding Floodway)	Streams	Wetlands
Ohio River - Ohio River Deep CSO Tunnel, including 2 crossings to southwest side of Ohio River (Figure 4-4)															
3 miles of 16' diameter tunnel in and along the Ohio River with possible tunnel relief outfall.															
16	20	15,542	2.94	3,969	4,820	3,502	0	3.64	4.43	3.22	0.00	0.00	5.00	0.00	0.00
Ohio River - Portion of Allegheny River Deep CSO Tunnel (Figure 4-4)															
0.7 miles of 16' diameter tunnel in and along the Ohio River.															
16	20	3,582	0.68	0	2,196	0	0	0.00	2.02	0.00	0.00	0.00	0.00	0.00	0.00
Ohio River - Portion of Monongahela River Deep CSO Tunnel (Figure 4-4)															
1.3 miles of 16' diameter tunnel in and along the Ohio River.															
16	20	6,963	1.32	0	2,305	0	0	0.00	2.12	0.00	0.00	0.00	0.00	0.00	0.00
Chartiers Creek - Portion of Ohio River Deep CSO Tunnel (Figure 4-4)															
0.1 miles of 16' diameter tunnel in and along Chartiers Creek															
16	20	500	0.09	0	248	0	0	0.00	0.23	0.00	0.00	0.00	0.00	0.00	0.00
Allegheny River - Allegheny River Deep CSO Tunnel (Figure 4-1 & 4-2)															
7.2 miles of 16' diameter tunnel in and along the Allegheny River with possible tunnel relief outfall.															
16	20	37,881	7.17	9,239	5,193	4,313	0	8.48	4.77	3.96	0.00	0.00	5.00	0.00	0.00
Allegheny River - Portion of Monongahela River Deep CSO Tunnel (Figure 4-1 & 4-3)															
0.5 miles of 16' diameter tunnel in and along the Allegheny River.															
16	20	2,451	0.46	219	807	1,425	0	0.20	0.74	1.31	0.00	0.00	0.00	0.00	0.00
Monongahela River - Monongahela River Deep CSO Tunnel (Figure 4-3)															
2.7 miles of 16' diameter tunnel in and along the Monongahela River with possible tunnel relief outfall.															
16	20	14,224	2.69	2,799	7,240	4,185	0	2.57	6.65	3.84	0.00	0.00	5.00	0.00	0.00
Grand Total		81,143	15	16,226	22,809	13,425	0	14.90	20.94	12.33	0.00	0.00	15.00	0.00	0.00

Table B-4 Calculations for Connecting Tunnels

Assumptions:

1. Assume connection tunnel outside diameter is 4 ft greater than inside diameter.
2. Assume permanent easement is 2 times the connecting tunnel outside diameter.

Calculation Approach

1. Permanent area of impact is calculated as (Pipe O.D. + 10 ft) x length within the resource, then divided by 43,560 to convert to acres
2. Temporary area of impact is zero as connecting tunnels will be constructed from drop shaft sites whose impacts are quantified in that category.

Drop Shaft	Inside Dia. (ft)	Outside Dia. (ft)	Length (ft)	Length (miles)	Connecting Tunnel Lengths Within Resources from GIS/Mapping (ft)				Permanent Area of Impact (acres)				Temporary Area of Impact (acres)			
					Floodway	100 year Floodplain (excluding Floodway)	Streams	Wetlands	Floodway	100 year Floodplain (excluding Floodway)	Streams	Wetlands	Floodway	100 year Floodplain (excluding Floodway)	Streams	Wetlands
Ohio River - Connecting tunnels for Ohio River CSO Tunnel including 2 crossings to southwest side of Ohio River - associated with drop shafts for O-06, O-27 & MR_CF11 (Figure 4-4)																
3 connecting tunnels, 10' diameter, total length of 340 ft																
O-06	10	14	307	0.06	11	5	0	0	0.007	0.004	0.000	0.000	0	0	0	0
O-27	10	14	30	0.01	0	30	0	0	0.000	0.019	0.000	0.000	0	0	0	0
MR_CF11	10	14	7	0.00	0	7	0	0	0.000	0.005	0.000	0.000	0	0	0	0
Totals			344	0.1	11	43	0	0	0.007	0.028	0.000	0.000	0.000	0.000	0.000	0.000
Ohio River - Connecting tunnel for portion of Allegheny River CSO Tunnel - associated with drop shafts for O-43 (Figure 4-1 & 4-4)																
1 connecting tunnel, 10' diameter, total length of 50 ft																
O-43	10	14	51	0.01	0	51	0	0	0.000	0.033	0.000	0.000	0	0	0	0
Chartiers Creek - Connecting tunnel for portion of Ohio River CSO Tunnel - associated with drop shaft for O-07 (Figure 4-4)																
1 connecting tunnel, 10' diameter, total length of 40 ft																
O-07	10	14	40	0.01	0	40	0	0	0.000	0.026	0.000	0.000	0	0	0	0
Allegheny River - Connecting tunnels for portion of Allegheny River CSO Tunnel associated with drop shafts MR_CF32, MR_CF24, MR_CF36, LNA_CF10 & A-22 (Figure 4-1)																
4 connecting tunnels, 3 @ 10' diameter and 1 @ 13' diameter, total length of 1,100 ft																
MR_CF32	10	14	828	0.16	209	241	0	0	0.134	0.155	0.000	0.000	0	0	0	0
MR_CF34	10	14	124	0.02	24	100	0	0	0.015	0.064	0.000	0.000	0	0	0	0
MR_CF36 & LNA_CF10	10	14	49	0.01	49	0	0	0	0.031	0.000	0.000	0.000	0	0	0	0
A-22	13	17	102	0.02	0	0	0	0	0.000	0.000	0.000	0.000	0	0	0	0
Totals			1,103	0.2	282	341	0	0	0.181	0.219	0.000	0.000	0.000	0.000	0.000	0.000
Allegheny River - Connecting tunnels for portion of Allegheny River CSO Tunnel associated with drop shafts MR_CF04, A-68, UA_CF04, A-41 & A-42 (Figure 4-2)																
5 connecting tunnels, 2 @ 10' diameter, 2 @ 13' diameter and 1 @ 16' diameter, total length of 3,100 ft																
MR_CF04	10	14	224	0.04	0	0	0	0	0.000	0.000	0.000	0.000	0	0	0	0
A-68	10	14	1,313	0.25	32	0	1,107	0	0.021	0.000	0.712	0.000	0	0	0	0
UA_CF04	13	17	1,255	0.24	137	4	1,074	0	0.107	0.003	0.838	0.000	0	0	0	0
A-41	13	17	230	0.04	0	0	0	0	0.000	0.000	0.000	0.000	0	0	0	0
A-42	16	20	56	0.01	0	56	0	0	0.000	0.051	0.000	0.000	0	0	0	0
Totals			3,078	0.6	169	60	2,181	0	0.128	0.055	1.550	0.000	0.000	0.000	0.000	0.000

Table B-4 Calculations for Connecting Tunnels

Assumptions:

1. Assume connection tunnel outside diameter is 4 ft greater than inside diameter.
2. Assume permanent easement is 2 times the connecting tunnel outside diameter.

Calculation Approach

1. Permanent area of impact is calculated as (Pipe O.D. + 10 ft) x length within the resource, then divided by 43,560 to convert to acres
2. Temporary area of impact is zero as connecting tunnels will be constructed from drop shaft sites whose impacts are quantified in that category.

Drop Shaft	Inside Dia. (ft)	Outside Dia. (ft)	Length (ft)	Length (miles)	Connecting Tunnel Lengths Within Resources from GIS/Mapping (ft)				Permanent Area of Impact (acres)				Temporary Area of Impact (acres)			
					Floodway	100 year Floodplain (excluding Floodway)	Streams	Wetlands	Floodway	100 year Floodplain (excluding Floodway)	Streams	Wetlands	Floodway	100 year Floodplain (excluding Floodway)	Streams	Wetlands
Monongahela River - Connecting tunnels for portion of Monongahela River CSO Tunnel associated with drop shafts MR_CF19, MR_CF20, MR_CF07 & M-29 (Figure 4-3)																
4 connecting tunnels, 3 @ 10' diameter and 1 @ 13' diameter, total length of 1,100 ft																
MR_CF19	10	14	22	0.00	0	22	0	0	0.000	0.014	0.000	0.000	0	0	0	0
MR_CF20	10	14	35	0.01	0	14	0	0	0.000	0.009	0.000	0.000	0	0	0	0
MR_CF07	10	14	989	0.19	0	58	842	0	0.000	0.037	0.541	0.000	0	0	0	0
M-29	13	17	101	0.02	0	0	0	0	0.000	0.000	0.000	0.000	0	0	0	0
Totals			1,147	0.2	0	94	842	0	0.000	0.060	0.541	0.000	0.000	0.000	0.000	0.000
Grand Total			5,763	1.1	462	629	3,023	0	0.316	0.420	2.091	0.000	0.000	0.000	0.000	0.000

Table B-5 Calculations for Conveyance/Consolidation Sewers

Assumptions:

1. Assume permanent easement is 20 feet wide for all sewers, trenchless and open cut.
2. Assume temporary easement for open cut sewers is 40 feet wide, or 20 ft in addition to the permanent easement.
3. Assume jacking pits and intermediate work pits for trenchless sewers will fall within the permanent easement, so the only additional (temporary) impact will be a contractor staging area. Assume the needed area is 0.2 acres per 500 ft of pipe.

Calculation Approach

1. For calculating length within the resource for streams without FEMA mapping and enclosed streams, use 50 feet beyond each bank of open streams, and 50 feet beyond each side of enclosed streams.
2. Permanent area of impact is calculated as 20' x length within the resource, then divided by 43,560 to convert to acres.
3. Temporary area of impact for open cut sewers is calculated as 20' x length within the resource, then divided by 43,560 to convert to acres.
4. Temporary area of impact for trenchless sewers is calculated as (0.2 acres/500 ft) x length within the resource.

Drop Shaft	Proposed Sewers Description for Table 11-1	Inside Dia. (ft)	Length (ft)	Length (miles)	Conveyance/Consolidation Sewer Lengths Within Resources from GIS/Mapping (ft)				Permanent Area of Impact (acres)				Temporary Area of Impact (acres)			
					Floodway	100 year Floodplain (excluding Floodway)	Streams	Wetlands	Floodway	100 year Floodplain (excluding Floodway)	Streams	Wetlands	Floodway	100 year Floodplain (excluding Floodway)	Streams	Wetlands
MR_CF34	2' diameter pipe, 610' long (MR_CF34)	2	614	0.12	0	614	0	0	0.000	0.282	0.000	0.000	0.000	0.282	0.000	0.000
MR_CF34	4' diameter pipe, 100' long (MR_CF34)	4	103	0.02	0	103	0	0	0.000	0.047	0.000	0.000	0.000	0.047	0.000	0.000
MR_CF34	6' diameter pipe, 120' long (MR_CF34)	6	118	0.02	0	118	0	0	0.000	0.054	0.000	0.000	0.000	0.054	0.000	0.000
MR_CF36	2' diameter pipe, 1,100' long (MR_CF36)	2	1,117	0.21	866	251	0	0	0.398	0.115	0.000	0.000	0.398	0.115	0.000	0.000
LNA_CF10	6.5' diameter pipe, 3,700' long (LNA_CF10)	6.5	3,665	0.69	3,665	0	0	0	1.683	0.000	0.000	0.000	1.683	0.000	0.000	0.000
LNA_CF10	7' diameter pipe, 2,900' long (LNA_CF10)	7	2,875	0.54	1,600	0	0	0	0.735	0.000	0.000	0.000	0.735	0.000	0.000	0.000
LNA_CF10	7.5' diameter pipe, 180' long (LNA_CF10)	7.5	180	0.03	180	0	0	0	0.083	0.000	0.000	0.000	0.083	0.000	0.000	0.000
A-22	7' diameter pipe, 90' long (A-22)	7	94	0.02	0	0	0	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Totals			9,093	1.7	6,311	1,086	0	0	2.898	0.499	0.000	0.000	2.898	0.499	0.000	0.000
Allegheny River - Conveyance/consolidation sewers for portion of Allegheny River CSO Tunnel associated with drop shafts MR_CF04, portion of A-68, UA_CF04, A-41 & A-42 (Figure 4-2)																
Trenchless Construction																
MR_CF04	4' diameter pipe, 1,100' long (MR_CF04)	4	1,116	0.21	0	0	0	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
MR_CF04	5' diameter pipe, 230' long (MR_CF04)	5	225	0.04	0	0	0	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
UA_CF04	5' diameter pipe, 3,300' long (UA_CF04)	5	3,264	0.62	602	154	0	0	0.276	0.071	0.000	0.000	0.241	0.062	0.000	0.000
A-68	7' diameter pipe, half of 400' length (A-68)	7	200	0.04	82	0	0	0	0.038	0.000	0.000	0.000	0.033	0.000	0.000	0.000
A-41	5' diameter pipe, 70' long (A-41)	5	73	0.01	0	0	0	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Totals			4,878	0.9	684	154	0	0	0.314	0.071	0.000	0.000	0.274	0.062	0.000	0.000
Open Cut Construction																
MR_CF04	5' diameter pipe, 40' long (MR_CF04)	5	44	0.01	0	0	0	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
UA_CF04	3' diameter pipe, 220' long (UA_CF04)	3	219	0.04	0	21	0	0	0.000	0.010	0.000	0.000	0.000	0.010	0.000	0.000
UA_CF04	5' diameter pipe, 3,500' long (UA_CF04)	5	3,471	0.66	2,260	323	0	0	1.038	0.148	0.000	0.000	1.038	0.148	0.000	0.000
UA_CF04	5.5' diameter pipe, 3,200' long (UA_CF04)	5.5	3,171	0.60	2,345	826	0	0	1.077	0.379	0.000	0.000	1.077	0.379	0.000	0.000
A-42	6' diameter pipe, 20' long (A-42)	6	22	0.00	0	22	0	0	0.000	0.010	0.000	0.000	0.000	0.010	0.000	0.000
A-42	10' diameter pipe, 30' long (A-42)	10	25	0.00	0	25	0	0	0.000	0.011	0.000	0.000	0.000	0.011	0.000	0.000

Table B-5 Calculations for Conveyance/Consolidation Sewers

Assumptions:

1. Assume permanent easement is 20 feet wide for all sewers, trenchless and open cut.
2. Assume temporary easement for open cut sewers is 40 feet wide, or 20 ft in addition to the permanent easement.
3. Assume jacking pits and intermediate work pits for trenchless sewers will fall within the permanent easement, so the only additional (temporary) impact will be a contractor staging area. Assume the needed area is 0.2 acres per 500 ft of pipe.

Calculation Approach

1. For calculating length within the resource for streams without FEMA mapping and enclosed streams, use 50 feet beyond each bank of open streams, and 50 feet beyond each side of enclosed streams.
2. Permanent area of impact is calculated as 20' x length within the resource, then divided by 43,560 to convert to acres.
3. Temporary area of impact for open cut sewers is calculated as 20' x length within the resource, then divided by 43,560 to convert to acres.
4. Temporary area of impact for trenchless sewers is calculated as (0.2 acres/500 ft) x length within the resource.

Drop Shaft	Proposed Sewers Description for Table 11-1	Inside Dia. (ft)	Length (ft)	Length (miles)	Conveyance/Consolidation Sewer Lengths Within Resources from GIS/Mapping (ft)				Permanent Area of Impact (acres)				Temporary Area of Impact (acres)			
					Floodway	100 year Floodplain (excluding Floodway)	Streams	Wetlands	Floodway	100 year Floodplain (excluding Floodway)	Streams	Wetlands	Floodway	100 year Floodplain (excluding Floodway)	Streams	Wetlands
Totals			6,952	1.3	4,605	1,217	0	0	2.114	0.559	0.000	0.000	2.114	0.559	0.000	0.000
Pine Creek - Conveyance/consolidation sewers for portion of Allegheny River CSO Tunnel associated with drop shafts - portion of A-68 (Figure 4-2)																
Trenchless Construction																
A-68	7' diameter pipe, half of 400' length (A-68)	7	199	0.04	82	0	0	0	0.038	0.000	0.000	0.000	0.038	0.000	0.000	0.000
Guyasuta Run - Conveyance/consolidation sewers for portion of Allegheny River CSO Tunnel associated with drop shafts - portion of UA_CF04 (Figure 4-2)																
Trenchless Construction																
UA_CF04	5' diameter pipe, 70' long (UA_CF04)	5	70	0.01	70	0	0	0	0.032	0.000	0.000	0.000	0.028	0.000	0.000	0.000
Monongahela River - Conveyance/consolidation sewers for portion of Monongahela River CSO Tunnel associated with drop shafts MR_CF19, MR_CF20, MR_CF07 (Figure 4-3)																
Trenchless Construction																
MR_CF19	2' diameter pipe, 170' long (MR_CF19)	2	169	0.03	0	169	0	0	0.000	0.078	0.000	0.000	0.000	0.068	0.000	0.000
MR_CF19	3' diameter pipe, 610' long (MR_CF19)	3	610	0.12	0	610	0	0	0.000	0.280	0.000	0.000	0.000	0.244	0.000	0.000
MR_CF07	4' diameter pipe, 1200' long (MR_CF07)	4	1,198	0.23	0	30	0	0	0.000	0.014	0.000	0.000	0.000	0.012	0.000	0.000
Totals			1,977	0.4	0	809	0	0	0.000	0.371	0.000	0.000	0.000	0.324	0.000	0.000
Open Cut Construction																
MR_CF19	2' diameter pipe, 880' long (MR_CF19)	2	883	0.17	0	592	0	0	0.000	0.272	0.000	0.000	0.000	0.272	0.000	0.000
MR_CF20	2' diameter pipe, 190' long (MR_CF20)	2	185	0.04	0	150	0	0	0.000	0.069	0.000	0.000	0.000	0.069	0.000	0.000
MR_CF20	3' diameter pipe, 1000' long (MR_CF20)	3	1,031	0.20	0	0	0	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
MR_CF07	4' diameter pipe, 820' long (MR_CF07)	4	820	0.16	0	0	0	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Totals			2,919	0.6	0	742	0	0	0.000	0.341	0.000	0.000	0.000	0.341	0.000	0.000
Monongahela River - Portion of Conveyance/consolidation sewers for retention treatment basin serving flow group UM_CF02 (Figure 4-5)																
Trenchless Construction																
UM_CF02	1.5' diameter pipe, 1,100' long (UM_CF02)	1.5	1,080	0.20	249	381	0	0	0.114	0.175	0.000	0.000	0.100	0.152	0.000	0.000
UM_CF02	10' diameter pipe, 5500' long (UM_CF02)	10	5,460	1.03	0	743	0	0	0.000	0.341	0.000	0.000	0.000	0.297	0.000	0.000
Totals			6,540	1.2	249	1,124	0	0	0.114	0.516	0.000	0.000	0.100	0.450	0.000	0.000
4-Mile Run - Portion of conveyance/consolidation sewers for portion of Monongahela River CSO Tunnel associated with drop shaft M-29 (Figure 4-3)																
Trenchless Construction																
M-29	12' diameter pipe, 220' long (M-29)	12	215	0.04	215	0	0	0	0.099	0.000	0.000	0.000	0.086	0.000	0.000	0.000
West Run - Portion of Conveyance/consolidation sewers for retention treatment basin serving flow group UM_CF02 (Figure 4-5)																
Trenchless Construction																

Table B-5 Calculations for Conveyance/Consolidation Sewers

Assumptions:

1. Assume permanent easement is 20 feet wide for all sewers, trenchless and open cut.
2. Assume temporary easement for open cut sewers is 40 feet wide, or 20 ft in addition to the permanent easement.
3. Assume jacking pits and intermediate work pits for trenchless sewers will fall within the permanent easement, so the only additional (temporary) impact will be a contractor staging area. Assume the needed area is 0.2 acres per 500 ft of pipe.

Calculation Approach

1. For calculating length within the resource for streams without FEMA mapping and enclosed streams, use 50 feet beyond each bank of open streams, and 50 feet beyond each side of enclosed streams.
2. Permanent area of impact is calculated as 20' x length within the resource, then divided by 43,560 to convert to acres.
3. Temporary area of impact for open cut sewers is calculated as 20' x length within the resource, then divided by 43,560 to convert to acres.
4. Temporary area of impact for trenchless sewers is calculated as (0.2 acres/500 ft) x length within the resource.

Drop Shaft	Proposed Sewers Description for Table 11-1	Inside Dia. (ft)	Length (ft)	Length (miles)	Conveyance/Consolidation Sewer Lengths Within Resources from GIS/Mapping (ft)				Permanent Area of Impact (acres)				Temporary Area of Impact (acres)			
					Floodway	100 year Floodplain (excluding Floodway)	Streams	Wetlands	Floodway	100 year Floodplain (excluding Floodway)	Streams	Wetlands	Floodway	100 year Floodplain (excluding Floodway)	Streams	Wetlands
UM_CF02	10' diameter pipe, 120' long (UM_CF02)	10	120	0.02	120	0	0	0	0.055	0.000	0.000	0.000	0.048	0.000	0.000	0.000
Streets Run - Portion of Conveyance/consolidation sewers for retention treatment basin serving flow group UM_CF02 (Figure 4-5)																
Open Cut Construction																
UM_CF02	3.5' diameter pipe, 960' long (UM_CF02)	3.5	960	0.18	0	587	0	0	0.000	0.270	0.000	0.000	0.000	0.270	0.000	0.000
Trenchless Total			20,055	3.8	2,768	5,672	170	0	1.271	2.604	0.078	0.000	1.112	2.269	0.068	0.000
Open Cut Total			22,567	4.3	10,916	4,962	0	0	5.012	2.278	0.000	0.000	5.012	2.278	0.000	0.000
Grand Total			42,622	8.1	13,684	10,634	170	0	6.283	4.882	0.078	0.000	6.124	4.547	0.068	0.000

Table B-6 Calculations for Drop Shafts

Assumptions:

1. Assume permanent easement is 0.5 acres per drop shaft
2. Assume temporary easement is 1.0 acres per drop shaft, or 0.5 acres in addition to the permanent easement

Calculation Approach

1. Exact location of easements unknown, but if drop shaft is located within the resource then both easements will be considered fully in the resource.
2. If drop shaft is not within a resource, then its assumed that the full temporary and permanent easements will not be in the resource (i.e. chosen to avoid the resource).

Drop Shaft	Inside Dia. (ft)	# of Drop Shafts Located Within Resources from GIS/Mapping				Permanent Area of Impact (acres)				Temporary Area of Impact (acres)			
		Floodway	100 year Floodplain (excluding Floodway)	Streams	Wetlands	Floodway	100 year Floodplain (excluding Floodway)	Streams	Wetlands	Floodway	100 year Floodplain (excluding Floodway)	Streams	Wetlands
Ohio River - Drop shafts for Ohio River CSO Tunnel including 2 crossings to southwest side of Ohio River - O-06, O-14E/O-14W, O-27 & MR_CF11 (Figure 4-4)													
4 shafts, each 10' diameter													
O-06	10	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
O-14E/O-14W	11	0	1	0	0	0.0	0.5	0.0	0.0	0.0	0.5	0.0	0.0
O-27	10	0	1	0	0	0.0	0.5	0.0	0.0	0.0	0.5	0.0	0.0
MR_CF11	10	0	1	0	0	0.0	0.5	0.0	0.0	0.0	0.5	0.0	0.0
Totals		0	3	0	0	0.0	1.5	0.0	0.0	0.0	1.5	0.0	0.0
Ohio River - Drop shaft for portion of Allegheny River CSO Tunnel - O-43 (Figure 4-1 & 4-4)													
1 shaft, 10' diameter													
O-07	10	0	1	0	0	0.0	0.5	0.0	0.0	0.0	0.5	0.0	0.0
Chartiers Creek - Drop shaft for portion of Ohio River CSO Tunnel - O-07 (Figure 4-4)													
1 shaft, 10' diameter													
O-43	10	0	1	0	0	0.0	0.5	0.0	0.0	0.0	0.5	0.0	0.0
Allegheny River - Drop shafts for portion of Allegheny River CSO Tunnel - MR_CF32, MR_CF24, MR_CF36, LNA_CF10 & A-22 (Figure 4-1)													
4 shafts, 3 @ 10' diameter and 1 @ 13' diameter													
MR_CF32	10	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
MR_CF34	10	0	1	0	0	0.0	0.5	0.0	0.0	0.0	0.5	0.0	0.0
MR_CF36 & LNA_CF10	10	1	0	0	0	0.5	0.0	0.0	0.0	0.5	0.0	0.0	0.0
A-22	13	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Totals		1	1	0	0	0.5	0.5	0.0	0.0	0.5	0.5	0.0	0.0
Allegheny River - Drop shaft for portion of Allegheny River CSO Tunnel - MR_CF04, A-68, UA_CF04, A-41 & A-42 (Figure 4-2)													
5 shafts, 2 @ 10' diameter, 2 @ 13' diameter and 1 @ 17' diameter													
MR_CF04	10	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
A-68	10	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
UA_CF04	13	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
A-41	13	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
A-42	17	0	1	0	0	0.0	0.5	0.0	0.0	0.0	0.5	0.0	0.0
Totals		0	1	0	0	0.0	0.5	0.0	0.0	0.0	0.5	0.0	0.0

Table B-6 Calculations for Drop Shafts

Assumptions:

1. Assume permanent easement is 0.5 acres per drop shaft
2. Assume temporary easement is 1.0 acres per drop shaft, or 0.5 acres in addition to the permanent easement

Calculation Approach

1. Exact location of easements unknown, but if drop shaft is located within the resource then both easements will be considered fully in the resource.
2. If drop shaft is not within a resource, then its assumed that the full temporary and permanent easements will not be in the resource (i.e. chosen to avoid the resource).

Drop Shaft	Inside Dia. (ft)	# of Drop Shafts Located Within Resources from GIS/Mapping				Permanent Area of Impact (acres)				Temporary Area of Impact (acres)			
		Floodway	100 year Floodplain (excluding Floodway)	Streams	Wetlands	Floodway	100 year Floodplain (excluding Floodway)	Streams	Wetlands	Floodway	100 year Floodplain (excluding Floodway)	Streams	Wetlands
Monongahela River - Drop shafts for portion of Monongahela River CSO Tunnel - MR_CF19, MR_CF20, MR_CF07 & M-29 (Figure 4-3)													
4 shafts, 3 @ 10' diameter and 1 @ 13' diameter													
MR_CF19	10	0	1	0	0	0.0	0.5	0.0	0.0	0.0	0.5	0.0	0.0
MR_CF20	10	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
MR_CF07	10	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
M-29	13	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Totals		0	1	0	0	0.0	0.5	0.0	0.0	0.0	0.5	0.0	0.0
Grand Total		1	8	0	0	0.5	4.0	0.0	0.0	0.5	4.0	0.0	0.0

Table B-7 Calculations for Facilities

Assumptions:

1. Assume permanent easement is 20 feet wide for the new outfall.
2. Assume temporary easement for open cut sewers is 40 feet wide, or 20 ft in addition to the permanent easement.
3. Assume permanent easement for facilities is 2 x the size of the facility footprint.
4. Assume temporary easement for facilities is 3 x the size of the facility footprint, or an additional area (beyond the permanent) equal to the facility footprint.

Calculation Approach

1. Permanent area of impact for new outfall is calculated as 20' x length within the resource, then divided by 43,560 to convert to acres.
2. Temporary area of impact for trenchless outfall is calculated as (0.2 acres/500 ft) x length within the resource.
3. Permanent area of impact for facilities is calculated as 2 x the area of the facility within the resource.
4. Temporary area of impact for facilities is calculated as 1 x the area of the facility within the resource.

Location	Proposed Facilities Description for Table 11-1	Length (ft)	Width (ft)	Area (sq ft)	Area (acres)	Facility Areas Within Resources from GIS/Mapping (acres)				Permanent Area of Impact (acres)				Temporary Area of Impact (acres)			
						Floodway	100 year Floodplain (excluding Floodway)	Streams	Wetlands	Floodway	100 year Floodplain (excluding Floodway)	Streams	Wetlands	Floodway	100 year Floodplain (excluding Floodway)	Streams	Wetlands
Ohio River - Wet Weather Pump Station located at Woods Run WWTP																	
WWTP	90' diameter pump station	NA	NA	6,362	0.15	0	0	0	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
WWTP	60' x 90' electrical building	60	90	5,400	0.12	0	0	0	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Totals										0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Ohio River - New O-06 Pump Station (Figure 4-4)																	
O-06	30' x 50' pump station	50	30	1,500	0.03	0	0	0	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Streets Run - CSO Retention Treatment Basin (RTB) with pump station (Figure 4-5)																	
UM_CF02	Retention treatment basin	280	200	56,000	1.29	0	0.64	0	0	0.000	1.286	0.000	0.000	0.000	0.643	0.000	0.000
UM_CF03	90' x 90' pump station	90	90	8,100	0.19	0	0	0	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Totals										0.000	1.286	0.000	0.000	0.000	0.643	0.000	0.000
						Outfall Length Within Resources from GIS/ Mapping											
Streets Run - Portion of CSO Retention Treatment Basin (RTB) outfall (Figure 4-5)																	
UM_CF04	9' diameter outfall, half of 800' length - open cut	400	NA	NA	NA	0	275	0	0	0.000	0.126	0.000	0.000	0.000	0.126	0.000	0.000
Monongahela River - Portion of CSO Retention Treatment Basin (RTB) outfall (Figure 4-5)																	
UM_CF04	9' diameter outfall, half of 800' length - open cut	400	NA	NA	NA	136	134	0	0	0.062	0.062	0.000	0.000	0.062	0.062	0.000	0.000
Grand Total										0.062	1.473	0.000	0.000	0.062	0.831	0.000	0.000

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION

ACKNOWLEDGMENT OF APPRISAL OF PERMIT CONDITIONS

Permit No. E02052-1818
Project Location: County Allegheny
Municipality City of Pittsburgh

Gentlemen:

Acknowledgment is made that I, (Permittee Name) Allegheny County Sanitary Authority (ALCOSAN)
and _____
(Name/address/telephone of individual responsible for supervision of work)

have been apprised of and are familiar with the terms and conditions of Permit No. _____ issued to
(Permittee): _____

giving its consent to:

1. Construct and maintain a 1,154 linear foot river wall within the Ohio River (WWF);
2. Relocate and construct four outfalls (Outfall 001, Outfall 002, CSO 026, and SW-2) within the Ohio River (WWF);
3. Remove 13 existing mooring cells within the Ohio River (WWF);
4. Place and maintain 0.66 acres of rip-rap within the Ohio River (WWF), along the aforementioned river wall, for scour protection, which includes 0.29 acres of mitigation rip-rap along the Ohio River.
5. Place and maintain fill in 0.61 acres of floodplain.

For the purpose of creating a usable footprint to expand ALCOSAN's existing Woods Run Wastewater Treatment Plant as part of a Consent Decree with the U.S. Environmental Protection Agency, Department of Environmental Protection, and Allegheny County Health Department, to eliminate sanitary sewer overflows and reduce combined sewer overflow events. As part of this project, 1,154 feet and 0.66 acres of permanent impact and approximately 93 linear feet of temporary impact to the Ohio River will take place. 0.61 acres of permanent floodplain impact will occur. The project site is located on Preble Avenue, approximately 0.4 miles from Beaver Avenue (Pittsburgh West, PA USGS topographic quadrangle; N: 40°, 28', 34"; W: -80°, 02', 38"; Sub-basin 20G; USACE Pittsburgh District), in the City of Pittsburgh, Allegheny County.

RETURN TO:
Department of Environmental Protection
Permitting & Technical Services Section
Waterways and Wetlands Program
400 Waterfront Drive
Pittsburgh, PA 15222-4745

(Permittee signature)

Date

(Signature of individual responsible for supervision work)

Date

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION

**WATER OBSTRUCTION AND ENCROACHMENT PERMIT
COMPLETION REPORT**

	Permit No.	<u>E02052-1818</u>
<u>Project Location:</u>	County	<u>Allegheny</u>
	Municipality	<u>City of Pittsburgh</u>

Gentlemen:

I (We) hereby certify that the following, authorized construction activities for the project originally described as;

1. Construct and maintain a 1,154 linear foot river wall within the Ohio River (WWF);
2. Relocate and construct four outfalls (Outfall 001, Outfall 002, CSO 026, and SW-2) within the Ohio River (WWF);
3. Remove 13 existing mooring cells within the Ohio River (WWF);
4. Place and maintain 0.66 acres of rip-rap within the Ohio River (WWF), along the aforementioned river wall, for scour protection, which includes 0.29 acres of mitigation rip-rap along the Ohio River.
5. Place and maintain fill in 0.61 acres of floodplain.

For the purpose of creating a usable footprint to expand ALCOSAN’s existing Woods Run Wastewater Treatment Plant as part of a Consent Decree with the U.S. Environmental Protection Agency, Department of Environmental Protection, and Allegheny County Health Department, to eliminate sanitary sewer overflows and reduce combined sewer overflow events. As part of this project, 1,154 feet and 0.66 acres of permanent impact and approximately 93 linear feet of temporary impact to the Ohio River will take place. 0.61 acres of permanent floodplain impact will occur. The project site is located on Preble Avenue, approximately 0.4 miles from Beaver Avenue (Pittsburgh West, PA USGS topographic quadrangle; N: 40°, 28’, 34”; W: -80°, 02’, 38”; Sub-basin 20G; USACE Pittsburgh District), in the City of Pittsburgh, Allegheny County.

were completed on _____, 20____, in accordance with the plans approved and that all unauthorized obstructions have been removed.

Name: _____
(typed or printed)

Signature: _____

Title: _____

Firm: _____

Date: _____

RETURN TO:
Department of Environmental Protection
Permitting & Technical Services Section
Waterways and Wetlands Program
400 Waterfront Drive
Pittsburgh, PA 15222-4745

Commonwealth of Pennsylvania
Department of Environmental Protection
Southwest Regional Office
Waterways and Wetlands Program - Permitting and Technical Services Section

WATER OBSTRUCTION AND ENCROACHMENT PERMIT

The Department of Environmental Protection (“Department”), established by the Act of December 3, 1970, P.L. 834 (71 P.S. §§510.1 et seq.) and empowered to exercise certain powers and perform certain duties under and by virtue of the Act of November 26, 1978, P.L. 1375, as amended by the Act of October 23, 1979, P.L. 204 (32 P.S. §§693.1 et seq.) known as the “Dam Safety and Encroachments Act”; Act of October 4, 1978, P.L. 851 (32 P.S. §§679.101 et seq.) known as the “Flood Plain Management Act”; Act of June 22, 1937, P.L. 1987, (35 P.S. §§691.1 et seq.), known as “The Clean Streams Law”; and the Administrative Code, Act of April 9, 1929, P.L. 177, as amended, which empowers the Department to exercise certain powers and perform certain duties by law vested in and imposed upon the Water Supply Commission of Pennsylvania and the Water and Power Resources Board, hereby issues this permit to:

Allegheny County Sanitary Authority (ALCOSAN)
3300 Preble Avenue
Pittsburgh, PA 15233

giving its consent to:

1. Construct and maintain a 1,154 linear foot river wall within the Ohio River (WWF);
2. Relocate and construct four outfalls (Outfall 001, Outfall 002, CSO 026, and SW-2) within the Ohio River (WWF);
3. Remove 13 existing mooring cells within the Ohio River (WWF);
4. Place and maintain 0.66 acres of rip-rap within the Ohio River (WWF), along the aforementioned river wall, for scour protection, which includes 0.29 acres of mitigation rip-rap along the Ohio River.
5. Place and maintain fill in 0.61 acres of floodplain.

For the purpose of creating a usable footprint to expand ALCOSAN’s existing Woods Run Wastewater Treatment Plant as part of a Consent Decree with the U.S. Environmental Protection Agency, Department of Environmental Protection, and Allegheny County Health Department, to eliminate sanitary sewer overflows and reduce combined sewer overflow events. As part of this project, 1,154 feet and 0.66 acres of permanent impact and approximately 93 linear feet of temporary impact to the Ohio River will take place. 0.61 acres of permanent floodplain impact will occur. The project site is located on Preble Avenue, approximately 0.4 miles from Beaver Avenue (Pittsburgh West, PA USGS topographic quadrangle; N: 40°, 28’, 34”; W: -80°, 02’, 38”; Sub-basin 20G; USACE Pittsburgh District), in the City of Pittsburgh, Allegheny County.

The issuance of this permit also constitutes approval of a Water Quality Certification under Section 401 of the Federal Water Pollution Control Act [33 U.S.C.A. 1341(a)].

This permit is issued in response to an application filed with the Department of Environmental Protection on June 25, 2019, and with the understanding that the work shall be performed in accordance with

the maps, plans, profiles and specifications filed with and made a part of the application on August 20, 2019, March 13, 2020, April 14, 2020, April 27, 2020, May 8, 2020 & May 14, 2020, subject, however, to the provisions of the Dam Safety and Encroachments Act, the Flood Plain Management Act, The Clean Streams Law, the Administrative Code, the Rules & Regulations promulgated thereunder and the following conditions and restrictions. **If the work authorized by this permit is not completed on or before December 31, 2025, this permit, if not previously revoked or specifically extended by the Department in writing, shall become void without further notification.**

1. The permittee shall sign the Acknowledgement of Appraisal of Permit Conditions thereby expressly certifying the permittee's acceptance of, and agreement to comply with, the terms and conditions of this permit. The permittee shall return a signed copy of the Acknowledgement of Appraisal of Permit Conditions to the Department. Unless the Acknowledgement of Appraisal of Permit Conditions form is completed and filed with the Department, this permit is void;

2. The Department, in issuing this permit, has relied on the information and data which the permittee has provided in connection with his permit application. If, subsequent to the issuance of this permit, such information and data prove to be false, incomplete or inaccurate, this permit may be modified, suspended, or revoked, in whole or in part, and the Department may, in addition, institute appropriate legal proceedings;

3. This permit does not give any property rights, either in real estate or material, nor any exclusive privileges, nor shall it be construed to grant or confer any right, title, easement, or interest in, to, or over any land belonging to the Commonwealth of Pennsylvania; neither does it authorize any injury to private property or invasion of private rights, nor any infringement of Federal, State, or Local laws or regulations; nor does it obviate the necessity of obtaining Federal assent when necessary;

4. The work shall at all times be subject to supervision and inspection by representatives of the Department, and no changes in the maps, plans, profiles, and specifications as approved shall be made except with the written consent of the Department. The Department, however, reserves the right to require such changes or modifications in the maps, plans, profiles, and specifications as may be considered necessary. The Department further reserves the right to suspend or revoke this permit if in its opinion the best interest of the Commonwealth will be subserved thereby;

5. This permit authorizes the construction, operation, maintenance and normal repair of the permitted structures conducted within the original specifications for the water obstruction or encroachment, and in accordance with the regulations of the Department and term and conditions of this permit. Any repairs or maintenance involving modifications of the water obstruction or encroachment from its original specifications, and any repairs or reconstruction involving a substantial portion of the structure as defined by regulations of the Department shall require the prior written approval and permit of the Department;

6. All construction debris, excavated material, brush, rocks, and refuse incidental to this work shall be removed entirely from the stream channel and placed either on shore above the influence of flood waters, or at such dumping ground as may be approved by the Department;

7. There shall be no unreasonable interference with the free discharge of the river or stream or navigation during construction;

8. If future operations by the Commonwealth of Pennsylvania require modification of the structure or work, or if, in the opinion of the Department of Environmental Protection, the structure or work shall cause unreasonable obstruction to the free passage of floodwaters or navigation, the permittee shall, upon due notice, remove or alter the structures, work or obstructions caused thereby, without expense to the Commonwealth of Pennsylvania, so as to increase the flood carrying capacity of the channel or render navigation reasonably free, easy, and unobstructed, in such manner as the Department may require. No claim shall be made against the Commonwealth of Pennsylvania on account of any such removal or alteration;

9. The permittee shall notify the Department, in writing, of the proposed time for commencement of work prior to the commencement of construction;

10. If construction work has not been completed within the time specified in this permit and the time limit specified in this permit has not been extended in writing by the Department or if this permit has been revoked for any reason, the permittee shall, at his own expense and in a manner that the Department may prescribe, remove all or any portion of the work as the Department requires and restore the watercourse and floodplain to their former condition;

11. The permittee shall fully inform the engineer or contractor, responsible for the supervision and conduct of the work, of the terms, conditions, restrictions and covenants of this permit. Prior to the commencement of construction, the permittee shall file with the Department in writing, on a form provided by the Department, a statement signed by the permittee and an individual responsible for the supervision or conduct of the work acknowledging and accepting the general and special conditions contained in this permit. Unless the acknowledgment and acceptance have been filed, this permit is void. A copy of this permit and the acknowledgment shall be available at the work site for inspection upon request by an officer or agent of the Department or another Federal, State, County, or municipal agency;

12. The permittee shall operate and maintain the structure or work authorized herein in a safe condition in accordance with the permit terms and conditions and the approved maps, plans, profiles, and specifications;

13. This permit may not be transferred without prior written approval from the Department, such approval being considered upon receipt of the properly executed "Application of Transfer of Permit" form;

14. If and when the permittee desires to discontinue use or abandon the activity authorized herein, he must remove all or part of the structure or work authorized and take other actions as are necessary to protect safety and the environment in accordance with a permit issued by the Department;

15. If the use of explosives in any waterways is required, the permittee shall secure the prior written permit from the Pennsylvania Fish and Boat Commission, pursuant to the Pennsylvania Fish and Boat Code, Act 1980-175 Title 30 Pennsylvania Consolidated Statutes, Section 2906. Requests should be directed to the Pennsylvania Fish and Boat Commission, Division of Environmental Services, 450 Robinson Lane, Bellefonte, PA 16823-9620, telephone 814-359-5140;

16. Permittee shall implement and monitor an Erosion and Sedimentation Control Plan prepared in accordance with Chapter 102 so as to minimize erosion and prevent excessive sedimentation into the receiving watercourse or body of water;

17. The project site shall at all times be available for inspection by authorized officers and employees of the Pennsylvania Fish and Boat Commission. Prior to commencement and upon completion of the work authorized by this permit, the permittee shall notify the Pennsylvania Fish and Boat Commission's Southwest Regional Office, RD #2, Box 39, Somerset, PA 15501, telephone 814-445-8974;

18. The project site shall at all times be available for inspection by authorized officers and employees of the County Conservation District. Prior to commencement and upon completion of the work authorized by this permit, the permittee shall notify the Allegheny County Conservation District, Riverfront Corporate Center, 33 Terminal Way, Suite 325B, Pittsburgh, PA 15219; 412-241-7645.

19. **Work may not commence until a signed copy of the Acknowledgement of Appraisal of Permit Conditions is received by the Department.** Any work authorized by this permit conducted prior to the Department's receipt of a signed copy of the Acknowledgement of Appraisal of Permit Conditions is a violation of the Dam Safety and Encroachments Act and the Clean Streams Law, and you may be subject to fines and penalties pursuant to those Acts.

20. **SPECIAL CONDITIONS** – see next page

SPECIAL CONDITIONS

- A. This is a phased project. This permit only authorizes the construction of the water obstructions and encroachments that are associated with the current phase of the overall project, as listed in this permit. This permit does NOT authorize construction of water obstructions and/or encroachments that are associated with future phases of the overall project. Additional authorization may be required for future water obstructions and/or encroachments. Care should be taken during the design of future phases of the overall project, to avoid or minimize impacts to regulated waters of the commonwealth or other significant adverse impacts on the environment, to the extent practicable.
- B. As part of any future/additional authorizations that may be required for this phased project, please be advised that the Comprehensive Environmental Assessment will need to be updated with each subsequent application for a Water Obstruction & Encroachment Permit.
- C. By accepting this permit, the permittee agrees to implement the stream mitigation plan as reviewed, revised and/or approved by the Department.
- D. Deposition of dredged or excavated materials on shore and all earthwork operations on shore will be carried out in such a way as to minimize erosion of the material and preclude its entry into the waterway.
- E. Demolition or excavated materials shall not be deposited in any wetland, watercourse, floodway, floodplain or other body of water without applying for and receiving a written permit from the Department.
- F. Within 30 days of completing construction of the stream restoration activities, the permittee shall submit “as-built” plans of the stream restoration areas and structures to the Department at: Department of Environmental Protection, Waterway and Wetlands Program, Permitting and Technical Services Section, 500 Waterfront Drive, Pittsburgh, PA 15222-4745. This information shall include sonar or depth soundings to document pre-construction conditions, and to document the “as-built” conditions of the constructed mitigation area.
- G. Permittee shall effectively monitor the stream mitigation areas, during year two (2) and year five (5), after construction. Reports from the year 2 and Year 5 monitoring efforts shall be submitted to the Department at: Department of Environmental Protection, Waterways and Wetlands Program, Water Quality Supervisor, 500 Waterfront Drive, Pittsburgh, PA 15222-4745. The monitoring reports shall contain sonar or depth soundings to document conditions after placement. These reports shall include information describing the success of the site at the time of inspection, an inventory of the stream structures installed, and an evaluation of what installed structures and materials remain, whether some material was lost, or if it all washout. In addition, a written plan and schedule to correct any deficiencies identified during the monitoring phase shall be provided, if applicable. Permittee shall implement such plans and schedule.
- H. An Aids to Navigation Plan shall be completed and submitted to the Pennsylvania Fish & Boat Commission for review and approval, prior to the start of construction.
- I. Prior to the beginning of work, all public water supplies or other water-related activities located downstream that may be affected by turbidity increases or other water quality changes caused by said work shall be sufficiently notified in advance to allow for preparation of any water quality changes.

- J. In order to avoid impacts to the nesting pair of peregrine falcons (PA endangered), or the active nest that is within 1000' of the project area, no construction should occur within the following areas, during the nesting season, February 15 to July 31:
- Modifications to the existing Disinfection Tank, to allow it to function as a Wet Weather Disinfection Tank.
 - A proposed new outfall to the Ohio River, at the North end of the Wet Weather Disinfection Tank designated "Outfall-002."
- K. This permit does not relieve the permittee of the responsibility to obtain any applicable approval/permit from the District Engineer, Pittsburgh District, U.S. Army Corps of Engineers, Room 1817 Federal Building, 1000 Liberty Avenue, Pittsburgh, PA 15222, under Section 10 of the Rivers and Harbor Act or Section 404 of the Clean Water Act of 1977.
- L. The Submerged Lands License Agreement entered into between the Department and Permittee covering this operation is incorporated herein by reference and the permittee shall comply with all of its terms and conditions.
- M. Within 7 days prior to commencement of the work authorized by this permit, the permittee shall notify Stuart Demanski, Water Quality Specialist Supervisor, Conservation, Restoration, and Inspection Section, Waterways & Wetlands Program, Pennsylvania Department of Environmental Protection at 500 Waterfront Drive, Pittsburgh, PA 15222. Telephone: (412)-442-5807. Email: sdemanski@pa.gov.
- N. This permit is not to be considered an approval of the structural analysis, the engineering specifications or the construction methods utilized during construction of this structure.
- O. This permit does not relieve the permittee of the responsibility to comply with all applicable local codes and ordinances, including floodplain and storm water management.
- P. Permittee shall manage dredged material removed from the river and excavated material removed from floodway and floodplain in accordance with the Solid Waste Management Act, Act of July 7, 1980, P.L. 380, No. 97, *as amended*, 35 P.S. §§ 6018.101-6018.1003 ("Solid Waste Management Act") and regulations promulgated thereunder. Permittee should contact the Facilities Chief, Bureau of Waste Management, Southwest Regional Office, with questions regarding this requirement.

DEPARTMENT OF ENVIRONMENTAL PROTECTION

Dana Drake
Dana Drake, P.E.
Environmental Program Manager
Waterways & Wetlands Program

May 18, 2020
Date



Southwest Regional Office

May 18, 2020

Michelle Buys
Allegheny County Sanitary Authority (ALCOSAN)
3300 Preble Avenue
Pittsburgh, PA 15233
Email Address: Michelle.buys@alcosan.org

Re: DEP File No. **E02052-1818**
ALCOSAN River Wall Extension
City of Pittsburgh
Allegheny County

Dear Michelle Buys:

Enclosed is your copy of your State Water Obstruction and Encroachment Permit (WOEP). Please review this permit so that you are aware of the extent of authorization and the conditions that apply to that authorization.

Please be advised that you do not have Federal authorizations for this project and such authorization is required prior to starting your project. In accordance with procedures established with the U.S. Army Corps of Engineers, you will be contacted directly by the Corps regarding Federal Authorization.

This WOEP is not effective until a copy of the Acknowledgment of Appraisal of Permit Conditions, signed by you, is received by the Department. Any work conducted prior to the Department's receipt of the signed Acknowledgment of Appraisal of Permit Conditions is a violation of the Dam Safety and Encroachments Act and the Clean Streams Law, and you may be subject to fines and penalties pursuant to those Acts.

A copy of the Permit, Acknowledgment of Appraisal of Permit Conditions, the Erosion and Sediment Control plan, this Issuance Letter, and any other applicable State and Federal authorizations, must be maintained on site during construction and available at the work site for inspection upon request by any officer or agent of the Department or any other Federal, State, County and Municipal agency.

A Completion Report must be submitted to this office within 30 days of completion of the approved project. The Completion Report form must be signed by you and the supervising engineer indicating that the work has been completed as approved.

This authorization does not relieve the applicant from applying for and obtaining any additional permits or approvals from local, state or federal agencies required for this project. Please be advised that if any other permits are required for this project, they must be issued prior to undertaking the activities described in the permit application. Issuance of the enclosed permit(s) does not indicate an affirmative action on any other pending or future permit applications. If you

are uncertain as to whether or not other permits are needed for this project, please use the Department's "Pre-Application Consultation Tool" (PACT) which can be found at <http://www.ahs.dep.pa.gov/PACT/> . The online tool is designed to quickly and easily assist potential applicants in determining which types of environmental permits, authorizations or notifications would be needed for specific projects. Based on the user's responses to a series of simple questions, PACT automatically provides an email response with information on permits and other information an applicant should consider.

Any person aggrieved by this action may appeal the action to the Environmental Hearing Board (Board), pursuant to Section 4 of the Environmental Hearing Board Act, 35 P.S. § 7514, and the Administrative Agency Law, 2 Pa.C.S. Chapter 5A. The Board's address is:

Environmental Hearing Board
Rachel Carson State Office Building, Second Floor
400 Market Street
P.O. Box 8457
Harrisburg, PA 17105-8457

TDD users may contact the Environmental Hearing Board through the Pennsylvania Relay Service, 800-654-5984.

Appeals must be filed with the Board within 30 days of receipt of notice of this action unless the appropriate statute provides a different time. This paragraph does not, in and of itself, create any right of appeal beyond that permitted by applicable statutes and decisional law.

A Notice of Appeal form and the Board's rules of practice and procedure may be obtained online at <http://ehb.courtapps.com> or by contacting the Secretary to the Board at 717-787-3483. The Notice of Appeal form and the Board's rules are also available in braille and on audiotape from the Secretary to the Board.

IMPORTANT LEGAL RIGHTS ARE AT STAKE. YOU SHOULD SHOW THIS DOCUMENT TO A LAWYER AT ONCE. IF YOU CANNOT AFFORD A LAWYER, YOU MAY QUALIFY FOR FREE PRO BONO REPRESENTATION. CALL THE SECRETARY TO THE BOARD AT 717-787-3483 FOR MORE INFORMATION. YOU DO NOT NEED A LAWYER TO FILE A NOTICE OF APPEAL WITH THE BOARD.

IF YOU WANT TO CHALLENGE THIS ACTION, YOUR APPEAL MUST BE FILED WITH AND RECEIVED BY THE BOARD WITHIN 30 DAYS OF RECEIPT OF NOTICE OF THIS ACTION.

If you have questions about your permit, please contact **Jim Sommer** of this office at **412.442.4268** or jamsommer@pa.gov.

Sincerely,

Dana Drake

Dana Drake, P.E.
Program Manager
Waterways & Wetlands Program

Enclosure(s)

cc: PA Fish and Boat Commission
U. S. Army Corps of Engineers (2017-1183)
Allegheny County Conservation District
Arcadis – (Bradley Olson – Bradley.Olson@arcadis.com)
Permitting & Technical Services Section DEP File No. E02052-1818
Mitigation Plan Folder for CRI

Exhibit F

**Municipal Resolutions of Adoption and
Related Municipal Correspondence**

RESOLUTION NO. 1386H

A RESOLUTION OF THE BOROUGH OF ETNA, ALLEGHENY COUNTY, PENNSYLVANIA, ADOPTING THE ALCOSAN ACT 537 SPECIAL STUDY.

WHEREAS, Section 5 of the Act of January 24, 1996, P.L. 1535, No. 537, known as the Pennsylvania Sewage Facilities Act, as amended, and the Rules and Regulations of the Department of Environmental Protection adopted thereunder, Chapter 71 of Title 25 of the Pennsylvania Code, requires the municipality to adopt an Official Sewage Facilities Plan providing for sewage services adequate to prevent contamination of waters and/or environmental health hazards with sewage wastes, and to revise said plan whenever it is necessary to meet the sewage disposal needs of the municipality, and

WHEREAS, the Allegheny County Sanitary Authority (ALCOSAN) has prepared an Act 537 Special Study – Interim Measures Wet Weather Plan (IWWP) as an amendment to ALCOSAN’s Act 537 Sewage Facilities Plan (1996) which provides for sewage facilities in all or portions of Etna Borough; and

WHEREAS, the scope of this Special Study is limited to Act 537 planning requirements that directly relate to the alternative of choice to be implemented by December 31, 2026: Regional Conveyance Facilities including the wet weather pump station to be constructed at ALCOSAN’s Woods Run Wastewater Treatment Plant; and

WHEREAS, adoption will be required by those municipalities through which the tunnel alignment passes and those locations where surface construction is proposed. As such, formal adoption of the Special Study is required from nine municipalities: Aspinwall Borough, City of Pittsburgh, Etna Borough, McKees Rocks Borough, Millvale Borough, O’Hara Township, Shaler Township, Sharpsburg Borough, and West Homestead Borough; and

WHEREAS, Etna Borough finds that the Facility Plan described above conforms to applicable zoning, subdivision, other municipal ordinances and plans and to a comprehensive program of pollution control and water quality management.

NOW THEREFORE, BE IT RESOLVED that Etna Borough does hereby adopt and submit to the Department of Environmental Protection for its approval as a revision to the Official Plan of the municipality, the above referenced Act 537 Special Study. The municipality hereby assures the Department of the complete and timely implementation of the said plan as required by law (Section 5, Sewage Facilities Act, as amended).

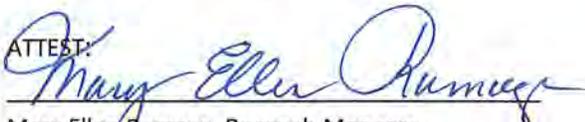
RESOLVED and **ADOPTED** this 16th day of November, 2021.

AUTHORIZED SIGNATURE:

MUNICIPAL SEAL



Pete Ramage, Council President

ATTEST:


Mary Ellen Ramage, Borough Manager

**RESOLUTION NO. 2849
BOROUGH OF MILLVALE
COUNTY OF ALLEGHENY**

**A RESOLUTION OF THE BOROUGH OF MILLVALE, ALLEGHENY COUNTY, PENNSYLVANIA,
ADOPTING THE ALCOSAN ACT 537 SPECIAL STUDY.**

WHEREAS, Section 5 of the Act of January 24, 1996, P.L. 1535, No. 537, known as the Pennsylvania Sewage Facilities Act, as amended, and the Rules and Regulations of the Department of Environmental Protection adopted thereunder, Chapter 71 of Title 25 of the Pennsylvania Code, requires the municipality to adopt an Official Sewage Facilities Plan providing for sewage services adequate to prevent contamination of waters and/or environmental health hazards with sewage wastes, and to revise said plan whenever it is necessary to meet the sewage disposal needs of the municipality, and

WHEREAS, the Allegheny County Sanitary Authority (ALCOSAN) has prepared an Act 537 Special Study – Interim Measures Wet Weather Plan (IWWP) as an amendment to ALCOSAN’s Act 537 Sewage Facilities Plan (1996) which provides for sewage facilities in all or portions of Millvale Borough; and

WHEREAS, the scope of this Special Study is limited to Act 537 planning requirements that directly relate to the alternative of choice to be implemented by December 31, 2036: Regional Conveyance Facilities including the wet weather pump station to be constructed at ALCOSAN’s Woods Run Wastewater Treatment Plant; and

WHEREAS, adoption will be required by those municipalities through which the tunnel alignment passes and those locations where surface construction is proposed. As such, formal adoption of the Special Study is required from nine municipalities: Aspinwall Borough, City of Pittsburgh, Etna Borough, McKees Rocks Borough, Millvale Borough, O’Hara Township, Shaler Township, Sharpsburg Borough, and West Homestead Borough; and

WHEREAS, Millvale Borough finds that the Act 537 Special Study conforms to applicable zoning, subdivision, other municipal ordinances and plans and to a comprehensive program of pollution control and water quality management; and

WHEREAS, the Act 537 Special Study has been submitted to the Millvale Borough Planning Commission for review and comment on March 16, 2022.

NOW, THEREFORE, BE IT RESOLVED that the Council of the Borough of Millvale, Allegheny County does hereby adopt and submit to the Department of Environmental Protection for its approval as a revision to the Official Plan of the Borough, the above referenced Act 537 Special Study. The municipality hereby assures the Department of the complete and timely implementation of the said plan as required by law (Section 5, Sewage Facilities Act, as amended).

RESOLVED this 08th day of March 2022 by the Millvale Borough Council by vote.

ATTEST:

BY:  James Machajewski, Jr., Council President

BY:  Eddie T. Figas, Manager/Secretary

EXAMINED AND APPROVED on this 08th day of March 2022.

ATTEST:

BY:  Brian P. Spoales, Mayor

**TOWNSHIP OF O'HARA
ALLEGHENY COUNTY, PENNSYLVANIA**

**A RESOLUTION OF THE TOWNSHIP OF O'HARA ADOPTING THE
ALCOSAN ACT 537 SPECIAL STUDY**

WHEREAS, Section 5 of the Act of January 24, 1996, P.L. 1535, No. 537, known as the Pennsylvania Sewage Facilities Act, as amended, and the Rules and Regulations of the Department of Environmental Protection adopted thereunder, Chapter 71 of Title 25 of the Pennsylvania Code, requires the municipality to adopt an Official Sewage Facilities Plan providing for sewage services adequate to prevent contamination of waters and/or environmental health hazards with sewage wastes, and to revise said plan whenever it is necessary to meet the sewage disposal needs of the municipality; and

WHEREAS, the Allegheny County Sanitary Authority (ALCOSAN) has prepared an Act 537 Special Study – Interim Measures Wet Weather Plan (IWWP) as an amendment to ALCOSAN's Act 537 Sewage Facilities Plan (1996) which provides for sewage facilities in all or portions of the Township of O'Hara; and

WHEREAS, the scope of this Special Study is limited to Act 537 planning requirements that directly relate to the alternative of choice to be implemented by December 31, 2036: Regional Conveyance Facilities including the wet weather pump station to be constructed at ALCOSAN's Woods Run Wastewater Treatment Plant; and

WHEREAS, adoption will be required by those municipalities through which the tunnel alignment passes and those locations where surface construction is proposed. As such, formal adoption of the Special Study is required from nine municipalities: Aspinwall Borough, City of Pittsburgh, Etna Borough, McKees Rocks Borough, Millvale Borough, Township of O'Hara, Shaler Township, Sharpsburg Borough, and West Homestead Borough; and

WHEREAS, the Township of O'Hara finds that the Act 537 Special Study conforms to applicable zoning, subdivision, other municipal ordinances and plans and to a comprehensive program of pollution control and water quality management.

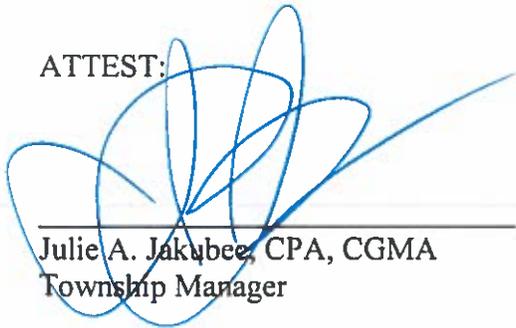
NOW, THEREFORE, BE IT RESOLVED that the Council of the Township of O'Hara, Allegheny County does hereby adopt and submit to the Department of Environmental Protection for its approval as a revision to the Official Plan of the Township, the above referenced Act 537 Special Study. The municipality hereby assures the Department of the complete and timely implementation of the said plan as required by law (Section 5, Sewage Facilities Act, as amended).

BILL NO. B-88-2021

RESOLUTION NO. R-72-2021

RESOLVED by Council vote of 6 to 0 on this 14th day of December 2021.

ATTEST:



Julie A. Jakubec, CPA, CGMA
Township Manager

TOWNSHIP OF O'HARA



Robert John Smith
President of Council



Adopted Denny, Jr. – Vogel 6 – 0 12/14/2021

OFFICIAL
BOROUGH OF WEST HOMESTEAD

RESOLUTION No. 22-007

A RESOLUTION OF THE BOROUGH OF WEST HOMESTEAD
ALLEGHENY COUNTY, PENNSYLVANIA, ADOPTING THE
ALCOSAN ACT 537 SPECIAL STUDY.

WHEREAS, Section 5 of the Act of January 24, 1996, P.L. 1535, No. 537, known as the Pennsylvania Sewage Facilities Act, as amended, and the Rules and Regulations of the Department of Environmental Protection adopted thereunder, Chapter 71 of Title 25 of the Pennsylvania Code, requires the municipality to adopt an Official Sewage Facilities Plan providing for sewage services adequate to prevent contamination of waters and/or environmental health hazards with sewage wastes, and to revise said plan whenever it is necessary to meet the sewage disposal needs of the municipality, and

WHEREAS, the Allegheny County Sanitary Authority (ALCOSAN) has prepared an Act 537 Special Study – Interim Measures Wet Weather Plan (IWWP) as an amendment to ALCOSAN’s Act 537 Sewage Facilities Plan (1996) which provides for sewage facilities in all or portions of West Homestead Borough and

WHEREAS, the scope of this Special Study is limited to Act 537 planning requirements that directly relate to the alternative of choice to be implemented by December 31, 2036: Regional Conveyance Facilities including the wet weather pump station to be constructed at ALCOSAN’s Woods Run Wastewater Treatment Plant; and

WHEREAS, adoption will be required by those municipalities through which the tunnel alignment passes and those locations where surface construction is proposed. As such, formal adoption of the Special Study is required from nine municipalities: Aspinwall Borough, City of Pittsburgh, Etna Borough, McKees Rocks Borough, Millvale Borough, O’Hara Township, Shaler Township, Sharpsburg Borough, and West Homestead Borough; and

WHEREAS, West Homestead Borough finds that the Act 537 Special Study conforms to applicable zoning, subdivision, other municipal ordinances and plans and to a comprehensive program of pollution control and water quality management: and

WHEREAS, the Act 537 Special Study has been sent to the West Homestead Borough Planning Commission for review and comment on January 26, 2022.

NOW, THEREFORE, BE IT RESOLVED that the Borough Council of West Homestead, Allegheny County does hereby adopt and submit to the Department of Environmental Protection for its approval as a revision to the Official Plan of the Borough, the above referenced Act 537 Special Study. The municipality hereby assures the Department of the complete and timely implementation of the said plan as required by law (Section 5, Sewage Facilities Act, as amended).

Adopted by the Council of the Borough of West Homestead this 8th day of March 2022.

ATTEST:

By:



Donna M. McMichael, Borough Secretary



Joseph M Baran, President of Council

Examined and approved this 8th day of March 2022.

By:

John J. Dindak, Mayor

ATTEST:



HAMPTON SHALER WATER AUTHORITY

PO BOX 66
3101 McCULLY RD
ALLISON PARK, PA 15101

412-486-4867
FAX 412-486-4345
www.hswa-pa.org

March 7, 2022

ALCOSAN

Ms. Jeanne K. Clark, Director of Governmental Affairs
3300 Preble Avenue
Pittsburgh, PA 15233

COMMENTS ON DRAFT 537 PLAN SPECIAL STUDY

Dear Ms. Clark:

Hampton Shaler Water Authority (HSWA) has been requested to supply a letter of support/comments on the ALCOSAN draft 537 Plan Special Study. HSWA has a uniquely strong understanding of the project and its importance. HSWA has been in dialogue with ALCOSAN since November 2019 when it became aware of a change in the proposed location of the Tunnel from the Lawrenceville side of the Allegheny River, to an ALCOSAN preferred location directly under the HSWA well locations. Before HSWA further discusses the project, and for any readers that may not know who or what HSWA is, let me introduce the organization.

Hampton Shaler Water Authority is a municipal authority organized under Commonwealth of Pennsylvania statute. HSWA was created in 2012 as a merger between Hampton Township Municipal Authority and the Water Department of Shaler Township. The two organizations saw great benefit to the merger of the organizations and since that time have voluntarily added the community water systems of the Boroughs of Etna (2013) and Sharpsburg (2017). The service area also includes portions of West Deer, O'Hara, Indiana, Richland, Reserve, Millvale, and Ross Townships. The total number of metered connections exceeds 25,600 across all the communities. The water supply system includes a number of tanks, pumpstations, and hundreds of miles of piping.

The water treatment plant draws its water from 12 wells located along the bank of the Allegheny River in Shaler Township and the Borough of Etna. Although these wells produce very high-quality water, the water is minimally treated for removal of small amounts of iron, manganese, calcium hardness, corrosion inhibitor and disinfected before being pumped into the distribution system. Annually, the wells supply 2.04 billion gallons of water, and this makes up 98.2% of all water in the system. The other small portion of water is purchased through an agreement with West View Water Authority. Additionally, emergency supplies are available for short term use from Fox Chapel Water Authority and Pittsburgh Water and Sewer Authority.

The United States Environmental Protection Agency and Commonwealth of Pennsylvania Department of Environmental both mandate drinking water suppliers to create and protect the water supply and its surrounding recharge area from new activities that may adversely affect either the quantity or quality of the source water. This includes a Zone I Delineation which is a 400' radius (800' diameter) where new activity is prohibited. The Zone II Delineation area is mapped by a Hydrogeologist based on many factors, including but not limited to porosity, direction of flow, hydraulic pressures, and alluvial materials.

Hampton Shaler Water Authority has a moral and fiduciary responsibility to protect this precious source of drinking water and to continue to provide high quality water to our customers in a cost-effective manner. HSWA prides itself in doing so with some of the lowest rates in western Pennsylvania.

The ALCOSAN project seeks to eliminate sanitary sewer combined overflows during wet weather into surface waters of the Commonwealth. Although this is a necessary and important project, it cannot be done in a manner that violates the Zone I rules and regulations or impairs the aquifer in either quantity or quality of water.

Therefore, HSWA recognizes the necessity of the project but only supports it to the extent that the aquifer is not compromised and done in accordance with Wellhead Protection Regulations. Additionally, more should be done to remove wet weather flows from the system, thus eliminating or reducing the overflows. All other options for moving the wet weather flows down stream and away from the wellfield prior to creating the overflows.

It is my sincere hope, as well as the Board of Directors of HSWA that a better mutual solution to the problem is found. HSWA remains open to reviewing and commenting on revisions and progress as plans further develop.

Sincerely,

HAMPTON SHALER WATER AUTHORITY



April L. Winklmann
Executive Director

cc: PA DEP Bureau of Safe Drinking Water



ALLEGHENY COUNTY SANITARY AUTHORITY
3300 Preble Avenue
Pittsburgh, PA 15233-1025
(412) 766-4810
www.alcosan.org

