

**Application of Pennsylvania-American Water Company for Acquisition of  
the Wastewater Assets of Butler Area Sewer Authority (“BASA”)**

**66 Pa. C.S. § 1329**

**Application Filing Checklist – Water/Wastewater**

**Docket No. A-2022-3037047**

20. Proof of Compliance. Provide proof of compliance with applicable design, construction and operation standards of DEP or of the county health department, or both, including:
- e. Provide documentation evidencing a 5-year compliance history with DEP with an explanation of each violation for the seller’s utilities that have been providing service as well as provide a copy of any DEP-approved corrective action plans.

**RESPONSE:**

- e. A table showing BASA’s 5-year compliance history is included in **Appendix A-20-e-1**. Documents comprising the current DEP-approved Corrective Action Plan are included in **Appendix A-20-e-2**.

**APPENDIX A-20-e-1**

**BASA 5-YEAR COMPLIANCE HISTORY**

INSPECTION ID	INSP CATEGORY	DATE INSPECTED	INSPECTION TYPE	AGENCY	INSPECTION RESULT DESCRIPTION	VIOLATION ID	VIOLATION DATE	VIOLATION TYPE	VIOLATION TYPE DESCRIPTION	RESOLVED DATE	# OF ENFORCEMENTS
3483784	PF	1/3/2023	Sanitary Sewer Overflow-Sampling	DEP	Viol(s) Noted & Immediately Corrected	980931	01/03/2023	92A.47(C)	NPDES - Illegal discharge to waters of the Commonwealth from a sanitary sewer overflow (SSO)	01/03/2023	0
3459372	PF	11/11/2022	Sanitary Sewer Overflow-Sampling	DEP	Violation(s) Noted	975996	11/11/2022	CSL611	CSL - Failure to comply with terms and conditions of a WQM permit	11/12/2022	0
3454546	PF	10/31/2022	Sanitary Sewer Overflow-Sampling	DEP	Viol(s) Noted & Immediately Corrected	974931	10/31/2022	CSL611	CSL - Failure to comply with terms and conditions of a WQM permit	10/31/2022	0
3362118	PF	5/7/2022	Sanitary Sewer Overflow-Sampling	DEP	Viol(s) Noted & Immediately Corrected	955495	05/07/2022	CSL611	CSL - Failure to comply with terms and conditions of a WQM permit	05/07/2022	0
3361899	PF	4/25/2022	Sanitary Sewer Overflow-Sampling	DEP	Viol(s) Noted & Immediately Corrected	955419	04/25/2022	CSL611	CSL - Failure to comply with terms and conditions of a WQM permit	04/26/2022	0
3334690	PF	3/18/2022	Sanitary Sewer Overflow-Sampling	DEP	Viol(s) Noted & Immediately Corrected	948319	03/18/2022	CSL611	CSL - Failure to comply with terms and conditions of a WQM permit	03/19/2022	0
3326649	PF	2/25/2022	Sanitary Sewer Overflow-Sampling	DEP	Violation(s) Noted	946359	02/25/2022	92A.47(C)	NPDES - Illegal discharge to waters of the Commonwealth from a sanitary sewer overflow (SSO)	02/25/2022	0
3324877	PF	2/17/2022	Sanitary Sewer Overflow-Sampling	DEP	Violation(s) Noted	945878	02/17/2022	92A.47(C)	NPDES - Illegal discharge to waters of the Commonwealth from a sanitary sewer overflow (SSO)	02/19/2022	0
3312972	PF	1/27/2022	Sanitary Sewer Overflow-Sampling	DEP	Viol(s) Noted & Immediately Corrected	943305	01/27/2022	CSL611	CSL - Failure to comply with terms and conditions of a WQM permit	01/27/2022	0
3241190	PF	8/26/2021	Sanitary Sewer Overflow-Sampling	DEP	Viol(s) Noted & Immediately Corrected	927570	08/26/2021	CSL611	CSL - Failure to comply with terms and conditions of a WQM permit	08/26/2021	0
3241121	PF	8/25/2021	Sanitary Sewer Overflow-Sampling	DEP	Viol(s) Noted & Immediately Corrected	927564	08/25/2021	92A.47(C)	NPDES - Illegal discharge to waters of the Commonwealth from a sanitary sewer overflow (SSO)	08/25/2021	0
3238371	PF	8/23/2021	Sanitary Sewer Overflow-Sampling	DEP	Viol(s) Noted & Immediately Corrected	927110	08/23/2021	CSL611	CSL - Failure to comply with terms and conditions of a WQM permit	08/23/2021	0
3221115	PF	7/17/2021	Sanitary Sewer Overflow-Sampling	DEP	Violation(s) Noted	923595	07/17/2021	92A.47(C)	NPDES - Illegal discharge to waters of the Commonwealth from a sanitary sewer overflow (SSO)	07/17/2021	0
3216607	PF	7/7/2021	Sanitary Sewer Overflow-Sampling	DEP	Viol(s) Noted & Immediately Corrected	922636	07/07/2021	CSL611	CSL - Failure to comply with terms and conditions of a WQM permit	07/07/2021	0
3209365	PF	6/17/2021	Sanitary Sewer Overflow-Sampling	DEP	Viol(s) Noted & Immediately Corrected	921156	06/17/2021	CSL611	CSL - Failure to comply with terms and conditions of a WQM permit	06/17/2021	0
3204514	PF	6/9/2021	Sanitary Sewer Overflow-Sampling	DEP	Viol(s) Noted & Immediately Corrected	920130	06/09/2021	92A.47(C)	NPDES - Illegal discharge to waters of the Commonwealth from a sanitary sewer overflow (SSO)	06/09/2021	0
3188756	PF	5/9/2021	Sanitary Sewer Overflow-Sampling	DEP	Viol(s) Noted & Immediately Corrected	916463	05/09/2021	92A.47(C)	NPDES - Illegal discharge to waters of the Commonwealth from a sanitary sewer overflow (SSO)	05/09/2021	0
3177242	PF	4/15/2021	Sanitary Sewer Overflow-Sampling	DEP	Viol(s) Noted & Immediately Corrected	913815	04/15/2021	CSL611	CSL - Failure to comply with terms and conditions of a WQM permit	04/15/2021	0
3167603	PF	3/25/2021	Sanitary Sewer Overflow-Sampling	DEP	Viol(s) Noted & Immediately Corrected	911580	03/25/2021	CSL611	CSL - Failure to comply with terms and conditions of a WQM permit	03/26/2021	0
3166633	PF	3/22/2021	Sanitary Sewer Overflow-Sampling	DEP	Viol(s) Noted & Immediately Corrected	911286	03/22/2021	CSL611	CSL - Failure to comply with terms and conditions of a WQM permit	03/23/2021	0
3154155	PF	3/1/2021	Sanitary Sewer Overflow-Sampling	DEP	Violation(s) Noted	908849	03/01/2021	92A.47(C)	NPDES - Illegal discharge to waters of the Commonwealth from a sanitary sewer overflow (SSO)	03/01/2021	0
3126336	PF	12/24/2020	Sanitary Sewer Overflow-Sampling	DEP	Violation(s) Noted	903175	12/24/2020	92A.47(C)	NPDES - Illegal discharge to waters of the Commonwealth from a sanitary sewer overflow (SSO)	12/24/2020	0
3077618	PF	9/7/2020	Sanitary Sewer Overflow-Sampling	DEP	Violation(s) Noted	893681	09/07/2020	92A.47(C)	NPDES - Illegal discharge to waters of the Commonwealth from a sanitary sewer overflow (SSO)	09/07/2020	0
3049569	PF	6/27/2020	Sanitary Sewer Overflow-Sampling	DEP	Viol(s) Noted & Immediately Corrected	887655	06/27/2020	92A.47(C)	NPDES - Illegal discharge to waters of the Commonwealth from a sanitary sewer overflow (SSO)	06/27/2020	0
3022278	PF	4/22/2020	Sanitary Sewer Overflow-Sampling	DEP	Viol(s) Noted & Immediately Corrected	883123	04/22/2020	CSL611	CSL - Failure to comply with terms and conditions of a WQM permit	04/22/2020	0
3015100	PF	3/30/2020	Sanitary Sewer Overflow-Sampling	DEP	Viol(s) Noted & Immediately Corrected	881205	03/30/2020	92A.47(C)	NPDES - Illegal discharge to waters of the Commonwealth from a sanitary sewer overflow (SSO)	03/30/2020	0
3013679	PF	3/23/2020	Sanitary Sewer Overflow-Sampling	DEP	Viol(s) Noted & Immediately Corrected	880810	03/23/2020	92A.47(C)	NPDES - Illegal discharge to waters of the Commonwealth from a sanitary sewer overflow (SSO)	03/23/2020	0

INSPECTION ID	INSP CATEGORY	DATE INSPECTED	INSPECTION TYPE	AGENCY	INSPECTION RESULT DESCRIPTION	VIOLATION ID	VIOLATION DATE	VIOLATION TYPE	VIOLATION TYPE DESCRIPTION	RESOLVED DATE	# OF ENFORCEMENTS
3013168	PF	3/20/2020	Sanitary Sewer Overflow-Sampling	DEP	Viol(s) Noted & Immediately Corrected	880688	03/20/2020	92A.47(C)	NPDES - Illegal discharge to waters of the Commonwealth from a sanitary sewer overflow (SSO)	03/20/2020	0
2989293	PF	1/25/2020	Sanitary Sewer Overflow-Sampling	DEP	Violation(s) Noted	875000	01/25/2020	92A.47(C)	NPDES - Illegal discharge to waters of the Commonwealth from a sanitary sewer overflow (SSO)	01/25/2020	0
3128399	PF	1/1/2021	Sanitary Sewer Overflow-Sampling	DEP	Violation(s) Noted	903566	01/01/2020	92A.47(C)	NPDES - Illegal discharge to waters of the Commonwealth from a sanitary sewer overflow (SSO)	01/01/2021	0
2953152	PF	10/31/2019	Sanitary Sewer Overflow-Sampling	DEP	Violation(s) Noted	866877	10/31/2019	92A.47(C)	NPDES - Illegal discharge to waters of the Commonwealth from a sanitary sewer overflow (SSO)	10/31/2019	0
2953151	PF	10/25/2019	Sanitary Sewer Overflow-Sampling	DEP	Viol(s) Noted & Immediately Corrected	866876	10/25/2019	CSL611	CSL - Failure to comply with terms and conditions of a WQM permit	10/25/2019	0
2903453	PF	7/6/2019	Sanitary Sewer Overflow-Sampling	DEP	Violation(s) Noted	854977	07/06/2019	92A.47(C)	NPDES - Illegal discharge to waters of the Commonwealth from a sanitary sewer overflow (SSO)	07/06/2019	0
2897451	PF	6/18/2019	Sanitary Sewer Overflow-Sampling	DEP	Violation(s) Noted	853420	06/18/2019	92A.47(C)	NPDES - Illegal discharge to waters of the Commonwealth from a sanitary sewer overflow (SSO)	06/19/2019	0
2887535	PF	5/30/2019	Sanitary Sewer Overflow-Sampling	DEP	Violation(s) Noted	850934	05/30/2019	92A.47(C)	NPDES - Illegal discharge to waters of the Commonwealth from a sanitary sewer overflow (SSO)	05/30/2019	0
2886432	PF	5/28/2019	Sanitary Sewer Overflow-Sampling	DEP	Violation(s) Noted	850731	05/28/2019	92A.47(C)	NPDES - Illegal discharge to waters of the Commonwealth from a sanitary sewer overflow (SSO)	05/29/2019	0
2876120	PF	5/6/2019	Sanitary Sewer Overflow-Sampling	DEP	Viol(s) Noted & Immediately Corrected	848655	05/06/2019	CSL611	CSL - Failure to comply with terms and conditions of a WQM permit	05/06/2019	0
2858882	PF	3/26/2019	Administrative/File Review	DEP	Violation(s) Noted	844999	03/26/2019	92A.47(C)	NPDES - Illegal discharge to waters of the Commonwealth from a sanitary sewer overflow (SSO)	03/26/2019	1
2831626	PF	1/24/2019	Sanitary Sewer Overflow-Sampling	DEP	Violation(s) Noted	840049	01/24/2019	92A.47(C)	NPDES - Illegal discharge to waters of the Commonwealth from a sanitary sewer overflow (SSO)	01/24/2019	0
2823115	PF	1/7/2019	Sanitary Sewer Overflow-Sampling	DEP	Viol(s) Noted & Immediately Corrected	838187	01/07/2019	CSL611	CSL - Failure to comply with terms and conditions of a WQM permit	01/07/2019	0
2818598	PF	12/21/2018	Sanitary Sewer Overflow-Sampling	DEP	Viol(s) Noted & Immediately Corrected	837143	12/21/2018	CSL611	CSL - Failure to comply with terms and conditions of a WQM permit	12/21/2018	0
2804497	PF	11/19/2018	Sanitary Sewer Overflow-Sampling	DEP	Viol(s) Noted & Immediately Corrected	833760	11/16/2018	CSL201	CSL - Unauthorized, unpermitted discharge of sewage to waters of the Commonwealth	11/16/2018	0
2785466	PF	9/30/2018	Sanitary Sewer Overflow-Sampling	DEP	Viol(s) Noted & Immediately Corrected	829954	09/30/2018	CSL611	CSL - Failure to comply with terms and conditions of a WQM permit	09/30/2018	0
2776540	PF	9/17/2018	Sanitary Sewer Overflow-Sampling	DEP	Viol(s) Noted & Immediately Corrected	828275	09/17/2018	CSL611	CSL - Failure to comply with terms and conditions of a WQM permit	09/17/2018	0
2773077	PF	9/9/2018	Sanitary Sewer Overflow-Sampling	DEP	Violation(s) Noted	827491	09/09/2018	CSL611	CSL - Failure to comply with terms and conditions of a WQM permit	09/11/2018	0
2888399	PF	6/2/2019	Sanitary Sewer Overflow-Sampling	DEP	Viol(s) Noted & Immediately Corrected	851164	06/02/2018	92A.47(C)	NPDES - Illegal discharge to waters of the Commonwealth from a sanitary sewer overflow (SSO)	06/02/2019	0
2735705	PF	5/25/2018	Sanitary Sewer Overflow-Sampling	DEP	Viol(s) Noted & Immediately Corrected	817989	05/25/2018	CSL611	CSL - Failure to comply with terms and conditions of a WQM permit	05/25/2018	0
2714843	PF	4/3/2018	Sanitary Sewer Overflow-Sampling	DEP	Viol(s) Noted & Immediately Corrected	812854	04/03/2018	92A.47(C)	NPDES - Illegal discharge to waters of the Commonwealth from a sanitary sewer overflow (SSO)	04/04/2018	0

**APPENDIX A-20-E-2**

**BASA CHAPTER 94 CORRECTIVE ACTION PLAN**

# BUTLER AREA SEWER AUTHORITY

## CHAPTER 94 CORRECTIVE ACTION PLAN

### PUMP STATION SANITARY SEWER OVERFLOWS (SSOs)

#### I. BACKGROUND

This Corrective Action Plan (CAP) is being submitted in response to a meeting between the Butler Area Sewer Authority (BASA) and the Pennsylvania Department of Environmental Protection (DEP) that was held at the request of the Authority on November 14, 2018. The purpose of the meeting was to discuss recurring wet weather sanitary sewer overflows (SSOs) during the 2018 record rainfall year associated with several of BASA's sewage pump stations and the corrective actions to reduce the overloaded conditions and/or to provide the additional capacities, if necessary, to address the hydraulic overload conditions and eliminate these SSOs. The need to implement a Connection Management Program to limit and/or control new connections to these overloaded pump stations was also discussed. A new connection prohibition must be imposed by BASA for the service areas tributary to the pump stations that are hydraulically overloaded until the DEP approves BASA's CAP. BASA's other pump station facilities and sewer system areas would not be subject to this new connection prohibition.

This CAP primarily focuses on three pump stations that have experienced recurring wet weather SSO events during 2018: the Fisher Heights Pump Station, the Brewster Booster Pump Station, and the Bryson Pump Station. The Fisher Heights Pump Station is not significantly affected by pumped flows from any upstream pump station. However, the Brewster Booster and Bryson Pump Stations are significantly affected hydraulically by pumped flows from other upstream pump stations. The CAP must consider the hydraulic interconnection of the upstream pump stations when identifying the cause of the SSOs and assessing corrective actions and any capital improvements to these two pump stations.

Therefore, the CAP will be subdivided into separate sections to address the following pump stations and pump station systems (listed by the pump station flow sequence):

1. The Fisher Heights Pump Station;
2. The Brewster and Brewster Booster Pump Station system, which also receives the flow from the upstream Fisher Heights Pump Station; and
3. The Greenwood, Benbrook and Bryson Pump Station system.

Although many of the CAP tasks are the similar for each of these systems, the tasks will be discussed relative to each specific system for scheduling and progress report purposes.

## II. IDENTIFICATION AND REDUCTION OF INFILTRATION AND INFLOW (I&I) SOURCES

BASA will continue its ongoing efforts to identify and remove sources of I&I to the gravity sewers within the service areas of these pump stations. Past experience indicates that the majority of I&I is coming from private laterals and illegal connections and these sources are very difficult to identify and correct. There are very few inspection tees or outside vented traps on the private sewer laterals to the public sewer in these sewer subsystems. Sewer televising during wet weather events is the only way to detect laterals contributing I&I to the public sewer, however, the high flows submerge cameras and prevent televising during these same periods. While BASA will continue efforts to identify and eliminate private lateral I&I sources, BASA's main focus has been and will be the identification and elimination of I&I sources in the public portion of the sewer system.

### A. CORRECTIVE ACTIONS COMPLETED AND IN PROGRESS

- 1. Contract 2018-01 Upper Sullivan Run Sewer Rehabilitation** – In April 2018, BASA authorized the expenditure of up to \$220,000 to complete point repairs to correct the identified sewer defects within the sewer system directly tributary to the Brewster Booster Pump Station, as well as the sewers tributary to the upstream Fisher Heights and Brewster Pump Stations that both contribute flow to the Brewster Booster Pump Station. In July 2018, State Pipe Services completed Contract No. 2018-01 Upper Sullivan Run Sewer Rehabilitation Project, pursuant to the North Hills Council of Governments (NHCOG) 2017-2018 Unit Price Sanitary Sewer Rehabilitation Contract. The project included point source repairs to correct Class 4 and 5 pipe defects and eliminate these potential sources of I&I that may be causing or contributing to the overflows. The open-cut and CIPP sewer spot repair work was initially started in the upstream Fisher Heights Pump Station service area, then proceeded to the service areas for the Brewster and Brewster Booster Pump Stations. Prior to starting each point repair, State Pipe Services televised the sewer to reassess the pipe defect and required repair. The pre-repair televising indicated that several of these defects were actively contributing significant I&I to the sewer system. Post-repair televising confirms the repair work successfully eliminated these active I&I sources. The total project costs for the open-cut spot repairs, CIPP, sewer cleaning and televising, and a manhole casting leak repairs was \$207,033 under the 2017-2018 NHCOG contract.
- 2. Contract 2018-04 Upper Sullivan Run Sewer Rehabilitation Phase II** – On September 11, 2018, the BASA Board authorized participation in the NHCOG 2018-2019 unit bid price sewer rehabilitation services contract. The BASA Board also allocated an additional \$250,000 for this sewer repair work within the sewer system directly tributary to the Booster PS, as well as the sewers tributary to the upstream Fisher Heights Pump Station and the Brewster PS that both contribute flow to the Booster PS. This work will include leaking manhole repairs, sewer point repairs, and lateral repairs within the public sewer right-of-way. Because some of the repair work is temperature dependent, e.g., manhole grouting, the work under this contract is expected to begin in the spring of 2019.

3. **Manhole Leak Sealing and Installation of Manhole I&I Inserts** – As time permits, BASA crews continue to inspect the manholes within these sewer systems to observe the wet weather flow conditions and identify active manhole leaks. BASA crews have found a number of manholes with active leaks contributing I&I, as well as a number of manholes that were situated in low-lying areas and drainage ditches that were subject to being inundated and leaking during wet weather events. BASA crews have successfully sealed some of these leaks by drilling into the manhole walls and injecting Seal Guard II chemical grout, a highly reactive dual component hydrophobic polyurethane designed to stop rapid (>50 gpm) water flows into concrete or other underground structures. However, the identification and repair of these manhole leaks is weather dependent because the grout is only activated when the leaks are active. Manhole sealing and grouting work is also included in the scope of BASA's Contract 2018-04 under the 2018-2019 NHCOC Unit Price Sanitary Sewer Rehabilitation Contract.

BASA also purchased 30 Man Pan Classic manhole inserts in June 2018. The manhole inserts were delivered in August 2018 and BASA crews have completed the installation of this initial quantity of manhole inserts in the manholes in the low-lying areas and drainage ditches directly tributary to these pump station systems, primarily in the Fisher Heights Pump Station area. In January 2019, BASA purchase and received an additional 30 Man Pan Classic manhole inserts. This second allocation of inserts will be installed in other manholes that are subject to inflow that are tributary to these pump station systems as such manholes are identified.

Any significant sources of I&I that may be found and the corrective actions to eliminate these sources will be reported as completed corrective actions in future progress reports under the report for the specific pump station sewer system where the sources were found.

### **III. FISHER HEIGHTS PUMP STATION**

The Fisher Heights Pump Station located at 2019 William Flynn Highway in Center Township pumps to the gravity sewers tributary to the Brewster Pump Station and then to the Brewster Booster Pump Station. The Fisher Heights Pump Station has experienced periodic wet weather SSO events in the past. Only one SSO was reported during the period from 2015 to 2017, however, there were four SSO events during 2018 due to the record rainfall in 2018. Flows exceeding the current pumping capacity of this station overflow from Manhole 7526, the lowest lying manhole upstream of the station. There are two possible scenarios that may be causing or contributing to this manhole overflow: (1) the existing pumps at the Fisher Heights Pump Station are not pumping at their design capacity, and/or (2) excessive I&I contributed by the gravity sewers are overloading the capacity of the pumps at this station. BASA proposes to investigate these possible scenarios to determine the specific cause(s) and required corrective action(s) to eliminate these overflows.

Manhole 7526 is located in the back yard of a private residence. BASA is proposing to eliminate the current overflow from Manhole 7526 by relocating the SSO point as part of the CAP to assess and eliminate the SSOs at this pump station.

**A. CORRECTIVE ACTIONS COMPLETED**

1. **Installation of Flow Meters within Tributary Sewer System** – In January 2019, BASA personnel identified and inspected potential flow metering locations within the gravity sewer system tributary to the Fisher Heights Pump Station. Based on this assessment, five area-velocity flow meters were installed at key locations in the sewer system to monitor and identify any specific sewer subsystems that are contributing significant I&I to the pump station. The flow metering data will help to define the magnitude of the peak wet weather flows contributed to this pump station and will be used to focus future efforts to further identify and try to eliminate I&I sources.

**B. CORRECTIVE ACTIONS TO BE COMPLETED**

1. **Relocation of SSO and Installation of SSO Flow Meter** – The volume of the SSOs from Manhole 7526 are unknown and cannot be readily measured. The cause and required corrective actions to address the SSOs at this pump station cannot be determined until the SSO flow rates and volume can be estimated by flow metering. Since meeting with the DEP, BASA completed field survey work to determine the elevations of Manhole 7526, other downstream manholes and the wet well of the pump station. Based on these elevations, the accessibility requirements for the overflow flow meter probe and the proximity to the existing flow meter in the wet well of the pump station, BASA plans to core drill a hole directly into the wall of the wet well and install a temporary 8-inch diameter overflow pipe from the wet well to the stream adjacent to the pump station (Refer to Fisher Heights Pump Station Drawing attached). The elevation of the core drilled hole should stop the current overflow at Manhole 7526 and shift the overflow further downstream to the new pump station wet well overflow pipe. A new area-velocity flow meter probe will be purchased and installed in the new overflow pipe that will be connected to the existing multiple probe flow meter in the wet well. This will eliminate the existing upstream SSOs at Manhole 7526, enable BASA to directly measure the volume and flow rates of any SSOs, and determine the pumping capacity required to eliminate the current SSOs. Assuming the new flow meter probe is delivered in a timely manner, the core drilling work, overflow pipe installation and new flow meter probe installation at this station should be completed by April 30, 2019.
2. **SSO Flow Metering Period** – After the new overflow pipe and flow meter are installed, BASA will monitor and meter all overflow events at this station. Several significant overflow events under different rainfall and groundwater conditions must be experienced in order to assess the peak wet weather flows that the pump station must be capable of handling to prevent overflows. BASA anticipates that the flow metering period will be at least 12 months to include all seasonal conditions. However, the duration of the SSO flow metering period is completely weather dependent and cannot be predicted. The completion schedule for all subsequent long-term corrective actions will be dependent on the length of the SSO flow metering period.

3. **Pump Drawdown Tests to Assess Actual Pumping Capacity and Identify Pump Station/Piping Issues** – BASA proposes to conduct pump drawdown tests of each pump at the Fisher Heights Pump Station to determine the pumping rate of each pump at normal flow and head conditions and at the simulated high wet well levels and lower static head conditions when the overflows have occurred. The pump tests will determine if the overflows are caused by the pumps at the Fisher Heights Pump Station not pumping at their design capacity. In order to conduct the pump tests, BASA must purchase four new pressure gauges and BASA personnel must drill and install pressure gauge taps on the suction and discharge piping of both pumps. BASA anticipates that the required pressure gauges can be purchased and installed by June 30, 2019. Depending on weather conditions, BASA is planning to complete the pump tests at the Fisher Heights Pump Station during the third quarter of 2019.
4. **Short-Term Pump Repair** – If the pump tests indicate that a pump is pumping at a reduced capacity, as a short-term corrective action, BASA will remove that pump and motor from service (one at a time) and have our pump repair contractor disassemble the pump and motor to identify any mechanical component(s) that may be repaired or replaced to restore pumping capacity. Depending on the availability of parts, the pump repair work may take 4 to 8 weeks. It is anticipated that this work, if necessary, would be completed during the fourth quarter of 2019.
5. **Pump Station Assessment and Preliminary Design Evaluation** – If the pump test determines that the pumps are pumping at their design capacity, the wet weather flows from I&I are exceeding the pumping capacity of the station and causing the overflows. While BASA will continue its ongoing efforts to identify and remove sources of I&I to the gravity sewer, it is unlikely that sufficient flow can be removed to negate the need for greater pumping capacity. Therefore, additional redundant, pumping capacity will be required to handle the wet weather peak flows at this pump station. The actual peak flows that must be handled will be determined during the SSO flow metering period. In the interim, BASA's in-house engineering staff and consulting engineer will initiate a preliminary assessment and design evaluation of the existing pump station, pump configuration and discharge force main to identify feasible alternatives to increase the capacity of the station.

This preliminary design evaluation will determine if the existing 40-year old, steel, dry well of the package pump station has sufficient room for larger pumps and motors, and the maximum size pumps and motors that could be installed. The existing generator will also be assessed to determine the maximum horsepower pump motors that it could handle. The evaluation will also consider replacement pump station alternatives including installing a new wet well mounted, suction lift pump station atop the existing wet well versus constructing a completely new submersible pump station and new building. The possibility of an equalization storage tank to capture the excess flows will also be considered to allow the existing pump station to remain in service without major modifications. The existing pump station property will also be assessed to determine if there is any

room available for new construction on the site or if additional land acquisition would be required.

Assuming the pump tests are completed by the end of the third quarter 2019, the pump station assessment and preliminary design evaluation will be initiated during the fourth quarter of 2019. While preliminary conclusions will be available sooner, the final conclusions and recommended structural improvements for final design cannot be completed until after the SSO flow metering period determines the peak wet weather flows that must be handled. Assuming the flow metering period can define the peak flows within 12 months (tentatively April 30, 2020), it is anticipated that the final structural improvement recommendations and final scope for the design work proposals should be completed by July 31, 2020.

6. **Design Plans, Specifications and Permitting Work** – The final scope of work for the design and permitting of the recommended structural improvements will be determined by the preliminary design evaluation (Step 5). An estimated 12 months will then be required to complete the final design and permitting work for the recommended structural improvements to eliminate the Fisher Heights Pump Station overflows. Assuming the final design scope is completed by July 31, 2020, the design work is expected to be completed by July 30, 2021.
7. **Advertise for Bids and Award Construction Contracts** – After the design and permitting work is completed, BASA must advertise for bids for the construction of the recommended structural improvements to eliminate the Fisher Heights Pump Station overflows. An estimated three to four months, depending on the time of year, will be required to complete this step. Assuming the design work is completed by July 31, 2021, it is anticipated that the contract for construction of the recommended structural improvements can be awarded by November 30, 2021.
8. **Construction of Recommended Structural Improvements** – Assuming the project is advertised for bids and the construction contract is awarded by November 30, 2021, actual construction work on this project would most likely start in early 2022. The construction work for the recommended structural improvements to address the Fisher Heights Pump Station overflows will require at least 365 days. Based on these estimates, the recommended structural improvements should be completed and operational by early 2023.

#### **IV. BREWSTER & BREWSTER BOOSTER PUMP STATION SYSTEM**

The Brewster Pump Station located at 306 East Butler Road in Center Township pumps to the gravity sewer immediately upstream of the Brewster Booster Pump Station. The Brewster Booster Pump Station is located 171 East Brewster Road in Center Township. As previously noted, the Fisher Heights Pump Station also contributes flow to the Brewster Pump Station. The design flow rates for the pumps (600 gallons per minute [gpm]) and the pump motors (40 HP) at the Brewster and Brewster Booster Pump Stations are identical. The only difference between the pumps is the variable frequency drive motors and pump controllers that were installed at the Brewster Pump Station in November 2012. The pumps at the Brewster Booster Pump Station have constant-speed motors. The Brewster Pump Station did not experience any wet weather

SSOs during the period from 2015 to 2017, but there was one wet weather SSO event that occurred during the record rainfall period in September 2018. The Brewster Booster Pump Station experienced only two wet weather SSOs during the period from 2015 to 2017; however, there were eight wet weather SSO events during 2018 due to the record rainfall.

The flows exceeding the current pumping capacity of the Brewster Booster Pump Station overflow from Manhole 7709, the lowest lying manhole upstream of the station. Manhole 7709 is located in the back yard of a private residence. The owners of this property and neighboring properties have filed complaints about the SSOs from this manhole and the negative impacts on their property. BASA evaluated and considered adding barrel section(s) to raise this manhole higher than the current surface grade to temporarily stop or at least reduce the frequency of the overflows at this manhole. However, this action was rejected because of the negative aesthetic impact on the residents. In order to mitigate the complaints by these property owners, BASA is proposing to eliminate the current overflow from Manhole 7709 as part of the CAP to assess and eliminate the SSOs at the Brewster Booster Pump Station.

#### A. CORRECTIVE ACTIONS COMPLETED

1. **Hydraulic Model and Pump Testing to Assess and Identify Pump Station/Piping Issues** – During 2018, BASA engineers completed the computer hydraulic model of the Brewster and Brewster Booster Pump Stations, the discharge force mains, and the gravity sewers tributary to Brewster Booster Pump Station. The model was used to reevaluate the original design operating conditions, assess the current operating conditions based on pump test data, and assess potential corrective actions. The model was based on: (1) BASA's field survey measurements to verify and determine key manhole and pump station elevations; (2) the pump drawdown tests of each pump at the Brewster and Brewster Booster Pump Stations; and (3) the flow metering data from the flow meters on the inlet gravity sewers to the wet wells of the pump stations and new flow meter that was installed in the gravity sewer immediately downstream of the location where the Brewster Booster Pump Station force main discharges into the gravity sewer, in order to measure the actual discharge flow from the Brewster Booster Pump Station. The pump drawdown tests assessed the pumping rate of each pump at normal flow and head conditions, as well as the simulated high wet well levels and lower static head conditions when the overflows have occurred.

The model proved to be much more difficult than originally anticipated because of the dynamic interaction of the variable-speed pumps at the Brewster Pump Station and the constant speed pumps at the Brewster Booster Pump Station, the surcharging of the upstream gravity sewers at peak high flow conditions, the inability to measure the force main discharge flow directly, and the inability to measure the overflow discharges. In addition, the discharge from the Fisher Heights Pump Station also appears to be influencing the model. Nevertheless, the model has yielded some definitive results:

- a. Both pumps at the Brewster Pump Station are pumping at a rate greater than the original peak design flow (600 gpm).

- b. Pump No. 1 at the Brewster Booster Pump Station is also pumping at a rate greater than the original peak design flow (600 gpm). However, Pump No. 2 at the Brewster Booster Pump Station is only pumping at or below its original design capacity (600 gpm).
- c. Both pump stations are capable of handling the normal dry weather flows and diurnal peak sewage flows with only one pump operating, as originally designed.
- d. High wet weather flows caused by excessive I&I have exceeded the pumping capacity of both pump stations.
- e. During high flows, the two pumps at the Brewster Pump Station will pump about 200 gpm (or more) than the two pumps at the Brewster Booster Pump Station, even if new pumps of the same design capacity were installed.
- f. Raising Manhole 7709, the overflow manhole upstream of the Brewster Booster Pump Station, and realigning the upstream gravity sewers does not appear to be a short-term solution to stop the overflows.
- g. Replacing Pump No. 2 at the Brewster Booster Pump Station with a similar capacity pump may help reduce overflows in the short-term, but it may not correct the overflow problem.

It is unlikely that a sufficient amount of I&I can be removed to eliminate the hydraulic overloading of these pump stations and the periodic overflows. Based on the model results, structural improvements such as increasing the capacity of these pump stations and potentially upsizing force mains and/or equalization/storage tanks will be required to eliminate these periodic overflows.

## **B. CORRECTIVE ACTIONS TO BE COMPLETED**

1. **Relocation of SSO and Installation of SSO Flow Meter** – The volume of the SSOs from Manhole 7709 are unknown and cannot be readily measured. The cause and required corrective actions to address the SSOs at these pump stations cannot be determined until the SSO flow rates and volume can be estimated by flow metering. At the meeting with the DEP, BASA proposed to restrict the pumping capacity of the Brewster Pump Station to prevent the hydraulic overloading of the Brewster Booster Pump Station and stop the current SSOs from Manhole 7709. This will shift the overflow location to the lowest manhole upstream of the Brewster Pump Station, where any SSO would flow into a more isolated drainage ditch instead of running over the ground surface in any residential property. BASA also proposed installing an overflow pipe with a flow meter at the Brewster Pump Station to measure the actual volume and flow rates of any SSO.

BASA completed field survey work to determine the elevations of the two manholes immediately upstream of the Brewster Pump Station and the wet well of the pump station. Based on these elevations, the accessibility requirements for the overflow flow meter probe and the proximity to the existing flow meter in the wet well of the pump station, BASA plans to core drill a hole directly into the wall of

the wet well and install a temporary 8-inch diameter overflow pipe from the wet well to the drainage ditch adjacent to the pump station (Refer to Brewster Pump Station Drawing attached). The elevation of the core drilled hole will maximize the storage capacity of the wet well before there is any overflow. A new area-velocity flow meter probe will be purchased and installed in the new overflow pipe and it will be connected to the existing multiple probe flow meter in the wet well. This will eliminate the existing SSOs at Manhole 7709, enable BASA to directly measure the volume and flow rates of any SSOs, and determine the pumping capacity required to eliminate the current SSOs. Assuming the new flow meter probe is delivered in a timely manner, the core drilling work, overflow pipe installation and new flow meter probe installation at the Brewster Pump Station should be completed by May 31, 2019.

2. **SSO Flow Metering Period** – After the new overflow pipe and flow meter are installed, BASA will monitor and meter all overflow events at this station. Several significant overflow events under different rainfall and groundwater conditions must be experienced in order to assess the peak wet weather flows that the pump station facilities must be capable of handling to prevent overflows. BASA anticipates that the flow metering period will be at least 12 months to include all seasonal conditions. However, the duration of the SSO flow metering period is completely weather dependent and cannot be predicted. The completion schedule for all subsequent long-term corrective actions will be dependent on the length of the SSO flow metering period.
  
3. **Pump Station Assessment and Preliminary Design Evaluation** – Based on the model results, structural improvements such as increasing the capacity of these pump stations and potentially upsizing force mains and/or equalization/storage tanks may be required to eliminate these periodic overflows. The actual peak flows that must be handled will be determined during the SSO flow metering period. In the interim, BASA’s in-house engineering staff and consulting engineer will initiate a preliminary assessment and design evaluation of the existing Brewster and Brewster Booster Pump Stations, pump configuration and discharge force main to identify feasible alternatives to increase the capacity of the station.

This preliminary design evaluation will determine if the existing 40-year old, steel, dry well of the package pump stations have sufficient room for larger pumps and motors, and the maximum size pumps and motors that could be installed. The existing generators will also be assessed to determine the maximum horsepower pump motors that they could handle. The evaluation will also consider replacement pump station alternatives including installing a new wet well mounted, suction lift pump station atop the existing wet wells versus constructing a completely new submersible pump station and new buildings. The possibility of an equalization storage tank to capture the excess flows will also be considered to allow the existing pump stations to remain in service without major modifications. The existing pump station properties will also be assessed to determine if there is any room available for new construction on the site or if additional land acquisition would be required for the improvements.

The pump station assessment and preliminary design evaluation will be initiated during the first quarter of 2020. While preliminary conclusions will be available sooner, the final conclusion and recommended structural improvements for final design cannot be completed until after the SSO flow metering period determines the peak wet weather flows that must be handled. Assuming the flow metering period can define the peak flows within 12 months (tentatively May 31, 2020), it is anticipated that the final structural improvement recommendations and final scope for the design work proposals should be completed by November 30, 2020.

6. **Design Plans, Specifications and Permitting Work** – The final scope of work for the design and permitting of the recommended structural improvements will be determined by the preliminary design evaluation (Step 5). An estimated 12 months will then be required to complete the final design and permitting work for the recommended structural improvements to eliminate the Brewster Booster Pump Station overflows. Assuming the final recommendation and design scope are completed by November 30, 2020, the design work is expected to be completed by November 30, 2021.
7. **Advertise for Bids and Award Construction Contracts** – After the design and permitting work is completed, BASA must advertise for bids for the construction of the recommended structural improvements to eliminate the Brewster Booster Pump Station overflows. An estimated three to four months, depending on the time of year, will be required to complete this step. Assuming the design work is completed by November 30, 2021, it is anticipated that the contract for construction of the recommended structural improvements can be awarded by March 31, 2022.
8. **Construction of Recommended Structural Improvements** – Assuming the project is advertised for bids and the construction contract is awarded by March 31, 2022, construction work on this project would probably start in summer of 2022. The construction work for the recommended structural improvements to address the Brewster Booster Pump Station overflows will require at least 365 days. Based on these estimates, the recommended structural improvements should be completed and operational by the summer of 2023.

## V. GREENWOOD, BENBROOK & BRYSON PUMP STATION SYSTEM

The Greenwood Pump Station located at 200 Greenwood Drive in Butler Township pumps directly to the Benbrook Pump Station. The Greenwood Pump Station experienced two wet weather overflow events in 2015, one event in 2017, and two events in February 2018 and September 2018, the wettest months during the 2018 record rainfall year. The Benbrook Pump Station located at 524 South Benbrook Road in Butler Township then pumps the sewage flow to the gravity sewers tributary to the Bryson Pump Station. The Benbrook Pump Station did not experience any wet weather overflow events from 2015 to 2017, but there were two overflow events during 2018, one due solely to power outage problems and one in September 2018 during wet weather. The Bryson Pump Station is located at 106 Bryson Road in Butler Township. The Bryson Pump Station did not experience any overflow events from 2015 to 2017; however, there were eight wet weather overflow events during 2018 and one overflow event due to a bubbler compressor failure in 2018.

The design flow rates for the pumps at all three of these pump stations are the same (500 gpm). The only differences between the pumps are the design total head and motor horsepower. The hydraulic influence that each of these stations has on the downstream pump stations, and even the upstream pump stations, must be carefully considered during the identification and evaluation of the necessary corrective actions to eliminate the SSOs at these stations.

Several possible scenarios were identified that may be causing or contributing to the recurring overflows at the Bryson Pump Station: (1) surcharging of the downstream manhole into which the Bryson Pump Station force main discharges is increasing the total head on the pumps and reducing the pump discharge rate below the design capacity; (2) the pumps at the Bryson Pump Station are not pumping at their design capacity; (3) the pumps at the Benbrook Pump Station are pumping at a rate greater than their design capacity and exceeding the pumping capacity of the Bryson Pump Station; and/or (4) excessive inflow and infiltration (I&I) contributed by the gravity sewers into the Bryson Pump Station are overloading the capacity of the pumps at this station. Similar scenarios may be causing or contributing to the overflows at the Greenwood Pump Station: (1) the pumps at the Benbrook Pump Station are not pumping at their design capacity causing the wet well to surcharge, which increases the total head on the pumps and reduces the pump discharge rate below the design capacity at the Greenwood Pump Station; (2) the pumps at the Greenwood Pump Station are not pumping at their design capacity; and/or (3) excessive inflow and infiltration (I&I) contributed by the gravity sewers into the Greenwood Pump Station are overloading the capacity of the pumps at this station. BASA proposes to investigate these possible scenarios to determine the specific cause(s) and required corrective action(s) to eliminate these overflows.

#### A. CORRECTIVE ACTIONS COMPLETED AND IN PROGRESS

1. **Repair of Collapsed Sewer Downstream of Bryson Pump Station Force Main Discharge** – On January 25, 2019, BASA found a collapsed sewer in the fourth segment of the 10-inch gravity sewer downstream of the manhole where the Bryson Pump Station force main discharges into the gravity sewer. The pipe collapse reduced the pipe opening to less than half of its diameter and caused significant surcharging of the upstream gravity sewers and manholes, including the manhole into which the Bryson Pump Station force main discharges. The increase head from this surcharging effectively reduced the pumping capacity of the Bryson Pump Station and limited its ability to handle the incoming flows during wet weather conditions. BASA believes that this is probably the major cause of the recurring SSOs that started in January 2018 at the Bryson Pump Station, as well as a contributing factor to periodic SSOs at the Greenwood and Benbrook Pump Stations.

BASA crews and a contractor excavated and replaced about 17 feet of the 14-foot deep gravity sewer on January 30, 2019. This repair eliminated the surcharging of the upstream gravity sewers. It is impossible to tell when the collapse occurred, but based on the blackness of the soil around the collapse, the crew feels the collapse has been there for some time. After BASA installed new pumps and motors in the Bryson Pump Station in May 2015, there were no SSOs at this station in 2015, 2016 and 2017. There was also no evidence of any surcharging when the force main discharge manhole was last inspected in September 2017 for

a new sewer connection. Since the recent recurring SSOs started in January 2018, BASA suspects that the collapse occurred sometime in December 2017 or early January 2018. BASA's CAP will include continued monitoring and evaluation of the Greenwood, Benbrook and Bryson Pump Station system, but BASA is optimistic that this repair will substantially reduce and possibly eliminate the recent recurring SSOs at the Bryson Pump Station.

2. **Televising Gravity Sewers Downstream of Bryson Pump Station Force Main**

**Discharge** – After completing the point repair of the collapsed pipe in the 10-inch gravity sewers downstream of the manhole into which the Bryson Pump Station force main discharges, BASA staff completed an internal television inspection of the downstream gravity sewers. The television inspection revealed that the entire 234-foot long sewer between Manholes 4626 and 4625, where the 10-inch gravity sewer that was repaired, and 212-foot sewer between Manholes 4625 and 4624 were also cracked at the top of the ABS Truss pipe. These sewer segments should be replaced or relined to prevent another pipe collapse. Because of the depth of these sewers and the proximity to nearby buildings, BASA feels that it would be less disruptive and quicker to reline these sewers rather than attempting an open cut sewer replacement.

**B. CORRECTIVE ACTIONS TO BE COMPLETED**

1. **Relining of Sewer Segments from Manholes 4626 to 4625 and 4625 to 4624** –

BASA will obtain formal price quotes for the relining of these sewers through the North Hills Council of Governments (NHCOG) unit price sewer rehabilitation contract and PA CoStars unit price sewer repair contracts. The sewer relining work is weather dependent and probably cannot be completed until the spring or summer of 2019. BASA expects to obtain final cost quotes for the proposed sewer relining work so that the BASA Board can formally authorize completion of this work at their regular meeting on May 14, 2019. Depending on the contractor's work load, it is anticipated that the sewer relining work can be completed by the end of September 30, 2019.

2. **Relocation of SSO and Installation of SSO Flow Meter** –

The volume of the SSOs from Manhole 4360 upstream of the Bryson Pump Station, as well as the manhole overflows at the Benbrook and Greenwood Pump Stations are unknown and cannot be readily measured. The cause and required corrective actions to address the SSOs at these pump stations cannot be determined until the SSO flow rates and volume can be estimated by flow metering. At the meeting with the DEP, BASA proposed to restrict the pumping capacity of the Greenwood Pump Station to prevent the hydraulic overloading of the Bryson Pump Station and stop the current SSOs from Manhole 4360. This would effectively shift the overflow location from Manhole 4360 to the lowest lying upstream manhole upstream of the Greenwood Pump Station, Manhole 4775, which is located on the other side of the creek to the north of the station, where any overflow would flow directly into the nearby stream instead of running over the ground surface near residential properties. BASA also proposed installing an overflow pipe with a flow meter at the Greenwood Pump Station overflow point to measure the actual volume and flow rates of any SSO and determine the peak wet weather flows that these three pump stations must be able to handle.

BASA completed field survey work to determine the elevation of the two manholes immediately upstream of the Greenwood Pump Station and the wet well of the pump station. Based on these elevations, the accessibility requirements for the overflow flow meter probe and the proximity to the existing flow meter in the wet well of the pump station, BASA plans to core drill a hole directly into the wall of the wet well and install a temporary 8-inch diameter overflow pipe from the wet well to the nearby stream adjacent to the pump station (Refer to Greenwood Pump Station Drawing attached). The elevation of the core drilled hole would be the same as the overflow elevation of Manhole 4775 in order to maximize the storage capacity of the wet well before there is any overflow. The proposed overflow metering installations at the Fisher Heights and Brewster Pump Stations only required purchasing and installing a new area-velocity flow meter probe in the new overflow pipe and connecting the new probe to the existing multiple probe flow meter in the wet well. However, the Greenwood Pump Station's existing flow meter is an older style meter that must be replaced to accept additional flow probes. Therefore, a new area-velocity flow meter probe and a new flow meter must be purchased to install a flow meter on the new overflow pipe. This will eliminate the existing unmeasured SSOs at Manhole 4775, enable BASA to directly measure the volume and flow rates of any SSOs, and determine the pumping capacity required to eliminate the current SSOs. Assuming the new flow meter probe is delivered in a timely manner, the core drilling work, overflow pipe installation and new flow meter probe installation at the Greenwood Pump Station is expected to be complete by June 30, 2019.

3. **SSO Flow Metering Period** – After the new overflow pipe and flow meter are installed, BASA will monitor and meter all overflow events at this station. Several significant overflow events under different rainfall and groundwater conditions must be experienced in order to assess the peak wet weather flows that the pump station facilities must be capable of handling to prevent overflows. BASA anticipates that the flow metering period will be at least 12 months to include all seasonal conditions. However, the duration of the SSO flow metering period is completely weather dependent and cannot be predicted. The completion schedule for all subsequent long-term corrective actions will be dependent on the length of the SSO flow metering period.
  
4. **Pump Drawdown Tests to Assess Actual Pumping Capacity and Identify Pump Station/Piping Issues** – BASA proposes to conduct pump drawdown tests of each pump at the Greenwood, Benbrook and Bryson Pump Stations to determine the pumping rate of each pump at normal flow and head conditions and at the simulated high wet well levels and lower static head conditions when the overflows have occurred. The pump tests will determine if the overflows are caused by the pumps at these stations not pumping at their design capacity for some reason. In order to conduct the pump tests, BASA must purchase new pressure gauges and BASA personnel must drill and install pressure gauge taps on the suction and discharge piping of both pumps at each pump station. BASA anticipates that the required pressure gauges can be purchased and installed by July 31, 2019. Depending on weather conditions, BASA is planning to complete the pump tests at these three stations by December 30, 2019.

5. **Short-Term Pump Repair** – If the pump tests indicate that any pump is pumping at a reduced capacity, as a short-term corrective action, BASA will remove that pump and motor from service (one at a time) and have our pump repair contractor disassemble the pump and motor to identify any mechanical component(s) that may be repaired or replaced to restore pumping capacity. Depending on the availability of parts, the pump repair work may take 4 to 8 weeks. It is anticipated that this work, if necessary, would be completed during the first or second quarter of 2020.
6. **Hydraulic Model to Assess and Identify Pump Station/Piping Issues** – Similar to the approach to assess the interaction of the Brewster and Brewster Booster Pump Stations, BASA proposes to develop a basic computer hydraulic model of the Greenwood, Benbrook and Bryson Pump Station system, the discharge force mains, and the gravity sewers tributary to Bryson Pump Station. The model will be used to reevaluate the original design operating conditions, assess the current operating conditions using the pump test data, and assess potential corrective actions. The model will be based on: (1) BASA’s field survey measurements to verify and determine key manhole and pump station elevations; (2) the pump drawdown tests of each pump at the Greenwood, Benbrook and Bryson Pump Stations; (3) the flow metering data from the flow meters installed on the inlet gravity sewers to the wet wells of the pump stations, and (4) the metered overflow data from the new overflow pipe and flow meter installation at the Greenwood Pump Station.

The model BASA developed to assess the Brewster and Brewster Booster Pump Station system proved to be more difficult than anticipated because of the dynamic interaction of the variable-speed and constant speed pumps, the surcharging of the upstream gravity sewers at peak flow conditions, the inability to measure the force main discharge flow directly, and the inability to measure the overflow discharges. While BASA’s ability to measure any overflow discharges will improve this model, it will still be much more complex and difficult to develop because of the dynamic interaction of three pump stations. BASA will begin the development of the model concurrently with the pump testing. It is anticipated that it will take at least four to six months after the pump tests are done to input all of the data and complete the hydraulic model. Assuming the pump tests are completed by December 31, 2019, the results of the model assessment would hopefully be available by the end of the second quarter 2020.

7. **Pump Station Assessment and Preliminary Design Evaluation** – The model results will determine if structural improvements such as increasing the pumping capacity of one or more of these pump stations and potentially upsizing force mains and/or equalization/storage tank(s) will be required to eliminate these periodic overflows. The actual peak flows that must be handled will be determined during the SSO flow metering period. In the interim period, BASA’s in-house engineering staff and consulting engineer will initiate a preliminary assessment and design evaluation of the existing Greenwood, Benbrook and Bryson Pump Stations, pump configuration and discharge force mains to identify feasible alternatives to increase the capacity of this pumping network.

This preliminary design evaluation will determine if the existing 40-year old, steel, dry well of the package pump stations have sufficient room for larger pumps and motors, and the maximum size pumps and motors that could be installed. The existing generators will also be assessed to determine the maximum horsepower pump motors that they could handle. The evaluation will also consider replacement pump station alternatives including installing a new wet well mounted, suction lift pump station atop the existing wet wells versus constructing a completely new submersible pump station and new buildings. The possibility of an equalization storage tank near the Greenwood Pump Station to capture the excess flows will also be considered. A storage equalization tank would allow the existing pump stations to remain in service without major modifications, and potentially at a significantly reduced cost than replacing all three pump stations. The existing pump station properties will also be assessed to determine if there is any room available for new construction on the sites or if additional land acquisition would be required for the improvements.

The pump station assessment and preliminary design evaluation will be initiated during the second quarter of 2020. While preliminary conclusions will be available sooner, the final conclusion and recommended structural improvements for final design cannot be completed until after the SSO flow metering period determines the peak wet weather flows that must be handled. Assuming the flow metering period can define the peak flows within 12 months (tentatively June 30, 2020), it is anticipated that the final structural improvement recommendations and final scope for the design work proposals should be completed by the end of the first quarter 2021.

8. **Design Plans, Specifications and Permitting Work** – The final scope of work for the design and permitting of the recommended structural improvements will be determined by the preliminary design evaluation (Step 7). An estimated 12 to 18 months will then be required to complete the final design and permitting work for the recommended structural improvements depending on how many pump stations upgrades/replacements are involved to eliminate the overflows. Assuming the final recommendation and design scope are completed by the end of the first quarter 2021, the final design work would be completed by the end of the third quarter 2022.
9. **Advertise for Bids and Award Construction Contracts** – After the design and permitting work is completed, BASA must advertise for bids for the construction of the recommended structural improvements to eliminate the Greenwood, Benbrook and Bryson Pump Station overflows. An estimated three to four months, depending on the time of year, will be required to complete this step. Assuming the design work is completed by September 30, 2022, it is anticipated that the contract for construction of the recommended structural improvements can be bid and awarded by January 31, 2023.
10. **Construction of Recommended Structural Improvements** – Assuming the project is advertised for bids and the construction contract is awarded by January 31, 2023, construction work on this project would probably start in the

spring of 2023. The construction work for the recommended structural improvements to address the Greenwood, Benbrook and Bryson Pump Station overflows will require at least 365 days and possibly longer, if more than one pump station upgrade/replacement is required. Based on these estimates, the recommended structural improvements should be completed and operational by the spring of 2024.

## VI. CONNECTION MANAGEMENT PROGRAM

As required by the DEP's Chapter 94 Regulations, BASA will prohibit new sewer service connections to the gravity sewer systems tributary to these overloaded pump station facilities until the DEP approves BASA's CAP for these facilities. The connection prohibition will be imposed in the gravity sewers tributary to the following pump stations:

1. Fisher Heights Pump Station,
2. Brewster Pump Station,
3. Brewster Booster Pump Station,
4. Greenwood Pump Station,
5. Benbrook Pump Station, and
6. Bryson Pump Station.

BASA's other pump station facilities and sewer system areas that are not hydraulically overloaded will not be subject to this new connection prohibition.

Most of these sewer systems serve only residential properties. There has been very little development and relatively few new sewer connections within these areas in recent years. Other than the previously approved Planning Module for the Wyncrest Estates residential development, which has 20 lots still available, within the sewer system tributary to the Greenwood Pump Station, BASA is not aware of any other development plans within these areas at this time. Any future new development plans that may arise within these areas must go through the Planning Module process and would have to be approved by the DEP.

In order to prevent economic hardship for any existing property owner that may have been planning to build on a vacant lot within these areas or the existing developer that has already invested significant financial resources for his development, BASA is herewith requesting that a limited number of new sewer connections be permitted by the DEP within these sewer service areas upon approval of BASA's CAP. Specifically, BASA is requesting DEP approval of up to 20 EDUs, or 8,000 gallons per day (gpd) of sewage flow (based on 400 gpd/EDU) within these sewer service areas, for use from the approval of the CAP through January 31, 2020. The end of January coincides with the due date for BASA's Fourth Quarter 2019 Progress Report, which will include a written request for DEP approval of additional new sewer connections for the rest of 2020. BASA acknowledges that the DEP approval of any future sewer connections is contingent upon BASA's progress towards completing the CAP.

In addition, BASA reserves the right to approve and issue new sewer connections permits for any property that meets the specific exception definitions in the Chapter 94 Regulations. Any replacement of discharge exceptions that may be approved by BASA will be reported to the DEP along with documentation supporting the replacement exception. Any proposed connections that would meet the exception criteria for the elimination of a threat to public health or for a facility of public need will be submitted to DEP for approval of the exception prior to the issuance of a new sewer connection permit.

## **VII. QUARTERLY PROGRESS REPORTS**

BASA will submit prepare and submit quarterly progress reports to the DEP to update the completion status of tasks as of the end of each calendar quarter. The quarterly progress reports will be submitted via email within 30 days after the end of each calendar quarter beginning with first quarter of 2019, which will be submitted by April 30, 2019. The quarterly progress reports will also include a list of any new sewer service connections permits that were issued during the previous calendar quarter and the remaining number of new sewer connection permits that have been approved by the DEP for the reporting period.

A color-coded bar chart summarizing the anticipated start date and the completion dates for the major CAP activities for each of the sewer subsystems discussed herein is attached. This bar chart provides a visual time line for the completion of the CAP activities. The bar chart will be updated as necessary in conjunction with BASA's quarterly progress reports.

**APPENDIX A-20-E-2**

**MAY 18, 2022 CORRECTIVE ACTION PLAN SCHEDULE REVISION**

**BUTLER AREA SEWER AUTHORITY**

100 LITMAN ROAD • BUTLER, PA 16001-3256  
(724) 282-1978 • FAX (724) 282-7656  
[www.basapa.org](http://www.basapa.org)

May 18, 2022

Sean A Singer, Water Quality Specialist Supervisor  
Clean Water Program  
230 Chestnut Street  
Meadville, PA 16335

RE: 2019 Corrective Action Plan Schedule Revision  
Butler Area STP  
NPDES Permit No. PA0026697

Dear Mr. Singer:

Butler Area Sewer Authority and Herbert, Rowland and Grubic, Inc. (HRG) have been actively working on the Fisher, Brewster, Brewster Booster (FBB) and the Greenwood, Benbrook, Bryson (GBB) upgrades per the 2019 Corrective Action Plan (CAP). During survey and design phases HRG found constructability issues that have caused delays in the projected project schedule outlined in your letter dated February 22, 2021. We propose the following changes to the CAP Schedule:

<u>Action</u>	<u>FBB Deadline</u>		<u>GBB Deadline</u>	
	<u>Existing</u>	<u>Proposed</u>	<u>Existing</u>	<u>Proposed</u>
Sewage Facilities Planning Completion	1/30/2022	-	1/30/2022	-
Sewage Facilities Planning Modification	-	-	-	7/31/2022
Submission of WQM Permit	6/30/2022	1/31/2023	6/30/2022	1/31/2023
Bid Award	5/31/2023	1/31/2024	8/31/2024	4/30/2025
Construction Completion	9/30/2024	5/31/2025	12/31/2025	8/31/2026

Thank you for your consideration. Please let us know if the DEP is agreeable to these changes or if additional information is required. If approved, the second quarter Corrective Action Plan report will reflect this adjusted schedule.

Cordially,



Duane E. McKee  
Executive Director, BASA

**Singer, Sean**

---

**From:** Duane McKee <dmckee@basapa.org>  
**Sent:** Tuesday, May 31, 2022 8:25 AM  
**To:** Singer, Sean  
**Subject:** RE: [External] BASA - 2019 CAP Request for Schedule Revision

Mr. Singer. We added the design completion date revisions to the schedule. The Design Work was adjusted to align with the proposed dates. Thanks

Action	FBB Deadline		GBB Deadline	
	Existing	Proposed	Existing	Proposed
Sewage Facilities Planning Completion	1/1/2022	-	1/1 2022	-
Sewage Facilities Planning Modification	-	-	-	7/31/2022
Submission of WQM Permit	6/30/2022	1/31/2023	6/30/2022	1/31/2023
Design Completion	1/31/2023	8/30,2023	4/30/2024	12/31/2024
Bid Award	5/31/2023	1/31/2024	8/31/2024	4/30/2025
Construction Completion	9/30/2024	5/31/2025	12/31/2025	8/31/2026

Please call or write with any additional questions.

---

**From:** Singer, Sean <ssinger@pa.gov>  
**Sent:** Wednesday, May 25, 2022 12:39 PM  
**To:** Duane McKee <dmckee@basapa.org>  
**Subject:** RE: [External] BASA - 2019 CAP Request for Schedule Revision

CAUTION: This email originated from outside your organization. Exercise caution when opening attachments or clicking links, especially from unknown senders.

Mr. McKee,

Thank you for submitting the attached request for a schedule revision to BASA’s February 22, 2021 Revised Corrective Action Plan (“RCAP”).

After review of this schedule revision I do have a question.

The current RCAP schedule has the following that is not mentioned within the current schedule revision request:

- Design work for the Fisher Heights Pump Station to be completed by January 31, 2023.
- Design work for the Brewster Pump Station to be completed by January 31, 2023.
- Design work for the Greenwood, Benbrook, and Bryson Pump Stations by April 30, 2024.

Question is whether the due dates for this Design Work will also be adjusted or should I keep the current dates (listed above)?

The letter concerning the February 22, 2021 Revised Corrective Action Plan is attached to this email for reference.

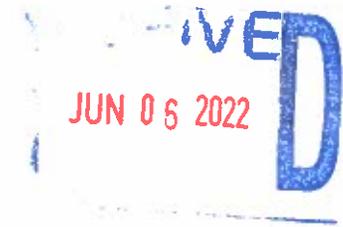
Thank you,

**Sean A. Singer** | Water Quality Specialist Supervisor  
Department of Environmental Protection | Clean Water Program

**APPENDIX A-20-E-2**

**JUNE 2, 2022 CORRECTIVE ACTION PLAN**

June 2, 2022



Mr. Duane E. McKee, Exec. Director  
Butler Area Sewer Authority  
100 Litman Road  
Butler, PA 16001-3256

Re: Proposed Revised Corrective Action Plan  
Butler Area STP  
NPDES Permit No. PA0026697  
Butler Township, Butler County

Dear Mr. McKee:

The Department of Environmental Protection (“Department”) has completed its review of the 2<sup>nd</sup> Revised Corrective Action Plan (“R2CAP”) to the March 26, 2019 Butler Area Sewer Authority’s Corrective Action Plan (“CAP”). The 1<sup>st</sup> Revised Corrective Action Plan (“RCAP”) was approved by the Department on February 22, 2021. As you are aware, you originally submitted a schedule for the R2CAP to the Department via email on May 18, 2022. Additional revisions to the schedule for the R2CAP were received by the Department via an email from you on May 31, 2022. The R2CAP requests an extension to the existing RCAP. The Department is pleased to inform you that your R2CAP is hereby approved.

The R2CAP proposes the following tasks for the Fisher Heights Pump Station System:

1. Submission of a permit application by January 31, 2023.
2. Design work for the Fisher Heights Pump Station to be completed by August 30, 2023.
3. Award contract for work to be performed at the Fisher Heights Pump Station by January 31, 2024.
4. Work at the Fisher Heights Pump Station to be completed by May 31, 2025.

The R2CAP proposes the following tasks for the Brewster & Brewster Booster Pump Station System:

1. Submission of a permit application by January 31, 2023.
2. Design work for the Brewster Pump Station to be completed by August 30, 2023.
3. Award contract for work to be performed at the Brewster Pump Station by January 31, 2024.
4. Work at the Brewster Pump Station to be completed by May 31, 2025.

The R2CAP proposes the following tasks for the Greenwood, Benbrook, and Bryson Pump Station System:

1. Sewage Facilities Planning Modification by July 31, 2022.
2. Submission of a permit application by January 31, 2023.
3. Design work for the Greenwood, Benbrook, and Bryson Pump Stations by December 31, 2024.
4. Award contract for work to be performed at the Greenwood, Benbrook, and Bryson Pump Stations by April 30, 2025.
5. Work at the Greenwood, Benbrook, and Bryson Pump Stations to be completed by August 31, 2026.

Mr. Duane McKee, Exec. Director

-2-

June 2, 2022

The Department requests BASA to continue submitting quarterly status reports to the Department. Quarterly Progress reports are due to the Department within 30 days following the end of each calendar quarter. The progress reports are required until you have successfully completed the R2CAP and eliminated the hydraulic overloads to your sewage conveyance system.

If you have any questions regarding this letter, please feel free to contact me at 814.332.6332.

Sincerely,



Sean A. Singer  
Water Quality Specialist Supervisor  
Clean Water Program

cc: T. Kiskadden (*via email*)  
C. Selby (*via email*)  
Bruce Leidy (*via email*)  
Corres. File thru Dickey/Kicher/Singer