



Sacramento Regional County Sanitation District Sacramento Regional Wastewater Treatment Plant

Progress Report Method of Compliance Work Plan and Schedule for Ammonia Effluent Limitations and Title 22 or Equivalent Disinfection Requirements

Submitted: July 9, 2020

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- Appendix B. Work Plan Schedule for Compliance

Sacramento Regional County Sanitation District Contact Information

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1.0 Introduction

On June 9, 2011, the Sacramento Regional County Sanitation District (Regional San) submitted a Method of Compliance Work Plan and Schedule for Ammonia Effluent Limitations and Title 22 or Equivalent Treatment Requirements (Work Plan). This submittal was required by the compliance schedule contained in the waste discharge requirements Order No. R5-2010-0114 (2010 NPDES Permit¹) adopted by the Central Valley Regional Water Quality Control Board (Regional Board) on December 9, 2010 for the Sacramento Regional Wastewater Treatment Plant (SRWTP). The 2010 NPDES Permit imposed new final effluent limitations for ammonia and nitrate (requiring nutrient reduction facilities) and new requirements for Title 22 or equivalent disinfection requirements (requiring tertiary treatment facilities). The 2010 NPDES Permit required the submittal of annual progress reports following approval of the Work Plan. The Regional Board approved the Work Plan on July 8, 2011.

As a component of a Partial Settlement Agreement, Regional San stated that it will post on its website a second progress report on or before February 1 of each year until completion of the nutrient reduction facilities. At Regional San’s discretion, these progress reports will also include an update on the tertiary treatment facilities in addition to the nutrient reduction facilities.

On April 21, 2016, Regional Board adopted Order R5-2016-0020 (2016 NPDES Permit) for the SRWTP which rescinds and replaces the 2010 NPDES Permit. The 2016 Permit also requires compliance with final effluent limitations for ammonia and nitrate and Title 22 or equivalent disinfection. The applicable requirements and schedules are reflected in the 2016 Permit and Tables 1 and 2 below.

2.0 Overall Compliance Schedule

The following compliance schedules for Ammonia Effluent Limitations and Title 22 or Equivalent treatment requirements are listed below in Table 1 and Table 2, respectively:

Table 1. Compliance Schedule for Ammonia Final Effluent Limitations

Task	Relevant Dates
i. Submit Method of Compliance Work Plan/Schedule	Due Date: 9 June 2011 Date Submitted: 9 June 2011 Date Approved: 8 July 2011 Status: Complete
ii. Submit and Implement Pollution Prevention Plan (PPP) for Ammonia ¹	Due Date: 9 December 2011 Date Submitted: 8 December 2011 Revised Plan Submitted: 15 November 2012 Date Approved: 17 May 2013 Status: Complete
iii. Progress Reports ²	Progress report required by permit due 9 July, annually ³

¹ The 2010 NPDES Permit was amended several times. All the amendments were incorporated into Regional Board Order No. R5-2010-0114-04

Method of Compliance Work Plan For Ammonia

Task	Relevant Dates
iv. Begin CEQA process for Compliance Project	Due Date: 19 May 2015 Process Initiated: 22 August 2012 Date EIR Approved: 24 September 2014 Status: Complete
v. Begin Construction of Compliance Project	Due Date: 19 May 2018 Status: Complete; Biological Nutrient Removal Notice to Proceed-April 27, 2016
vi. Full Compliance	Due Date: 11 May 2021

¹The Discharger shall continue to implement the PPP.

²The progress reports shall detail the steps implemented towards achieving compliance with waste discharge requirements, including studies, construction progress, evaluation of measures implemented, and recommendations for additional measures as necessary to achieve full compliance by the final compliance date.

³Regional San will prepare an additional report annually, to be posted on the Regional San's website on or before February 1 of each year, beginning in 2014. This additional report is not required by the 2016 NPDES Permit, but is a report the Partial Settlement Agreement states that Regional San will prepare. Both reports will be posted on Regional San's website, but only the report required by July 9 is required to be transmitted directly to the Regional Board.

Table 2. Compliance Schedule for Title 22 or Equivalent Treatment Requirements

Task	Relevant Dates
i. Submit Method of Compliance Work Plan/Schedule	Due Date: 9 June 2011 Date Submitted: 9 June 2011 Date Approved: 8 July 2011 Status: Complete
ii. Progress Reports ¹	Progress report required by permit due 9 July, annually
iii. Begin CEQA process for Compliance Project	Due Date: 16 May 2017 Process Initiated: 22 August 2012 Date EIR Approved: 24 September 2014 Status: Complete
iv. Begin Construction of Compliance Project	Due Date: 16 May 2020 Status: Complete; Tertiary Treatment Facility Notice to Proceed-April 11, 2018
v. Submit Seasonal Operations Plan ²	No later than 30 days prior to full compliance
vi. Full Compliance	Due Date: 9 May 2023

¹The progress reports shall detail the steps implemented towards achieving compliance with waste discharge requirements, including studies, construction progress, evaluation of measures implemented, and recommendations for additional measures as necessary to achieve full compliance by the final compliance date.

²The plan shall incorporate as a goal to reasonably limit the amount of unfiltered discharge and describe anticipated operations of the Facility when flows in excess of filter design capacity occur considering influent flows to the entire Facility, available storage, river flows, impending meteorological conditions, and any other relevant operational considerations. This plan will be periodically updated, as necessary, based on accumulated operating data experience.

Installation of advanced treatment technologies is needed to meet the new discharge permit requirements. To construct the required treatment facilities, Regional San identified other major activities needed to achieve compliance with the NPDES Permit requirements, including:

- Treatment Technology Identification - Completed
- Pilot Study Implementation
 - ❖ Phase 1 - Treatment Technology Selection - Completed
 - ❖ Phase 2 - Design Criteria Optimization - Completed

- ❖ Phase 3 - Process optimization and additional operator training - In planning (but not required to operate nutrient reduction or tertiary treatment facilities)
- Establishment of the Program Management Office (PMO) - Completed
- Select treatment technologies for environmental review, design, and implementation - Completed
- Design full-scale treatment systems - Completed
- Environmental Analysis - Completed
- Construction Phase - In progress (for nutrient reduction, Title 22 or equivalent, and related facilities)
- Startup and Commissioning - In planning for nutrient reduction and Title 22 or equivalent facilities. In progress for some related facilities (nutrient reduction and Flow Equalization facilities), and completed for other related facilities. See Appendix A for status of all the individual projects.

3.0 Progress towards Compliance

The following is a summary of the various activities associated with complying with the Ammonia Effluent Limitations and Title 22 or Equivalent requirements. The summary provided here is the information required as part of the permit requirements.

3.1 Pilot Study Implementation

The Phase 2 Pilot System was completed in December 2014. A final report was completed in December 2015.

The goal of the Phase 3 Pilot Study is to further optimize the biological process and provide training to operators. This phase is not required to successfully commission the new facilities.

3.2 Design of Treatment Systems

Design consultants have been procured to provide pre-designs and final designs of various individual treatment systems and project features. Designs for all major projects have been completed. Table 3 lists the major projects required to meet nutrient-related (i.e., final ammonia and nitrate) limitations and Title 22 or Equivalent treatment requirements. Major design projects, as defined in the Partial Settlement Agreement, are those with a design contract in excess of \$1 million. Dates in bold are actual dates of accomplishment. Other dates are planned dates. Regional San has determined that construction completion will be designated as when nutrient reduction facilities and the Title 22 or Equivalent treatment facilities are commissioned as a combined system instead of separate facilities. Additional project information is included in Appendix A.

Table 3. Major EchoWater Projects

Major Project	Design Contract Award	Construction Contract Award	Construction Completion
Biological Nutrient Removal (BNR)	22 Feb 2013	27 Apr 2016	31 Oct 2021 ¹
Flow Equalization	28 Aug 2013	25 Feb 2015	30 Sep 2020
RAS Pumping System	13 Nov 2013	25 May 2016	31 Dec 2019
Building Relocations	25 Sep 2013	19 Mar 2015	29 Feb 2016
Site Preparation	11 Dec 2013	25 Feb 2015	11 Nov 2016
Main Electrical Substation Expansion	In House Design	01 Jan 2016	30 Dec 2016
Disinfection Chemical Storage	11 Dec 2013	22 Jul 2015	16 Nov 2017
Nitrifying Sidestream Treatment	26 Mar 2014	13 Jan 2016	01 Oct 2019
Tertiary Treatment Facilities (TTF)	27 May 2015	11 April 2018	18 Nov 2022
Channel Air Blowers	11 Nov 2016	23 May 2018	05 Aug 2020

¹ Contractor’s submitted schedule. See Section 3.8 Schedule for additional information.

3.3 Environmental Analysis

The CEQA process was initiated on August 22, 2012 and the Final Environmental Impact Report (EIR) was certified by the Regional San Board of Directors on September 24, 2014.

3.4 Construction Phase

Construction of major projects supporting the key ammonia and nitrate and Title 22 or Equivalent treatment facilities was initiated in February 2015. Six major projects have been completed as of May 31, 2020. There are currently four major projects under construction. The key project needed to meet ammonia and nitrate treatment requirements is the Biological Nutrient Removal project which is under construction. The key project needed to meet the Title 22 or equivalent requirements is the Tertiary Treatment Facilities project which is also under construction.

3.5 Startup and Commissioning

Startup and commissioning for each project will occur as major treatment processes are completed and existing processes are cut over as required. Additional time is required to start up and commission the new facilities together (i.e., Biological Nutrient Removal and Tertiary Treatment) to ensure stable overall process operation. Regional San is defining full compliance of the Title 22 or Equivalent treatment facilities as completion of the last project (the Tertiary Treatment Facilities). This phase is anticipated to be accomplished by May 2023.

3.6 Regional San Project Acceptance

This milestone of the project is a contractual step to formally close out the construction project and is subject to Regional San Board action. Treatment facilities will have already been commissioned and will be fully operational. This date is subject to the nearest Board meeting after all contractual issues have been resolved and is not related to permit compliance.

3.7 Ammonia Pollution Prevention

As stated in the November 2012 revised Ammonia PPP, domestic waste contributes the majority of ammonia in the treatment plant influent. Most of the ammonia found in domestic waste is derived from urea, which breaks down rapidly to ammonia in the wastewater conveyance system. Therefore, the primary source of ammonia to the sewer system is considered uncontrollable.

From January 1 to May 31, 2020, the average daily influent ammonia concentration was 33 milligrams per liter (mg/L), and the average daily effluent ammonia concentration was 30 mg/L with a maximum daily effluent result of 36 mg/L. Regional San is in compliance with the interim maximum daily, average weekly, and average monthly effluent limitations for ammonia which are 47 mg/L, 43 mg/L, and 39 mg/L, respectively.

Industrial point sources remain a relatively insignificant source of ammonia, contributing about 1% of the influent load. Potential influent ammonia concentration reduction from source control of industrial users will be negligible. Regional San will continue to identify and screen potential new significant ammonia point source dischargers.

Ammonia removal will take place through two different treatment processes, the Nitrifying Sidestream Treatment (NST) and the Biological Nutrient Removal (BNR). All commissioning activities have been completed and final acceptance was issued on May 13, 2020. NST reduces ammonia from the solids storage basin and biosolids recycling facility return flows prior to their discharge into the plant influent, and is removing approximately 22% of the ammonia passing through the SRWTP. As of May 31, 2020, NST has removed approximately 3.0 million pounds of ammonia. The BNR process is still in construction.

3.8 Schedule

Regional San has been making good faith efforts to meet the compliance dates for ammonia and nitrate final effluent limitations, and for Title 22 or equivalent treatment requirements. Construction for all of the projects required to provide the necessary treatment facilities to meet the permit requirements is in progress or has been completed.

The schedule provided by the BNR contractor in June 2020 shows BNR construction completion by October 31, 2021. Notably, the contractor's schedule and BNR construction completion pertains specifically to "facility completion," which is not necessarily reflective of Regional San's anticipated date of compliance with the final ammonia and nitrate effluent limits as contained in the NPDES permit. Regional San anticipates complying with ammonia and nitrate removal requirements in phases, as requisite facilities are commissioned into service. Regional San staff continues to closely monitor construction activities and is providing as much assistance as possible for commissioning activities and will continue to work closely with the contractor to identify and evaluate means by which compliance can be met without unacceptable risks or costs.

Method of Compliance Work Plan For Ammonia

The construction contractor for the treatment facilities needed to meet the Title 22 or equivalent requirements (Tertiary Treatment Facilities) was issued a notice to proceed on April 30, 2018. The contractor continues to make good progress with concrete placements on all structures. The contractor's schedule currently shows a completion date that will allow Regional San to meet the May 9, 2023 compliance date.

A Program schedule is included in Appendix B showing the major projects as well as other projects and work efforts required to comply with the final effluent limitations for ammonia and nitrate limitations and for Title 22 or equivalent requirements. The high level schedule shown in Table 3 may reflect more recent updates to key project milestones.

Appendices

- A. Status of Ammonia and Nitrate Reduction and Title 22 or Equivalent Projects
- B. Work Plan Schedule for Compliance

Appendix A

Status of Ammonia and Nitrate Reduction and Title 22 or Equivalent Projects

Status of Ammonia and Nitrate Reduction and Title 22 or Equivalent Projects

Biological Nutrient Removal

A construction contract was awarded on April 27, 2016 and Notice to Proceed was issued on May 27, 2016. Construction continues to progress and a detailed commissioning schedule has been developed and integrated into the construction schedule. This effort shows that the contractor will not complete all construction by May 11, 2021. The latest contractor's schedule shows commissioning of all facilities being completed by October 31, 2021. See Section 3.8 Schedule for additional information about the schedule for construction.

Tertiary Treatment Facilities

The contract was awarded on April 11, 2018. Notice to Proceed was issued on April 30, 2018. Construction is progressing with concrete placement on all structures. The contractor's schedule shows construction complete by November 18, 2022. The project is on schedule to meet this date but due to the complex construction activities, there is very little to no float in the construction schedule.

Nitrifying Sidestream Treatment

The contract was awarded on January 13, 2016 and Notice to Proceed was issued on February 19, 2016. Construction was completed in October 2019. All commissioning activities have been completed and final acceptance was issued on May 13, 2020.

Channel Air Blowers

The contract was awarded on May 23, 2018 and Notice to Proceed was issued on September 4, 2018. The new blower systems have been successfully commissioned and are in operation. Demolition of the existing blower systems is in progress. All work is scheduled to be completed by August 5, 2020. Final acceptance is scheduled for September 2020.

Flow Equalization

A construction contract was awarded on February 25, 2015 and Notice to Proceed was issued on March 4, 2015. The contractor is experiencing delays from the wash-down system vendor who defaulted on his contract. The prime contractor has assumed control of the remaining work and is making progress to complete the automated wash-down system. However the basins can be used without the automated wash-down system. Construction and commissioning is expected to be completed by September 30, 2020.

RAS Pumping System

A construction contract was awarded on May 25, 2016 and Notice to Proceed was issued on June 15, 2016. Commissioning was completed on December 31, 2019 and the system is in operation. Final acceptance is scheduled for July 22, 2020.

Building Relocations

Construction was completed on February 29, 2016 and final acceptance was issued on July 13, 2016.

Site Preparation

Construction was completed on November 11, 2016 and final acceptance issued on October 11, 2017.

Main Electrical Substation Expansion

Construction was completed on December 30, 2016 and final acceptance was issued on February 22, 2017.

Disinfection Chemical Storage

Construction was completed on November 16, 2017 and final acceptance was issued on September 12, 2018.

Appendix B

Work Plan Schedule for Compliance

Activity ID	Activity Name	Original Duration	Remaining Duration	Start	Finish	2012												2013												2014												2015												2016												2017												2018												2019												2020												2021												2022												2023											
						Q1				Q2				Q3				Q4				Q1				Q2				Q3				Q4				Q1				Q2				Q3				Q4				Q1				Q2				Q3				Q4				Q1				Q2				Q3				Q4				Q1				Q2				Q3				Q4																																																			
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Program Summary						Program Summary																																																																																																																																															
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Design Submittal #1						Design Submittal #1																																																																																																																																															
Design Submittal #2						Design Submittal #2																																																																																																																																															
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SM-Main Electrical Substation Expansion Project (MESE)						SM-Main Electrical Substation Expansion Project (MESE)																																																																																																																																															
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■ Remaining Level of Effort ■ Remaining Work ◆ Milestone
■ Actual Level of Effort ■ Critical Remaining Work ◆ Gates
■ Actual Work ▬ Summary



Activity ID	Activity Name	Original Duration	Remaining Duration	Start	Finish	2012-2023																																															
						2012				2013				2014				2015				2016				2017				2018				2019				2020				2021				2022				2023			
						Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4				
Fiber Optic Network Replacement (FOR)		452	3	10-Jun-14 A	02-Mar-16	Fiber Optic Network Replacement (FOR)																																															
Fiber Optic Network Replacement Design		194	0	10-Jun-14 A	30-Jan-15 A	Fiber Optic Network Replacement Design																																															
Fiber Optic Network Replacement Bid & Award		73	0	11-Feb-15 A	20-May-15 A	Fiber Optic Network Replacement Bid & Award																																															
Fiber Optic Network Replacement Construction		165	0	20-May-15 A	27-Jan-16 A	Fiber Optic Network Replacement Construction																																															
Fiber Optic Network Replacement Commissioning		87	0	07-Oct-15 A	27-Feb-16 A	Fiber Optic Network Replacement Commissioning																																															
Fiber Optic Network Replacement Closeout		3	3	29-Feb-16	02-Mar-16	Fiber Optic Network Replacement Closeout																																															
Flow Equalization (FEQ)		2008	1278	16-Apr-12 A	04-Nov-20	Flow Equalization (FEQ)																																															
Flow Equalization Planning		395	0	16-Apr-12 A	23-Oct-13 A	Flow Equalization Planning																																															
Flow Equalization Contractor Prequalification Process		165	0	23-Apr-14 A	09-Dec-14 A	Flow Equalization Contractor Prequalification Process																																															
Flow Equalization Bid and Award		65	0	10-Dec-14 A	11-Mar-15 A	Flow Equalization Bid and Award																																															
Flow Equalization Construction		876	1260	24-Nov-14 A	30-Sep-20	Flow Equalization Construction																																															
Flow Equalization Commissioning		1079	499	26-May-15 A	30-Sep-20	Flow Equalization Commissioning																																															
Flow Equalization Closeout		25	25	01-Oct-20	04-Nov-20	Flow Equalization Closeout																																															
BNR (w PEPS Construction)		2632	1317	16-Mar-12 A	09-Dec-21	BNR (w PEPS Construction)																																															
BNR Planning		294	0	16-Mar-12 A	03-May-13 A	BNR Planning																																															
BNR Design		865	77	24-Jan-13 A	13-May-16	BNR Design																																															
BNR/PEPS Bid and Award		170	100	26-Oct-15 A	13-May-16	BNR/PEPS Bid and Award																																															
BNR/PEPS Construction		1586	1199	13-May-16 A	29-Oct-21	BNR/PEPS Construction																																															
BNR/PEPS Commissioning		1274	696	13-May-16 A	29-Oct-21	BNR/PEPS Commissioning																																															
BNR/PEPS Closeout		29	29	01-Nov-21	09-Dec-21	BNR/PEPS Closeout																																															
Primary Effluent Pump Station (PEPS) (Plan & Design Only)		984	29	14-May-12 A	08-Apr-16	Primary Effluent Pump Station (PEPS) (Plan & Design Only)																																															
Primary Effluent PS Planning		413	0	14-May-12 A	16-Dec-13 A	Primary Effluent PS Planning																																															
Prim Effluent PS Design		609	1	24-Oct-13 A	07-Apr-16	Prim Effluent PS Design																																															
Prim Effluent PS Bid and Award		115	0	27-Oct-15 A	08-Apr-16	Prim Effluent PS Bid and Award																																															
Return Activated Sludge Pump Station (RAS)		1928	882	14-May-12 A	31-Jul-20	Return Activated Sludge Pump Station (RAS)																																															
RAS PS Planning		447	0	14-May-12 A	31-Jan-14 A	RAS PS Planning																																															
RAS PS Design		693	0	15-Nov-13 A	12-Jul-16	RAS PS Design																																															
RAS PS Bid and Award		107	0	13-Jan-16 A	15-Jun-16 A	RAS PS Bid and Award																																															
RAS PS Construction		860	605	15-Jun-16 A	03-Jun-20	RAS PS Construction																																															
RAS PS Commissioning		663	577	22-May-17 A	01-Jun-20	RAS PS Commissioning																																															
RAS PS Closeout		23	23	01-Jul-20	31-Jul-20	RAS PS Closeout																																															
Tertiary Treatment Facilities (TTF) (Filtration, FIPS, DCB)		2471	1525	21-May-12 A	03-Feb-23	Tertiary Treatment Facilities (TTF) (Filtration, FIPS, DCB)																																															
Tertiary Treatment Facilities Planning (TTF)		862	0	21-May-12 A	09-Jul-15 A	Tertiary Treatment Facilities Planning (TTF)																																															
Tertiary Treatment Facilities (TTF) Design		668	65	27-May-15 A	04-Apr-18	Tertiary Treatment Facilities (TTF) Design																																															
Tertiary Treatment Facilities (TTF) Bid and Award		80	38	08-Jan-18 A	09-May-18	Tertiary Treatment Facilities (TTF) Bid and Award																																															
Tertiary Treatment Facilities (TTF) Construction		997	545	19-Jan-18 A	18-Nov-22	Tertiary Treatment Facilities (TTF) Construction																																															
Tertiary Treatment Facilities (TTF) Commissioning		535	535	01-Jun-20	01-Nov-22	Tertiary Treatment Facilities (TTF) Commissioning																																															
Tertiary Treatment Facilities (TTF) Closeout		29	29	26-Dec-22	03-Feb-23	Tertiary Treatment Facilities (TTF) Closeout																																															
Effluent Disinfection - Ph1 Chemical Storage (DCS)		1474	505	09-Jul-12 A	29-Aug-18	Effluent Disinfection - Ph1 Chemical Storage (DCS)																																															
Disinfection Planning - Ph1 Chemical Storage		412	0	09-Jul-12 A	07-Feb-14 A	Disinfection Planning - Ph1 Chemical Storage																																															
Disinfection Design - Ph1 Chemical Storage		443	0	12-Dec-13 A	30-Jun-15 A	Disinfection Design - Ph1 Chemical Storage																																															
Disinfection Bid and Award - Ph1 Chemical Storage		95	0	14-May-15 A	20-Aug-15 A	Disinfection Bid and Award - Ph1 Chemical Storage																																															
Disinfection Construction - Ph1 Chemical Storage		544	359	20-Aug-15 A	28-Dec-17	Disinfection Construction - Ph1 Chemical Storage																																															
Disinfection Commissioning - Ph1 Chemical Storage		357	327	18-Apr-16 A	20-Dec-17	Disinfection Commissioning - Ph1 Chemical Storage																																															
Disinfection Closeout - Ph1 Chemical Storage		174	174	29-Dec-17	29-Aug-18	Disinfection Closeout - Ph1 Chemical Storage																																															
Nitrifying Sidestream Treatment (NST)		14908	61	06-May-13 A	07-Jul-20	Nitrifying Sidestream Treatment (NST)																																															
Nitrifying Sidestream Planning		332	0	06-May-13 A	14-May-14 A	Nitrifying Sidestream Planning																																															
Nitrifying Sidestream Design		445	0	26-Mar-14 A	15-Jun-16 A	Nitrifying Sidestream Design																																															
Nitrifying Sidestream Bid and Award		131	0	16-Sep-15 A	31-May-16 A	Nitrifying Sidestream Bid and Award																																															
Nitrifying Sidestream Construction		14465	0	19-Feb-16 A	06-May-20 A	Nitrifying Sidestream Construction																																															
Nitrifying Sidestream Commissioning		809	0	10-May-16 A	31-Mar-20	Nitrifying Sidestream Commissioning																																															
Nitrifying Sidestream Closeout		43	43	07-May-20	07-Jul-20	Nitrifying Sidestream Closeout																																															
Channel Air Blower System (CAB)		831	503	16-Nov-16 A	16-Sep-20	Channel Air Blower System (CAB)																																															

■ Remaining Level of Effort ■ Remaining Work ◆ Milestone
■ Actual Level of Effort ■ Critical Remaining Work ◆ Gates
■ Actual Work ▾ Summary



