

Early actors to be recognized in the 2024 Watershed Permit

BACWA Information Template

The Regional Water Board is considering a concept where agencies that implement upgrades to remove nutrients prior to the establishment of load caps in 2024 will be given lowest priority if any further action is needed to reduce loads past 2024. For example: Plant A, which is in a subembayment with Plants B, C, and D, decides to implement an early action. At a later date (for example, 2029), science shows that the assimilative capacity is less than envisioned, and loads must be reduced. The Regional Water Board would first require load reductions from Plants B, C, and D.

Planning level targets (PLTs) will be established as a precursor to load caps in the 2019 Nutrient Watershed Permit Fact Sheet. Please note that while it was originally envisioned that the PLTs would be based on total nitrogen loads, it is likely they will be based on dissolved inorganic nitrogen (DIN) loads.

The Regional Water Board has expressed interest in recognizing agencies engaged in early actions in the Fact Sheet of the 2019 Nutrient Watershed Permit. These early actions would include treatment improvements but may also include large irrigation recycled water projects. BACWA has already shared with the Regional Water Board the information we recently collected in the Nutrient Growth and Implementation Survey in October 2018, but in doing so learned that more information is needed about agencies that are moving forward with a specific project to remove nutrients. Since this information would be included in the Permit Fact Sheet, and not the main body of the permit, any project described therein would *not* be a binding requirement. ***If your agency has identified a specific project that is scheduled to be in construction by the adoption of the next Watershed Permit in 2024, and you would like it to be recognized in the 2019 Watershed Permit, please fill out the information template below.***

<u>Agency Name:</u> Central Contra Costa Sanitary District (1)
<u>General Project Description:</u> Central San is planning an innovative 20 million gallon per day advanced recycled water project (referred to as the Water Exchange Project) that would result in multiple benefits including generating additional water supply and significant effluent nitrogen load reduction. In 2018, a Memorandum of Understanding (MOU) was executed between Central San, Contra Costa Water District, and Santa Clara Valley Water District. Central San would implement nutrient removal and advanced recycled water treatment for a portion of its wastewater flow and wholesale the recycled water to Contra Costa Water District, whereby Contra Costa Water District would then convey the recycled water to two refineries adjacent to Central San. The recycled water delivery will free up raw canal water that is currently delivered to the refineries by Contra Costa Water District. Through agreements and other water storage and conveyance improvements, additional water supply would be made available to Santa Clara Valley Water District. Nutrient removal upgrades will be key for meeting the refineries' water quality requirements and can provide additional benefit to Central San if nutrient reduction is required.
<u>Project Schedule, including current status and estimated completion date:</u> Project is currently in the Planning Phase. Anticipated completion date would be 2024, if approved and funded.

Estimated Project Budget:

Approximately \$400M from multiple agencies.

Load Reduction Calculations:

- 1. Projected effluent concentration DIN after project is complete, if applicable (mg/L):**
To be determined.
- 2. Load removed of DIN upon project completion, based on projected effluent loads at the time of completion, calculated on an annual basis (kg/d):**
To be determined. See approximate percent reduction anticipated below.
- 3. Percent reduction of DIN loads compared to before project becomes operational (%):**
Currently expected to be at least 30 percent.

Agency Name: Central Contra Costa Sanitary District (2)

General Project Description:

In 2017, as a part of the Central San Comprehensive Wastewater Master Plan (CWMP), Central San evaluated nutrient removal alternatives to reduce the nutrient load to the Suisun Bay. The CWMP recommended membrane bio-reactors (MBRs) and the conventional Modified Ludzack-Ettinger (MLE) biological process to both reduce the nutrient load to the Suisun Bay and to supply potential future recycled water customer demand. In January 2019, to further develop and act on the recommendation of CWMP, Central San started to work with a consultant to characterize the influent wastewater and further evaluate the wastewater facilities required to reduce nutrients. This Steam and Aeration Blower Systems Renovations Project will assess alternatives that addresses both current and future needs including the potential for nutrient reduction; and prepare 10-percent pre-design documents for the selected alternative. The project will also strive to maintain flexibility for Central San to demonstrate and possibly implement innovative nutrient reduction technologies. Central San's capital improvement plan includes over \$11M budget for improvements to reduce nutrient loads. These nutrient load reduction improvements will be considered under this Steam and Aeration Blower Systems Renovations Project.

Project Schedule, including current status and estimated completion date:

Project is currently in the Planning/Pre-Design Phase. Design completion expected by 2023. Construction is expected through 2027.

Estimated Project Budget:

Planning/Pre-design budget is \$2.6M. Total project cost expected to be >\$60M.

Load Reduction Calculations:

- 1. Projected effluent concentration DIN after project is complete, if applicable (mg/L):**
To be determined during design.
- 2. Load removed of DIN upon project completion, based on projected effluent loads at the time of completion, calculated on an annual basis (kg/d):**
To be determined during design.
- 3. Percent reduction of DIN loads compared to before project becomes operational (%):**
To be determined during design.

Agency Name: Delta Diablo

General Project Description: Delta Diablo (District) is currently completing design of the East County Bioenergy Project (ECBP), which is an organics co-digestion project under a public-private partnership with Mt. Diablo Resource Recovery (local waste hauler) and Anaergia, Inc. (technology provider). This project would divert approximately 114 tons per day of organic waste from local landfills in support of state-mandated diversion goals under SB 1383, while allowing the District to become energy self-sufficient with excess electricity sold to the local power grid. Although the District has completed environmental documentation highlighting the project’s benefits in reducing greenhouse gas emissions, it would elevate effluent nutrient loading due to acceptance of organic waste.

As described in the companion document, entitled “Factors Impacting Nutrient Loads” (submitted by the District on January 15, 2019), the District is seeking a Planning Level Target (PLT) that includes an allowance for the increased effluent nutrient loading associated with co-digestion of organics to allow deferred implementation of a sidestream treatment process (i.e., ammonia stripping with chemical addition) to support overall ECBP financial feasibility and risk management.

However, the District is currently working with Calpine, who utilizes 90% of recycled water flow for cooling water at two large power plants, to assess potential water quality impacts and costs associated with higher recycled water ammonia concentrations associated with ECBP implementation. If feasible solutions to address these concerns are not identified, the District may elect to implement the referenced sidestream treatment process to remove the increased nitrogen loading from organics co-digestion, as well as the current baseline loading from digestion of wastewater sludges.

Project Implementation Schedule: The District is nearing completion of 30% design. If the District proceeds with implementing an “early action” via sidestream treatment, construction would be completed by January 2022.

Project Cost: The estimated cost of the sidestream treatment process is \$4.5-5.0 million.

Estimated Nutrient Load Reduction: Current and future (following ECBP implementation) effluent ammonia loading from solids dewatering centrifuge centrate flows is estimated at 328 kg NH₃-N/d and 671 kg NH₃-N/d. Assuming 80% removal in the centrate sidestream treatment process, effluent ammonia loading is estimated at 134 kg NH₃-N/d, which represents a 194 kg NH₃-N/d reduction (~10-12%) as a result of this early action project.

Agency Name: Dublin San Ramon Services District

General Project Description

DSRSD Recycled Water Program

As of 2018 DSRSD recycled 43.2% of its final effluent and 79.1% during the peak irrigation season. Combined, LAVWMA member agencies recycled approximately 2.097 billion gallons of secondary effluent for use in the Tri-Valley area for landscape irrigation, contractor load out for dust control, and treatment facility processes. Approximately 37 % of the fully treated secondary effluent generated by

LAVWMA agencies is recycled annually. Member agencies project the demand and production of recycled water will increase by an additional 22% over the next 5 years.

Project Schedule, including current status and estimated completion date

The projections noted are based on recycled water projects that have been identified and are scheduled for construction

Estimated Project Budget

- **DSRSD Recycled Water Program**
 - **DSRSD EBMUD Recycled Water Agency (DERWA)**
 - Approximately \$86,000,000.00 in existing capital assets
 - Approximate annual operating and maintenance budget of \$2,100,000.00
- Additional Capital Assets and Operating costs associated with The City of Livermore Recycled Water Program.

Load Reduction Calculations

1. **Projected effluent concentration DIN after project is complete, if applicable (mg/L):**
2. **Load removed of DIN upon project completion, based on projected effluent loads at the time of completion, calculated on an annual basis (kg/d):**
3. **Percent reduction of DIN loads compared to before project becomes operational (%):**

Recycling reduces loads

- DSRSD 43.2% Annually – (79.1 % From May thru September)
- LAVWMA Member Agencies Recycle 37% of the effluent annually
- LAVWMA Member Agencies project an increase in recycling of an additional 22% over the next 5 years.

Agency Name: East Bay Municipal Utility District (EBMUD)

General Project Description

EBMUD has embarked on an effort to develop a comprehensive master plan that will integrate and coordinate all the competing priorities of aging infrastructure needs, seismic vulnerabilities, regulatory changes, growth in the service area, Resource Recovery (R2) Program strategies, climate change impacts, and operational improvements for its main wastewater treatment plant.

Project Schedule, including current status and estimated completion date

Development of this Master Plan will take place over the next few years and will utilize the combined efforts of District staff and consultant(s). We are currently procuring professional consulting services and anticipate the project to be completed by 2021.

Estimated Project Budget

Approximately ~\$3M for the combined efforts of District staff and consultant(s).

Load Reduction Calculations

4. **Projected effluent concentration DIN after project is complete, if applicable (mg/L):**
5. **Load removed of DIN upon project completion, based on projected effluent loads at the time of completion, calculated on an annual basis (kg/d):**
6. **Percent reduction of DIN loads compared to before project becomes operational (%):**

Agency Name: Fairfield-Suisun Sewer District

General Project Description

In the 2009 Secondary Expansion project, the District voluntarily increased nutrient treatment by converting two aerobic digestion basins into Aeration Basins (known as Train C aeration basins) with anoxic zones. Trains A & B are conventional aeration basins without anoxic zones.

Project Schedule, including current status and estimated completion date

Train C has been operating since 2009 with the District experimenting various flow scenarios to evaluate nutrient reduction. Train C has taken greater load over the past 4+ years during upgrades of Trains A & B and during the 2018 blower upgrade currently underway. It expected that plant operations will change with the upgraded blower configuration, but the DIN reduction has not been quantified.

Estimated Project Budget

The voluntary anoxic additions is estimated to have cost \$2MM, Blower upgrade will cost \$10.6MM

Load Reduction Calculations

1. **Projected effluent concentration DIN after project is complete, if applicable (mg/L):** As observed in the Group Annual Report, the total nitrogen has varied significantly due to the varying flows splits between Trains A, B and C. TN loads have ranged from an average of 1000 kg N/d and range from 483 kg N/d to 1571 kg N/d. Due limited data, especially Nitrate and Nitrite (NOx wasn't required until the 13267 letter), we have not been stable and therefore able to correlate and predict with any confidence the most sustainable operation.
2. **Load removed of DIN upon project completion, based on projected effluent loads at the time of completion, calculated on an annual basis (kg/d):**
3. **Percent reduction of DIN loads compared to before project becomes operational (%):**

Agency Name: Hayward, City of

General Project Description

The City of Hayward decided to move forward with recommendations from the Facility Plan to replace the existing Trickling Filter/Solid Contact (TF/SC) process with Biological Nutrient Removal (BNR). The recommended implementation of BNR is a two-phase project. Initially, one of the two existing TFs will be replaced with BNR by converting the existing SC tanks to anoxic/oxic basins and the other TF will remain in service to treat approx. 50% of the flow. Eventually, the entire secondary treatment will be upgraded to BNR.

Project Schedule, including current status and estimated completion date

Construction completed in 2025

Estimated Project Budget

\$80 Million

Load Reduction Calculations

1. **Projected effluent concentration DIN after project is complete, if applicable (mg/L):**
2. **Load removed of DIN upon project completion, based on projected effluent loads at the time of completion, calculated on an annual basis (kg/d):**
3. **Percent reduction of DIN loads compared to before project becomes operational (%):**

Agency Name: Las Gallinas Valley Sanitary District

General Project Description: In 2019, the Las Gallinas Valley Sanitary District (LGVSD) will begin construction on a project to upgrade its secondary treatment process from rock trickling filters to a hybrid fixed film/suspended growth activated sludge process. Nitrification will be achieved in that process, rather than in separate fixed film reactor, as is currently the case. The new system will also achieve partial denitrification and effluent nutrient load reductions. As part of the upgrade, the capacity of the secondary treatment process is also being increased to better accommodate high wet weather flows. Other elements of the upgrade project include construction of an additional secondary clarifier, transition from use of hypochlorite to UV for disinfection, and an expansion of LGVSD's existing Title 22 Recycled Water Treatment Facility.

Project Implementation Schedule: The project is scheduled to be constructed in phases over a three-year period. The transition from existing to new treatment facilities is expected to occur in 2022, but may be delayed by unforeseen circumstances.

Project Cost: Info to follow.

Estimated Nutrient Load Reduction: Info to follow.

Agency Name: Oro Loma and Castro Valley Sanitary Districts

General Project Description

Project Name: Oro Loma/Castro Valley Nutrient Optimization Project

The Oro Loma and Castro Valley Sanitary Districts are upgrading the existing treatment facility to convert the existing activated sludge process to a Modified Ludzack-Ettinger Process. The new process will nitrify and denitrify all dry weather flows to the limit of carbon. Dry weather DIN levels are expected at or below 15 mg/L with total annual DIN reductions of 50%.

The project includes the construction of a fourth aeration train, retrofit of existing mechanical aerators to fine bubble diffusers, installation of 6 high efficiency blowers, and all associated process instrumentation.

Project Schedule, including current status and estimated completion date

The project is under construction with start-up expected in Summer 2020. To date, the piles have been installed and the tank and blower building foundations are in progress. The contractor remains on schedule.

Estimated Project Budget

\$24.7M

Load Reduction Calculations

1. Projected effluent concentration DIN after project is complete, if applicable (mg/L): Dry weather ≤ 15 mg/L.
2. Load removed of DIN upon project completion, based on projected effluent loads at the time of completion, calculated on an annual basis (kg/d): 971 kg/d
3. Percent reduction of DIN loads compared to before project becomes operational (%): 50% on annual basis.

Agency Name: Palo Alto, City of

General Project Description

The City of Palo Alto Regional Water Quality Control Plant (RWQCP) plans to move forward with recommendations from preliminary evaluations to convert existing nitrifying aeration basins to a biological nutrient removal process. Below schedule, budget, and load reductions are based on preliminary estimates and are subject to change in the next few years as the RWQCP moves forward with this project. RWQCP is currently in the design phase for this project and may not operate facility immediately for full nutrient removal potential pending impacts to solids disposal and implementation costs.

Project Schedule, including current status and estimated completion date

Predesign: completed February 2018
Design: in progress, expected complete by 2019
Construction: expected to begin in 2020 and completed by 2022

Estimated Project Budget

\$31,000,000

Load Reduction Calculations

1. **Projected effluent concentration DIN after project is complete, if applicable (mg/L):** < 15 mg/L
2. **Load removed of DIN upon project completion, based on projected effluent loads at the time of completion, calculated on an annual basis (kg/d):** 850 kg/d
3. **Percent reduction of DIN loads compared to before project becomes operational (%):** 41%

<p>Agency Name: San Francisco (San Francisco International Airport), City and County of</p>
<p>General Project Description</p> <ol style="list-style-type: none"> 1) <u>Process Enhancements</u>: The Airport has performed process enhancements during the 2016-2019 period to achieve full nitrification as of January 2019 as part of our recycled water system planning; 95+% ammonia removal has been typical during 2018. 2) <u>Sequencing Batch Reactor Tanks</u>: The Airport anticipates design and construction of additional sequencing batch reactor (SBR) tanks to provide adequate system capacity and redundancy to the existing three SBRs, and anticipates incorporating nutrient removal in the design. 3) <u>Advanced Water Treatment Plant</u>: The Airport has 90% design of an advanced water treatment plant (AWTP) with MF/RO/UV, which would lead to greater recycled water usage and reduce discharges to the Bay.
<p>Project Schedule, including current status and estimated completion date</p> <ol style="list-style-type: none"> 1) The Airport achieved full nitrification as of January 2019. 2) The Airport has requested funding for the 2019/2020 fiscal year. Subject to any required environmental review and project approvals, construction could be completed by 2022. 3) Funding for construction is currently pending. No reliable timeline.
<p>Estimated Project Budget</p> <ol style="list-style-type: none"> 1) Extra energy costs for nitrification not quantified; using all system capacity to achieve, so no redundancy in the system adds unquantified liability. 2) ~\$30 million 3) ~\$60 million with distribution pipeline
<p>Load Reduction Calculations</p> <ol style="list-style-type: none"> 7. Projected effluent concentration DIN after project is complete, if applicable (mg/L): <15mg/L 8. Load removed of DIN upon project completion, based on projected effluent loads at the time of completion, calculated on an annual basis (kg/d): Depends upon recycled water demand and nutrient requirements of downstream biologically active filters. Unknown. 9. Percent reduction of DIN loads compared to before project becomes operational (%): >50%

<p>Agency Name: San Leandro WPCP</p>
<p>General Project Description</p> <p>Treatment wetlands: Conversion of a 4.3 acre storage basin into an open water treatment wetlands. The City received a grant for design and permitting from SFBRA. Construction to follow</p>

Project Schedule, including current status and estimated completion date

In the RFP process currently. Design and permitting completion expected in 2020/21. Construction to follow with anticipated completion range of 2022-2024

Estimated Project Budget

\$539,000.00 for design and permitting
\$2-4 million for construction (tighter estimate upon design completion)

Load Reduction Calculations

1. **Projected effluent concentration DIN after project is complete, if applicable (mg/L):**
2. **Load removed of DIN upon project completion, based on projected effluent loads at the time of completion, calculated on an annual basis (kg/d):**
3. **Percent reduction of DIN loads compared to before project becomes operational (%):**10%
anticipated reduction based on preliminary calculations

Agency Name San Mateo, City of

General Project Description

The City of San Mateo is in Year 5 of its Clean Water Program, a \$1 billion capital improvement effort designed to eliminate sanitary sewer overflows and expand the wastewater treatment plant (WWTP). The WWTP Nutrient Removal and Wet Weather Flow Management Upgrade and Expansion Project focuses on new liquid processes and includes a headworks, primary treatment tanks, biological nutrient removal (BNR) / membrane bioreactors, and a wet weather management system that consists of equalization basins and a BioActiflo unit. The BNR process will have a design capacity of 21 million gallons per day (mgd) with the ability to process up to 42 mgd during peak wet weather events. The process will meet an effluent total nitrogen concentration of 15 mg N/L (BACWA's Level 2). During wet weather, the facility will be able to handle 78 mgd.

Project Schedule, including current status and estimated completion date

The WWTP expansion project is currently under design. Construction activities are anticipated to begin in late summer 2019 with completion scheduled for 2024.

Estimated Project Budget

The project budget for the WWTP expansion is \$533 million.

Load Reduction Calculations

4. **Projected effluent concentration DIN after project is complete, if applicable (mg/L):** 14 mg/L
5. **Load removed of DIN upon project completion, based on projected effluent loads at the time of completion, calculated on an annual basis (kg/d):**
Annual (dry season, May 1 – September 30) = 564 kg N/d, DIN
Annual (whole year) = 607 kg N/d, DIN
6. **Percent reduction of DIN loads compared to before project becomes operational (%):**
Annual (dry season) % removal = 60%
Annual (whole year) = 56%

Agency Name: Sunnyvale, City of

General Project Description

Under the WPCP's current configuration, effluent from primary treatment is gravity fed to 440 acres of mechanically aerated Oxidation Ponds, where organic matter and ammonia are readily degraded by aerobic and anaerobic bacteria. Denitrification also occurs year-round in the Oxidation Ponds, resulting in an annual average of 60% reduction in influent TN. Pond effluent is pumped to trickling filters, which provide additional nitrification of residual ammonia. Downstream clarifiers use compressed air and polymer to coagulate, flocculate, and remove biological solids (algae and bacteria) generated during treatment in the Oxidation Ponds and trickling filters. While the pond system provides numerous operational, process, and economic benefits, the process is inextricably tied to and heavily influenced by seasonal fluctuations in weather patterns that are oftentimes difficult to predict and respond to and ensure compliance with effluent limitations.

As such, the City is replacing WPCP's current Secondary Treatment Facilities with a new Conventional Activated Sludge (CAS) system consisting of bioreactors and secondary clarifiers configured as a Modified Ludzak-Ettinger (MLE) process per the Master Plan. Construction of the new CAS system will occur in two stages. For the Stage 1 project, a portion of the CAS system will be constructed for 2025 and will consist of two aeration basins, four secondary clarifiers, and associated appurtenances. This CAS system will operate in parallel with the existing secondary treatment system (Oxidation Ponds, FGRs, DAFTs) under a split-flow regime until 2035. Primary effluent will be apportioned using a weir structure (PE Distribution Structure), with approximately 2/3 going to the new CAS system and the remaining 1/3 to the existing secondary treatment system. Whereas, effluent from the existing secondary treatment system will be blended with effluent from the new CAS system at a point upstream of the disinfection/dechlorination system. Continued operation of the Oxidation Ponds under the split-flow regime allows the City to retain flexibility in managing its flow due to the large storage capacity of the Oxidation Ponds while keeping operational costs low.

The Stage 1 CAS system is one project under the *Sunnyvale Cleanwater Program*, which is a massive 30-year plus rebuild project that began in 2016 with a project to replace the existing Headworks and Primary Treatment Facilities. Along with the use of modern sedimentation tank design for enhanced solids removal, the new facilities will improve protection of downstream processes and of biosolids quality through use of influent bar screens and high efficiency grit basins, upgrade treatment reliability through the installation of a 2 MW generator and new primary effluent pipeline, and phase-out the combustion influent pump engines in favor of electric motor-driven engines. Another project to rehabilitate the existing secondary treatment system and optimize its performance is scheduled to begin in 2021 and be completed in early 2023.

Project Schedule, including current status and estimated completion date

Construction of the new Headworks and Primary Treatment Facility began in 2016 and is expected to be completed by 2021. Design of the Stage 1 CAS system began in 2018 and is expected to be completed in 2021. Construction is scheduled to start in 2021 and be completed in 2025.

Estimated Project Budget

\$122 M – Headworks and Primary Treatment Facilities
\$168 M – Stage 1 CAS (Split Flow)

Load Reduction Calculations

These calculations were based on TN rather than DIN as the source material from the design engineer (Technical Memo D1, December 2018, Carollo) characterizes concentrations and load projections in TN. We assume that effluent TN is a close approximation to DIN.

- 1. Projected effluent concentration DIN after project is complete, if applicable (mg/L):**
May-Oct: 10.6 mg/L TN
Nov-Apr: 10.9 mg/L TN
- 2. Load removed of DIN upon project completion, based on projected effluent loads at the time of completion, calculated on an annual basis (kg/d):**
2,700 kg/d (influent) – 553 kg/d (effluent) = 2,147 kg/d TN
- 3. Percent reduction of DIN loads compared to before project becomes operational (%):**
31% (based on effluent TN)

Agency Name: City and County of San Francisco – SFPUC – Treasure Island Plant

General Project Description

New Treasure Island Treatment Plan is in the Planning Phase. Currently, the new Plant design includes treatment process that will greatly minimize nutrient loads to the San Francisco Bay. Treasure Island population will also increase with new development. Design is commencing in 2019 and is expected to continue until mid-2020. Construction is expected to go from the end of 2020 until the beginning of 2022.

Project Schedule, including current status and estimated completion date

Project is currently in the Design phase. Construction is expected to go from the end of 2020 until the beginning of 2022.

Estimated Project Budget

\$70 to \$110Million

Load Reduction Calculations -

This information has not been completed developed yet

- 1. Projected effluent concentration DIN after project is complete, if applicable (mg/L):**
Assuming typical influent wastewater nitrogen composition, the estimated DIN concentration would be 8.1 – 8.3 mgN/L based on an effluent TN concentration of 10 mgN/L.
- 2. Load removed of DIN upon project completion, based on projected effluent loads at the time of completion, calculated on an annual basis (kg/d):**
This information is not available at this time.

3. Percent reduction of DIN loads compared to before project becomes operational (%):

This information is not available at this time

Agency Name: Union Sanitary District

General Project Description

USD has completed an assessment of solids and liquid system capacities in 2018 and is in the process of predesigning alternatives for treatment plant improvements including nutrient removal. The District expects to receive and evaluate planning level cost estimates for improvement project alternatives in February 2019. Successful project alternatives will be incorporated into the District's ongoing master planning effort which will be completed in the summer of 2019. The master plan will include a trigger-based approach and schedule for the construction of improvements necessary to ensure compliance with the District's strategic objectives and all applicable rules and regulations.

Project Schedule, including current status and estimated completion date:

Estimated Project Budget

Load Reduction Calculations

- 1. Projected effluent concentration DIN after project is complete, if applicable (mg/L):**
- 2. Load removed of DIN upon project completion, based on projected effluent loads at the time of completion, calculated on an annual basis (kg/d):**
- 3. Percent reduction of DIN loads compared to before project becomes operational (%):**