

**REQUEST FOR QUALIFICATION BASED
PROPOSALS FOR
DESIGN/BUILD PROJECT DELIVERY SERVICES**



**SANTA FE COUNTY WATER RECLAMATION FACILITY
(SFCWRF)**

SANTA FE, NEW MEXICO

RFP No. 2019-0016-CMO/BT

JULY 2018

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I. ADVERTISEMENT

SANTA FE COUNTY
Request for Qualifications Based Proposals
For
Design Build Project Delivery Services
Santa Fe County Water Reclamation Facility
(SFCWRF)

RFP No. 2019-0016-CMO/BT

Santa Fe County (County) is requesting proposals from licensed, qualified Offeror's to provide Design Build Delivery Services based upon the scope of work outlined in this Request for Qualifications Based Proposal (RFP). All potential Offeror's are to read, understand and accept the requirements of this RFP. All proposals submitted shall be valid for ninety (90) days subject to action by the County. The County reserves the right to reject any and all proposals in part or in whole. A completed proposal shall be submitted in a sealed container indicating the proposal title and number along with the Offeror's name and address clearly marked on the outside of the container. All proposals shall be received by **2:00 PM (MDT) on August 27, 2018**, at the Santa Fe County Purchasing Division, 142 W. Palace Avenue (2nd Floor), Santa Fe, New Mexico 87501. By submitting a proposal for the requested services, each Offeror is certifying that it is a qualified firm and its proposal complies with regulations and requirements stated within the Request for Proposals.

A Pre-Proposal Conference will be held on **August 9, 2018, at 10:00AM (MDT)** in the **Projects Conference Room located at 901 West Alameda, Suite 20-C, Santa Fe, New Mexico, 87501**. Attendance at the Pre-proposal conference is not mandatory.

EQUAL EMPLOYMENT OPPORTUNITY: All qualified Offeror's will received consideration of contract(s) without regard to race, color, religion, sex or national origin, ancestry, age, physical and mental handicap, serious medical conditions, disability, spousal affiliation, sexual orientation or gender identity.

Request for proposals will be available by contacting Bill Taylor, Procurement Manager, 142 W. Palace Avenue (2nd Floor), Santa Fe, New Mexico 87501, by telephone at (505) 992-6735, or by email at wtaylor@santafecountynm.gov or via the County website at www.santafecountynm.gov/services/currentsolicitations.

PROPOSALS RECEIVED AFTER THE DATE AND TIME SPECIFIED ABOVE WILL NOT BE CONSIDERED AND WILL BE REJECTED BY SANTA FE COUNTY.

II. INTRODUCTION

A. PURPOSE OF THE REQUEST FOR PROPOSALS

Santa Fe County (County) is requesting proposals for Design-Build project delivery services for the Santa Fe County Water Reclamation Facility (SFCWRF) Project based upon the Scope of Work described below.

All potential Offerors are to read, understand and accept the requirements of this Request for Qualification Based Proposal. It is the County's intent to select the most qualified Design-Build Delivery Team using a **two phase evaluation process** for recommended selection for the desired services.

B. BACKGROUND

The County operates the Quill Wastewater Treatment Facilities (QWWTF) to treat domestic wastewater from local neighborhoods and the nearby Penitentiary of New Mexico (PNM) and is actively evaluating connection of additional nearby service areas as part of the ongoing Sewer Master Plan.

The QWWTF requires significant improvements to meet the National Pollutant Discharge Elimination System (NPDES) requirements, provide adequate quality for beneficial use of reclaimed wastewater with no setback/access limits, plans for future expansion, and meet anticipated limits for land application of biosolids.



The QWWTF's maximum treatment capacity is 280,000 gallons per day (gpd) and has the ability to discharge treated effluent by land-applying effluent over 95 acres as permitted by the New Mexico Environment Department (NMED) groundwater discharge permit (GWDP) DP-234. The Current average daily flow is 124,000 gpd.

The QWWTF currently utilizes aerated lagoons and settling ponds for biological treatment and disinfection via chlorine. The treated effluent produced at the QWWTF does not consistently meet GWDP standards. The QWWTF has been maintained but due to its advanced age, deteriorating condition, inadequate technology, and limited potential for upgrades and/or repairs, it will be replaced. Significant improvements are necessary to meet the GWDP/NPDES requirements and increase capacity for future growth which can most cost-effectively be accomplished by replacement of the facility.



The County contracted with HDR, Engineering in June 2017, for a Preliminary Engineering Report (PER), which is provided as part of this solicitation, that recommended that the QWWTF be replaced. The PER looked at two different processes but ultimately recommended a Membrane Bioreactor Wastewater Treatment Facility with a capacity of 0.50 Million Gallons per Day (MGD).

This new facility is being called the **Santa Fe County Water Reclamation Facility (SFCWRF)**.

C. SCOPE OF WORK

Utilizing a Design-Build project delivery method, the County is authorized to plan, design, and construct the new SFCWRF facility.

The project consists of the design and construction of a new 0.50 MGD Wastewater Treatment Facility to replace the existing QWWTP facility. The existing QWWTF will remain in operation during construction and commissioning of the new facility. The proposed project contemplates the construction of one Membrane Bioreactor (MBR) train with a process capacity up to 0.50 MGD with a modular design for expansion to either 1.0 MGD or 2.0 MGD ultimate capacity in the future.

The project includes all utility and infrastructure requirements including but not limited to electrical, gas, telecommunications, SCADA, sanitary sewer, potable water, permitting, and fire protection/suppression.

Specialty elements and considerations for the project shall include but are not limited to the following:

- Membrane Bioreactor (MBR) Basin and Equipment.
- Future modular expandability in 0.50 MGD increments.
- New Wastewater Lift Station.
- New Fine Screen and Grit Building.
- New Operations Building with blowers, RAS pumps, Sodium Hypochlorite/Citric Acid Equipment, and Disinfection.
- Biological Basins and Aeration Equipment.
- Aerobic Digesters.
- Reuse storage and pumping.
- Concrete sludge drying beds.
- Maintain existing QWWTF operations during construction and commissioning.
- Decommissioning of existing facility.
- Meet all applicable NPDES Tier 2 permit requirements, including:
 - Effluent quality less than 3.0 mg N/L total nitrogen.
 - Effluent quality less than 1.0 mg P/L total phosphorus.
- Discharge from the WWTF by effluent reuse shall meet GWQB and NMED Class 1A permit requirements.

Additionally, the County will also consider as part of the project the following additive items:

- Alternate 50 KW Solar Array.
- Alternate driveway construction.
- Alternate electrical feed to new facility.

All required studies and reports including but not limited to boundary/topographic surveying, and soils and hydrological testing are included in the project as is project commissioning.

The Maximum Allowable Construction Cost (MACC) for this project (all phases) is \$7,750,000 exclusive of NMGRT.

D. SCHEDULE OF SERVICES

As a design-build project allows the use of multiple concurrent elements, the goal of the project is to have the entire project (all phases) complete by December of 2019, and the County intends to work with the selected Offeror and develop a project/construction schedule in phases.

E. INSURANCE REQUIREMENTS

Please refer to the attached SAMPLE STANDARD FORM OF AGREEMENT BETWEEN OWNER AND DESIGN BUILDER for the insurance requirements.

F. PROCUREMENT MANAGER

The County has designated a Procurement Manager who is responsible for the conduct of this procurement whose name, address, and telephone number is listed below. All deliveries via express carrier should be addressed as followed:

Bill Taylor, CPO, Purchasing Manager
Santa Fe County Purchasing Division
142 W. Palace Avenue, 2nd Floor
Santa Fe, NM 87501
(505) 992-6753
Email: wtaylor@santafecountynm.gov

Any inquiries or requests regarding this procurement should only be submitted to the Procurement Manager in writing. Offeror's may contact **ONLY** the Procurement Manager regarding this procurement. ***Other County employees do not have the authority to respond on behalf of the County.***

G. DEFINITION OF TERMINOLOGY

This section contains definitions and abbreviations that are used throughout the Request for Qualifications Based Proposal (RFP), including appropriate abbreviations.

"Architect" means a member of the Design Build Team who is a New Mexico licensed architect and is responsible for the architectural

"BCC" means the elected Board of County Commissioners whom all powers of the County are vested and who are responsible for the proper and efficient administration of the County government.

"Close of Business" means 5:00 PM Mountain Standard or Mountain Daylight Time, whichever is in effect on the date provided in the RFP.

"Construction Contractor" means a member of the Design Build Team who is a New Mexico licensed general contractor and is responsible for the construction services and who will sign the Contract.

“Contract” or **“Agreement”** means a written agreement between the County (the Owner) and a firm for the work covered by this RFP.

“County” means Santa Fe County.

“Design Build Project Delivery System” means a procurement process by which the County contracts with one firm who has the responsibility for the design, construction and delivery of a project under a single contract with the County.

“Design Build Team” or **“firm”** as the terms are used herein, are synonymous with one another and, within the broad definition mean any offeror, who may be a person, a legal entity, a consortium of experts, a joint venture, a team of persons who, through partnership, general or limited or other legal entity, corporation, association, other organizations, or any combination thereof, formally organized so that it may submit a qualified offer in response to a request for proposal and, as a result, who may be considered for a contract award for a design build project delivery systems with a Using Agency/Owner. No distinction is made between formally organized design build firms and a project-specific design build firm.

“Determination” means the written documentation of a decision by the Chief Procurement Officer including findings of fact supporting a decision. A determination becomes part of the procurement file.

“Desirable” the terms “may”, “can”, “should”, “preferable”, or “prefers” identify a desirable of discretionary item or factor (as opposed to “mandatory”).

“Evaluation Committee” or **“Selection Committee”** means a body appointed by the County to perform the evaluations of Offeror proposals. A body constituted in accordance with Section 13-1-121 NMSA 1978 to evaluate proposals and make recommendations and or selections of the heightened ranked Offerors based on qualifications and cost.

“Finalist” means an Offeror who meets all mandatory specifications of this Request for Proposals and whose score on evaluation factors is sufficiently high to merit further consideration by the Evaluation Committee.

“MACC” means the maximum allowable construction cost which may include the estimated construction cost, the cost of design, utility connection fees, site development costs, built in equipment and furnishings, and a maximum contingency allowance of ten percent (10%).

“Mandatory” the terms “must”, “shall”, “will”, “is required”, or “are required”, identify a mandatory term or factor (as opposed to desirable) of this RFP. Failure to meet a mandatory item or factor will result in the rejection of the Offeror’s proposal. Rejection of the proposal will be subject to review of the Selection Committee and a final decision on the rejection will be made the County’s Chief Procurement Officer.

“Offeror” is any person, corporation, or partnership who chooses to submit a proposal in response to this RFP, with the intent of providing design build services for this project.

“Owner” as defined in the Agreement between the Owner and the Design Builder shall be Santa Fe County.

“Owner Team” means a Project Manager, the County Operations Division, County Manager’s Office, the County Planning Division, and the using agency.

“Procurement Manager” means the person or designee authorized by the County to manage or administer a procurement requiring the evaluation of competitive sealed proposals.

“Project” for the purposes of this solicitation means the Water Reclamation.

“Project Team” means all members of the Design Build team including all consultants who will be responsible for the completion of the Project.

“Purchasing Division” means the County Purchasing Office of the County Finance Division.

“Proposal” is the Offerors phased response to this RFP.

“Request for Qualifications Based Proposals” or **“RFP”** means all documents including those attached or incorporated by reference, used for soliciting proposals for this Project.

“Responsible Offeror” or **“Responsive Proposal”** means an Offeror who submits a responsive proposal or who has furnished, when required, information and data to prove that their financial resources, production or service facilities, personnel, service reputation and experience are adequate to make satisfactory delivery of the services or items of tangible personal property described in the proposal of this RFP.

“Responsive Offeror” or **“Responsible Proposal”** means an offer or proposal which conforms in all material respects to the requirements set forth in the RFP as determined by the Selection Committee. Material respects of a request for proposals included but are not limited to: quality, quantity or delivery requirements.

“Selection” means a formal written notice by the Chair of the Selection Committee that a firm has been selected to enter into a contract for services.

“Technical Irregularities” are matters of form rather than substance evident from the proposal document, or insignificant mistakes that can be waived or corrected without prejudice to other Offeror’s; that is, where there is no effect on price, quality or quantity. If discussions are not held or if best and final offers upon which award will be made have been received, the Selection Committee may waive such irregularities or allow an Offeror to correct them if either is in the best interest of the County. Examples include the failure of an Offeror to:

- a) Submit the number of signed proposals required by the RFP;
- b) Sign the proposal, but only if the unsigned proposal is accompanied by other material indicating the Offeror’s intent to be bound; or
- c) Acknowledge receipt of an amendment involved had not effect on price, quality or quantity.

“Using Agency” means Santa Fe County and its’ departments and offices.

III. CONDITIONS GOVERNING THE PROCUREMENT

This section of the RFP contains the schedule governing the procurement, which describes the major procurement events and the conditions.

A. SEQUENCE OF EVENTS

The Procurement Manager will make every effort to adhere to the following schedule:

Action	Responsibilities	Estimated Date
Issue RFP	County/Purchasing	30-Jul-18
Pre-Proposal Conference	<u>County/Offoror's</u>	9-Aug-18
Acknowledgement Form Due	Offeror's/Purchasing	9-Aug-18
Deadline to Receive Written Questions For Phase I of the RFP	Offeror's/Purchasing	10-Aug-18
Response to Written Questions	Purchasing/Offeror's	13-Aug-18
Submission of Phase I Proposal	Offeror's/Purchasing	27-Aug-18
Proposal Shortlisting	County/Evaluation Committee	29-Aug-18
Notice of Shortlisted Offeror's	County Purchasing - CPO	30-Aug-18
Phase II Mandatory Pre-proposal Conference	Purchasing	6-Sep-18
Questions/Clarifications for Phase II	Offeror's/Purchasing	13-Sep-18
Amendments/Responses to Ph II Written Questions	County/Purchasing	17-Sep-18
Phase II Proposals Due	Offeror's/Purchasing	26-Sep-18
Review of Proposals	County/Evaluation Committee	27-Sep-18
Interviews (If necessary)	<u>County/Offoror's</u>	4-Oct-18
Final Selection and Notice of Intent to Award	County/CPO	18-Oct-18
Award of Contract	County/Successful Offeror	30-Oct-18

B. SEQUENCE OF EVENTS – DESCRIPTION OF ACTIVITIES

1. Issue of RFP – this RFP is issued by the Santa Fe County Purchasing Division in accordance with the provisions of Section 13-1-119 through 13-1-124 NMSA 1978.

2. Pre-proposal Conference – a Pre-proposal Conference is scheduled to occur on the date indicated in the “Sequence of Events” in Section III.A. Questions may be submitted at the Pre-proposal Conference and after up to and until the deadline indicated in the “Sequence of Events” in Section III.A. A public log will be kept of the names of potential Offerors that attended the Pre-proposal Conference.
3. Acknowledgment of Receipt Form – a potential Offeror shall hand deliver, return by facsimile or email the “Acknowledgment of Receipt Form” provided in Appendix A to have its name and firm placed on the procurement distribution list. The form shall be signed by an authorized representative of the organization, dated, and returned by close of business on the date indicated in the “Sequence of Events” in Section III.A.
4. Deadline to Submit Additional Written Questions – potential Offerors may submit written questions regarding this RFP until the close of business indicated in the “Sequence of Events” in Section III.A. All written questions must be addressed to the Procurement Manager listed in Section III.F and sent via facsimile or email. Any contact with any other County staff member other than the Procurement Manager named in this solicitation may be grounds for rejection of a Proposal.
5. Response to Written Questions – written responses to written questions and any RFP addenda will be distributed on the date indicated in the “Sequence of Events” in Section III.A. to all potential Offerors whose names appear on the procurement distribution list.
6. Submission of Phase One Proposal – proposals shall be submitted in sealed envelopes, addressed to:

Santa Fe County Purchasing Division
RFP No. 2019-0016-CMO/BT
142 W. Palace Avenue – 2nd Floor
Santa Fe, New Mexico
ATTENTION: Mr. Bill Taylor, Procurement Manager

ALL OFFEROR PROPOSALS MUST BE RECEIVED FOR REVIEW AND EVALUATION BY THE PROCUREMENT MANAGER OR DESIGNEE NO LATER THAN **2:00 PM August 27, 2018**. **Proposals received after this deadline will not be accepted. The date and time will be recorded on each proposal.**

A public log will be kept of the names of all Offerors that have submitted proposals. Pursuant to Section 13-1-116 NMSA 1978, the contents of any proposal shall not be disclosed to competing Offerors prior to contract award.

Receipt of Proposals: The Purchasing Division will time-stamp proposals as the Purchasing Office and proposals will be held in a secure location. Proposals received after the deadline will be deemed non-responsive and will be returned unopened to the Offeror.

Confidentiality of Proposals: Proposals will not be opened publicly and shall not be open to public inspections until after an Offeror has been selected for the award of the contract and conclusion of successful contract negotiations. An Offeror may request in writing non-disclosure of confidential data.

Such data shall accompany the proposal and shall be readably separable from the proposal in order to facilitate eventual public inspections of the non-confidential portion of the proposal.

Non-Conforming Proposals: Proposals will be reviewed for completeness, format and compliant with the requirements of the RFP. In any proposal is deemed non-responsive by the Selection Committee, the Offeror will notified in writing of such determination.

7. Phase One Proposal/Shortlisting – the Selection Committee will review each proposal. Points will be allocated per Section IV.A. of the RFP be each committee member. Member’s point totals will be translated to a numeric ranking. The Selection Committee member rankings will be totaled to determine the overall ranking of the firms. The Selection Committee shall determine the rankings without the possibility of a tie. A maximum of three (3) firms will be short-listed.

The evaluation of proposal will be performed by an Evaluation Committee appointed by County Management. The process will take place during the timeframe indicated in the “Sequence of Events” described in III.A. During this time, the Procurement Manager may initiate discussions with Offerors who submit responsive or potentially responsive proposals for the purpose of clarifying aspects of the proposals, but proposals may be accepted and evaluated without such discussion. Discussion SHALL NOT be initiated by any Offeror.

8. Phase Two Mandatory Pre-proposal Conference – provides shortlisted Offerors an opportunity to discuss the details of the project criteria with the Owner’s Team. **SELECTED OFFEROR’S ARE REQUIRED TO ATTEND.**

9. Questions/Clarifications – between issuing the Phase Two documents and submission of the Phase Two proposals, prospective Offerors may contact the Procurement Manager with questions about the scope of the project or the RFP schedule.

10. RFP Phase Two Amendments – if an RFP amendment is deemed necessary, it will be issued prior to the submission deadline. The Purchasing Division will distribute the amendment in writing to all short-listed Offerors.

11. Submission of Phase Two Proposal – proposals shall be submitted in sealed envelopes, addressed to:

Santa Fe County Purchasing Division
RFP No. 2019-0016-CMO/BT
142 W. Palace Avenue – 2nd Floor
Santa Fe, New Mexico
ATTENTION: Mr. Bill Taylor, Procurement Manager

Receipt of Proposals: The Purchasing Division will time-stamp proposals as the Purchasing Office and proposals will be held in a secure location. Proposals received after the deadline will deemed non-responsive and will be returned unopened to the Offeror.

Confidentiality of Proposals: Proposals will not be opened publicly and shall not be open to public inspections until after an Offeror has been selected for the award of the contract and conclusion of successful contract negotiations. An Offeror may request in writing non-disclosure of confidential data. Such data shall accompany the proposal and shall be readably separable from the proposal in order to facilitate eventual public inspections of the non-confidential portion of the proposal.

Non-Conforming Proposals: Proposals will be reviewed for completeness, format and compliant with the requirements of the RFP. In any proposal is deemed non-responsive by the Selection Committee, the Offeror will notified in writing of such determination.

12. Interviews/Award (if necessary) – if necessary, notice to finalist(s) will include the interview date, time and location. The purpose of the interview is to allow the Offeror to present qualifications, past performance, quality of proposed design, quality of construction approach, demonstrated response to program requirements, management plan for constructing the project, and cost and schedule. It will also provide an opportunity for the Selection Committee to seek clarification of the Offeror's proposal. A maximum of thirty (30) minutes will allotted for each interview to include a ten (10) minute question and answer session by the Selection Committee. Points will be allocated by each member of the Committee and each member's points will be translated into a numeric ranking of the interviewed firms. Individual member rankings will be totaled together to determine the overall ranking after the interviews. In the event of a tie for first, after the completion of interviews, the tie shall be broken by awarding the firm with the higher ranking from the shortlist. All calculations of point standings shall occur during the Selection Committee meeting for this project with all members in attendance.

13. Notice of Intent to Award – the Procurement Manager will notify the selected Offeror in writing of the final intent to award. This notice will include the overall rankings for the project award. At this time, the Purchasing Division will maintain at least one copy of each Offeror's proposal. Proposals are opened for public inspection after the award and conclusion of successful contract negotiations. Any unsuccessful Offeror wishing to retrieve all copies of the their proposal must do so within one (1) month after the Notice of Intent to Award.

14. Contract Negotiations – the Owner and successful Offeror will begin contact negotiations as soon as possible after the Notice of Intent to Award. If contract negotiations are not finalized within thirty (30) days after Notice of Intent to Award, Owner may conclude negotiations with the selected Offeror and begin negotiations with the next ranked Offeror based on final ranking.

15. Right to Protest and Protest Period – in accordance with Section 13-1-172 NMSA 1978, any Offeror who is aggrieved in connection with a solicitation or the award of a contract may protest in writing to the Procurement Manager. The written protest must be submitted within fifteen (15) calendar days after knowledge of the facts or occurrences giving rise to the protest. Protests must be submitted in written form to:

Mr. Bill Taylor, Procurement Manager
Santa Fe County Purchasing Division
P.O. Box 276
Santa Fe, New Mexico 87504

Protests must include the name and address of the protestant, the solicitation number, and the statement of grounds for the protest, including appropriate supporting exhibits. Protests received after the deadline will not be accepted.

IV. EVALUATION PROCESS

The County will utilize a two-phase request for proposal procedure for awarding the Contract as follows:

1. During **Phase One**, the Selection Committee will evaluate each Offeror's experience, technical competence and capability to perform; the past performance of the Offeror's team; and, other appropriate factors submitted by the team of Offeror in response to the RFP. Qualifications of Offeror's will be evaluated as described in Section IV.A., and a maximum of 3 Offerors will be short-listed in accordance with technical and qualification based criteria.
2. During **Phase Two**, each short-listed Offeror will be required to attend a **MANDATORY** Pre-Proposal meeting for any clarifications regarding the RFP. After the Pre-Proposal meeting the offerors will be allowed one Alternative Concepts meeting with the County Project team to propose a specific technical concepts to their design solution.

A. PHASE I EVALUATION CRITERIA

Phase I of this solicitation will result in the narrowing of Offeror's to a maximum of three (3) firms based upon the Phase I evaluation factors. A maximum of three (3) firms will be selected to then submit Technical and Price proposals for Phase II.

Shortlisting – A maximum of 1000 points are possible in scoring each proposal for the shortlist evaluation. The Selection Committee will evaluate the Phase I proposals applying for selection. The evaluation criteria to be used by the Selection Committee for the proposal shortlist and the corresponding point values for each criterion are as follows:

Criteria	Max.
	Points
Specialized design and technical competence of the business, including a joint venture or association regarding the type of structure required	300
Past Performance, documents record of performance of the team on projects of a similar nature relative to budget and schedule, quality of work and customer satisfaction, compliance with applicable laws and regulations and safety record.	200
Project staffing/craft labor capabilities, reliable staffing sources, reliable project staffing	150
Capacity and capability of business, including any consultants and their representatives, qualifications and locations to perform the work, including any specialized services within the time limitations.	150
Management plan, management and administration of the team and team resources	50
Health and Safety with respect to site safety and quality assurance/quality control	50
Proximity, familiarity and experience with the Project area and Site	50
New Mexico produced work	50

A.1. EVALUATION FACTORS

A brief explanation of each evaluation category is listed below. Information in one category may overlap information in other categories. Offeror's are encouraged to fully address each category completely, as points are assigned for responses to each. Responses to the RFP shall include information and past project experiences specific to the team submitting the proposal.

Specialized Design (300 points)

- Vision/mission and project delivery philosophy to include expectation statements concerning:
- Elements for successful partnering
- Proposed Design Period Peer technical/administrative review by the County's Team
- Brief history of firm in New Mexico
- List all design consultants and how they provide value to this project
- Firm's experience and ability to incorporate energy conserving and sustainable measures into project design and construction.

Past Record of Performance (200 points)

The Selection Committee will evaluate the quality of the Offeror's past performance. The assessment of the Offeror's past performance will be used as a means of evaluating the relative capability of the Offeror's to successfully meet the requirements of the RFP. The Offeror must provide the information requested below for past performance evaluation or affirmatively state that it possesses no relevant, directly related, or similar past performance.

Design Team: submit past performance data on as many as three (3) projects that demonstrate design past performances, in performing similar in scope, size and complexity to that described in the RFP.

Include design awards, customer letters of recommendation etc., with points of contact and telephone numbers.

Construction Team: submit past performance data on as many as three (3) projects that demonstrate design past performances, in performing similar in scope, size and complexity to that described in the RFP. Include design awards, customer letters of recommendation etc., with points of contact and telephone numbers.

- Information on previous design/build projects to include clear descriptions of the specific roles of the design and construction team owner's project budget, final construction cost estimates, bid price including accepted alternates, total number and cost of Change Orders.
- Explain any project difficulties and how the Offeror handled these issues.
- Attach Contractor's Final Application and Certification of Payment (AIA Form G702 or equal) for these design build project.

***Offerors are cautioned that the Selection Committee will use data provided by the teaming partners as well as data obtained from other sources in the evaluation of past performance.*

Project Staffing (150 points)

Provide an organizational chart of key project personnel and also address how critical subcontractors will be selected and managed.

Design Team: Submit resumes for the Design Team Project Manager, Project Architect, Design Quality Control Manager, and other key members of the design team that will be assigned to this project. Also, describe as many as three (3) previous partnering/teaming arrangements with construction teams and any design-build projects.

Construction Team: Submit resumes for all key personnel (PM, QCM, Safety Manager and Project Superintendent) that demonstrates technical qualifications in all disciplines required to perform work similar to that described in the RFP. Also describe as many as three (3) previous partnering/teaming arrangements with construction teams and any design-build projects.

Capacity and Capability (150 points)

- Information regarding project team's past capability to meet schedules, meet budgets and meet project administration requirements.
- Indicate relationship of the project team's current workload to the project workload of this Project and personnel in the New Mexico office.
- Demonstrated ability to provide performance and labor/material payment bonds in amounts sufficient to cover the cost of the work on this Project.

Management Plan (50 points)

- Describe processes to minimize risk and to ensure that cost, schedule and quality status issues are clearly communicated with the team and the County's team.
- Firm's approach to project cost estimating and incorporation of Life Cycle Cost Analysis into design process.
- Communication protocol and software to support the same.

Health and Safety (50 points)

- Describe the processes and/or the plan to effectively and efficiently provide Quality Assurance/Quality Control and manage site safety.
- Submit insurance industry standard Experience Modifier Rate for each of the past three (3) years. If there are extenuating circumstances concerning ratings, provide background information and referenced for validation.

Proximity to and Familiarity with Santa Fe County and the Project site (50 points)

- Provide information relative to the project's location and how members of the project team can respond to issues at the site and with the community at large.
- Indicate previous projects completed in the close vicinity of this Project.

New Mexico Produced Work (50 points)

- The County's goal is to support New Mexico owned businesses. Indicate the volume of work to be produced by New Mexico firms, using New Mexico based employees on this Project. Indicate the number of New Mexico based employees that will be part of the Project Team.

B. PHASE II DOCUMENTS (Note: this information is tentative; the actual Phase II Proposal Requirements will be issued with Phase II of the solicitation)

Offeror's selected for the Phase II short-list will be notified of their selection and of the mandatory Phase II offeror's conference. The Phase II documents will be distributed to each Offeror and will include but not be limited to the following:

Section 1: Brief description of the requirements of the Phase II submission, and the general requirements for the quotes (using established wage rates, including NMGR as a separate line item, conforming to all applicable laws, etc.); listing of requirements for all communications during the Phase II proposal submission process; identification of general insurance requirements, liability and professional liability (Errors and Omissions) insurance requirements, as well as any special insurance information; bonding requirements.

Section 2: Detailed Program of Requirements documents with a breakdown of the specific scope of work under this Project.

Section 3: Staging area site map and specific requirements for Contractor's field office, Project Manager's field office and other logistics/staging are requirements.

Section 4: General requirements for the Project including the requirements for working in and around the project, specific requirements for project signage, and specific requirements for interfacing with the County and Using Agency staff.

Section 5: Facility Design Guidelines, which provides outline specifications to help guide the Offeror's with materials selections and setting standards of quality.

Section 6: The Bid/Proposal Form, which will require Construction Contractor's signature and will record the following:

- Lump Sum: A lump sum amount for the design and construction of the work, per the requirements of the detailed scope of work and all other requirements. The NMGRt will be shown separately, as well as the total with the NMGRt included.
- Schedule: A schedule showing the start and completion dates for all major activities and phased of the work, to include design, design reviews and approvals, permits and other agency reviews and approvals, construction by major activity, punch list and completion. This schedule will be a part of the information used in the evaluation process to select the Contractor.
- Alternates. Quoted pricing for any identified alternates with the acknowledgement that the lump sums quoted for each alternate includes all required labor, equipment, materials, associated materials and/or equipment items, profit, overhead, fees and general conditions and design/engineering costs to provide the work in a complete and timely manner.
- Allowances: Listing of specified allowances with the acknowledgement that they are in the lump sum quoted amount, to include all associated profit, overhead, fees and general conditions, and general design/engineering costs.
- Additive and Deductive Change Orders:
 - The percentage of mark-up (profit, overhead, general conditions, design and related costs) that will be applied to the Contractor's direct construction costs for any additive or deductive change order quotes and/or work.
 - The percentage of mark-up (profit, overhead, general conditions, design and related costs) that will be applied to the Contractor's direct construction costs for any additive or deductive change order quotes and/or work, where the design is provided by another entity.
 - The total amount of mark-up (profit, overhead, general conditions, design and related costs) the Contractor will allow on any subcontractor's or supplier's direct labor, equipment, and/or material costs for any additive or deductive change order quotes and/or work.

Section 7: Owner provided information including, but not limited design guidelines and previously completed preliminary engineering report.

B.1. PHASE II EVALUATION CRITERIA (Note: this information is tentative; the actual Phase II Evaluation Criteria will be issued with Phase II of the solicitation)

A maximum of as many as three (3) Offeror's will advance to Phase II. Phase II will be evaluated on the Offeror's technical proposal and price proposal. Offeror's are required to submit separate technical and price proposals.

The success proposal will be the one that provides the best value to the County, based upon a total score calculated using the criteria listed below (“weighted criteria”). Criteria 3 and 4 below will primarily be evaluated considering the objectives stated in the project program, requirements stated in the performance specifications, service life span and guarantees, operating and maintenance costs, life cycle costs, appearance, operations fixtures and equipment.

Criteria	Max.
	Points
Project Staffing (previous score as Phase I unless conditions changed)	150
Past Performance (previous score as Phase I unless conditions changed)	200
Quality of Design Solution, including technical submittals	250
Quality of Construction Approach	100
Management Plan for constructing the Project	50
Cost and Schedule	250

B.2. EVALUATION FACTORS

A brief explanation of each evaluation category is listed below.

Project Staffing (150 points)

Provide an organizational chart of key project personnel and also address how critical subcontractors will be selected and managed.

Design Team: Submit resumes for the Design Team Project Manager, Project Architect, Design Quality Control Manager, and other key members of the design team that will be assigned to this project. Also, describe as many as three (3) previous partnering/teaming arrangements with construction teams and any design-build projects.

Construction Team: Submit resumes for all key personnel (PM, QCM, Safety Manager and Project Superintendent) that demonstrates technical qualifications in all disciplines required to perform work similar to that described in the RFP. Also describe as many as three (3) previous partnering/teaming arrangements with construction teams and any design-build projects.

Past Record of Performance (200 points)

The Selection Committee will evaluate the quality of the Offeror’s past performance. The assessment of the Offeror’s past performance will be used as a means of evaluating the relative capability of the Offeror’s to successfully meet the requirements of the RFP. The Offeror must provide the information requested below for past performance evaluation or affirmatively state that it possesses no relevant, directly related, or similar past performance.

Design Team: submit past performance data on as many as three (3) projects that demonstrate design past performances, in performing similar in scope, size and complexity to that described in the RFP. Include design awards, customer letters of recommendation etc., with points of contact and telephone numbers.

Construction Team: submit past performance data on as many as three (3) projects that demonstrate design past performances, in performing similar in scope, size and complexity to that described in the RFP. Include design awards, customer letters of recommendation etc., with points of contact and telephone numbers.

- Information on previous design/build projects to include clear descriptions of the specific roles of the design and construction team owner's project budget, final construction cost estimates, bid price including accepted alternates, total number and cost of Change Orders.
- Explain any project difficulties and how the Offeror handled these issues.
- Attach Contractor's Final Application and Certification of Payment (AIA Form G702 or equal) for these design build project.

***Offerors are cautioned that the Selection Committee will use data provided by the teaming partners as well as data obtained from other sources in the evaluation of past performance.*

Quality of Proposed Design solution, including required technical submittals (200 points)

Evaluation will consider conformance to the Project Program Requirements including functional organization, space allocation and functional and operational requirements as reflected in the site and building layout. Offeror is to prepare conceptual drawings and plans that illustrate the architectural image of the proposed facility. These images will show site plan, conceptual floor plan and building elevations. Unique characteristics that the Offeror is proposing shall be shown separately to clarify intent.

- 100 – 150 points if proposal exceeds specified minimum performance or capability requirements in a way beneficial to the County; proposal must have more strengths and no deficiencies.
- 60 – 99 points if proposal meets specified minimum performance or capability requirements delineated in the Request for Proposals; proposal must have no deficiencies but may have one or more strengths.
- 0 – 59 points if proposal does not clearly meet some specified minimum performance or capability requirements delineated in the Request for Proposal, but any such uncertainty is correctable.

Quality of Construction Approach (100 points)

Offeror is to describe the quality of products (building materials...) that have been included as part of the proposal. The discussion shall include any system enhancements to reduce life cycle costs of the building, and describe sustainable design features incorporated into the project.

- 100 – 150 points if the proposal exceeds specified minimum performance or capability requirements in a way beneficial to the County; proposal must have one or more strengths and no deficiencies.

- 60 – 99 points if proposal meets specified minimum performance or capability requirements delineated in the Request for Proposals; proposal must have no deficiencies but may have one or more strengths.
- 0 – 59 points if proposal does not clearly meet some specified minimum performance or capability requirements delineated in the Request for Proposal, but any such uncertainty is correctable.

Management Plan for constructing the Project (50 points)

Offeror is to provide any enhancements to the personnel and procedures identified in the Phase I Qualification Statement.

- Describe how the construction will be managed, including security and safety controls, staging areas, delivery routes, crane locations and interfaces required at the site with the Using Agency.
- Address project specific criteria, risks that have been identified by the RFP and additional risks that the team has identified. State how those risks will be mitigated.
- Address protocol to support optimization of sustainability principles.
 - 39 – 50 points if proposal exceeds specified minimum performance or capability requirements that benefit the County; proposal must have one or more strengths and no deficiencies.
 - 18 – 38 points if proposal meets specified minimum performance or capability requirements delineated in the Request for Proposal; proposal; must have no deficiencies but may have one or more strengths.
 - 0 – 17 points if proposal does not clearly meet some specified minimum performance or capability requirements delineated in the Request for Proposal, but any such uncertainty is correctable.

Project Schedule and Cost (250 points)

Offeror is to provide its proposed schedule dates for the Water Reclamation Project including at a minimum the following:

- Indicate critical dates and other information in sufficient detail for the Selection Committee to determine if the time frames are reasonable.
- Describe ability of the firm to deliver the project within the construction time identified.

The proposal must address Final Completion and Certificate of Occupancy by December 31, 2018, but Offeror may propose an earlier date. Points will be awarded on basis of quality of viability of the schedule presented and the extent to which completion is within such December 31, 2018, date.

The total cost will be evaluated and substantiated for reasonableness and realistic cost assessment in relation to the proposed conceptual design. Offeror may submit a price proposal that is below the MACC, but in no case should a proposal be submitted in excess of the MACC inclusive of NMGR. Lowest cost will be awarded 250 points. The following formula will be used to calculate points for each higher cost proposal:

Lowest Cost receives 250 points

Higher Cost Lowest cost/higher cost - %, multiplied by 250 points = total points

V. GENERAL REQUIREMENTS INFORMATION

This section contains information about the RFP process and conditions under which this RFP is issued and how the intended project will be completed.

This procurement will be conducted in accordance with Chapter 13, NMSA 1978, NMAC 1.4.1 and Santa Fe County Procurement regulations.

A. Roles and Responsibilities of the Design Build Team – The following general services shall be provided by the Design Build Team in connection with the Project. The Design Build Team shall at a minimum:

- Become fully informed about the Project and have the experience and ability necessary to perform the related services.
- Provide human resources, equipment and facilities necessary to furnish the required services through all phases of the Project. This shall include, but not be limited to:
 - Coordinating and working closely with the Project Manager's from Santa Fe County.
 - Site Development and Planning.
 - Consider County and Using Agency's input on conceptual design.
 - Design development documents at 30%, 60%, 90%, and final.
 - Make presentations to and obtain feedback from County and Using Agency.
 - Prepare plans, specifications and construction documents (all materials used in construction shall meet all applicable code and regulatory requirements).
 - Obtain approval for the Project budget and Design from the County's Project Team at the completion of the various phases of design and construction document development.
 - Provide general architectural/engineering supervision and contract administration during construction.
 - Provide on-site observation during construction.
 - Analyze alternatives and design the most sustainable project consistent with economic feasibility, environmental characteristics, expected life of improvement, operations and maintenance, energy conservation and state-of-the-art technology.
 - Provide periodic estimate updates to assure the County that the actual construction costs remain within the Project budget.

- Perform required services in an expeditious manner to coincide with the Project schedule.
- Furnish qualified construction personnel who keep the County's team advised on A/E matters pertaining to the construction of the Project, and who will work towards the goals of obtaining results prescribed by the plans and specifications. This shall require cooperate between the County's team and the designated Project Manager with meetings on a weekly basis.
- Possess professional ethics and qualifications and represent the County in accordance with a high standard of professional conduct.
- Secure all applicable building permits.

B. Roles and Responsibilities of the County's Team – Examine documents submitted by the Design Build team and render decisions promptly to avoid unreasonable delay in the project.

- If the County observes or otherwise becomes aware of any fault or defect in the Project or nonconformance with the Contract Documents, prompt written notice thereof shall be given by the County to the Design Build team.

C. Acceptance of Conditions Governing Procurement – Offerors shall indicate their acceptance of the Conditions Governing the Procurement section in their Letter of Transmittal. Submission of a proposal constitutes acceptance of the Evaluation Factors contained in Section IV of this RFP.

D. Incurring Cost – Any cost incurred by the Offeror in preparation, transmittal, presentation of any proposal or material submitted in response to this RFP shall be borne solely by the Offeror.

E. Consultants and Subcontractors – Since the award is made on the qualifications-based evaluation process, replacement of consultants/subcontractors after award of and prior to the contract execution may cause the Offeror to be disqualified. The Contractor must perform all work that may result from this RFP, and payments will be made only to the Contractor. Use of sub consultants/subcontractors identified in the proposal is permitted, but since the award of the contract is to be made on a qualifications-based evaluation process, subcontracting the responsibilities of the Construction Contractor portion of the work is not permitted. Use of subcontractors must be clearly explained in the proposal, and major subcontractors must be identified by name. The Contractor shall be wholly responsible for the entire performance whether or not subcontractors are used.

F. Amended Proposals – An Offeror may submit an amended proposal before the deadline for receipt of proposals. Such amended proposals must be completed replacements for a previously submitted proposal and must be clearly identified as such in the transmittal letter. County personnel will not merge, collate, or assemble proposed materials.

G. Proposal Offer Firm – Responses to this RFP, including proposal prices, will be considered firm for ninety (90) days after the due date for receipt of proposals or ninety (90) days after receipt of a best and final offer.

H. Disclosure of Proposal Contents – Proposals are not open to public inspection until after an Offeror(s) has been selected for contract award.

An Offeror may request non-disclosure of confidential information in its proposal. Proprietary or confidential data shall be readably separable from the proposal in order to facilitate eventual public inspection of the non-confidential portion of the proposal. Confidential data is normally restricted confidential financial information concerning the Offeror's organization and data that qualifies as a trade secret in accordance with the Uniform Trade Secrets Act, 57-3A-1 to 57-3A-7 NMSA 1978. The price of products offered or the cost of services proposed shall not be designated as proprietary or confidential information.

If a request for disclosure of information for which an Offeror has made a written request for confidentiality, the Procurement Manager shall examine the Offeror's request and make a written determination that specifies which portions of the proposal should be disclosed. Unless the Offeror takes legal action to prevent the disclosure, the proposal will be disclosed. The proposal shall be open to public inspection subject to any statutory prohibition on the disclosure of confidential data.

I. No Obligation – This procurement in no manner obligates the County or any of its departments to the use of any proposed professional services until a valid written contract is awarded and approved by the appropriate authorities.

J. Termination – This RFP may be cancelled at any time and any and all proposals may be rejected in whole or in part when the County determines such action to be in the best interest of the County.

K. Sufficient Appropriation – Any contract awarded as a result of this RFP process may be terminated if sufficient appropriations or authorizations do not exist. Such termination will be effected by sending written notice to the Contractor. The County's decisions as to whether sufficient appropriations and authorizations are available will be accepted by the Contractor as final.

L. Legal Review – The County requires that all Offerors agree to be bound by the General Requirements contained in this RFP. Any Offeror concerns must be promptly brought to the attention of the Procurement Manager.

M. Governing Law – This procurement and any agreement with Offerors that may result shall be governed by the laws of the state of New Mexico.

N. Basis for Proposal – Only information supplied by the County in writing through the Procurement Manager or in this RFP should be used as the basis for the preparation of the Offeror proposals.

O. Contract Terms and Conditions – The contract between the County and the Contractor will follow the format specified by the County and contain the terms and conditions set forth by the County in Appendix D - Standard Form of Agreement between Owner and Design/Builder Lump Sum as modified by the County. Any questions about the contract terms and conditions must be brought to the attention of the Procurement Manger.

P. Contract Deviations – Any additional terms and conditions which may be the subject of negotiation, will be discussed only between the County and the selector Offeror and shall not be deemed an opportunity to amend the Offeror's proposal.

Q. Offeror Qualifications – The Selection Committee may make such investigations as necessary to determine the ability of the Offeror to adhere to the requirements specified within this RFP. The Selection Committee will reject the proposal of any Offeror who is deemed not a Responsible Offeror or fails to submit a Responsive Offer as defined by NMSA 1978 13-1-83 and 13-1-85, and herein. The Selection Committee reserves the right to waive minor technical irregularities. This right is at the sole discretion of the Selection Committee, subject to Procurement Manager approval.

R. Clarification from Offerors – The Selections Committee after review of the proposals and/or interviews may request clarifications on information submitted by any and all Offerors in a written format with a specified deadline for response.

S. Release of Information – Only the Procurement Manager is authorized to release information about the Project covered by this RFP. Offerors must refer to the Procurement Manager any requests to release any information that pertains to the work or activities covered by any action or award related to this RFP.

T. Right to Waive Minor Irregularities – The Selection Committee reserves the right to recommend the waiver of minor irregularities. The Selection Committee also reserves the right to recommend the waiver of mandatory requirements provided that all of the otherwise responsive proposals failed to meet the mandatory requirements and/or doing so does not otherwise materially affect the procurement. This right is as the sole discretion of the Procurement Manager.

U. Change in Contractor Representatives – The County reserves the right to require a change in contractor representatives if the assigned representatives are not, in the opinion of the County meeting its needs adequately. Any change in contractor representatives must receive prior County approval.

V. Notice – The Procurement Code, Sections 13-1-28 through 13-1-199 NMSA 1978, imposes civil and misdemeanor criminal penalties for its violation. In addition the New Mexico criminal statutes impose felony penalties for bribes, gratuities and kick-backs.

W. County Rights – The County reserves the right to accept all or a portion of an Offeror's proposal.

X. Right to Publish – Throughout the duration of this procurement process and contract term, potential Offerors and contractors must secure from the County written approval prior to the release of any information that pertains to the potential work or activities covered by this procurement or subsequent contract. Failure to adhere to this requirement may result in disqualification of the Offeror's proposal or termination of the contract.

Y. Ownership of Proposals – All documents submitted in response to the RFP shall become property of the County. However, any technical or user documentation submitted with the proposals on the non-selected Offerors shall be returned after the expiration of the protest period.

Z. Electronic Mail Address Required – A large part of communication regarding this procurement will be conducted by electronic mail (e-mail). It is recommended that Offeror should have a valid e-mail address to receive this correspondence.

AA. Hold Harmless – If service delivered hereunder is covered by any patent, copyright, trademark or application thereof, the Design Build Team will indemnify and hold the County harmless from any and all losses, costs, expenses, and legal fees on account of any claims or legal actions filed for infringement of such rights by the Design Build Team.

BB. Purchase Order – The County will not be responsible for any service performed without its written and approved purchase order, contract or approved change order signed by the authorized representative.

CC. Compliance with Applicable Laws – The Design Build Team shall comply with all federal and state laws and regulations pertaining to work under its charge and shall bear all expenses associated with such compliance. The Design Build Team agrees to comply with state laws and rules applicable to worker's compensation benefits for its employees. If the Design Build Team fails to comply with applicable worker's compensation laws and rules, the County may terminate the contract. The Design Build Team will be responsible for obtaining all required insurance.

DD. Conflict of Interest – The Design Build Team shall warrant that it presently has no interest and will not acquire any interest, directly or indirectly, which could conflict in any manner or degree with the performance of service under the award of the contract.

EE. Stipend – At the conclusion of Phase Two of this RFP, those short-listed firms who were not selected for contract negotiations will receive a flat stipend of \$25,000 inclusive of NMGR, payable within thirty (30) days of a written Award of Contract, notwithstanding the provisions described under "Incurring Cost". The stipend payment may be denied if the "non-selected", short-listed firm fails to submit an acceptable design solution with their Phase Two response.

FF. Bid Bond – Securing in the amount of not less than five percent (5%) of the total amount of the proposal submitted is required of each short-listed, selected Offeror. An acceptable Bond or Cashier's Check must accompany each proposal as a guarantee that, if awarded the contract, the Offeror will enter into a contract promptly and execute the required Contract Documents. The successful Offeror's security will be retained until they have signed a contract and furnished required Payment and Performance Bonds. The security will become part of the County as liquidated damages for delay and additional expenses caused thereby in the event that the contract is not executed and/or acceptable one-hundred percent (100%) Performance and Payment bonds are not delivered within the time set forth. The County reserves the right to retain the security of the next two ranked Offerors until the accepted Offeror enters into a contract or until forty-five (45) days after the receipt of proposals, whichever is shorter. All other security will be returned within seven (7) days of the selection announcement.

GG. Preferences in Procurement by Santa Fe County – **NOTE: Preferences will only apply in the Phase One/Shortlisting Evaluation of the RFP. General Contractor may receive Resident in-state or Veteran in-state preference and the Architect/Engineering Firm may receive a Santa Fe County Preference (Ex. Possible for D-B Team to receive a total of 15% in preferences)**

A. New Mexico In-state Preference

New Mexico Law, Section 13-1-21 NMSA 1978, provides a preference in the award of public works contracts for an **"in-state resident business"**. Application of a resident business preference for any Offeror requires that the Offeror to provide a copy of a valid and current certificate as a resident business. Certifications are issued by the state Taxation and Revenue Department.

If an Offeror submits with its proposal a copy of a valid and current in-state resident business certificate, 5% of the total weight of all evaluation factors used in the evaluation of proposals may be awarded or added to the Offeror's score.

Certifications by the state Taxation and Revenue Department for the resident contractor takes into consideration such activities as the business or contractor's payment of property taxes or rent and payment of unemployment insurance on employees who are residents of the state.

OR

B. New Mexico Resident Veteran Preference

New Mexico Law, Section 13-1-22 NMSA 1978, provides a preference in the award of public works contracts for a **"resident veteran business"**. Certification by the state Taxation and Revenue Department for the resident veteran business requires the Offeror to provide evidence of annual revenue and other evidence of veteran status.

An Offeror who wants the veteran contractor preference to be applied to its proposal is required to submit with its proposal the certification from the state Taxation and Revenue Department and the sworn affidavit attached hereto as Appendix C.

If an Offeror submits with its proposal a copy of a valid and current veteran resident business certificate, 10%, 8%, or 5 of the total weight of all evaluation factors used in the evaluation of proposals may be awarded or added to the Offeror's score, depending on the business' annual revenue.

C. Santa Fe County Preference

Santa Fe County Ordinance 2012-4 provides for a **County Preference** for a "Santa Fe County Business". Application of the County preference in procurement requires an Offeror to obtain and provide a Santa Fe County Business Certificate issued by the Santa Fe County Procurement Manager. Certification by the Procurement Manager takes into consideration the business' corporate standing in the state, business licensure or registration, the duration of the business' primary office location and the payment of taxes.

If an Offeror submits with its proposal a copy of its Santa Fe County Business Certificate issued by the Procurement Manager, 5% of the total weight of all the evaluation factors used in the evaluation of proposals may be awarded to the Offeror's score.

The in-state, veteran or County preferences do not apply to procurement of services or goods involving federal funds or federal grant funds.

HH. Double-sided Documents – All submitted bids/proposal documents shall be double-sided, pursuant to Santa Fe County Resolution 2013-7, Adopting Sustainable Resource Management Principles, Section 2.A. "Waste Reduction and Reuse... all documents shall be double-sided, including those that are generated by outside entities using County funds and consultants and contractors doing business with the County".

II. Living Wage – Contractor shall comply with the requirements of Santa Fe County Ordinance 2014-1 (Establishing a Living Wage).

VI. RESPONSE FORMAT, ORGANIZATION, AND SPECIFICATIONS

A. Number of Responses – Only one proposal may be submitted by each Offeror for this project. Offerors shall provide six (6) identical copies of their proposal at the location specified in Section III.

B. Phase One Proposal Format – The proposal shall be limited in format and length. Format will be 8-1/2" x 11" with foldout sheets allowed up to 11" x 17" in size. All foldout sheets, up to a maximum of 11" x 17" sheets will be counted as two pages and shall be labeled as such. Length of the proposal shall be limited to a maximum of twenty (20) numbered pages (printed sheet faces) of text no smaller than 10 point and/or graphics. If there is any question as to format requirements contact the Procurement Manager for clarification prior to submittal of the proposal.

Material excluded from the twenty (20) pages maximum count is limited to:

- Front Cover (photos with captions on inside cover allowed)
- Divider pages (blank except for title information)
- Back cover (photos with captions on inside back cover allowed)
- Submittal letter (two page maximum)
- Table of Contents page (one page maximum, number as i)
- Certificate(s) of Insurance (include as Attachment A)
- Required Forms

C. Proposal Organization – All pages shall be numbered except for those specifically excluded from the page county. All foldout pages shall be counted as two (2) pages and shall be numbered as such. Proposals shall be organized and tabbed in the same order as the evaluation criteria.

D. Submittal Letter – (Two page maximum) Each proposal must be accompanied by a submittal letter. The submittal letter shall identify the Offerors as follows:

- Identify the name and title of the person(s) authorized to contractually obligate the Offeror for the purpose of the RFP and the contract; and the name and license number of the A/E of record in New Mexico and the name and license number of the General Contractor.
- Identify the names, titles, telephone and fax numbers, and email address of persons to be contacted for clarification questions regarding this RFP.
- Shall represent that the information provided in the RFP proposal documents is truthful, accurate and complete and that the firm and individual responsible for the submission shall be fully responsible for and bound by all information, data, certifications, disclosures and attachments included in the RFP proposal documents.
- Agree to compliance with all codes, regulation, facilities, Santa Fe County standards and requirements in law.
- Be signed by the person authorized to contractually obligate the Offeror

- Acknowledge receipt of any and all addendums/amendments to this RFP.

E. Completed Campaign Contribution Disclosure Form – Refer to Required Forms and include as Attachment B.

VII. INSURANCE

A. Insurance Requirements – The minimum requirements for this RFP are:

- Architects Professional Liability (Errors and Omissions): a minimum of \$250,000 per occurrence and \$1,000,000 in the aggregate. Please refer to the Agreement for actual requirements. With this proposal submit a certification of Insurance showing current coverage equal to or greater than what is required in this RFP.
- Contractor's Commercial General Liability: a minimum of \$10,000,000 per occurrence and \$20,000,000 in the aggregate.
- Umbrella Policy in the amount of \$20,000,000

If the Design Build Team is a joint venture and/or association, the required insurance coverage will be in the name of the joint venture or association.

END OF REQUEST FOR PROPOSALS

APPENDIX A
ACKNOWLEDGEMENT OF RECEIPT FORM
DESIGN/BUILD SFCWRF
RFP No. 2019-0016-CMO/BT

In acknowledgement of receipt this Request for Proposal of the undersigned agrees that he/she has received a complete copy, beginning with the title page and table of contents and ending in Appendix D.

The acknowledgement of receipt shall be signed and returned to the Procurement Manager no later than close of business on August 9, 2018. Only potential Offerors who elect to return this form completed with the indicated intention of submitting a proposal will receive copies of the all Offeror written questions and the County's responses to those questions as well as RFP amendments, if any are issued.

FIRM: _____

REPRESENTED BY: _____

TITLE: _____ PHONE NO.: _____

EMAIL: _____ FAX NO.: _____

ADDRESS: _____

CITY: _____ STATE: _____ ZIP CODE: _____

SIGNATURE: _____ DATE: _____

This name and address will be used for all correspondence related to this Request for Proposal.

- ☐ Firm does intend to respond to this Request for Proposals.
☐ Firm does not intent to respond to this Request for Proposals.

Bill Taylor, CPO, Purchasing Manager
Santa Fe County Purchasing Division
142 W. Palace Avenue, 2nd Floor
Santa Fe, NM 87501
(505) 992-6753
wtaylor@santafecountynm.gov

APPENDIX B
CAMPAIGN CONTRIBUTION DISCLOSURE FORM

Pursuant to the Procurement Code, Sections 13-1-28, et seq., NMSA 1978 and NMSA 1978, § 13-1-191.1 (2006), as amended by Laws of 2007, Chapter 234, any prospective contractor seeking to enter into a contract with any state agency or local public body for professional services, a design and build project delivery system, or the design and installation of measures the primary purpose of which is to conserve natural resources must file this form with that state agency or local public body. This form must be filed even if the contract qualifies as a small purchase or a sole source contract. The prospective contractor must disclose whether they, a family member or a representative of the prospective contractor has made a campaign contribution to an applicable public official of the state or a local public body during the two years prior to the date on which the contractor submits a proposal or, in the case of a sole source or small purchase contract, the two years prior to the date the contractor signs the contract, if the aggregate total of contributions given by the prospective contractor, a family member or a representative of the prospective contractor to the public official exceeds two hundred and fifty dollars (\$250) over the two year period.

Furthermore, the state agency or local public body may cancel a solicitation or proposed award for a proposed contract pursuant to Section 13-1-181 NMSA 1978 or a contract that is executed may be ratified or terminated pursuant to Section 13-1-182 NMSA 1978 of the Procurement Code if: 1) a prospective contractor, a family member of the prospective contractor, or a representative of the prospective contractor gives a campaign contribution or other thing of value to an applicable public official or the applicable public official's employees during the pendency of the procurement process or 2) a prospective contractor fails to submit a fully completed disclosure statement pursuant to the law.

The state agency or local public body that procures the services or items of tangible personal property shall indicate on the form the name or names of every applicable public official, if any, for which disclosure is required by a prospective contractor.

THIS FORM MUST BE INCLUDED IN THE REQUEST FOR PROPOSALS AND MUST BE FILED BY ANY PROSPECTIVE CONTRACTOR WHETHER OR NOT THEY, THEIR FAMILY MEMBER, OR THEIR REPRESENTATIVE HAS MADE ANY CONTRIBUTIONS SUBJECT TO DISCLOSURE.

The following definitions apply:

“Applicable public official” means a person elected to an office or a person appointed to complete a term of an elected office, who has the authority to award or influence the award of the contract for which the prospective contractor is submitting a competitive sealed proposal or who has the authority to negotiate a sole source or small purchase contract that may be awarded without submission of a sealed competitive proposal.

“Campaign Contribution” means a gift, subscription, loan, advance or deposit of money or other thing of value, including the estimated value of an in-kind contribution, that is made to or received by an applicable public official or any person authorized to raise, collect or expend contributions on that official’s behalf for the purpose of electing the official to statewide or local office. “Campaign Contribution” includes the payment of a debt incurred in an election campaign, but does not include the value of services provided without compensation or unreimbursed travel or other personal expenses of individuals who volunteer a portion or all of their time on behalf of a candidate or political committee, nor does it include the administrative or solicitation expenses of a political committee that are paid by an organization that sponsors the committee.

“Family member” means spouse, father, mother, child, father-in-law, mother-in-law, daughter-in-law or son-in-law of (a) a prospective contractor, if the prospective contractor is a natural person; or (b) an owner of a prospective contractor.

“Pendency of the procurement process” means the time period commencing with the public notice of the request for proposals and ending with the award of the contract or the cancellation of the request for proposals.

“Prospective contractor” means a person or business that is subject to the competitive sealed proposal process set forth in the Procurement Code or is not required to submit a competitive sealed proposal because that person or business qualifies for a sole source or a small purchase contract.

“Representative of a prospective contractor” means an officer or director of a corporation, a member or manager of a limited liability corporation, a partner of a partnership or a trustee of a trust of the prospective contractor.

DISCLOSURE OF CONTRIBUTIONS:

Contribution Made By: _____

Relation to Prospective Contractor: _____

Name of Applicable Public Official: _____

Date Contribution(s) Made: _____

Amount(s) of Contribution(s): _____

Nature of Contribution(s): _____

Purpose of Contribution(s): _____

(Attach extra pages if necessary)

Signature

Date

Title (position)

OR

NO CONTRIBUTIONS IN THE AGGREGATE TOTAL OVER TWO HUNDRED FIFTY DOLLARS (\$250) WERE MADE to an applicable public official by me, a family member or representative.

Signature

Date

Title (position)

APPENDIX C
RESIDENT VETERANS PREFERENCE CERTIFICATION

_____ (NAME OF CONTRACTOR) hereby certifies the following
in regard to application of the resident veterans' preference to this procurement.

Please check the box below:

☐ I declare under penalty of perjury that my business prior year revenue starting January 1 ending December 31 is up to \$3M allowing me the 10% preference discount on this solicitation. I understand that knowingly giving false or misleading information about this fact constitutes a crime.

☐ I agree to submit a report or reports to the State Purchasing Division of the General Services Department declaring under penalty of perjury that during the last calendar year starting January 1 and ending on December 31, the following to be true and accurate:

In conjunction with this procurement and the requirements of this business application for a Resident Veteran Business Preference/Resident Veteran Contractor Preference under Sections 13-1-21 or 13-1-22 NMSA 1978, which awarded a contract which was on the basis of having such veterans Preference, I agree to report to the State Purchasing Division of the General Services Department the awarded amount involved. I will indicate in the report the award amount as a purchase from a public body or as a public works contract from a public body as the case may be.

I understand that knowingly giving false or misleading information on this report constitutes a crime.

I declare under penalty of perjury that this statement is true to the best of my knowledge. I understand that giving false or misleading statements about material fact regarding this matter constitutes a crime.

(Signature of Business Representative)*

(Date)

*Must be an authorized signatory of the Business.

The representations made in checking the box constitutes a material representation by the business that is subject to protest and may result in denial of an award or un-award of the procurement involved if the statements are proven to be incorrect.

SIGNED AND SEALED THIS _____ DAY OF _____, 2017.

NOTARY PUBLIC

My Commission Expires:

**APPENDIX D
SAMPLE**

DBIA



DESIGN-BUILD
INSTITUTE OF AMERICA

**STANDARD FORM OF GENERAL
CONDITIONS OF CONTRACT
BETWEEN OWNER AND
DESIGN-BUILDER**

Document No. 535

First Edition, 1998

© Design-Build Institute of America

Washington, DC

INSTRUCTIONS

For DBIA Document No. 535 Standard Form of General Conditions of Contract
Between Owner and Design-Builder (1998 Edition)

General Instructions

No.	Subject	Instruction
1.	Standard Forms	Standard form contracts have long served an important function in the United States and international construction markets. The common purpose of these forms is to provide an economical and convenient way for parties to contract for design and construction services. As standard forms gain acceptance and are used with increased frequency, parties are able to enter into contracts with greater certainty as to their rights and responsibilities.
2.	DBIA Standard Form Contract Documents	Since its formation in 1993, the Design-Build Institute of America (ADBIA®) has regularly evaluated the needs of owners, design-builders, and other parties to the design-build process in preparation for developing its own contract forms. Consistent with DBIA's mission of promulgating best design-build practices, DBIA believes that the design-build contract should reflect a balanced approach to risk that considers the legitimate interests of all parties to the design-build process. DBIA's Standard Form Contract Documents reflect a modern risk allocation approach, allocating each risk to the party best equipped to manage and minimize that risk, with the goal of promoting best design-build practices.
3.	Use of Non-DBIA Documents	To avoid inconsistencies among documents used for the same project, DBIA's Standard Form Contract Documents should not be used in conjunction with non-DBIA documents unless the non-DBIA documents are appropriately modified on the advice of legal counsel.
4.	Legal Consequences	DBIA Standard Form Contract Documents are legally binding contracts with important legal consequences. Contracting parties are advised and encouraged to seek legal counsel in completing or modifying these Documents.
5.	Reproduction	DBIA hereby grants to purchasers a limited license to reproduce up to five copies of completed original Documents for use on a particular project. At least two original versions of the Agreement should be signed by the parties. Any other reproduction of DBIA Documents is prohibited.
6.	Modifications	<p>Effective contracting is accomplished when the parties give specific thought to their contracting goals and then tailor the contract to meet the unique needs of the project and the design-build team. For that reason, these Documents may require modification for various purposes including, for example, to comply with local codes and laws, or to add special terms. Also, in some instances, these Documents must be modified to indicate the selection of a particular contract term.</p> <p>Any modifications to these Documents should be underlined to distinguish them from original language. Any handwritten modifications should be initialed by the parties. To delete provisions, strike through the printed words so that original language remains legible. At no time should a document be re-typed in its entirety. Re-creating the document violates copyright laws and destroys one of the advantages of standard forms familiarity with the terms.</p> <p>Additions to DBIA Document No. 535, <i>Standard Form of General Conditions of Contract Between Owner and Design-Builder</i>, 1998 Edition, ("General Conditions of Contract") shall be in the form of written Supplementary Conditions. These are referenced in Section 2.1.3 of DBIA Document No. 525, <i>Standard Form of Agreement Between Owner and Design-Builder C Lump Sum</i>, 1998 Edition, (ADBIA Document No. 525®) and DBIA Document No. 530, <i>Standard Form of Agreement Between Owner and Design-Builder C Cost Plus Fee with an Option for a Guaranteed Maximum Price</i>, 1998 Edition, (ADBIA Document No. 530®).</p>
7.	Execution	It is good practice to execute two original copies of the Agreement. Only persons authorized to sign for the contracting parties may execute the Agreement.

Specific Instructions

Section	Title	Instruction
General	Purpose of this Document	<p>The General Conditions of Contract provide the terms and conditions under which the Work of the Project will be performed.</p> <p>This document accompanies DBIA Document No. 525 and DBIA Document No. 530 (each referred to herein generally as “agreement”). It may also be incorporated by reference into other related agreements, as between the Design-Builder and the Design Consultant, and the Design-Builder and the Subcontractor.</p>
General	Checklist	<p>The following Sections reference documents that are to be attached to the Agreement:</p> <p>Section 2.3.1 Performance Standard Requirements Section 3.5.1 Owner’s Permit List Section 9.4.1 Unit Prices</p>
2.2.1	Design Professional Services	The parties should be aware that in addition to requiring compliance with state licensing laws for design professionals, some states also require that the design professional have a corporate professional license.
2.3.1	Standard of Care for Design Professional’s Services	Design-Builder’s obligation is to deliver a design that meets prevailing industry standards. However, DBIA believes that if Owner has identified specific performance standards that can be objectively measured, Design-Builder is obligated to design the Project to satisfy these standards. To avoid any confusion and to ensure that the parties fully understand what their obligations are, the specific performance standards must be set forth in an exhibit to the Agreement entitled “Performance Standard Requirements.”
3.5.1	Government Approvals and Permits	Design-Builder is responsible for obtaining all necessary permits, approvals and licenses, except to the extent specific permits, approvals, and licenses are set forth in an Owner’s Permit List, which must be attached as an exhibit to the Agreement. The parties, prior to execution of the Agreement, should discuss which permits, approvals and licenses need to be obtained for the Project, and which party is in the best position to do so.
5.1.1	Design-Builder’s Insurance Requirements	Design-Builder is obligated to provide insurance coverage from insurance carriers that meet the criteria set forth in the Insurance Schedule attached to Section 10.1 of the Agreement.
5.1.2	Coverage Amounts and Durations	Design-Builder’s liability insurance must be written for the amounts set forth in the Insurance Schedule made part of the Agreement and must include completed operations insurance for the period of time set forth in the Insurance Schedule.
5.1.3	Exclusions to Design-Build	Parties are advised that standard liability insurance policies may contain exclusions for the design-build delivery method. This Section 5.1.3 requires that any such exclusions be deleted from the policy.
5.1.4	Errors and Omissions Insurance	This Section 5.1.4 does not require the purchase of errors and omissions insurance by the Design-Builder or its Design-Consultant. Should Owner, after its analysis of the risk factors involved, require this insurance, the coverage required shall be as set forth in the Insurance Schedule attached at Section 10.1 of the Agreement. To the extent such coverage is required, any exclusion for the design-build delivery method should be deleted.
5.4.1	Bonds and Other Performance Security	Design-Builder is only obligated to provide bonds or other forms of performance security to the extent called for in Section 10.2 of the Agreement.
9.4.1.1	Contract Price Adjustments	Unit prices, if established, shall be attached pursuant to Article 2 of the Agreement.
9.4.3	Payment/	When Owner disputes Design-Builder’s entitlement to a change order or disagrees with Design-

Section	Title	Instruction
	Performance of Disputed Services	Builder regarding the scope of Work, and nevertheless expects Design-Builder to perform the services, Design-Builder's cash flow and ability to complete the Work will be hampered if Owner fails to pay Design-Builder for the disputed services. This Section provides a balanced approach whereby Design-Builder is required to perform the services, but Owner is required to pay fifty percent (50%) of Design-Builder's reasonable estimated direct costs of performing such services until the dispute is settled. By so doing, Owner does not forfeit its right to deny total responsibility for payment, and Design-Builder does not give up its right to demand full payment. The dispute shall be resolved according to Article 10.
Article 10	Contract Adjustments and Disputes	DBIA endorses the use of partnering, negotiation, mediation and arbitration for the prevention and resolution of disputes. The General Conditions of Contract provides for the parties' Representatives and Senior Representatives to attempt to negotiate the dispute or disagreement. If this attempt fails, the dispute shall be submitted to mandatory, non-binding mediation. Any dispute that cannot be resolved by mediation shall then be submitted to binding arbitration.
10.3.4	Arbitration	The prevailing party in any arbitration shall receive reasonable attorneys' fees from the other party. DBIA supports this "loser pays" provision to encourage parties to negotiate or mediate their differences and to minimize the number of frivolous disputes.
10.4	Duty to Continue Performance	Pending the resolution of any dispute or disagreement, both Owner and Design-Builder shall continue to perform their respective duties under the Contract Documents, unless the parties provide otherwise in the Contract Documents.
10.5	Consequential Damages	DBIA believes that it is inappropriate for either Owner or Design-Builder to be responsible to the other for consequential damages arising from the Project. This limitation on consequential damages in no way restricts, however, the payment of liquidated damages, if any, under Article 5 of the Agreement.
11.4	Design-Builder's Right to Terminate for Cause	If Design-Builder properly terminates the Agreement for cause, it shall recover from Owner in the same way as if Owner had terminated the Agreement for convenience under Article 8 of the Agreement. Owner shall pay to Design-Builder its costs, reasonable overhead and profit on the costs, and an additional payment based on a percentage of the remaining balance of the Contract Price, all as more fully set forth in Article 8 of the Agreement.

DBIA



DESIGN-BUILD
INSTITUTE OF AMERICA

Standard Form of General Conditions of Contract Between Owner and Design-Builder

*This document has important implications for all parties. Consultation with
an attorney is recommended before completion or modification.*

DBIA



DESIGN-BUILD
INSTITUTE OF AMERICA

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Article 1

General

1.1 Mutual Obligations

1.1.1 Owner and Design-Builder commit at all times to cooperate fully with each other, and proceed on the basis of trust and good faith, to permit each party to realize the benefits afforded under the Contract Documents.

1.2 Basic Definitions

1.2.1 *Agreement* refers to the executed contract between Owner and Design-Builder under either DBIA Document No. 525, *Standard Form of Agreement Between Owner and Design-Builder C Lump Sum* (1998 Edition) or DBIA Document No. 530, *Standard Form of Agreement Between Owner and Design-Builder C Cost Plus Fee with an Option for a Guaranteed Maximum Price* (1998 Edition).

1.2.2 *Day or Days* shall mean calendar days unless otherwise specifically noted in the Contract Documents.

1.2.3 *Design Consultant* is a qualified, licensed design professional who is not an employee of Design-Builder, but is retained by Design-Builder, or employed or retained by anyone under contract with Design-Builder or Subcontractor, to furnish design services required under the Contract Documents.

1.2.4 *Hazardous Conditions* are any materials, wastes, substances and chemicals deemed to be hazardous under applicable Legal Requirements, or the handling, storage, remediation, or disposal of which are regulated by applicable Legal Requirements.

1.2.5 *General Conditions of Contract* refer to this DBIA Document No. 535, *Standard Form of General Conditions of Contract Between Owner and Design-Builder* (1998 Edition).

1.2.6 *Legal Requirements* are all applicable federal, state and local laws, codes, ordinances, rules, regulations, orders and decrees of any government or quasi-government entity having jurisdiction over the Project or Site, the practices involved in the Project or Site, or any Work.

1.2.7 *Owner's Project Criteria* are developed by or for Owner to describe Owner's program requirements and objectives for the Project, including use, space, price, time, site and expandability requirements, as well as submittal requirements and other requirements governing Design-Builder's performance of the Work. Owner's Project Criteria may include conceptual documents, design criteria, performance requirements and other Project-specific technical materials and requirements.

1.2.8 *Site* is the land or premises on which the Project is located.

1.2.9 *Subcontractor* is any person or entity retained by Design-Builder as an independent contractor to perform a portion of the Work and shall include materialmen and suppliers.

1.2.10 *Sub-Subcontractor* is any person or entity retained by a Subcontractor as an independent contractor to perform any portion of a Subcontractor's Work and shall include materialmen and suppliers.

1.2.11 *Substantial Completion* is the date on which the Work, or an agreed upon portion of the Work, is sufficiently complete so that Owner can occupy and use the Project or a portion thereof for its intended purposes.

1.2.12 *Work* is comprised of all Design-Builder's design, construction and other services required by the Contract Documents, including procuring and furnishing all materials, equipment, services and labor reasonably inferable from the Contract Documents.

Article 2

Design-Builder's Services and Responsibilities

2.1 General Services

2.1.1 Design-Builder's Representative shall be reasonably available to Owner and shall have the necessary expertise and experience required to supervise the Work. Design-Builder's Representative shall communicate regularly with Owner and shall be vested with the authority to act on behalf of Design-Builder. Design-Builder's Representative may be replaced only with the mutual agreement of Owner and Design-Builder.

2.1.2 Design-Build shall provide Owner with a monthly status report detailing the progress of the Work, including whether (i) the Work is proceeding according to schedule, (ii) discrepancies, conflicts, or ambiguities exist in the Contract Documents that require resolution, (iii) health and safety issues exist in connection with the Work, and (iv) other items require resolution so as not to jeopardize Design-Build's ability to complete the Work for the Contract Price and within the Contract Time(s).

2.1.3 Design-Build shall prepare and submit, at least three (3) days prior to the meeting contemplated by Section 2.1.4 hereof, a schedule for the execution of the Work for Owner's review and response. The schedule shall indicate the dates for the start and completion of the various stages of Work, including the dates when Owner information and approvals are required to enable Design-Build to achieve the Contract Time(s). The schedule shall be revised as required by conditions and progress of the Work, but such revisions shall not relieve Design-Build of its obligations to complete the Work within the Contract Time(s), as such dates may be adjusted in accordance with the Contract Documents. Owner's review of and response to the schedule shall not be construed as relieving Design-Build of its complete and exclusive control over the means, methods, sequences and techniques for executing the Work.

2.1.4 The parties will meet within seven (7) days after execution of the Agreement to discuss issues affecting the administration of the Work and to implement the necessary procedures, including those relating to submittals and payment, to facilitate the ability of the parties to perform their obligations under the Contract Documents.

2.2 Design Professional Services

2.2.1 Design-Build shall, consistent with applicable state licensing laws, provide through qualified, licensed design professionals employed by Design-Build, or procured from qualified, independent licensed Design Consultants, the necessary design services, including architectural, engineering and other design professional services, for the preparation of the required drawings, specifications and other design submittals to permit Design-Build to complete the Work consistent with the Contract Documents. Nothing in the Contract Documents is intended or deemed to create any legal or contractual relationship between Owner and any Design Consultant.

2.3 Standard of Care for Design Professional Services

2.3.1 The standard of care for all design professional services performed to execute the Work shall be the care and skill ordinarily used by members of the design profession practicing under similar conditions at the same time and locality of the Project. Notwithstanding the preceding sentence, if the parties agree upon specific performance standards for any aspect of the Work, which standards are to be set forth in an exhibit to the Agreement entitled "Performance Standard Requirements," the design professional services shall be performed to achieve such standards.

2.4 Design Development Services

2.4.1 Design-Build and Owner shall, consistent with any applicable provision of the Contract Documents, agree upon any interim design submissions that Owner may wish to review, which interim design submissions may include design criteria, drawings, diagrams and specifications setting forth the Project requirements. On or about the time of the scheduled submissions, Design-Build and Owner shall meet and confer about the submissions, with Design-Build identifying during such meetings, among other things, the evolution of the design and any significant changes or deviations from the Contract Documents, or, if applicable, previously submitted design submissions. Minutes of the meetings will be maintained by Design-Build and provided to all attendees for review. Following the design review meeting, Owner shall review and approve the interim design submissions in a time that is consistent with the turnaround times set forth in Design-Build's schedule.

2.4.2 Design-Build shall submit to Owner Construction Documents setting forth in detail drawings and specifications describing the requirements for construction of the Work. The Construction Documents shall be consistent with the latest set of interim design submissions, as such submissions may have been modified in a design review meeting. The parties shall have a design review meeting to discuss, and Owner shall review and approve, the Construction Documents in accordance with the procedures set forth Section 2.4.1 above. Design-Build shall proceed with construction in accordance with the approved Construction Documents and shall submit one set of approved Construction Documents to Owner prior to commencement of construction.

2.4.3 Owner's review and approval of interim design submissions and the Construction Documents is for the purpose of mutually establishing a conformed set of Contract Documents compatible with the requirements of the Work. Neither Owner's review nor approval of any interim design submissions and Construction Documents shall be deemed to transfer any design liability from Design-Builder to Owner.

2.4.4 To the extent not prohibited by the Contract Documents or Legal Requirements, Design-Builder may prepare interim design submissions and Construction Documents for a portion of the Work to permit construction to proceed on that portion of the Work prior to completion of the Construction Documents for the entire Work.

2.5 Legal Requirements

2.5.1 Design-Builder shall perform the Work in accordance with all Legal Requirements and shall provide all notices applicable to the Work as required by the Legal Requirements.

2.5.2 The Contract Price and/or Contract Time(s) shall be adjusted to compensate Design-Builder for the effects of any changes in the Legal Requirements enacted after the date of the Agreement affecting the performance of the Work, or if a Guaranteed Maximum Price is established after the date of the Agreement, the date the parties agree upon the Guaranteed Maximum Price. Such effects may include, without limitation, revisions Design-Builder is required to make to the Construction Documents because of changes in Legal Requirements.

2.6 Government Approvals and Permits

2.6.1 Except as identified in an Owner's Permit List attached as an exhibit to the Agreement, Design-Builder shall obtain and pay for all necessary permits, approvals, licenses, government charges and inspection fees required for the prosecution of the Work by any government or quasi-government entity having jurisdiction over the Project.

2.6.2 Design-Builder shall provide reasonable assistance to Owner in obtaining those permits, approvals and licenses that are Owner's responsibility.

2.7 Design-Builder's Construction Phase Services

2.7.1 Unless otherwise provided in the Contract Documents to be the responsibility of Owner or a separate contractor, Design-Builder shall provide through itself or Subcontractors the necessary supervision, labor, inspection, testing, start-up, material, equipment, machinery, temporary utilities and other temporary facilities to permit Design-Builder to complete construction of the Project consistent with the Contract Documents.

2.7.2 Design-Builder shall perform all construction activities efficiently and with the requisite expertise, skill and competence to satisfy the requirements of the Contract Documents. Design-Builder shall at all times exercise complete and exclusive control over the means, methods, sequences and techniques of construction.

2.7.3 Design-Builder shall employ only Subcontractors who are duly licensed and qualified to perform the Work consistent with the Contract Documents. Owner may reasonably object to Design-Builder's selection of any Subcontractor, provided that the Contract Price and/or Contract Time(s) shall be adjusted to the extent that Owner's decision impacts Design-Builder's cost and/or time of performance.

2.7.4 Design-Builder assumes responsibility to Owner for the proper performance of the Work of Subcontractors and any acts and omissions in connection with such performance. Nothing in the Contract Documents is intended or deemed to create any legal or contractual relationship between Owner and any Subcontractor or Sub-Subcontractor, including but not limited to any third-party beneficiary rights.

2.7.5 Design-Builder shall coordinate the activities of all Subcontractors. If Owner performs other work on the Project or at the Site with separate contractors under Owner's control, Design-Builder agrees to reasonably cooperate and coordinate its activities with those of such separate contractors so that the Project can be completed in an orderly and coordinated manner without unreasonable disruption.

2.7.6 Design-Builder shall keep the Site reasonably free from debris, trash and construction wastes to permit Design-Builder to perform its construction services efficiently, safely and without interfering with the use of adjacent land areas. Upon Substantial Completion of the Work, or a portion of the Work, Design-Builder shall remove all debris, trash,

construction wastes, materials, equipment, machinery and tools arising from the Work or applicable portions thereof to permit Owner to occupy the Project or a portion of the Project for its intended use.

2.8 Design-Builder's Responsibility for Project Safety

2.8.1 Design-Builder recognizes the importance of performing the Work in a safe manner so as to prevent damage, injury or loss to (i) all individuals at the Site, whether working or visiting, (ii) the Work, including materials and equipment incorporated into the Work or stored on-Site or off-Site, and (iii) all other property at the Site or adjacent thereto. Design-Builder assumes responsibility for implementing and monitoring all safety precautions and programs related to the performance of the Work. Design-Builder shall, prior to commencing construction, designate a Safety Representative with the necessary qualifications and experience to supervise the implementation and monitoring of all safety precautions and programs related to the Work. Unless otherwise required by the Contract Documents, Design-Builder's Safety Representative shall be an individual stationed at the Site who may have responsibilities on the Project in addition to safety. The Safety Representative shall make routine daily inspections of the Site and shall hold weekly safety meetings with Design-Builder's personnel, Subcontractors and others as applicable.

2.8.2 Design-Builder and Subcontractors shall comply with all Legal Requirements relating to safety, as well as any Owner-specific safety requirements set forth in the Contract Documents, provided that such Owner-specific requirements do not violate any applicable Legal Requirement. Design-Builder will immediately report in writing any safety-related injury, loss, damage or accident arising from the Work to Owner's Representative and, to the extent mandated by Legal Requirements, to all government or quasi-government authorities having jurisdiction over safety-related matters involving the Project or the Work.

2.8.3 Design-Builder's responsibility for safety under this Section 2.8 is not intended in any way to relieve Subcontractors and Sub-Subcontractors of their own contractual and legal obligations and responsibility for (i) complying with all Legal Requirements, including those related to health and safety matters, and (ii) taking all necessary measures to implement and monitor all safety precautions and programs to guard

against injury, losses, damages or accidents resulting from their performance of the Work.

2.9 Design-Builder's Warranty

2.9.1 Design-Builder warrants to Owner that the construction, including all materials and equipment furnished as part of the construction, shall be new unless otherwise specified in the Contract Documents, of good quality, in conformance with the Contract Documents and free of defects in materials and workmanship. Design-Builder's warranty obligation excludes defects caused by abuse, alterations, or failure to maintain the Work by persons other than Design-Builder or anyone for whose acts Design-Builder may be liable. Nothing in this warranty is intended to limit any manufacturer's warranty which provides Owner with greater warranty rights than set forth in this Section 2.9 or the Contract Documents. Design-Builder will provide Owner with all manufacturers' warranties upon Substantial Completion.

2.10 Correction of Defective Work

2.10.1 Design-Builder agrees to correct any Work that is found to not be in conformance with the Contract Documents, including that part of the Work subject to Section 2.9 hereof, within a period of one year from the date of Substantial Completion of the Work or any portion of the Work, or within such longer period to the extent required by the Contract Documents.

2.10.2 Design-Builder shall, within seven (7) days of receipt of written notice from Owner that the Work is not in conformance with the Contract Documents, take meaningful steps to commence correction of such nonconforming Work, including the correction, removal or replacement of the nonconforming Work and any damage caused to other parts of the Work affected by the nonconforming Work. If Design-Builder fails to commence the necessary steps within such seven (7) day period, Owner, in addition to any other remedies provided under the Contract Documents, may provide Design-Builder with written notice that Owner will commence correction of such nonconforming Work with its own forces. If Owner does perform such corrective Work, Design-Builder shall be responsible for all reasonable costs incurred by Owner in performing such correction. If the nonconforming Work creates an emergency requiring an immediate response, the seven (7) day periods identified herein shall be deemed inapplicable.

2.10.3 The one year period referenced in Section 2.10.1 above applies only to Design-Builder's obligation to correct nonconforming Work and is not intended to constitute a period of limitations for any other rights or remedies Owner may have regarding Design-Builder's other obligations under the Contract Documents.

Article 3

Owner's Services and Responsibilities

3.1 Duty to Cooperate

3.1.1 Owner shall, throughout the performance of the Work, cooperate with Design-Builder and perform its responsibilities, obligations and services in a timely manner to facilitate Design-Builder's timely and efficient performance of the Work and so as not to delay or interfere with Design-Builder's performance of its obligations under the Contract Documents.

3.1.2 Owner shall provide timely reviews and approvals of interim design submissions and Construction Documents consistent with the turnaround times set forth in Design-Builder's schedule.

3.2 Furnishing of Services and Information

3.2.1 Unless expressly stated to the contrary in the Contract Documents, Owner shall provide, at its own cost and expense, for Design-Builder's information and use the following, all of which Design-Builder is entitled to rely upon in performing the Work:

- .1** Surveys describing the property, boundaries, topography and reference points for use during construction, including existing service and utility lines;
- .2** Geotechnical studies describing subsurface conditions, and other surveys describing other latent or concealed physical conditions at the Site;
- .3** Temporary and permanent easements, zoning and other requirements and encumbrances affecting land use, or necessary to permit the proper design and construction of the Project and enable Design-Builder to perform the Work;

- .4** A legal description of the Site;
- .5** To the extent available, as-built and record drawings of any existing structures at the Site; and
- .6** To the extent available, environmental studies, reports and impact statements describing the environmental conditions, including Hazardous Conditions, in existence at the Site.

3.2.2 Owner is responsible for securing and executing all necessary agreements with adjacent land or property owners that are necessary to enable Design-Builder to perform the Work. Owner is further responsible for all costs, including attorneys' fees, incurred in securing these necessary agreements.

3.3 Financial Information

3.3.1 At Design-Builder's request, Owner shall promptly furnish reasonable evidence satisfactory to Design-Builder that Owner has adequate funds available and committed to fulfill all of Owner's contractual obligations under the Contract Documents. If Owner fails to furnish such financial information in a timely manner, Design-Builder may stop Work under Section 11.3 hereof or exercise any other right permitted under the Contract Documents.

3.3.2 Design-Builder shall cooperate with the reasonable requirements of Owner's lenders or other financial sources. Notwithstanding the preceding sentence, after execution of the Agreement Design-Builder shall have no obligation to execute for Owner or Owner's lenders or other financial sources any documents or agreements that require Design-Builder to assume obligations or responsibilities greater than those existing obligations Design-Builder has under the Contract Documents.

3.4 Owner's Representative

3.4.1 Owner's Representative shall be responsible for providing Owner-supplied information and approvals in a timely manner to permit Design-Builder to fulfill its obligations under the Contract Documents. Owner's Representative shall also provide Design-Builder with prompt notice if it observes any failure on the part of Design-Builder to fulfill its contractual

obligations, including any errors, omissions or defects in the performance of the Work.

3.5 Government Approvals and Permits

3.5.1 Owner shall obtain and pay for all necessary permits, approvals, licenses, government charges and inspection fees set forth in the Owner's Permit List attached as an exhibit to the Agreement.

3.5.2 Owner shall provide reasonable assistance to Design-Builder in obtaining those permits, approvals and licenses that are Design-Builder's responsibility.

3.6 Owner's Separate Contractors

3.6.1 Owner is responsible for all work performed on the Project or at the Site by separate contractors under Owner's control. Owner shall contractually require its separate contractors to cooperate with, and coordinate their activities so as not to interfere with, Design-Builder in order to enable Design-Builder to timely complete the Work consistent with the Contract Documents.

Article 4

Hazardous Conditions and Differing Site Conditions

4.1 Hazardous Conditions

4.1.1 Unless otherwise expressly provided in the Contract Documents to be part of the Work, Design-Builder is not responsible for any Hazardous Conditions encountered at the Site. Upon encountering any Hazardous Conditions, Design-Builder will stop Work immediately in the affected area and duly notify Owner and, if required by Legal Requirements, all government or quasi-government entities with jurisdiction over the Project or Site.

4.1.2 Upon receiving notice of the presence of suspected Hazardous Conditions, Owner shall take the necessary measures required to ensure that the Hazardous Conditions are remediated or rendered harmless. Such necessary measures shall include Owner retaining qualified independent experts to (i) ascertain whether Hazardous Conditions have actually been encountered, and, if they have been encountered, (ii) prescribe the remedial measures that Owner must

take either to remove the Hazardous Conditions or render the Hazardous Conditions harmless.

4.1.3 Design-Builder shall be obligated to resume Work at the affected area of the Project only after Owner's expert provides it with written certification that (i) the Hazardous Conditions have been removed or rendered harmless and (ii) all necessary approvals have been obtained from all government and quasi-government entities having jurisdiction over the Project or Site.

4.1.4 Design-Builder will be entitled, in accordance with these General Conditions of Contract, to an adjustment in its Contract Price and/or Contract Time(s) to the extent Design-Builder's cost and/or time of performance have been adversely impacted by the presence of Hazardous Conditions

4.1.5 To the fullest extent permitted by law, Owner shall indemnify, defend and hold harmless Design-Builder, Design Consultants, Subcontractors, anyone employed directly or indirectly for any of them, and their officers, directors, employees and agents, from and against any and all claims, losses, damages, liabilities and expenses, including attorneys' fees and expenses, arising out of or resulting from the presence, removal or remediation of Hazardous Conditions at the Site.

4.1.6 Notwithstanding the preceding provisions of this Section 4.1, Owner is not responsible for Hazardous Conditions introduced to the Site by Design-Builder, Subcontractors or anyone for whose acts they may be liable. Design-Builder shall indemnify, defend and hold harmless Owner and Owner's officers, directors, employees and agents from and against all claims, losses, damages, liabilities and expenses, including attorneys' fees and expenses, arising out of or resulting from those Hazardous Conditions introduced to the Site by Design-Builder, Subcontractors or anyone for whose acts they may be liable.

4.2 Differing Site Conditions

4.2.1 Concealed or latent physical conditions or subsurface conditions at the Site that (i) materially differ from the conditions indicated in the Contract Documents or (ii) are of an unusual nature, differing materially from the conditions ordinarily encountered and generally recognized as inherent in the Work are collectively referred to herein as “Differing Site Conditions.” If Design-Builder encounters a Differing Site Condition, Design-Builder will be entitled to an adjustment in the Contract Price and/or Contract Time(s) to the extent Design-Builder’s cost and/or time of performance are adversely impacted by the Differing Site Condition.

4.2.2 Upon encountering a Differing Site Condition, Design-Builder shall provide prompt written notice to Owner of such condition, which notice shall not be later than fourteen (14) days after such condition has been encountered. Design-Builder shall, to the extent reasonably possible, provide such notice before the Differing Site Condition has been substantially disturbed or altered.

Article 5

Insurance and Bonds

5.1 Design-Builder’s Insurance Requirements

5.1.1 Design-Builder is responsible for procuring and maintaining from insurance companies authorized to do business in the state in which the Project is located, and with a minimum rating set forth in the Agreement, the following insurance coverages for certain claims which may arise from or out of the performance of the Work and obligations under the Contract Documents:

- .1** Coverage for claims arising under workers’ compensation, disability and other similar employee benefit laws applicable to the Work;
- .2** Coverage for claims by Design-Builder’s employees for bodily injury, sickness, disease, or death;
- .3** Coverage for claims by any person other than Design-Builder’s employees for bodily injury, sickness, disease, or death;

- 4** Coverage for usual personal injury liability claims for damages sustained by a person as a direct or indirect result of Design-Builder’s employment of the person, or sustained by any other person;
- .5** Coverage for claims for damages (other than to the Work) because of injury to or destruction of tangible property, including loss of use;
- .6** Coverage for claims of damages because of personal injury or death, or property damage resulting from ownership, use and maintenance of any motor vehicle; and
- .7** Coverage for contractual liability claims arising out of Design-Builder’s obligations under Section 7.4.1 hereof.

5.1.2 Design-Builder’s liability insurance required by Section 5.1.1 above shall be written for the coverage amounts set forth in the Agreement and shall include completed operations insurance for the period of time set forth in the Agreement.

5.1.3 Design-Builder’s liability insurance set forth in Sections 5.1.1.1 through 5.1.1.7 above shall specifically delete any design-build or similar exclusions that could compromise coverages because of the design-build delivery of the Project.

5.1.4 To the extent Owner requires Design-Builder or any Design Consultant to provide professional liability insurance for claims arising from the negligent performance of design services by Design-Builder or the Design Consultant, the coverage limits, duration and other specifics of such insurance shall be as set forth in the Agreement. Any professional liability shall specifically delete any design-build or similar exclusions that could compromise coverages because of the design-build delivery of the Project. Such policies shall be provided prior to the commencement of any design services hereunder.

5.1.5 Prior to commencing any construction services hereunder, Design-Builder shall provide Owner with certificates evidencing that (i) all insurance obligations required by the Contract Documents are in full force and in effect and will remain in effect for the duration required by the Contract Documents and (ii) no insurance coverage will be canceled, renewal refused,

or materially changed unless at least thirty (30) days prior written notice is given to Owner.

5.2 Owner's Liability Insurance

5.2.1 Owner shall procure and maintain from insurance companies authorized to do business in the state in which the Project is located such liability insurance to protect Owner from claims which may arise from the performance of Owner's obligations under the Contract Documents or Owner's conduct during the course of the Project.

5.3 Owner's Property Insurance

5.3.1 Unless otherwise provided in the Contract Documents, Owner shall procure and maintain from insurance companies authorized to do business in the state in which the Project is located property insurance upon the entire Project to the full insurable value of the Project, including professional fees, overtime premiums and all other expenses incurred to replace or repair the insured property. The property insurance obtained by Owner shall include as additional insureds the interests of Owner, Design-Builder, Design Consultants, Subcontractors and Sub-Subcontractors, and shall insure against the perils of fire and extended coverage, theft, vandalism, malicious mischief, collapse, flood, earthquake, debris removal and other perils or causes of loss as called for in the Contract Documents. The property insurance shall include physical loss or damage to the Work, including materials and equipment in transit, at the Site or at another location as may be indicated in Design-Builder's Application for Payment and approved by Owner.

5.3.2 Unless the Contract Documents provide otherwise, Owner shall procure and maintain boiler and machinery insurance that will include the interests of Owner, Design-Builder, Design Consultants, Subcontractors and Sub-Subcontractors.

5.3.3 Prior to Design-Builder commencing any Work, Owner shall provide Design-Builder with certificates evidencing that (i) all Owner's insurance obligations required by the Contract Documents are in full force and in effect and will remain in effect until Design-Builder has completed all of the Work and has received final payment from Owner and (ii) no insurance coverage will be canceled, renewal refused, or materially changed unless at least thirty (30) days prior written notice is given to Design-Builder. Owner's property insurance shall not lapse or be canceled if Owner occupies a portion of the Work pursuant to Section 6.6.3 hereof. Owner shall provide Design-Builder with the necessary endorsements from the insurance company prior to occupying a portion of the Work.

5.3.4 Any loss covered under Owner's property insurance shall be adjusted with Owner and Design-Builder and made payable to both of them as trustees for the insureds as their interests may appear, subject to any applicable mortgage clause. All insurance proceeds received as a result of any loss will be placed in a separate account and distributed in accordance with such agreement as the interested parties may reach. Any disagreement concerning the distribution of any proceeds will be resolved in accordance with Article 10 hereof.

5.3.5 Owner and Design-Builder waive against each other and Owner's separate contractors, Design Consultants, Subcontractors, agents and employees of each and all of them, all damages covered by property insurance provided herein, except such rights as they may have to the proceeds of such insurance. Design-Builder and Owner shall, where appropriate, require similar waivers of subrogation from Owner's separate contractors, Design Consultants and Subcontractors and shall require each of them to include similar waivers in their contracts.

5.4 Bonds and Other Performance Security

5.4.1 If Owner requires Design-Builder to obtain performance and labor and material payment bonds, or other forms of performance security, the amount, form and other conditions of such security shall be as set forth in the Agreement.

Article 6 **Payment**

6.1 Schedule of Values

6.1.1 Within ten (10) days of execution of the Agreement, Design-Builder shall submit for Owner's review and approval a schedule of values for all of the Work. The Schedule of Values will (i) subdivide the Work into its respective parts, (ii) include values for all items comprising the Work and (iii) serve as the basis for monthly progress payments made to Design-Builder throughout the Work.

6.2 Monthly Progress Payments

6.2.1 On or before the date established in the Agreement, Design-Builder shall submit for Owner's review and approval its Application for Payment requesting payment for all Work performed as of the date of the Application for Payment. The Application for Payment shall be accompanied by all supporting documentation required by the Contract Documents and/or established at the meeting required by Section 2.1.4 hereof.

6.2.2 The Application for Payment may request payment for equipment and materials not yet incorporated into the Project, provided that (i) Owner is satisfied that the equipment and materials are suitably stored at either the Site or another acceptable location, (ii) the equipment and materials are protected by suitable insurance and (iii) upon payment, Owner will receive the equipment and materials free and clear of all liens and encumbrances.

6.2.3 The Application for Payment shall constitute Design-Builder's representation that the Work has been performed consistent with the Contract Documents, has progressed to the point indicated in the Application for Payment, and that title to all Work will pass to Owner free and clear of all claims, liens, encumbrances, and security interests upon the incorporation of the Work into the Project, or upon Design-Builder's receipt of payment, whichever occurs earlier.

6.3 Withholding of Payments

6.3.1 On or before the date established in the Agreement, Owner shall pay Design-Builder all amounts properly due. If Owner determines that Design-Builder is not entitled to all or part of an Application for Payment, it will notify Design-Builder in writing at least five (5) days prior to the date payment is due. The notice shall indicate the specific amounts Owner intends to withhold, the reasons and contractual basis for the withholding, and the specific measures Design-Builder must take to rectify Owner's concerns. Design-Builder and Owner will attempt to resolve Owner's concerns prior to the date payment is due. If the parties cannot resolve such concerns, Design-Builder may pursue its rights under the Contract Documents, including those under Article 10 hereof.

6.3.2 Notwithstanding anything to the contrary in the Contract Documents, Owner shall pay Design-Builder all undisputed amounts in an Application for Payment within the times required by the Agreement.

6.4 Right to Stop Work and Interest

6.4.1 If Owner fails to pay Design-Builder any amount that becomes due, Design-Builder, in addition to all other remedies provided in Contract Documents may stop Work pursuant to Section 11.3 hereof. All payments due and unpaid shall bear at the rate set forth in the Agreement.

6.5 Design-Builder's Payment Obligations

6.5.1 Design-Builder will pay Design Consultants and Subcontractors, in accordance with its contractual obligations to such parties, all the amounts Design-Builder has received from Owner on account of their work. Design-Builder will impose similar requirements on Design Consultants and Subcontractors to pay those parties with whom they have contracted. Design-Builder will indemnify and defend Owner against any claims for payment and mechanic's liens as set forth in Section 7.3 hereof.

6.6 Substantial Completion

6.6.1 Design-Builder shall notify Owner when it believes the Work, or to the extent permitted in the Contract Documents, a portion of the Work, is substantially complete. Within five (5) days of Owner's receipt of Design-Builder's notice, Owner and Design-Builder will jointly inspect such Work to verify that it is substantially complete in accordance with the requirements of the Contract Documents. If such Work is substantially complete, Owner shall prepare and issue a Certificate of Substantial Completion that will set forth (i) the date of Substantial Completion of the Work or portion thereof, (ii) the remaining items of Work that have to be completed before final payment, (iii) provisions (to the extent not already provided in the Contract Documents) establishing Owner's and Design-Builder's responsibility for the Project's security, maintenance, utilities and insurance pending final payment and (iv) an acknowledgment that warranties commence to run on the date of Substantial Completion, except as may otherwise be noted in the Certificate of Substantial Completion.

6.6.2 Upon Substantial Completion of the entire Work or, if applicable, any portion of the Work, Owner shall release to Design-Builder all retained amounts relating, as applicable, to the entire Work or completed portion of the Work, less an amount equal to the reasonable value of all remaining or incomplete items of Work as noted in the Certificate of Substantial Completion.

6.6.3 Owner, at its option, may use a portion of the Work which has been determined to be substantially complete, provided, however, that (i) a Certificate of Substantial Completion has been issued for the portion of Work addressing the items set forth in Section 6.6.1 above, (ii) Design-Builder and Owner have obtained the consent of their sureties and insurers, and to the extent applicable, the appropriate government authorities having jurisdiction over the Project, and (iii) Owner and Design-Builder agree that Owner's use or occupancy will not interfere with Design-Builder's completion of the remaining Work.

6.7 Final Payment

6.7.1 After receipt of a Final Application for Payment from Design-Builder, Owner shall make final payment by the time required in the Agreement, provided that Design-Builder has completed all of the Work in conformance with the Contract Documents.

6.7.2 At the time of submission of its Final Application for Payment, Design-Builder shall provide the following information:

- .1** an affidavit that there are no claims, obligations or liens outstanding or unsatisfied for labor, services, material, equipment, taxes or other items performed, furnished or incurred for or in connection with the Work which will in any way affect Owner's interests;
- .2** a general release executed by Design-Builder waiving, upon receipt of final payment by Design-Builder, all claims, except those claims previously made in writing to Owner and remaining unsettled at the time of final payment;
- .3** consent of Design-Builder's surety, if any, to final payment;
- .4** all operating manuals, warranties and other deliverables required by the Contract Documents; and
- .5** certificates of insurance confirming that required coverages will remain in effect consistent with the requirements of the Contract Documents.

6.7.3 Upon making final payment, Owner waives all claims against Design-Builder except claims relating to (i) Design-Builder's failure to satisfy its payment obligations, if such failure affects Owner's interests, (ii) Design-Builder's failure to complete the Work consistent with the Contract Documents, including defects appearing after Substantial Completion and (iii) the terms of any special warranties required by the Contract Documents.

Article 7

Indemnification

7.1 Patent and Copyright Infringement

7.1.1 Design-Builder shall defend any action or proceeding brought against Owner based on any claim that the Work, or any part thereof, or the operation or use of the Work or any part thereof, constitutes infringement of any United States patent or copyright, now or hereafter issued. Owner shall give prompt written notice to Design-Builder of any such action or proceeding and will reasonably provide authority, information and assistance in the defense of same. Design-Builder shall indemnify and hold harmless Owner from and against all damages and costs, including but not limited to attorneys' fees and expenses awarded against Owner or Design-Builder in any such action or proceeding. Design-Builder agrees to keep Owner informed of all developments in the defense of such actions.

7.1.2 If Owner is enjoined from the operation or use of the Work, or any part thereof, as the result of any patent or copyright suit, claim, or proceeding, Design-Builder shall at its sole expense take reasonable steps to procure the right to operate or use the Work. If Design-Builder cannot so procure such right within a reasonable time, Design-Builder shall promptly, at Design-Builder's option and at Design-Builder's expense, (i) modify the Work so as to avoid infringement of any such patent or copyright or (ii) replace said Work with Work that does not infringe or violate any such patent or copyright.

7.1.3 Sections 7.1.1 and 7.1.2 above shall not be applicable to any suit, claim or proceeding based on infringement or violation of a patent or copyright (i) relating solely to a particular process or product of a particular manufacturer specified by Owner and not offered or recommended by Design-Builder to Owner or (ii) arising from modifications to the Work by Owner or its agents after acceptance of the Work. If the suit, claim or proceeding is based upon events set forth in the preceding sentence, Owner shall defend, indemnify and hold harmless Design-Builder to the same extent Design-Builder is obligated to defend, indemnify and hold harmless Owner in Section 7.1.1 above.

7.1.4 The obligations set forth in this Section 7.1 shall constitute the sole agreement between the parties relating to liability for infringement of violation of any patent or copyright.

7.2 Tax Claim Indemnification

~~**7.2.1** If, in accordance with Owner's direction, an exemption for all or part of the Work is claimed for taxes, Owner shall indemnify, defend and hold harmless Design-Builder from and against any liability, penalty, interest, fine, tax assessment, attorneys' fees or other expenses or costs incurred by Design-Builder as a result of any action taken by Design-Builder in accordance with Owner's directive.~~

7.3 Payment Claim Indemnification

7.3.1 Providing that Owner is not in breach of its contractual obligation to make payments to Design-Builder for the Work, Design-Builder shall indemnify, defend and hold harmless Owner from any claims or mechanic's liens brought against Owner or against the Project as a result of the failure of Design-Builder, or those for whose acts it is responsible, to pay for any services, materials, labor, equipment, taxes or other items or obligations furnished or incurred for or in connection with the Work. Within three (3) days of receiving written notice from Owner that such a claim or mechanic's lien has been filed, Design-Builder shall commence to take the steps necessary to discharge said claim or lien, including, if necessary, the furnishing of a mechanic's lien bond. If Design-Builder fails to do so, Owner will have the right to discharge the claim or lien and hold Design-Builder liable for costs and expenses incurred, including attorneys' fees.

7.4 Design-Builder's General Indemnification

7.4.1 Design-Builder, to the fullest extent permitted by law, shall indemnify, hold harmless and defend Owner, its officers, directors, employees and agents from and against claims, losses, damages, liabilities, including attorneys' fees and expenses, for bodily injury, sickness or death, and property damage or destruction (other than to the Work itself) to the extent resulting from the negligent acts or omissions of Design-Builder, Design

Consultants, Subcontractors, anyone employed directly or indirectly by any of them or anyone for whose acts any of them may be liable.

7.4.2 If an employee of Design-Builder, Design Consultants, Subcontractors, anyone employed directly or indirectly by any of them or anyone for whose acts any of them may be liable has a claim against Owner, its officers, directors, employees, or agents, Design-Builder's indemnity obligation set forth in Section 7.4.1 above shall not be limited by any limitation on the amount of damages, compensation or benefits payable by or for Design-Builder, Design Consultants, Subcontractors, or other entity under any employee benefit acts, including workers' compensation or disability acts.

7.5 — Owner's General Indemnification

~~7.5.1 — Owner, to the fullest extent permitted by law, shall indemnify, hold harmless and defend Design-Builder and any of Design-Builder's officers, directors, employees, or agents from and against claims, losses, damages, liabilities, including attorneys' fees and expenses, for bodily injury, sickness or death, and property damage or destruction (other than to the Work itself) to the extent resulting from the negligent acts or omissions of Owner's separate contractors or anyone for whose acts any of them may be liable.~~

Article 8

Time

8.1 Obligation to Achieve the Contract Times

8.1.1 Design-Builder agrees that it will commence performance of the Work and achieve the Contract Time(s) in accordance with Article 5 of the Agreement.

8.2 Delays to the Work

8.2.1 If Design-Builder is delayed in the performance of the Work due to acts, omissions, conditions, events, or circumstances beyond its control and due to no fault of its own or those for whom Design-Builder is responsible, the Contract Time(s) for performance shall be reasonably extended by Change Order. By way of example, events that will entitle Design-Builder to an extension of the Contract Time(s) include acts or omissions of Owner or anyone under Owner's control (including separate contractors),

changes in the Work, Differing Site Conditions, Hazardous Conditions, wars, floods, labor disputes, unusual delay in transportation, epidemics abroad, earthquakes, adverse weather conditions not reasonably anticipated, and other acts of God.

8.2.2 In addition to Design-Builder's right to a time extension for those events set forth in Section 8.2.1 above, Design-Builder shall also be entitled to an appropriate adjustment of the Contract Price provided, however, that the Contract Price shall not be adjusted for those events set forth in Section 8.2.1 above that are beyond the control of both Design-Builder and Owner, including the events of war, floods, labor disputes, earthquakes, epidemics, adverse weather conditions not reasonably anticipated, and other acts of God.

Article 9

Changes to the Contract Price and Time

9.1 Change Orders

9.1.1 A Change Order is a written instrument issued after execution of the Agreement signed by Owner and Design-Builder, stating their agreement upon all of the following:

- .1** The scope of the change in the Work;
- .2** The amount of the adjustment to the Contract Price; and
- .3** The extent of the adjustment to the Contract Time(s).

9.1.2 All changes in the Work authorized by applicable Change Order shall be performed under the applicable conditions of the Contract Documents. Owner and Design-Builder shall negotiate in good faith and as expeditiously as possible the appropriate adjustments for such changes.

9.1.3 If Owner requests a proposal for a change in the Work from Design-Builder and subsequently elects not to proceed with the change, a Change Order shall be issued to reimburse Design-Builder for reasonable costs incurred for estimating services, design services and services involved in the preparation of proposed revisions to the Contract Documents.

9.2 Work Change Directives

9.2.1 A Work Change Directive is a written order prepared and signed by Owner, directing a change in the Work prior to agreement on an adjustment in the Contract Price and/or the Contract Time(s).

9.2.2 Owner and Design-Builder shall negotiate in good faith and as expeditiously as possible the appropriate adjustments for the Work Change Directive. Upon reaching an agreement, the parties shall prepare and execute an appropriate Change Order reflecting the terms of the agreement.

9.3 Minor Changes in the Work

9.3.1 Minor changes in the Work do not involve an adjustment in the Contract Price and/or Contract Time(s) and do not materially and adversely affect the Work, including the design, quality, performance and workmanship required by the Contract Documents. Design-Builder may make minor changes in the Work consistent with the intent of the Contract Documents, provided, however that Design-Builder shall promptly inform Owner, in writing, of any such changes and record such changes on the documents maintained by Design-Builder.

9.4 Contract Price Adjustments

9.4.1 The increase or decrease in Contract Price resulting from a change in the Work shall be determined by one or more of the following methods:

- .1** Unit prices set forth in the Agreement or as subsequently agreed to between the parties;
- .2** A mutually accepted, lump sum, properly itemized and supported by sufficient substantiating data to permit evaluation by Owner;
- .3** Costs, fees and any other markups set forth in the Agreement; and
- .4** If an increase or decrease cannot be agreed to as set forth in items .1 through .3 above and Owner issues a Work Change Directive, the cost of the change of the Work shall be determined by the reasonable expense and savings in the

performance of the Work resulting from the change, including a reasonable overhead and profit, as may be set forth in the Agreement. If the net result of both additions and deletions to the Work is an increase in the Contract Price, overhead and profit shall be calculated on the basis of the net increase to the Contract Price. If the net result of both additions and deletions to the Work is a decrease in the Contract Price, there shall be no overhead or profit adjustment to the Contract Price. Design-Builder shall maintain a documented, itemized accounting evidencing the expenses and savings associated with such changes.

9.4.2 If unit prices are set forth in the Contract Documents or are subsequently agreed to by the parties, but application of such unit prices will cause substantial inequity to Owner or Design-Builder because of differences in the character or quantity of such unit items as originally contemplated, such unit prices shall be equitably adjusted.

9.4.3 If Owner and Design-Builder disagree upon whether Design-Builder is entitled to be paid for any services required by Owner, or if there are any other disagreements over the scope of Work or proposed changes to the Work, Owner and Design-Builder shall resolve the disagreement pursuant to Article 10 hereof. As part of the negotiation process, Design-Builder shall furnish Owner with a good faith estimate of the costs to perform the disputed services in accordance with Owner's interpretations. If the parties are unable to agree and Owner expects Design-Builder to perform the services in accordance with Owner's interpretations, Design-Builder shall proceed to perform the disputed services, conditioned upon Owner issuing a written order to Design-Builder (i) directing Design-Builder to proceed and (ii) specifying Owner's interpretation of the services that are to be performed. If this occurs, Design-Builder shall be entitled to submit in its Applications for Payment an amount equal to fifty percent (50%) of its reasonable estimated direct cost to perform the services, and Owner agrees to pay such amounts, with the express understanding that (i) such payment by Owner does not prejudice Owner's right to argue that it has no responsibility to pay for such services and (ii) receipt of such payment by Design-Builder does not prejudice Design-Builder's right to seek full payment of the disputed services if Owner's order is deemed to be a change to the Work.

9.5 Emergencies

9.5.1 In any emergency affecting the safety of persons and/or property, Design-Builder shall act, at its discretion, to prevent threatened damage, injury or loss. Any change in the Contract Price and/or Contract Time(s) on account of emergency work shall be determined as provided in this Article 9.

Article 10

Contract Adjustments and Disputes

10.1 Requests for Contract Adjustments and Relief

10.1.1 If either Design-Builder or Owner believes that it is entitled to relief against the other for any event arising out of or related to the Work or Project, such party shall provide written notice to the other party of the basis for its claim for relief. Such notice shall, if possible, be made prior to incurring any cost or expense and in accordance with any specific notice requirements contained in applicable sections of these General Conditions of Contract. In the absence of any specific notice requirement, written notice shall be given within a reasonable time, not to exceed twenty-one (21) days, after the occurrence giving rise to the claim for relief or after the claiming party reasonably should have recognized the event or condition giving rise to the request, whichever is later. Such notice shall include sufficient information to advise the other party of the circumstances giving rise to the claim for relief, the specific contractual adjustment or relief requested and the basis of such request.

10.2 Dispute Avoidance and Resolution

10.2.1 The parties are fully committed to working with each other throughout the Project and agree to communicate regularly with each other at all times so as to avoid or minimize disputes or disagreements. If disputes or disagreements do arise, Design-Builder and Owner each commit to resolving such disputes or disagreements in an amicable, professional and expeditious manner so as to avoid unnecessary losses, delays and disruptions to the Work.

10.2.2 Design-Builder and Owner will first attempt to resolve disputes or disagreements at the field level through discussions between Design-Builder's Representative and Owner's Representative.

10.2.3 If a dispute or disagreement cannot be resolved through Design-Builder's Representative and Owner's Representative, Design-Builder's Senior Representative and Owner's Senior Representative, upon the request of either party, shall meet as soon as conveniently possible, but in no case later than thirty (30) days after such a request is made, to attempt to resolve such dispute or disagreement. Prior to any meetings between the Senior Representatives, the parties will exchange relevant information that will assist the parties in resolving their dispute or disagreement.

10.2.4 If after meeting the Senior Representatives determine that the dispute or disagreement cannot be resolved on terms satisfactory to both parties, the parties shall submit the dispute or disagreement to non-binding mediation. The mediation shall be conducted by a mutually agreeable impartial mediator, or if the parties cannot so agree, a mediator designated by the American Arbitration Association ("AAA") pursuant to its Construction Industry Mediation Rules. The mediation will be governed by and conducted pursuant to a mediation agreement negotiated by the parties or, if the parties cannot so agree, by procedures established by the mediator.

10.3 Arbitration

10.3.1 Any claims, disputes or controversies between the parties arising out of or relating to the Agreement, or the breach thereof, which have not been resolved in accordance with the procedures set forth in Section 10.2 above shall be decided by arbitration in accordance with the Construction Industry Arbitration Rules of the AAA then in effect, unless the parties mutually agree otherwise.

10.3.2 The award of the arbitrator(s) shall be final and binding upon the parties without the right of appeal to the courts. Judgment may be entered upon it in accordance with applicable law by any court having jurisdiction thereof.

10.3.3 Design-Builder and Owner expressly agree that any arbitration pursuant to this Section 10.3 may be joined or consolidated with any arbitration involving any other person or entity (i) necessary to resolve the claim, dispute or controversy, or (ii) substantially involved in or affected by such claim, dispute or controversy. Both Design-Builder and Owner will include appropriate provisions in all contracts they execute with other parties in connection with the Project to require such joinder or consolidation.

10.3.4 The prevailing party in any arbitration, or any other final, binding dispute proceeding upon which the parties may agree, shall be entitled to recover from the other party reasonable attorneys' fees and expenses incurred by the prevailing party.

10.4 Duty to Continue Performance

10.4.1 Unless provided to the contrary in the Contract Documents, Design-Builder shall continue to perform the Work and Owner shall continue to satisfy its payment obligations to Design-Builder, pending the final resolution of any dispute or disagreement between Design-Builder and Owner.

10.5 CONSEQUENTIAL DAMAGES

10.5.1 Notwithstanding anything herein to the contrary (except as set forth in section 10.5.2 below), neither design-builder nor owner shall be liable to the other for any consequential losses or damages, whether arising in contract, warranty, tort (including negligence), strict liability or otherwise, including but not limited to losses of use, profits, business, reputation or financing.

10.5.2 The consequential damages limitation set forth in Section 10.5.1 above is not intended to affect the payment of liquidated damages, if any, set forth in Article 5 of the Agreement, which both parties recognize has been established, in part, to reimburse Owner for some damages that might otherwise be deemed to be consequential.

Article 11

Stop Work and Termination for Cause

11.2.3 Upon declaring the Agreement terminated pursuant to Section 11.2.2 above, Owner may enter upon the premises and take possession, for the purpose

11.1 Owner's Right to Stop Work

11.1.1 Owner may, without cause and for its convenience, order Design-Builder in writing to stop and suspend the Work. Such suspension shall not exceed sixty (60) consecutive days or aggregate more than ninety (90) days during the duration of the Project.

11.1.2 Design-Builder is entitled to seek an adjustment of the Contract Price and/or Contract Time(s) if its cost or time to perform the Work has been adversely impacted by any suspension of stoppage of work by Owner.

11.2 Owner's Right to Perform and Terminate for Cause

11.2.1 If Design-Builder persistently fails to (i) provide a sufficient number of skilled workers, (ii) supply the materials required by the Contract Documents, (iii) comply with applicable Legal Requirements, (iv) timely pay, without cause, Design Consultants or Subcontractors, (v) prosecute the Work with promptness and diligence to ensure that the Work is completed by the Contract Time(s), as such times may be adjusted, or (vi) perform material obligations under the Contract Documents, then Owner, in addition to any other rights and remedies provided in the Contract Documents or by law, shall have the rights set forth in Sections 11.2.2 and 11.2.3 below.

11.2.2 Upon the occurrence of an event set forth in Section 11.2.1 above, Owner may provide written notice to Design-Builder that it intends to terminate the Agreement unless the problem cited is cured, or commenced to be cured, within seven (7) days of Design-Builder's receipt of such notice. If Design-Builder fails to cure, or reasonably commence to cure, such problem, then Owner may give a second written notice to Design-Builder of its intent to terminate within an additional seven (7) day period. If Design-Builder, within such second seven (7) day period, fails to cure, or reasonably commence to cure, such problem, then Owner may declare the Agreement terminated for default by providing written notice to Design-Builder of such declaration.

of completing the Work, of all materials, equipment, scaffolds, tools, appliances and other items thereon, which have been purchased or provided for the

performance of the Work, all of which Design-Builder hereby transfers, assigns and sets over to Owner for such purpose, and to employ any person or persons to complete the Work and provide all of the required labor, services, materials, equipment and other items. In the event of such termination, Design-Builder shall not be entitled to receive any further payments under the Contract Documents until the Work shall be finally completed in accordance with the Contract Documents.

At such time, if the unpaid balance of the Contract Price exceeds the cost and expense incurred by Owner in completing the Work, such excess shall be paid by Owner to Design-Builder. Notwithstanding the preceding sentence, if the Agreement establishes a Guaranteed Maximum Price, Design-Builder will only be entitled to be paid for Work performed prior to its default. If Owner's cost and expense of completing the Work exceeds the unpaid balance of the Contract Price, then Design-Builder shall be obligated to pay the difference to Owner. Such costs and expense shall include not only the cost of completing the Work, but also losses, damages, costs and expense, including attorneys' fees and expenses, incurred by Owner in connection with the procurement and defense of claims arising from Design-Builder's default, subject to the waiver of consequential damages set forth in Section 10.5 hereof.

11.2.4 If Owner improperly terminates the Agreement for cause, the termination for cause will be converted to a termination for convenience in accordance with the provisions of Article 8 of the Agreement.

11.3 Design-Builder's Right to Stop Work

11.3.1 Design-Builder may, in addition to any other rights afforded under the Contract Documents or at law, stop work for the following reasons:

- .1** Owner's failure to provide financial assurances as required under Section 3.3 hereof; or
- .2** Owner's failure to pay amounts properly due under Design-Builder's Application for Payment.

11.3.2 Should any of the events set forth in Section 11.3.1 above occur, Design-Builder has the right to provide Owner with written notice that Design-Builder will stop work unless said event is cured within seven (7) days from Owner's receipt of Design-Builder's notice. If Owner does not cure the problem within such seven (7) day period, Design-Builder may stop work. In such case, Design-Builder shall be entitled to make a claim for adjustment to the Contract Price and Contract Time(s) to the extent it has been adversely impacted by such stoppage.

11.4 Design-Builder's Right to Terminate for Cause

11.4.1 Design-Builder, in addition to any other rights and remedies provided in the Contract Documents or by law, may terminate the Agreement for cause for the following reasons:

- .1** The Work has been stopped for sixty (60) consecutive days, or more than ninety (90) days during the duration of the Project, because of court order, any government authority having jurisdiction over the Work, or orders by Owner under Section 11.1.1 hereof, provided that such stoppages are not due to the acts or omissions of Design-Builder or anyone for whose acts Design-Builder may be responsible.
- .2** Owner's failure to provide Design-Builder with any information, permits or approvals that are Owner's responsibility under the Contract Documents which result in the Work being stopped for sixty (60) consecutive days, or more than ninety (90) days during the duration of the Project, even though Owner has not ordered Design-Builder in writing to stop and suspend the Work pursuant to Section 11.1.1 hereof.
- .3** Owner's failure to cure the problems set forth in Section 11.3.1 above after Design-Builder has stopped the Work.

11.4.2 Upon the occurrence of an event set forth in Section 11.4.1 above, Design-Builder may provide written notice to Owner that it intends to terminate the Agreement unless the problem cited is cured, or commenced to be cured, within seven (7) days of

Owner's receipt of such notice. If Owner fails to cure, or reasonably commence to cure, such problem, then Design-Builder may give a second written notice to Owner of its intent to terminate within an additional seven (7) day period. If Owner, within such second seven (7) day period, fails to cure, or reasonably commence to cure, such problem, then Design-Builder may declare the Agreement terminated for default by providing written notice to Owner of such declaration. In such case, Design-Builder shall be entitled to recover in the same manner as if Owner had terminated the Agreement for its convenience under Article 8 of the Agreement.

11.5 Bankruptcy of Owner or Design-Builder

11.5.1 If either Owner or Design-Builder institutes or has instituted against it a case under the United States Bankruptcy Code (such party being referred to as the "Bankrupt Party"), such event may impair or frustrate the Bankrupt Party's ability to perform its obligations under the Contract Documents. Accordingly, should such event occur:

- .1** The Bankrupt Party, its trustee or other successor, shall furnish, upon request of the non-Bankrupt Party, adequate assurance of the ability of the Bankrupt Party to perform all future material obligations under the Contract Documents, which assurances shall be provided within ten (10) days after receiving notice of the request; and
- .2** The Bankrupt Party shall file an appropriate action within the bankruptcy court to seek assumption or rejection of the Agreement within sixty (60) days of the institution of the bankruptcy filing and shall diligently prosecute such action.

If the Bankrupt Party fails to comply with its foregoing obligations, the non-Bankrupt Party shall be entitled to request the bankruptcy court to reject the Agreement, declare the Agreement terminated and pursue any other recourse available to the non-Bankrupt Party under this Article 11.

11.5.2 The rights and remedies under Section 11.5.1 above shall not be deemed to limit the ability of the non-Bankrupt Party to seek any other rights and remedies provided by the Contract Documents or by

law, including its ability to seek relief from any automatic stays under the United States Bankruptcy Code or the right of Design-Builder to stop Work under any applicable provision of these General Conditions of Contract.

Article 12 **Miscellaneous**

12.1 Assignment

12.1.1 Neither Design-Builder nor Owner shall, without the written consent of the other assign, transfer or sublet any portion or part of the Work or the obligations required by the Contract Documents.

12.2 Successorship

12.2.1 Design-Builder and Owner intend that the provisions of the Contract Documents are binding upon the parties, their employees, agents, heirs, successors and assigns.

12.3 Governing Law

12.3.1 The Agreement and all Contract Documents shall be governed by the laws of the place of the Project, without giving effect to its conflict of law principles.

12.4 Severability

12.4.1 If any provision or any part of a provision of the Contract Documents shall be finally determined to be superseded, invalid, illegal, or otherwise unenforceable pursuant to any applicable Legal Requirements, such determination shall not impair or otherwise affect the validity, legality, or enforceability of the remaining provision or parts of the provision of the Contract Documents, which shall remain in full force and effect as if the unenforceable provision or part were deleted.

12.5 No Waiver

12.5.1 The failure of either Design-Builder or Owner to insist, in any one or more instances, on the performance of any of the obligations required by the other under the Contract Documents shall not be construed as a waiver or relinquishment of such obligation or right with respect to future performance.

12.6 Headings

12.6.1 The headings used in these General Conditions of Contract, or any other Contract Document, are for ease of reference only and shall not in any way be construed to limit or alter the meaning of any provision.

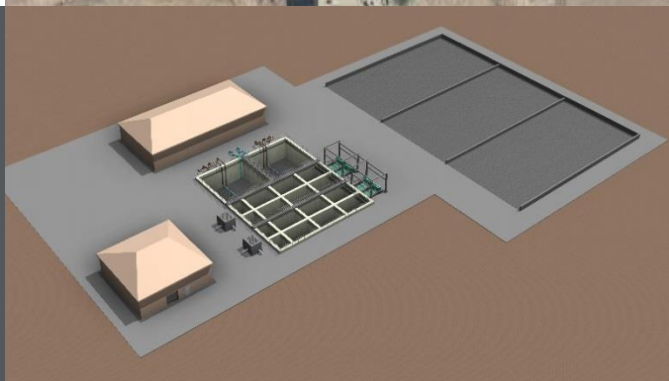
12.7 Notice

12.7.1 Whenever the Contract Documents require that notice be provided to the other party, notice will be deemed to have been validly given (i) if delivered in person to the individual intended to receive such notice,

(ii) four (4) days after being sent by registered or certified mail, postage prepaid to the address indicated in the Agreement or (iii) if transmitted by facsimile, by the time stated in a machine generated confirmation that notice was received at the facsimile number of the intended recipient.

12.8 Amendments

12.8.1 The Contract Documents may not be changed, altered, or amended in any way except in writing signed by a duly authorized representative of each party.



PRELIMINARY ENGINEERING REPORT

Quill Wastewater Treatment Facility

Santa Fe County, New Mexico

June 2017



ENGINEER'S CERTIFICATION

I, Edward A. DuBois Jr., certify that I am a licensed Professional Engineer registered in the State of New Mexico (PE #17615), and that this document was prepared by me or under my direction.



Edward A. DuBois, Jr., P.E.

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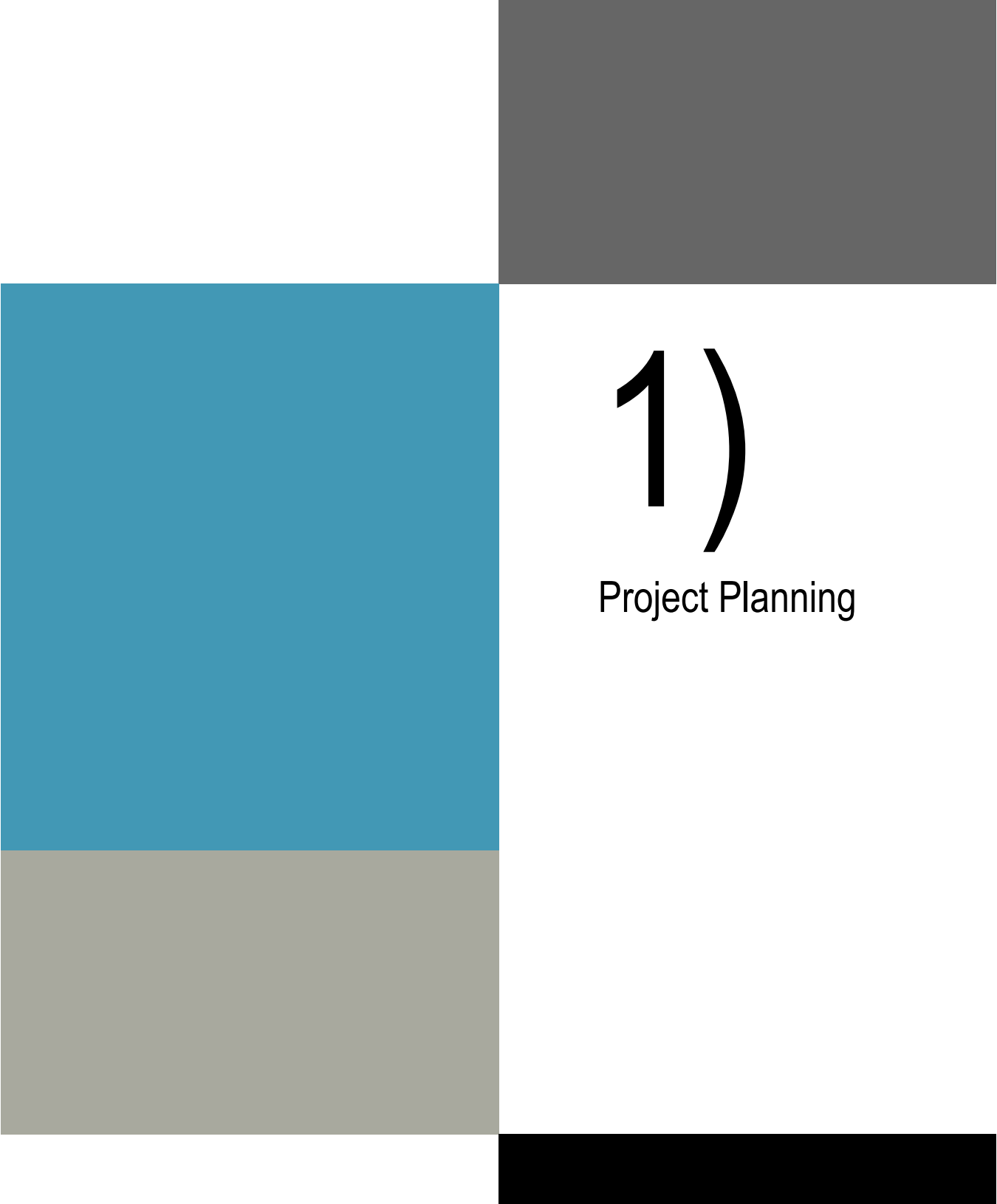
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Abbreviations and Terminology

af	acre-feet
af/yr	acre-feet per year
BBER	Bureau of Business & Economic Research [UNM]
BOD	biochemical oxygen demand
City	City of Santa Fe
County	Santa Fe County
DIP	ductile iron pipe
DO	dissolved oxygen
EPA	Environmental Protection Agency
gal	gallon
gpd	gallons per day
gpm	gallons per minute
GPS	Geospatial & Population Studies [UNM]
GWQB	Groundwater Quality Bureau [NMED]
GWDP	Groundwater Discharge Permit
HDPE	high density polyethylene
HDR	HDR Engineering, Inc.
HMI	human machine interface
hp	horsepower
kW	kilowatt
kWh	kilowatt hour
LOT	limit of technology
LS	lift station
MBR	membrane bioreactor
MCC	motor control center
MF	microfiltration
MG	million gallons
mgd	millions of gallons per day
mg/L	milligrams per liter
NMED	New Mexico Environment Department
NPDES	National Pollutant Discharge Elimination System

O&M	Operations and Maintenance
OSE	Office of the State Engineer
PER	Preliminary Engineering Report
PNM	Penitentiary of New Mexico
PS	pump station
psi	pounds per square inch
PCCP	prestressed concrete cylinder pipe
PVC	polyvinyl chloride
RAS	return activated sludge
SBR	sequencing batch reactor
SCADA	supervisory control and data acquisition
sf	square feet
SFC	Santa Fe County
SWPPP	Stormwater Pollution Prevention Plan
State	State of New Mexico
TDH	total dynamic head
UF	ultrafiltration
VFD	variable frequency drive
WAS	waste activated sludge
WW	wastewater
WWTF	Wastewater Treatment Facility
<p>When dealing with irrigation and land application, water quantities are generally expressed in terms of acre-feet, which can be defined as an area of 1 acre with a depth of 1 foot of water. In terms of the wastewater treatment facility, water quantities are generally expressed in terms of million gallons per day (mgd). When referencing pumping capacities, water quantities are provided in terms of gallons per minute (gpm). Some commonalities of terms need to be addressed for the ease of the reader such as:</p>	
Reclaimed Water = Reuse Water	
Ground Water Discharge = Land Application or Irrigation	
Tank = Basin	
1 acre = 43,560 square feet	
1 acre-foot = 325,850 gallons	
1 mgd = 694 gpm	



1)

Project Planning

1) Project Planning

Santa Fe County (County) owns and operates the Quill Wastewater Treatment Facility (WWTF), which treats domestic wastewater. The WWTF requires significant improvements to meet the National Pollutant Discharge Elimination System (NPDES) requirements, provide beneficial use of reclaimed wastewater with no setback/access limits, plan for future expansion, and meet anticipated limits for land application of biosolids.

The County has contracted HDR Engineering, Inc. (HDR) to prepare a Preliminary Engineering Report (PER) to evaluate alternatives to upgrade the existing Quill WWTF. The goals for the PER are to:

- Review regulatory requirements.
- Document and describe existing conditions at the facility.
- Analyze size and capacities of existing wastewater infrastructure and provide preliminary sizing for new infrastructure.
- Summarize and provide design criteria and estimates of probable construction costs for proposed facilities.
- Develop a phasing plan for constructing the new WWTF for the preferred alternative.

It is estimated the WWTF was originally built in the 1960s with additions such as the Operations Building built in 1989. The WWTF treats domestic wastewater from local residential neighborhoods and the nearby prison, Penitentiary of New Mexico (PNM). The WWTF's maximum treatment capacity is 280,000 gallons per day (gpd) and has the ability to discharge treated effluent by land-applying over 95 acres as permitted by the New Mexico Environment Department (NMED) Groundwater Discharge Permit (GWDP) DP-234. The current average daily flow is approximately 136,000 gpd.

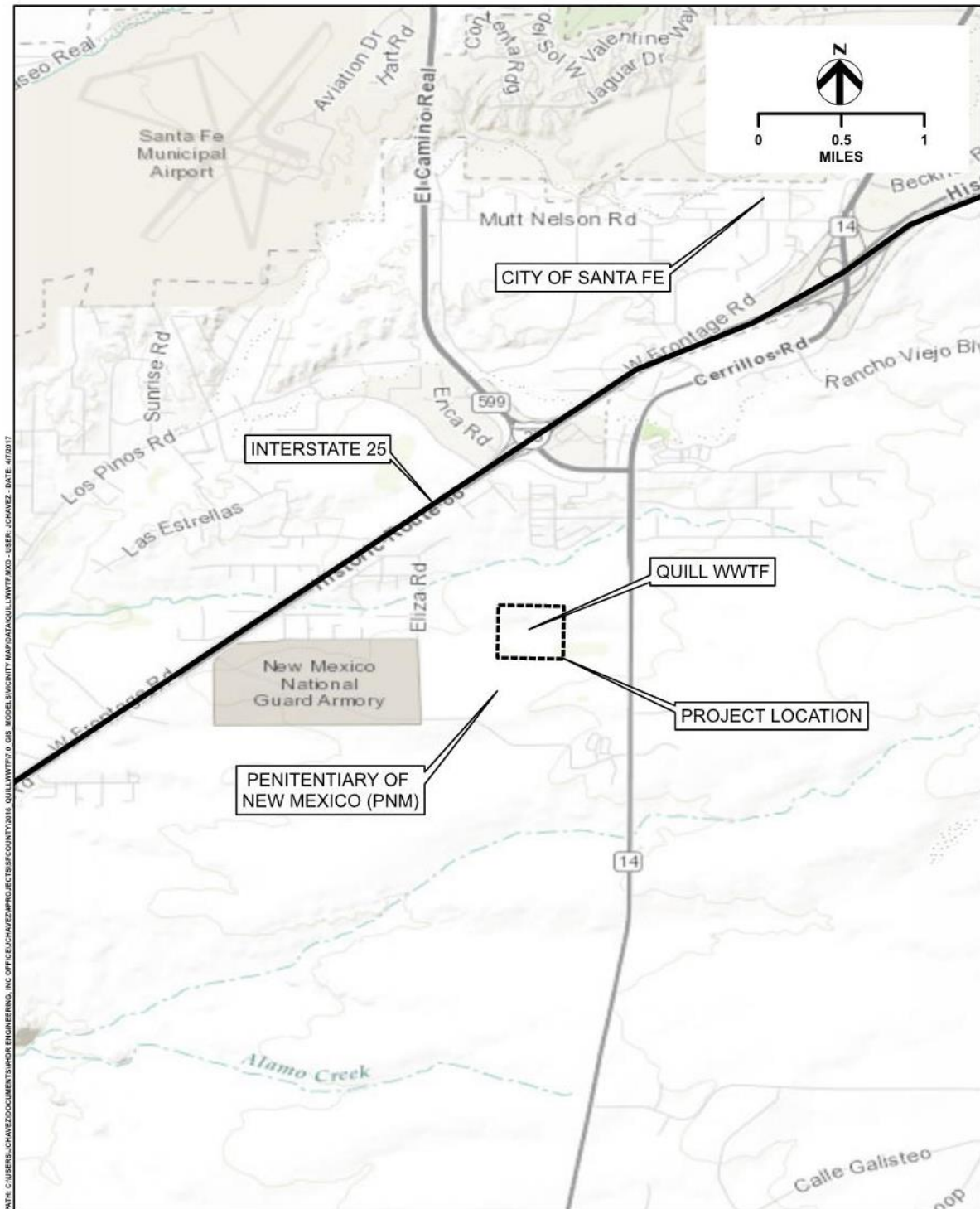
The County does not currently possess a NPDES permit for the discharge of treated effluent to surface waters of the United States. It is assumed that a NPDES permit will be issued as a result of the proposed improvements in this PER, which will be similar to the City of Santa Fe's (City) Paseo Real WWTF permit limits, since both facilities eventually discharge to the Rio Grande.

HDR met with County staff and WWTF operators multiple times to discuss their needs and proposed improvements. The County intends to decommission the existing facility and construct a new WWTF to meet NPDES/GWDP requirements and is actively considering connection of additional service areas.

a. Location

Santa Fe County is located in north central New Mexico, which includes the City of Santa Fe. The Quill WWTF is approximately 1 mile south of the intersection of Interstate 25 and NM 599; directly west of NM 14 and located within the PNM property. A map

showing the overall County wastewater collection system is provided in Appendix A. A vicinity map of Quill WWTF is shown in Figure 1.



b. Environmental Resources Present

An Environmental Information Document (EID) has not been prepared for this project. If local funding is used, an EID will not be required. If federal funding is used, an Environmental Assessment (EA) following the National Environmental Policy Act (NEPA) process will be required.

It is assumed there are no known archaeological, cultural, or other historic resources identified at the existing WWTF due to its already disturbed state.

Biological resources are limited at the site since the area is disturbed and in use for the existing wastewater treatment plant and irrigation areas of reuse water.

See Section 2) for NPDES/GWDP requirements.

c. Population Trends

The planning period for this PER is 20 years, to the year 2037. The population growth for the area is developed for the 20-year period.

According to the 2010 US Census, the population of Santa Fe County was estimated to be 144,170. Table 1 summarizes the population trends for Santa Fe County.

Table 1: Population Trends

Year	1990	2000	2010	2015	2020	2030	2040
Santa Fe County Population	98,928	129,292	144,170	148,238	151,767	162,782	175,242
Cumulative County % Change	--	30.7	42.2	45	47.4	54.7	62.4

Note: Information interpreted from US Census (2015), UNM BBER, and UNM GPS

The University of New Mexico (UNM) Bureau of Business & Economic Research (BBER) and Geospatial & Population Studies (GPS) departments develop population projections throughout the state and estimates an approximate 62.4% increase in population for Santa Fe County from year 1990 to year 2040. This percentage increase projects a future population of 175,242 for Santa Fe County in year 2040. The City of Santa Fe is included in the population numbers.

Currently, contributing wastewater flows to the WWTF are approximately 136,000 gpd average daily flow with a maximum daily flow of 280,000 gpd. The main contributors are from the PNM, NM National Guard Complex via a private lift station, Valle Vista Subdivision via a lift station, Santa Fe County Business Park Development, and the New Mexico Film Studio.

There are several existing developed areas and undeveloped areas within the potential service area (SDA-1) that could be served by the Quill WWTF as shown in Figure 2. Much of the potential growth depends on the type of development and infill of those undeveloped areas. The City of Santa Fe is operated independently and is not associated with this PER.

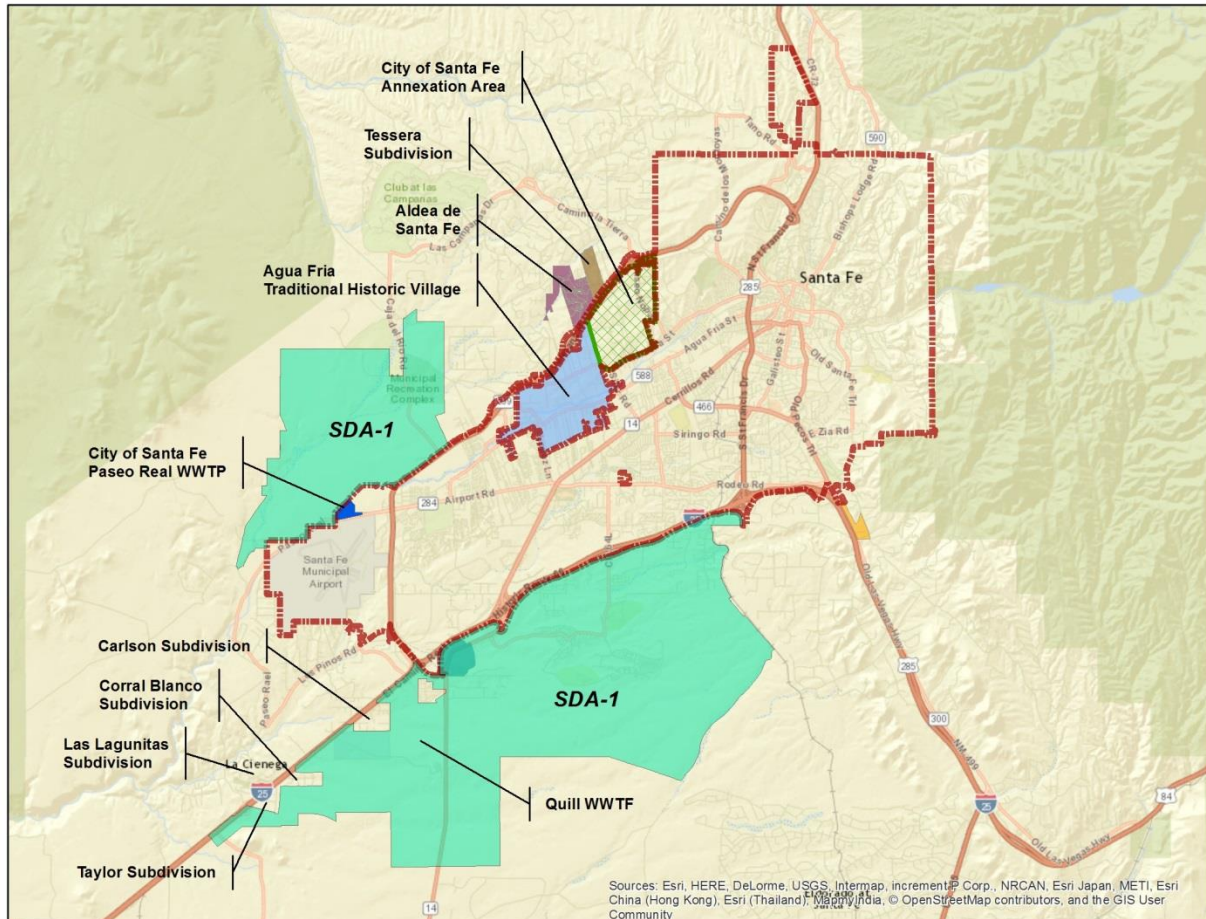


Figure 2: SFC Development Areas

Potential growth areas within the County will be studied in a subsequent Wastewater Master Plan in 2017.

The existing Abajo lift station could be brought on-line to the Quill WWTF in the near future. The Abajo lift station has a capacity to pump 450 gpm [approx. 0.65 million gallons per day (mgd)] although the existing wastewater volume is much lower. A map showing the overall County wastewater collection system is provided in Appendix A.


Overall build out of the Quill WWTF has the potential to reach 2.0 mgd for the 20 year planning period based on discussions with County staff. As directed by County staff, a phased modular approach to for the new WWTF using 0.5 mgd as the standard increment was used. Evaluations were performed for both 0.5 mgd and 1.0 mgd

treatment process options with the associated headworks and disinfection to be sized for both 1.0 and 2.0 mgd options. Based on discussions with County staff, a 0.5 mgd plant will be the basis of design with flexibility to expand to 1.0 mgd, which could potentially be seen in about 10 years.

With limited funding in today's economy, communities are trying to optimize capital and not over plan for potential growth.

d. Community Engagement

The Quill WWTF and utilities have been discussed at County meetings over the recent years. The intent of public involvement is to help the community develop an understanding for the need of the project and funding to meet these requirements.



2)

Existing Facilities

2) Existing Facilities

a. Location Map

The approximate Quill WWTF property boundary is shown in Figure 3. All major components of the system are located within this property boundary. All staff, visitors, and construction crews must enter through PNM's guarded entrance to gain access to the Quill WWTF.

b. History

The Quill WWTF was built more than 50 years ago to treat domestic wastewater from nearby collection systems, including PNM located nearby, with a maximum treatment capacity of 280,000 gpd.

The WWTF currently utilizes aerated lagoons and settling ponds for biological treatment and disinfection via chlorine. The treated effluent produced at the WWTF does not consistently meet GWDP standards.

Other recent improvements include:

- Constructed headworks and operations building – 1989
- Installed irrigation reuse pumps – 2014
- Replaced mechanical fine screen in the headworks building – 2015
- Modified the existing irrigation system to allow for the land application of reuse water during the winter – 2015

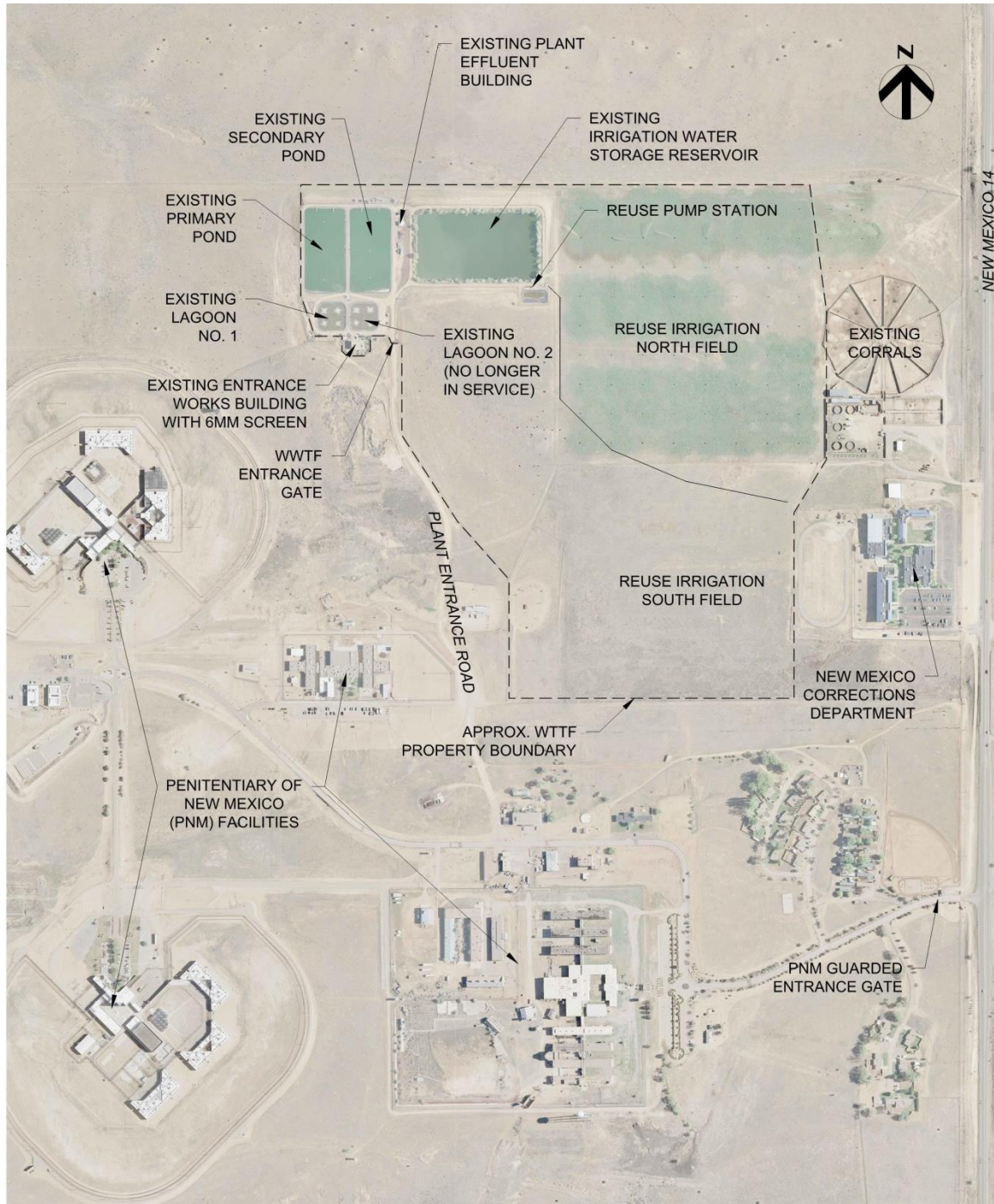


Figure 3: Quill WWTF Boundary and Entrance

c. Condition of Existing Facilities

The existing biological wastewater treatment process utilizes aerated lagoons and settling ponds, and is consistently unable to meet the NPDES requirements for Biological Oxygen Demand (BOD) and Total Suspended Solids (TSS). In addition, the treatment process does not have the capability for nitrogen removal which is typically required for land application. The following tables were compiled from existing influent and effluent data taken at the Quill WWTF over the past three years. Phosphorous was not sampled over that period, but future testing will start in 2017. See Appendix B for influent and effluent flow data.

Table 2: Existing Influent Data

Limit	Units	Average	Maximum
Flow	mgd	0.136	0.289
BOD, Influent	mg / L	323	680
TSS, Influent	mg / L	215	620
Total Nitrogen, Influent	mg N / L	42	53
Total Phosphorus, Influent	mg P / L	--	--

Table 3: Existing Effluent Data and Existing GWDP Requirements

Limit	Units	Existing Effluent (30 Day Avg.)	Existing GWDP (30 Day Avg.)	Existing GWDP (Max.)
Fecal Coliform	org/100 mL	130	200	400
BOD, Effluent	mg / L	33.1	30	45
TSS, Effluent	mg / L	75.7	30	45
Total Nitrogen, Effluent	mg N / L	16.2	--	20
Total Phosphorus, Effluent	mg P / L	--	--	--
Turbidity, Effluent	mg P / L	Monitor Only	Monitor Only	Monitor Only

As shown in Table 3, the existing WWTF is unable to meet even NMED GWDP Class 2 limits. County operations has honorably tried to maintain the existing WWTF functionality, but due to its advanced age, deteriorating conditions, inadequate technology, and limited potential for upgrades and/or repairs is unable to do so.

The existing WWTF consists of an entrance works, recirculation pump station, aerated lagoons, settling ponds, exit works disinfection, effluent pump station, reuse storage pond, irrigation pump station, reuse irrigation system, and laboratory/operations building. The entrance works consists of both influent mechanical and manual bar screens, parshall flume and junction box. The exit works includes the chlorine contact basin and chlorine equipment building. A condition summary of the existing facilities is provided in the following table.

Table 4: Condition Summary

Component	Condition	Failure(s)
Entrance Works	Good	None
Recirculation Pump Station	Fair	None
Aerated Lagoons	Poor	Yes
Settling Ponds	Poor	Yes
Exit Works Disinfection – Chlorine Contact Basin, Chlorine Equipment Building	Fair	None
Effluent Pump Station	Fair	None
Reuse Storage Pond	Poor	Yes
Irrigation Pump Station	Good	None
Reuse Irrigation System	Good/Fair	None
Electrical / Controls / Instrumentation	Poor	Yes
Laboratory – Building, Operations	Good	None

No violations have occurred, but as stated earlier, the existing WWTF is unable to meet the Class 2 permit. Further information on the condition of existing WWTF components is described as follows.

Entrance Works

Known failures: None

Condition: Good

The existing entrance works building was built in the 1990s. The mechanical screen was replaced in 2015 with a 0.25 in (6 mm) Lakeside Raptor® Micro Strainer screen. This Lakeside mechanical screen and the influent bypass equipped with a manual bar screen are to remain in place and undisturbed for this project. This 6 mm screen is shown in The effluent leaving the entrance works enters the parshall flume. This parshall flume was installed in the 1990's and includes a head sensing ultrasonic flow meter and chart sensing. The junction box capturing the effluent leaving the entrance works is designed to split wastewater flow into both aerated lagoons. Current operations only direct wastewater into Lagoon No. 1 (west) since Lagoon No. 2 (east) is no longer in operation.



Figure 4: Existing 6 mm Lakeside Screen

Recirculation Pump Station

Known failures: None

Condition: Fair

The existing recirculation pump station was built in approx. year 1990. This pump station includes a junction and splitter box for controlling the amount of wastewater entering and leaving either the settling ponds or the aerated lagoons. The wastewater from both the settling ponds and aerated lagoons then recirculates back to this pump station to create a recycle process. This pump station includes two recirculation ponds. This pump station will be abandoned in place.

Aerated Lagoons

Known failures: Lagoon No. 2 (east) has been taken out of service due to a leak, which is believed to be caused by settling and damage to the liner.

Condition: Poor

There are two existing high-density polyethylene (HDPE) lined aerated lagoons, each of which are equipped with four 10 hp floating aerators. These aerated lagoons are shown in Figure 5. Both aerated lagoons have a 10 foot sidewater depth (SWD). These lagoons have a cell capacity of approx. 0.84 MG each and cover a surface area of approx. 0.4 acres each. Both aerated lagoons are currently serving as sludge storage, and have

never been cleaned. It is unknown exactly how much sludge has settled in the lagoons, but the volume is estimated to be substantial. The sludge will need to be removed and disposed in the future. Lagoon No. 2 will be removed and regraded in all options. Lagoon No. 1 could be used as an overflow emergency storage basin for influent flows or removed and regraded as well. The HDPE liner may need to be replaced if the lagoon is reused as an overflow.



Figure 5: Existing Aerated Lagoon and Settling Ponds

Settling Ponds

Known failures: Both ponds are subject to substantial algae growth because they are shallow and the sunlight can penetrate to the bottom of the pond. Since there is no easy way to remove solids from these settling ponds, the solids tend to go septic and rise to the surface creating odors.

Condition: Poor

There are two existing HDPE lined settling ponds that have a 5 foot SWD. The purpose of these ponds is to settle out solids from the aerated lagoons. Each of the settling ponds is equipped with three 5 hp floating aerators. The settling ponds are shown in the distance in Figure 5. These ponds have a cell capacity of approx. 2.9 MG each and cover a surface area of approx. 2 acres each. These settling ponds are to be either abandoned in place or used for treated effluent storage for the new WWTF system selected for this project, but new HDPE liners would be required. Both settling ponds are currently serving as sludge storage, and have never been cleaned. It is unknown exactly how much sludge has settled in the ponds, but the volume is estimated to be substantial. The sludge will need to be removed and disposed in the future.

Exit Works

Known failures: None

Condition: Fair

Flow from the settling ponds is transferred to the chlorine contact basin where disinfection is accomplished with the use of a sodium hypochlorite tablet dispensing system. The treated effluent is then released back to the settling ponds or the reuse storage pond. A new chlorine equipment building was built in the 1990's and the disinfection equipment was replaced and the chlorine contact basin was renovated.

Effluent Pump Station

Known failures: None

Condition: Fair

The effluent pump station was renovated in the 1990's with a new effluent lift station including two Flygt submersible pumps. There is a transit time flow meter installed at this pump station.

Reuse Storage Pond

Known failures: The reuse pond has reached its storage capacity on several occasions throughout the years and spilled over to the northwest. The improvements to the winter reuse irrigation system have corrected the issue.

Condition: Fair

The existing storage pond has a cell capacity of approximately 20 MG of reclaimed water effluent. This effluent is then discharged or land applied on property owned by the Penitentiary of New Mexico (PNM) adjacent to the WWTF. This pond is clay-lined with concrete sidewalls and covers a surface area of approx. 5.5 acres. This storage pond could continue to be used as is, abandoned in place, or regraded and relined with HDPE pending funding.

Irrigation Pump Station

Known failures: None

Condition: Good

The irrigation pump station was renovated in 2014 with a new irrigation lift pump assembly. This pump station is shown in Figure 6.



Figure 6: Existing Reuse Irrigation Pumps

Reuse Irrigation System

Known failures: None

Condition: Good/Fair

A portion of the reuse irrigation sprinkler system was improved in 2015 to allow for winter irrigation. The area irrigated with reuse effluent is split into two sections: north field and south field. The north field is approx. 57 acres of rangeland and the south field is approx. 38 acres of rangeland. The sprinkler system used for irrigation is shown in Figure 7. A reclaimed water, or reuse, study is planned to be conducted in the near future. Depending on the findings of the study and/or the WWTF system selected for this project, further improvements in the irrigation system may be required in the future.



Figure 7: Existing Irrigation Sprinkler System

Electrical / Controls / Instrumentation

Known failures and violations: None

Condition: Poor

All electrical, controls, and instrumentation equipment required or impacted by this project, including a backup generator, will be installed or replaced, respectively.

Laboratory – Building, Operations

Known failures and violations: None

Condition: Good

The existing laboratory building was built in the 1990's, and is shared with Operations and Entrance Works. Operators currently only perform limited testing, so the size of the existing operations and laboratory building is adequate for the existing facility. It is anticipated that additional in-house testing will be necessary with the new treatment process implementation for process control. This may require minor modifications including additional equipment.

d. Financial Status of any Existing Facilities

The County operates both water and sewer systems within in the County and funds the utilities through a variety of sources including utility bonds, loans, impact fees, utility revenues, and state and county grants. It is anticipated that this project will be funded through a utility bond. It is anticipated that the County will have approximately \$8 million for construction not including engineering services. Information on costs, including Annual O&M, may be found in Section 6).

Rate Schedules

Table 5 shows fees and charges by calendar year set forth according to Santa Fe County Ordinance No. 2014-II.

Table 5: Sewer Rate Schedule


Calendar Year During Which Rates are Effective	Monthly Fixed Fee	Monthly Usage Charge (Per 1,000 Gallons Above Base Rate of 1,000 Gallons)
2015	\$ 7.54	\$ 4.50
2016	\$ 7.73	\$ 4.50
2017	\$ 7.95	\$ 4.69
2018	\$ 8.18	\$ 4.89
2019 and Each Calendar Year	\$ 8.42	\$ 5.10

Calendar Year During Which Rates are Effective	Monthly Fixed Fee	Monthly Usage Charge (Per 1,000 Gallons Above Base Rate of 1,000 Gallons)
Thereafter		

A future Rate Study and Cost of Service study will be included in the County's Wastewater Master Plan.

e. Water / Energy / Waste Audits

No audits of the existing Quill WWTF have been completed. However, the new facilities should optimize energy costs by using VFDs (variable frequency drives), energy efficient pumps, premium efficiency motors and other methods to ensure the County that this project is sustainable.



3)

Need for Project

3) Need for Project

As mentioned in previous sections, the existing Quill WWTF requires significant improvements to meet the GWDP/NPDES requirements and increase capacity for future growth. In addition, the County would like the new facility to provide beneficial use of reclaimed wastewater with no setback/access limits, prepare for future expansion, and meet anticipated limits for land application of solids.

a. Health, Sanitation, and Security

Land application or irrigation of land using reclaimed wastewater is considered groundwater discharge since the water can percolate down to the groundwater. The State regulates the use of reclaimed wastewater to ensure the protection of public health and the environment. The NMED Groundwater Quality Bureau (GWQB) is responsible for issuing land application GWDPs by class as shown in Table 6.

The County's current GWDP follows Class 2 quality standards; however, the County would like to meet Class 1A and anticipated future NPDES permit requirements. Table 7 summarizes the minimum water quality requirements for Class 1A reuse. Access and restrictions for Class 1A reuse is listed below in Table 8.

Table 6: Approved Uses for Reclaimed Wastewater by Class

Class of Reclaimed Wastewater	Approved Uses
Class 1A (<i>Classification for Proposed Quill WWTF</i>)	All Class 1 uses. <i>No setback limit</i> to dwelling unit or occupied establishment
	Backfill around potable water pipes
	Irrigation of food crops ¹
Class 1B	Impoundments (recreational or ornamental)
	Irrigation of parks, school yards, golf courses ²
	Irrigation of urban landscaping ²
	Snow making
	Street cleaning
	Toilet flushing
Class 2 (<i>Classification for Existing Quill WWTF</i>)	Backfill around non-potable piping
	Concrete mixing
	Dust control
	Irrigation of fodder, fiber, and seed crops for milk-producing animals
	Irrigation of roadway median landscapes
	Irrigation of sod farms

Class of Reclaimed Wastewater	Approved Uses
	Livestock watering
	Soil compaction
Class 3	Irrigation of fodder, fiber, and seed crops for non-milk-producing animals
	Irrigation of forest trees (silviculture)

¹ Irrigation of food crops should only be allowed for food crops when there is no contact between the edible portion of the crop and the wastewater. Spray irrigation is prohibited for food crops.

² If reclaimed wastewater is applied using spray irrigation, the setback limitation of Appendix C of this report) "Spray Irrigation" should be observed. (NMED GWQB)

Table 7: Class 1A Reclaimed Wastewater Effluent Requirements

Class of Reclaimed Wastewater	Wastewater Quality Parameter	Wastewater Quality Standards	
		30-Day Average	Maximum
Class 1A	BOD ₅	10 mg/l	15 mg/l
	Turbidity	3 NTU	5 NTU
	Fecal Coliform	5 organisms per 100 ml	23 organisms per 100 ml
	TRC or UV Transmissivity	Monitor Only	Monitor Only

Note: Class 1B, 2, and 3 not shown; see Appendix C for complete table

Table 8: Class 1A Reclaimed Wastewater Access Restrictions and Setback Requirements

Class of Reclaimed Wastewater	Spray Irrigation	Flood / Surface Drip Irrigation
Class 1A	<ul style="list-style-type: none"> No access control No set-back to dwelling unit or occupied establishment 	No access control

Note: Class 1B, 2, and 3 not shown; see Appendix C for complete table

The new WWTF will meet NMED Class 1A for effluent reuse with no setback limits and no access limits. The NMED classes are shown in Table 6. Any disposal/aquifer

recharge during the winter season shall meet requirements of the acquired National Pollutant Discharge Elimination System (NPDES) permit.

Currently, the County does not use an NPDES permit for the Quill WWTF. The Environmental Protection Agency (EPA) and NMED are currently in discussions for the City of Santa Fe's (City) WWTF NPDES permit limits. The limits are much stricter than the City's current NPDES permit or the County's Valle Vista subdivision permit (NM0028614). It is assumed that any future County NPDES permit would have to meet similar requirements of the City's NPDES permit. Therefore, the following information is based on the current discussions about the City's proposed NPDES permit limits.

The limits are separated into two Tiers. Tier 1 level would be immediately implanted at the City WWTF (i.e. Paseo Real) while Tier 2 levels would be implemented sometime in the near future. The Tier 1 levels for the City's potential NPDES limits are that of 6.9 mg N/L total nitrogen and 3.1 mg P/L total phosphorus. Tier 2 levels have significantly stricter requirements. The Tier 2 levels of 3.0 mg N/L total nitrogen and 1.0 mg P/L total phosphorus are based on a combination of a logical step-wise reduction in limits from Tier 1 coupled with the limit of technology (LOT). It is well documented that LOT for total nitrogen limits is in the range of 3 to 4 mg N/L. Most of the existing plants located in areas with impaired waters, such as Chesapeake Bay, are typically required to meet a total nitrogen discharge limit of 3 mg N/L. The LOT for nitrogen was deemed a worst-case scenario for the City and used as the Tier 2 limit.

1. The 1.0 mg P/L total phosphorus (i.e. Tier 2) was selected for the following reasons:
2. It is a common discharge level that HDR sees nationally.
3. It is a reasonable step reduction from Tier 1 (3.1 mg P/L) to a more stringent level

The LOT for total phosphorus is approximately 0.02 mg P/L, which would result in a reduction of two orders of magnitude from the Tier 1 level of 3.1 mg P/L. The 0.02 mg P/L represents the amount of soluble non-reactive P in the stream. This amount will vary from plant to plant which is why the value was listed as approximately. A reduction of this magnitude is not considered practical or likely by regulatory agencies; therefore, 1.0 mg P/L total phosphorus will be used as a more likely next step in limits.

Using NPDES Tier 2 permit requirements will improve marketability of reuse water. A few possibilities include credit returns and selling reuse water potential customers such as to the City. Therefore, the proposed Quill WWTF shall be designed to meet the proposed Tier 2 limits based on the City's WWTF:

- 3.0 mg N/L total nitrogen
- 0.1 mg P/L total phosphorus

More detail on wastewater treatment regulations and requirements may be found in Section 3) and Appendix C.

Since the Total Nitrogen target is 3 mg N/L, some additional wastewater characterization should be completed prior to design. Specifically, testing on influent carbon characterization to identify the portion of influent load that is amenable to nutrient load reduction should be conducted. Given that limits for both biological P and N reduction, carbon becomes a scarce commodity.

If there is not sufficient carbon, external carbon would have to be provided. Given the plant size, Micro-C would be used at approximately \$2.50/gal. In order to calculate demand, the testing would identify how much additional carbon is required for max month to size the facilities, followed by day to day for O&M.

In addition, supplementary testing on influent BOD/TSS should be completed prior to design. Due to the lack of frequency of the BOD/TSS influent data and their existing range of recorded values, if these values are found to be higher and more frequently, then the facilities might have to be made slightly larger.

b. Aging Infrastructure

The WWTF requires significant improvements to meet EPA's NPDES and NMED's GWDP requirements, provide beneficial use of reclaimed wastewater with no setback/access limits, plan for future expansion, and meet anticipated limits for land application of biosolids.

County operations has valiantly tried to maintain the existing WWTF functionality, but it is in urgent need of replacement, due to its advanced age, deteriorating conditions, inadequate technology, limited potential for upgrades and/or repairs, and inability to consistently meet existing NMED GWDP Class 2 limits.

Throughout NM and the US, communities have to meet lower standards to provide for the beneficial use of reclaimed water. A full-scale wastewater process replacement enables the County to meet NMED GWDP Class 1A limits and anticipated future EPA NPDES limits. Compliance with the NPDES permit as stated in the previous section will enable the County to discharge to surface water, for example to the Rio Grande in exchange for water rights and provides the treatment required for possible aquifer storage recovery (ASR).

The existing WWTF as stated in Section 2) will be decommissioned with the exception of the Operations Building, new mechanical fine screen, reuse storage pond, and reuse irrigation system.

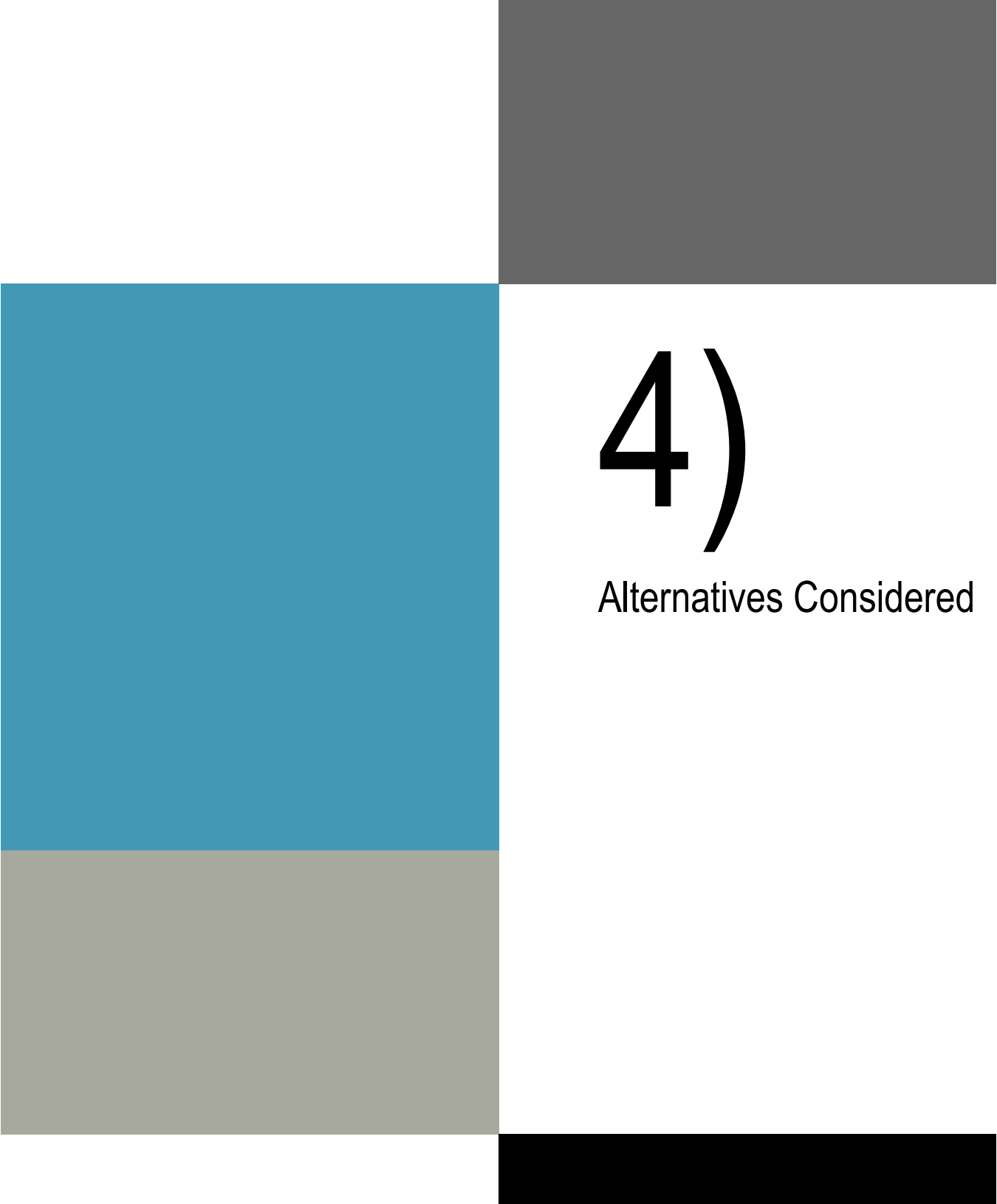
c. Reasonable Growth

Estimating the projected wastewater flows for the new WWTF is not straightforward. For the entire planning area, the anticipated future flow rates may be as high as 2 mgd, which would include currently developed and undeveloped land. However, it is unlikely that the entire planning area will be connected and/or developed by the design year of

this PER, which is 2037. Potential growth areas within in the County and number of new connections will be studied in a subsequent Wastewater Master Plan in 2017.

Therefore, after discussions with County staff, the average daily design flowrate for the Quill WWTF was determined to be 0.5 mgd for the main process, with the expectation that expansion to 1.0 mgd will occur within the design period. Headworks and UV will be sized for 1.0 or 2.0 mgd which is more appropriate.

However, as shown in Section 4), site plans were developed for both alternatives with an average daily flow of 0.5 mgd and 1.0 mgd, respectively.



4)

Alternatives Considered

4) Alternatives Considered

After discussions with County staff, two alternatives were ultimately considered for this project. The first alternative is a membrane bioreactor (MBR) system. The second alternative is a sequencing batch reactor (SBR) system. A “do nothing” alternative was not considered because the Quill WWTF is not consistently meeting the existing GWDP or future NPDES permit requirements and it is inconsistent with the County’s plan to use reclaimed wastewater for beneficial uses and land applied solids.

Each system was steady-state process modeled using HDR’s Envision model to confirm manufacturer’s recommendations. HDR’s approach to flows for the modeling included an Average Annual (0.5 mgd), Max Month (0.6 mgd), and a Peak Flow (1.0 mgd) with a 1.2 peaking factor.

4.1) Membrane Bioreactor (MBR)

a. Description

The MBR alternative includes new mechanical fine screening/grit, BNR, MBR, followed by UV disinfection.

The MBR is a variation of the activated sludge process and relies on membrane separation of solids. Secondary clarifiers in a conventional system are replaced by these membranes which are located at the end of the activated sludge basin to capture and return biomass to the beginning of the basin (i.e. return to the beginning of the activated sludge process). These membranes are mounted in modules that can be lowered into the bioreactor, and are subjected to a vacuum that draws water through the membrane while retaining solids in the basin. This process has the ability to sustain high sludge concentrations while providing a high quality effluent. A general concept of an MBR with a nitrification and partial denitrification configuration is shown in Figure 8.

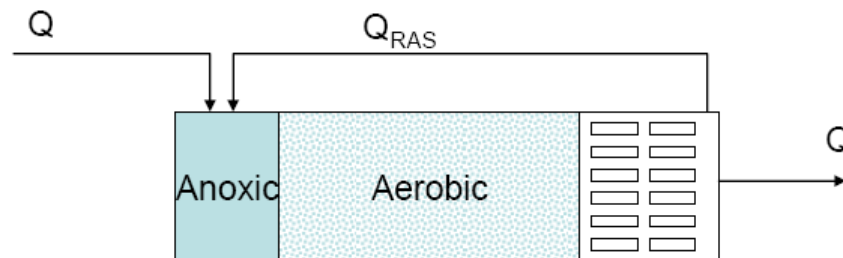


Figure 8: General MBR Configuration with Nitrification & Denitrification

The MBR process requires better wastewater pretreatment than conventional systems. A 1 mm or 2 mm fine screen will need to be added before the MBR with no opportunity to bypass or overflow this screen. This screen can be either a perforated plate or a drum. It is not unusual for a MBR system to have a two stage screening process; for example, a 6 mm screen followed by a 2 mm screen. Effective grit removal is also important as grit abrades to the membrane and reduces its effective life.

Following, the BNR/MBR process, UV disinfection would occur.

Solids handling is accomplished by aerobic digestion and concrete sludge drying beds that are composted by a paddle aerator. Class A sludge will be produced and may be hauled off to a landfill or used as compost on various parks, fields, etc.

A process schematic of the MBR system is shown in Figure 9.

Since there are several companies manufacturing the proprietary MBR system, the construction of the system can be competitively bid. These companies include, but are not limited to, Evoqua (formerly known as Siemens), GE, Huber, Kubota, and Mitsubishi. Manufacturer information is provided in Appendix D.

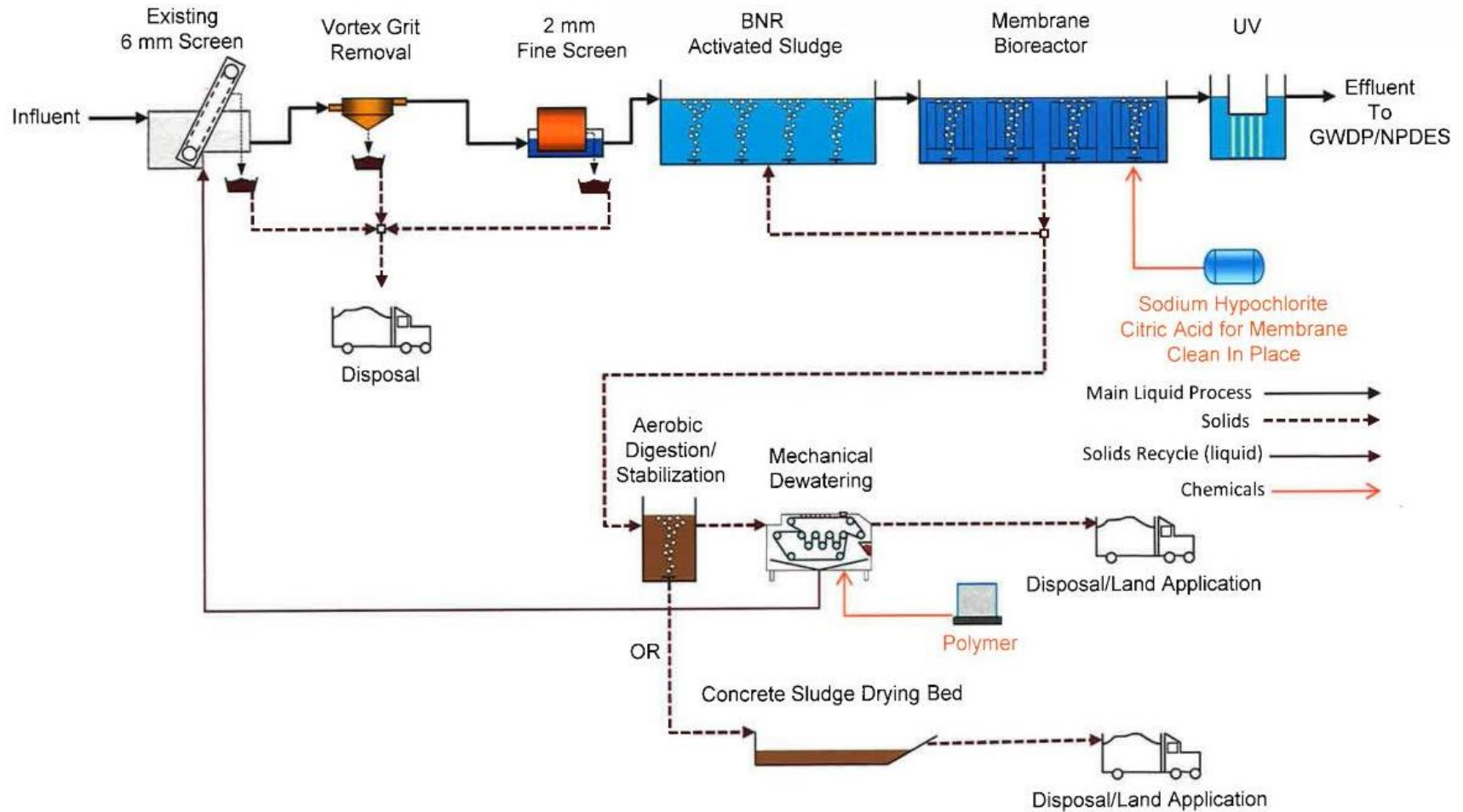


Figure 9: MBR Process Schematic

b. Design Criteria

The following listed information describes the design criteria for the MBR alternative:

- Meet all applicable NPDES Tier 2 permit requirements, including:
 - Effluent quality less than 3.0 mg N/L total nitrogen
 - Effluent quality less than 1.0 mg P/L total phosphorus
- Discharge from the WWTF by effluent reuse shall meet GWQB and NMED Class 1A permit requirements.

More detail on wastewater treatment regulations and requirements may be found in Section 3) and Appendix B.

c. Map

The proposed site plan of the preliminary MBR system implementation with both a 0.5 mgd and 1.0 mgd sizing for the County is shown in Figure 10 and Figure 11, respectively.

Major improvements include:

- New Fine Screen and Grit Building
- New Operations Building with blowers, RAS pumps, Sodium Hypochlorite/Citric Acid Equipment, and UV Disinfection
- Biological Basins and Aeration Equipment
- MBR Basin and Equipment
- Aerobic Digesters
- Concrete Sludge Drying Beds

Other items that could be additive alternates include:

- Aeration Lagoon No. 1 – remove and dispose including sludge removal
- Primary Settling Pond – remove and dispose including sludge removal
- Primary Settling Pond – regrade and reline for additional reuse storage
- Secondary Settling Pond – remove and dispose including sludge removal
- Secondary Settling Pond – regrade and reline for additional reuse storage

TO REPLACE SHEET

Figure 10: 0.5 mgd Design Flow MBR Proposed Location

TO REPLACE SHEET

Figure 11: 1.0 mgd Design Flow MBR Proposed Location

d. Environmental Impacts

It is not expected that there will be any environmental impacts with either of the proposed alternatives. All new construction will be within the existing property and specifically, areas which are already disturbed.

The site must be graded to prevent storm water runoff.

e. Land Requirements

The implementation of this treatment alternative will fit within the footprint of the existing WWTF property as indicated in the location layouts in both Figure 10 and Figure 11. All new structures will be constructed within existing property. Therefore, no additional land or easements are anticipated at this time.

f. Potential Construction Problems

The following is a list of potential construction problems that need to be considered for the MBR system:

- All staff, visitors, and construction crews must enter through PNM's guarded entrance to gain access to the Quill WWTF entrance gate. The WWTF site is large enough to accommodate construction staging and a contractor field office, so mobilization of construction equipment and materials is not anticipated to be problematic.
- The construction activities for this alternative would exceed 1 acre of ground disturbance, so a Stormwater Pollution Prevention Plan (SWPPP) will be required by the contractor.
- A geotechnical investigation will need to be performed prior to design.
- The preference to locate the MBR facility at the existing aerated lagoons location may create minor problems with the existing treatment operation.
- The nearby location of the PNM may require additional security and safety measures during construction.

g. Sustainability Considerations

I) Water and Energy Efficiency

The MBR allows for water and energy efficiency. This alternative addresses water efficiency by allowing for more effective reuse water which impacts water conservation in a positive manner. The new facilities will allow for more energy efficient design and practices. The MBR may use more electricity but the carbon footprint is significantly reduced due to compact size.

II) Green Infrastructure

The MBR alternative provides for the reuse of treated effluent for either NPDES or GWDP uses. This process aids in water conservation for the community. The site will be graded to not allow for stormwater runoff from the site.

I) Other Sustainability Considerations

The new facilities will optimize energy costs by using VFDs (variable frequency drives), energy efficient pumps, premium efficiency motors and other methods to ensure the County that this project is sustainable.

h. Cost Estimates

Estimates of probable construction costs for a new MBR facility are summarized in Table 9 and provided in Appendix E. Costs were obtained from the most updated cost estimating guides and from the most recent construction costs from similar projects. Equipment costs were obtained from various equipment manufacturers.

This cost estimate includes a 20% contingency, which will be refined as the design is completed. These costs may fluctuate due to bidding climate or when actual construction occurs.

Table 9: MBR WWTF – 0.5 mgd Design Flow – Cost Estimate

Component	MBR
Site Work, including Mobilization and Demobilization	\$758,855
Existing Wastewater Ponds	\$20,000
Fine Screen and Grit Building	\$1,095,000
Operations Building	\$989,100
Biological Basins	\$440,000
MBR Basin	\$1,712,000
Aerobic Digesters	\$330,000
Sludge Drying Beds	\$268,000
Permits, Bonds, Insurance, Start-up, Testing Allowance	\$295,000
Subtotal	\$5,907,955
Contingency @ 20%	\$1,181,591
Total Estimated Construction Costs	\$7,089,546
Engineering @ 10%	\$708,955
Survey & Geotechnical	\$10,000
Construction Observation Services @ 3%	\$212,686

Component	MBR
Subtotal Total Estimated Costs	\$8,021,187
NMGRT @ 7%	\$561,483
TOTAL ESTIMATE OF PROBABLE COSTS	\$8,582,670

Table 10: MBR WWTF – 1.0 mgd Design Flow – Cost Estimate

Component	MBR
Site Work, including Mobilization and Demobilization	\$836,000
Existing Wastewater Ponds	\$20,000
Fine Screen and Grit Building	\$1,204,000
Operations Building	\$1,048,500
Biological Basins	\$800,000
MBR Basin	\$2,179,500
Aerobic Digesters	\$645,000
Sludge Drying Beds	\$400,000
Permits, Bonds, Insurance, Start-up, Testing Allowance	\$395,000
Subtotal	\$7,528,000
Contingency @ 20%	\$1,505,600
Total Estimated Construction Costs	\$9,033,600
Engineering @ 10%	\$903,360
Survey & Geotechnical	\$10,000
Construction Observation Services @ 3%	\$271,008
Subtotal Total Estimated Costs	\$10,217,968
NMGRT @ 7%	\$715,258
TOTAL ESTIMATE OF PROBABLE COSTS	\$10,933,226

4.2) Sequencing Batch Reactor (SBR)

a. Description

The SBR alternative is an activated sludge process operated under non-steady state conditions (i.e. varies with time). A SBR can have multiple operation configurations:

- A fill-and-draw type of reactor system that involves single completely mixed reactors. The need for separate sedimentation tanks is not necessary since the mixed liquor remains in the reactors during all cycles.
- A true batch mode with aeration and sludge settlement both occurring in the same basin.

The preferred SBR configuration for the County is the true batch configuration. Therefore, the true batch configuration will be referred to as the SBR alternative moving forward.

The main difference between SBR and conventional continuous-flow, activated sludge systems is sequence parameters. The SBR basin carries out the functions of equalization, aeration and sedimentation in a time sequence rather than in the conventional space sequence of conventional continuous-flow systems. Additionally, the SBR system can be designed with the ability to treat a wide range of influent volumes whereas the conventional continuous system is based upon a fixed influent flowrate. Thus, there is flexibility associated with working in a time sequence.

The SBR system produces sludge with good settling properties, provided the influent wastewater is admitted into the aeration in a controlled manner. An appropriately designed SBR process is a unique combination of equipment and software. The software automated controls reduce the number of operators required to operate this system. The availability of computerized controls in recent years has made the SBR process more attractive.

As mentioned, the SBR system operates by automated cycles, including fill, react, settle, decant and idle. The duration, dissolved oxygen concentration, and mixing in these periods could be altered according to the needs of the specific treatment facility. Appropriate aeration and decanting is essential for the correct operation of the SBR system. The majority of the SBR aeration equipment consists of jet, fine and coarse bubble systems. In this alternative, solids handling is accomplished by aerobic digestion and/or concrete sludge drying beds that are composted by a paddle aerator. As discussed with the County, the disc filters for the SBR system are preferred to be sand filters. This alternative is well proven in the industry to produce reclaimed water quality effluent.

Following, the BNR/SBR process, flow will proceed to a sand filter before UV disinfection.

Solids handling is accomplished by aerobic digestion and concrete sludge drying beds that are composted by a paddle aerator. Class A sludge will be produced and may be hauled off to a landfill or used as compost on various parks, fields, etc.

A process schematic of the SBR system is shown in Figure 12.

Since there are several companies manufacturing the proprietary SBR system, the construction of the system can be competitively bid. These companies include, but are not limited to, Evoqua (formerly known as Siemens) and Xylem. More information on manufacturer details may be found in Appendix E.

b. Design Criteria

The following listed information describes the design criteria for the MBR alternative:

- Meet all applicable NPDES Tier 2 permit requirements, including:
 - Effluent quality less than 3.0 mg N/L total nitrogen
 - Effluent quality less than 1.0 mg P/L total phosphorus
- Discharge from the WWTF by effluent reuse shall meet GWQB and NMED Class 1A permit requirements.

More detail on wastewater treatment regulations and requirements may be found in Section 3) and Appendix C.

c. Map

The proposed site plan of the preliminary SBR system implementation with both a 0.5 mgd and 1.0 mgd sizing for the County is shown in Figure 13 and Figure 14, respectively.

- Major improvements include:
 - New Grit Building
 - New Operations Building with blowers
 - SBR/Biological Basin and Equipment
 - UV Building
 - Effluent Filter
 - Aerobic Digesters
 - Concrete Sludge Drying Beds

Other items that could be additive alternates include:

- Aeration Lagoon No. 1 – remove and dispose including sludge removal
- Primary Settling Pond – remove and dispose including sludge removal
- Primary Settling Pond – regrade and reline for additional reuse storage
- Secondary Settling Pond – remove and dispose including sludge removal
- Secondary Settling Pond – regrade and reline for additional reuse storage

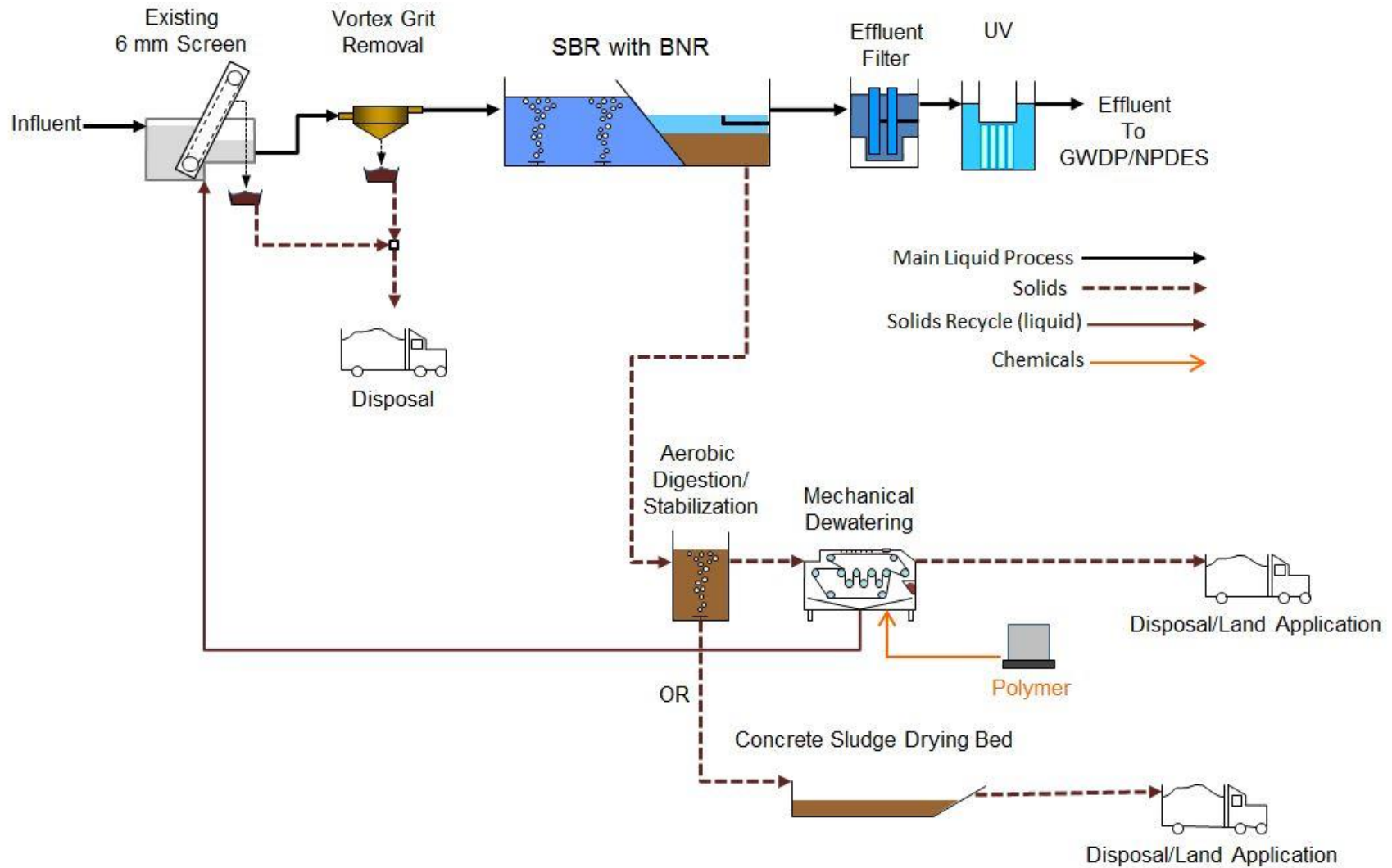


Figure 12: SBR Process Schematic

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Figure 13: 0.5 mgd Design Flow SBR Proposed Location

TO REPLACE SHEET

Figure 14: 1.0 mgd Design Flow SBR Proposed Location

d. Environmental Impacts

It is not expected that there will be any environmental impacts with either of the proposed alternatives. All new construction will be within the existing property and specifically, areas which are already disturbed.

The site must be graded to prevent stormwater runoff.

e. Land Requirements

The implementation of this treatment alternative will fit within the footprint of the existing WWTF property as indicated in the schematic layout in Figure 12. All new structures will be constructed within existing property. Therefore, no additional land or easements are anticipated at this time.

f. Potential Construction Problems

The following is a list of potential construction problems that need to be considered for the SBR system:

- All staff, visitors, and construction crews must enter through PNM's guarded entrance to gain access to the Quill WWTF entrance gate. The WWTF site is large enough to accommodate construction staging and a contractor field office, so mobilization of construction equipment and materials is not anticipated to be problematic.
- The construction activities for this alternative would exceed 1 acre of ground disturbance, so a Stormwater Pollution Prevention Plan (SWPPP) will be required by the contractor.
- A geotechnical investigation will need to be performed during design.
- The preference to locate the SBR facility at the existing aerated lagoons location may create minor problems with the existing treatment operation.
- The nearby location of the PNM may require additional security and safety measures during construction.

g. Sustainability Considerations

I) Water and Energy Efficiency

The SBR allows for water and energy efficiency but less than the MBR alternative. The new facilities will allow for more energy efficient design and practices.

II) Green Infrastructure

The SBR alternative provides for the recycle and reuse of treated effluent for either NPDES or GWDP uses. This process aids in water conservation for the community. The site will be graded to not allow stormwater runoff from the site.

III) Other Sustainability Considerations

The new facilities will optimize energy costs by using VFDs (variable frequency drives), energy efficient pumps, premium efficiency motors and other methods to ensure the County that this project is sustainable.

h. Cost Estimates

Estimates of probable construction costs for a new SBR facility are in summarized in Table 11 and Table 12 and provided in Appendix E. Costs were obtained from the most updated cost estimating guides and from the most recent construction costs from similar projects. Equipment costs were obtained from various equipment manufacturers.

This cost estimate includes a 20% contingency, which will be refined as the design is completed. These costs may fluctuate due to bidding climate or when actual construction occurs.

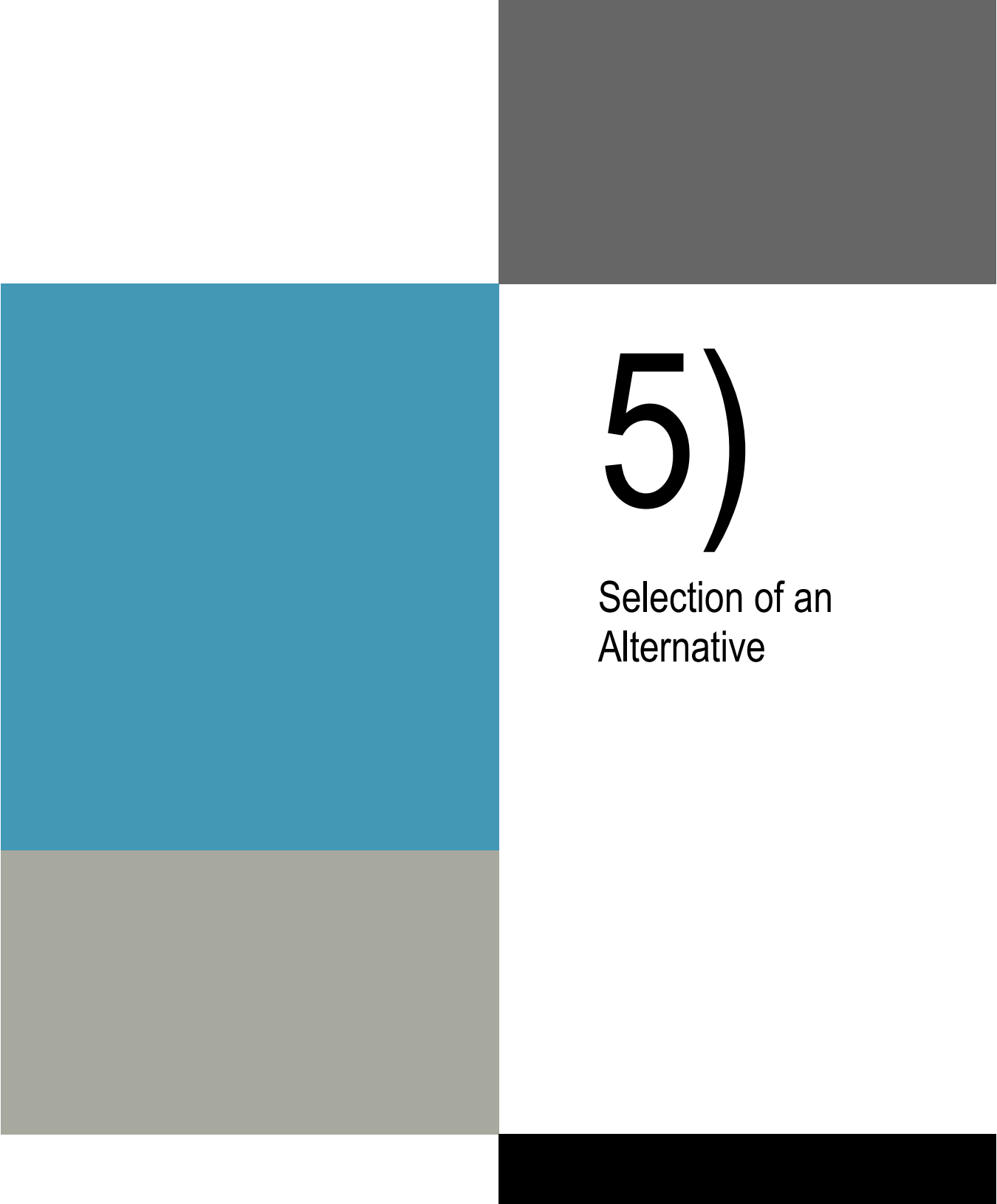
Table 11: SBR WWTF – 0.5 mgd Design Flow – Cost Estimate

Component	SBR
Site Work, including Mobilization and Demobilization	\$809,575
Existing Wastewater Ponds	\$20,000
Grit Building	\$561,000
Operations Building	\$455,000
UV Building	\$339,100
SBR / Biological Basins	\$1,618,000
Effluent Filter	\$242,500
Aerobic Digesters	\$330,000
Sludge Drying Beds	\$268,000
Permits, Bonds, Insurance, Start-up, Testing Allowance	\$295,000
Subtotal	\$4,938,175
Contingency @ 20%	\$987,635
Total Estimated Construction Costs	\$5,925,810
Engineering @ 10%	\$592,581
Survey & Geotechnical	\$10,000
Construction Observation Services @ 3%	\$177,774
Subtotal Total Estimated Costs	\$6,706,165

Component	SBR
NMGRT @ 7%	\$469,432
TOTAL ESTIMATE OF PROBABLE COSTS	\$7,175,597

Table 12: SBR WWTF – 1.0 mgd Design Flow – Cost Estimate

Component	SBR
Site Work, including Mobilization and Demobilization	\$930,170
Existing Wastewater Ponds	\$20,000
Grit Building	\$586,000
Operations Building	\$455,000
UV Building	\$398,500
SBR / Biological Basins	\$3,166,000
Effluent Filter	\$475,000
Aerobic Digesters	\$645,000
Sludge Drying Beds	\$400,000
Permits, Bonds, Insurance, Start-up, Testing Allowance	\$395,000
Subtotal	\$7,470,670
Contingency @ 20%	\$1,494,134
Total Estimated Construction Costs	\$8,964,804
Engineering @ 10%	\$896,480
Survey & Geotechnical	\$10,000
Construction Observation Services @ 3%	\$268,944
Subtotal Total Estimated Costs	\$10,140,229
NMGRT @ 7%	\$709,816
TOTAL ESTIMATE OF PROBABLE COSTS	\$10,850,045



5)

Selection of an Alternative

5) Selection of an Alternative

As discussed in previous sections, the following treatment alternatives are considered:

- Membrane Bioreactor (MBR)
- Sequencing Batch Reactor (SBR)

A general comparison of the advantages and disadvantages of both alternatives was conducted, as shown in Table 13.

Table 13: Alternative Comparison

Alternative	Advantages	Disadvantages
MBR	<ul style="list-style-type: none"> • Technology is becoming more common in United States • Highest quality effluent more consistently • Provides redundancy • Proven simpler process with less concerns about filamentous activated sludge • No need for secondary clarifiers, therefore, requiring less area for process • Lower disinfection dose requirement due to low turbidity effluent • Cheaper for expansion/modularity 	<ul style="list-style-type: none"> • Higher capital cost • Higher O&M cost: higher energy use and fouling control • Need additional fine screening equipment • Future membrane replacement
SBR	<ul style="list-style-type: none"> • No RAS system needed • Can operate in continuous-flow mode • Lower equipment costs 	<ul style="list-style-type: none"> • Sludge wasting • Application of process kinetics • More complicated selection of key operating conditions, including the fraction of tank content removal • Higher concrete costs especially with expansion from 0.5 to 1.0 mgd • More difficult to operate consistently

A comparison of the specifics of each proposed Quill WWTF alternative was prepared and is shown in Table 14.

Table 14: Alternative Specifics Comparison

Parameter	MBR	SBR
Footprint	1.0 MGD - 2 Trains - BNR 30' x 82'; MBR 9' x 14'; 0.5 MGD - 1 Train but could use two for BNR	1.0 MGD - 2 Trains/4 basins each at SBR 50' x 50'; 0.5 MGD - 1 train/2 basins
Level of Treatment	Class 1A; MBR consistently delivers the highest quality effluent than other alternatives	Class 1A
BNR Performance Reliability	Best	Good
Capital Cost	Higher	Lower Equipment Costs; Higher concrete costs especially with expansion from 0.5 mgd to 1.0 mgd
O&M Costs	Higher; Replace membranes every 7/10 years (Approx. \$425k)	Lower, but more difficult to operate
Equipment Costs (Process only)	1.0 MGD - \$1,725,000; 0.5 MGD - \$1,550,000 includes BNR for two trains; 0.5 MGD - \$1,300,000 for one train	1.0 MGD - \$1,260,000; 0.5 MGD - \$630,000
Energy Costs	Highest	Lower
Ease of Operation	BNR is flexible; MBR is somewhat inflexible, but much more reliable	Automated; Flexible; More opportunity for operator error
Competition/Vendors	Multiple Vendors	Multiple Vendors
Ease of Construction	More complex equipment	More concrete; less complicated
Screening	2 Fine Screens (1-2 mm); Grit Removal	Grit Removal
Effluent Filter	Not Required	Disc Filter (Tier 1); Sand Filter (Tier 2)
Chemical Needs/Usage	Required for cleaning; 1,000 gallons of sodium hypochlorite; 500 gallons a year of citric acid	Not Required

a. Life Cycle Cost Analysis

A summary of the estimate of probable construction costs for both alternatives is shown in Table 15.

Table 15: Alternative Cost Comparison

Phase	MBR	SBR
Total Estimated Project Cost (0.5 mgd) including Engineering Design and NMGR	\$ 8,582,670	\$ 7,175,597
Total Estimated Project Cost (1.0 mgd) including Engineering Design and NMGR	\$ 10,933,226	\$ 10,850,045

The MBR has a higher capital construction cost compared with the SBR at the 0.5 mgd design flow, however, as the plant expands to 1.0 mgd and beyond, both alternatives capital construction cost are essentially equal.

In order to compare the alternatives for a 20-year design period, a Net Present Worth analysis was performed, which includes engineering design, capital construction cost and annual operations & maintenance cost adjusted to present day dollars.

Table 16 summarizes the Present Worth (Life Cycle costs) for the alternatives.

Table 16: Alternative Present Worth Comparison

Parameter	MBR	SBR
Capital Costs (0.5 mgd) including Engineering Design and NMGR	\$ 8,582,670	\$ 7,175,597
Average Annual O&M	\$ 428,002	\$ 308,439
O&M Present Worth (2.5% - Federal Discount Rate from OMB Circular A-94)	\$ 7,514,007	\$ 4,808,306
Present Value 20-yr Life Cycle Cost (0.5 mgd)	\$ 16,096,677	\$ 11,983,903

A detailed breakdown of the opinions of probable construction cost can be found in Appendix E.

b. Non-Monetary Factors

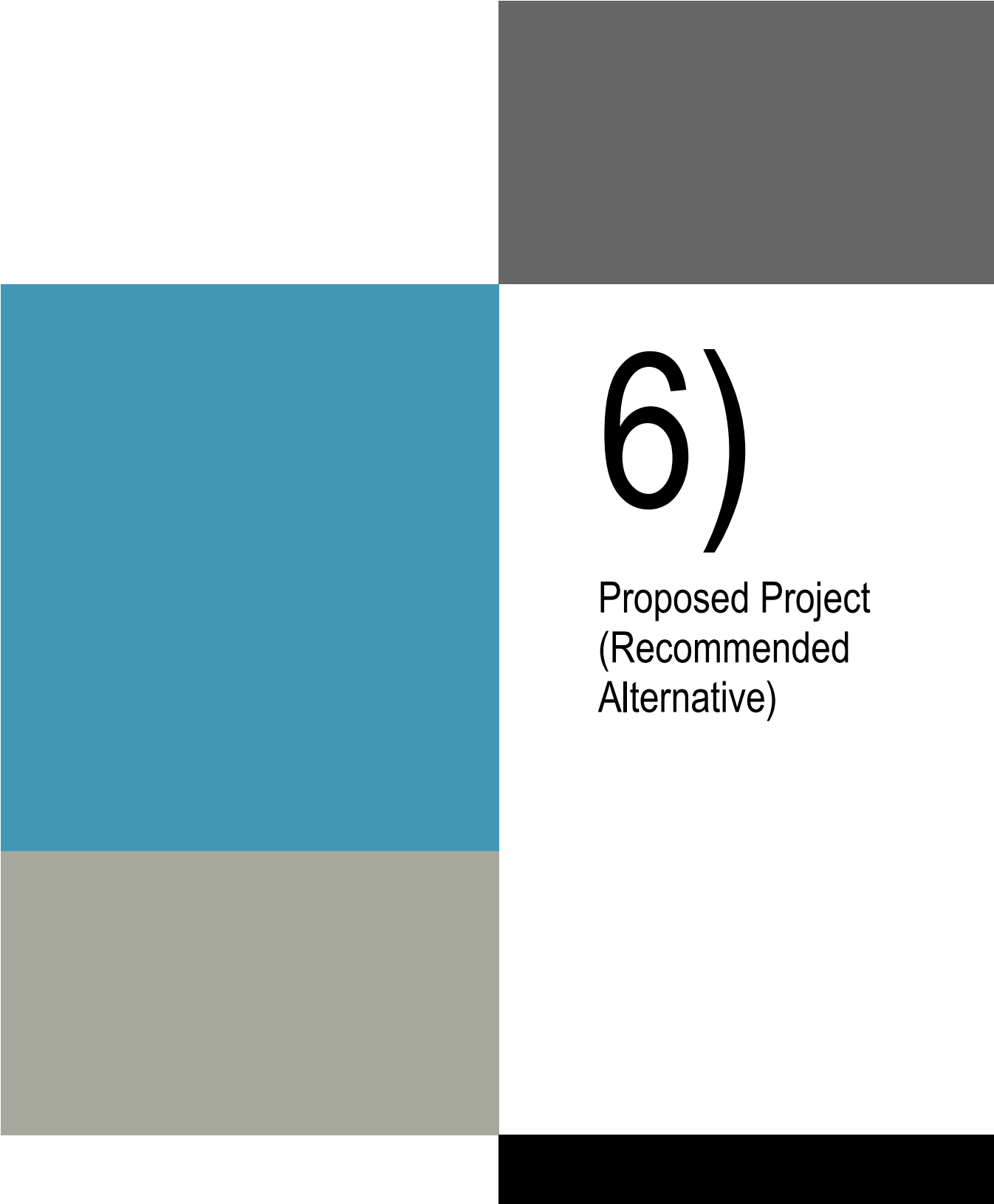
Matrix Rating System

A matrix rating system was compiled using typical criterion as shown in Table 17. This matrix compares both alternatives based on a weighted scoring system with a parameter weight percentage (i.e. ranking weight). Each parameter is scored on a scale of 1 through 10 or 1 through 5. This score is then adjusted to account for the ranking weight to provide final scores.

Table 17: Alternative Matrix Rating

Parameter	Ranking Weight	MBR	SBR
GWDP Regulatory Compliance	10	10	8
NPDES Regulatory Compliance	10	10	7
Technology/Experience/History	10	10	8
Competitive Bid	5	5	5
Site Efficiency, Land Issues, Constructability	5	5	3
Cost Consideration	10	8	10
O&M Cost	10	7	8
Expandability/Modularity	10	9	4
Operational Complexity	10	8	8
Reliability/Redundancy	5	5	3
Future NPDES Reg. Compliance	5	5	2
Owner Preference	10	8	6
Total:	100	80.0	65.5

After comparing the parameters for both alternatives, the matrix suggests the recommended alternative is the **membrane bioreactor (MBR)** system. Out of a maximum score of 100, the MBR system totaled a final score of 80.0 compared to the SBR system final score of 68.5. With further analysis between the alternatives in this Section 5), the recommended alternative will be discussed in Section 6).



6)

Proposed Project
(Recommended
Alternative)

6) Proposed Project (Recommended Alternative)

The recommended alternative is the MBR treatment system. The proposed system is to construct one MBR train with a 0.5 mgd process capacity with a modular design to expand to either 1.0 mgd in the near future and up to 2.0 mgd at ultimate capacity.

MBR was ultimately selected due to its delivery of a consistently higher quality effluent, better expansion/modularity, increased reliability, easier to operate consistently, smaller footprint, and owner preference.

The MBR enables the County to meet NMED GWDP Class 1A limits and anticipated future EPA NPDES limits. Compliance with the NPDES permit as stated earlier will enable the County to discharge to surface water, for example to the Rio Grande in exchange for water rights and provides the treatment required for possible aquifer storage recovery (ASR).

The MBR has a higher capital construction cost compared with the SBR at the 0.5 mgd design flow, however, as the plant expands to 1.0 mgd and beyond in the near future, both alternatives capital construction cost are essentially equal.

The MBR can achieve the lowest levels of treatment, in the likelihood that the EPA and NMED lower their requirements, by adding extra chemicals but without the capital costs for new facilities, since filtration is included with the MBR. The SBR would require a denitrification filter which would involve substantial capital costs.

a. Preliminary Project Design

The following information further describes the preliminary design of the proposed alternative. More information on the MBR system or the existing facilities can be found in Section 4.1) and Section 2), respectively. The MBR schematic shown in Figure 9 provides the sequence of equipment for treatment.

Fine screen and grit building

The preliminary treatment/headworks will add 2 (2 mm) fine screens before the MBR basins to provide full redundancy and no bypass or overflow. One of the fine screens will serve as a stand-by for maintenance and emergency purposes. The fine screens cannot be gravity fed, so a new influent lift station must be installed after the existing 6 mm Lakeside Raptor® Micro Strainer screen, which will remain in service in the existing Operations Building.

A vortex grit removal system will be installed as well. This grit system will reduce formation of heavy grit deposits throughout the system, reduce the frequency of aerobic digester cleaning, and protect equipment, such as the fine screen, from abnormal wear and abrasion.

The new fine screens and grit removal equipment are to be installed in a newly constructed building estimated at 2,500 square feet (sf).

For the fine screen capacity, 1 mgd is approx. \$165,000 each and 2 mgd is approximately \$205,000 each. An additive or deductive alternative could be an option to optimize construction costs.

Treatment process

The process treatment will include 1 treatment train consisting of 4 concrete basins, 2 concrete MBR membrane basins, and 1 concrete aerobic digester basin. All 4 basins included in the train will be sized for a 0.5 mgd capacity. The 4 aeration basins listed in treatment system sequence include: anaerobic, anoxic, anoxic/aerobic, and aerobic. Each MBR basins would be constructed for 0.5 mgd but only equipped to handle 0.25 mgd.

The pumps, controls, electrical equipment, and other secondary treatment equipment (e.g. the on-site sodium hypochlorite system and blowers) will be installed in the newly constructed Operations building estimated at 5,000 sf.

Disinfection

The existing disinfection equipment will be replaced for the MBR system. The new system will provide UV disinfection with a 1.0 mgd capacity for redundancy. The UV equipment will be installed in a newly constructed Operations building.

For the UV capacity, 1 mgd is approximately \$208,000 each and 2 mgd is approximately \$303,000 with full redundancy. An additive or deductive alternative could be an option to optimize construction costs.

Biosolids

Solids handling is accomplished by aerobic digestion (1 basin) and concrete sludge drying beds (2 beds) that are composted by a paddle aerator. Class A sludge will be produced and may be hauled off to a landfill or used as compost on various parks, fields, etc.

Irrigation

Improvements to the existing onsite reuse irrigation system were not studied in this PER.

The existing clay-lined reuse storage pond is to remain in place. This storage pond will continue to hold reuse effluent for on-site irrigation purposes.

Depending on the final location of the reuse water, additional transmission and distribution reuse piping, and pump stations will be required.

Laboratory and Operations

Additional supervisory control and data acquisition (SCADA) controls could be added to the existing laboratory.

Additive alternatives

Additional improvements that could be included as additive/deductive alternatives which have been identified, but possibly outside the budget of this project, include:

1. Regrading and relining the existing settling ponds into additional reuse storage ponds. This would be after the removal and disposal of existing sludge.
2. Aeration Lagoon No. 1 could also be regraded with the removal and disposal of existing sludge.
3. Installing BNR basins with a capacity of 1.0 mgd for future expansion. This alternative would have 1.0 mgd basins equipped with 0.5 mgd equipment. This alternative may provide a long-term capital cost savings.
4. Regrading and relining with HDPE the existing reuse storage pond.

A preliminary rendering of the 1.0 mgd MBR system option for the Quill WWTF is shown in Figure 15.

TO REPLACE SHEET

Figure 15: Preliminary Rendering of MBR System

b. Project Schedule

The proposed project schedule is as follows:

- Design – 6 to 8 months
- Construction bidding, evaluation and award – 1 to 2 months
- Construction – 12 to 18 months; MBR equipment lead time can be up to 8 months.
- Startup and project closeout – 1 month

c. Permit Requirements

As stated in Section 3), land application of reuse water will meet Class 1A from the NMED GWDP and any discharge to surface water will meet Tier 2 of the NDPES permit. The existing GWDP DP-234 will need to be updated. Also, a new NDPES permit (or renewal if the permit is dormant) will be required.

d. Sustainability Considerations

I) Water and Energy Efficiency

The MBR increases water and energy efficiency by allowing for more effective reuse of water, which contributes positively to water conservation efforts. The new facilities will allow for more energy efficient design and practices.

II) Green Infrastructure

The MBR alternative provides for the reuse of treated effluent for either NPDES or GWDP uses. This process aids in water conservation for the community.

III) Other Sustainability Considerations

The new facilities will optimize energy costs by using VFDs (variable frequency drives), energy efficient pumps, premium efficiency motors and other methods to ensure the County that this project is sustainable.

e. Total Project Cost Estimate (Engineer's Opinion of Probable Cost)

The cost for a 0.5 mgd design flow MBR system is \$8,582,670 as shown in Section 4.1). These costs for the new MBR facility are shown in more detail in Appendix E.

f. Annual Operating Budget

The wastewater O&M costs will increase with the proposed WWTF improvements, therefore sewer rates may increase accordingly.

A future Rate Study and Cost of Service study will be included in the Wastewater Master Plan.

I) Annual O&M Costs

The annual wastewater O&M costs are expected to increase for the proposed WWTF improvements because of an increase in staff and maintenance.

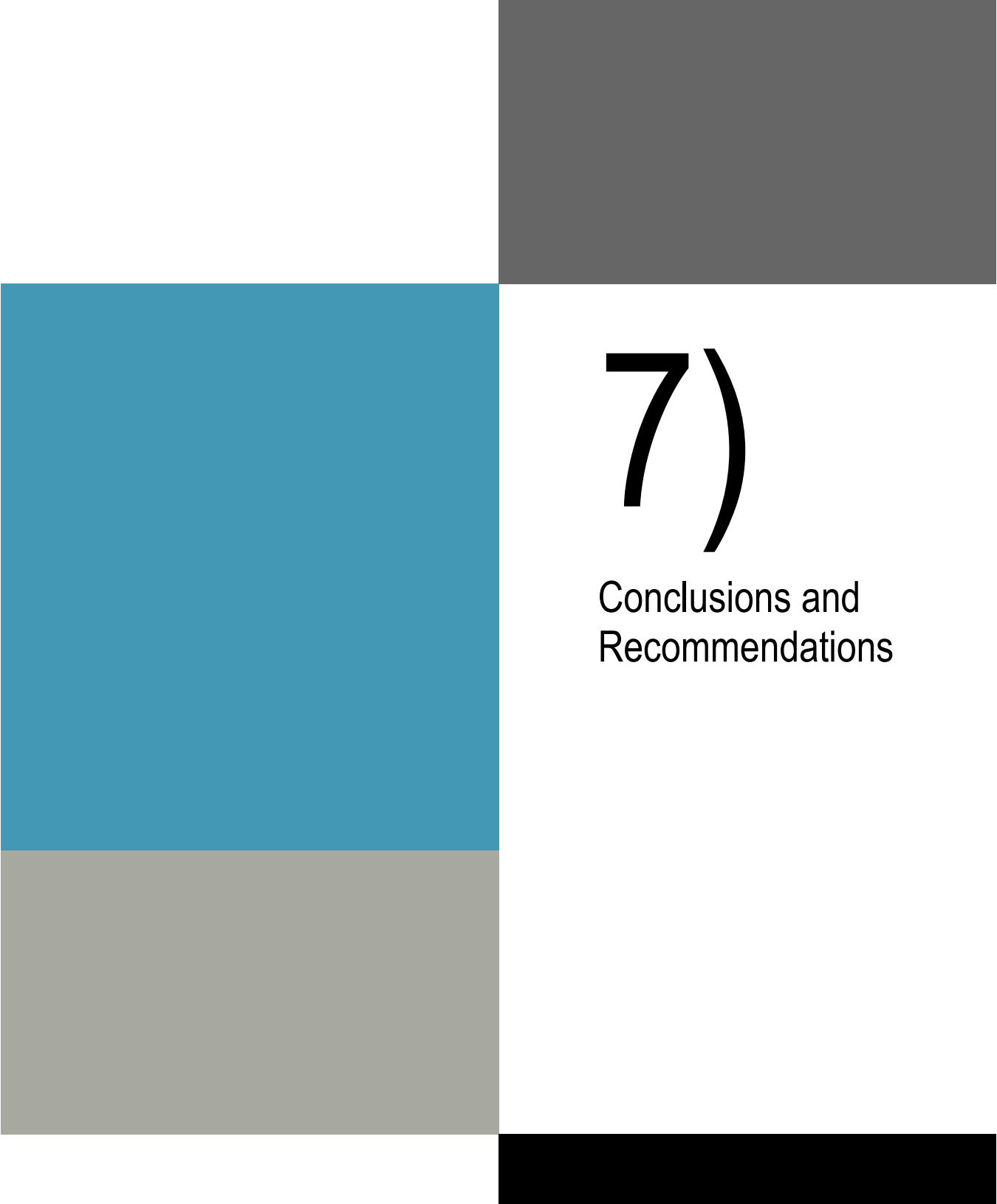
The Quill WWTF is currently managed by a level 4 operator and at least one operator is onsite during the day. These operators may require additional training to operate the treatment alternatives under consideration required per the Utility Operator Certification Regulations.

Accordingly, the County WWTF staff is estimated to need six employees at 1,500 hours per year at \$20/hour, based on the Estimating Staffing for Municipal Wastewater Treatment Facilities from the US EPA (See Appendix F).

The estimated increase in wastewater O&M cost is as follows:

Table 18: Wastewater O&M Cost Difference

Component	Annual Cost Difference
Power*	\$ 179,252
Chemicals	\$ 7,500
Operations	\$ 147,030
Total	\$ 333,782
*Based on energy consumption at \$0.13 / kWh	



7)

Conclusions and Recommendations

7) Conclusions and Recommendations

The recommendations for design as discussed in this PER will substantially benefit the Santa Fe County for both existing and future demands. The proposed MBR system improvements will allow the County to meet NMED GWDP Class 1A limits and anticipated future EPA NPDES limits by consistently providing the highest level of quality effluent for reuse irrigation with no limitations on surface water disposal.

The MBR does have a higher capital construction cost at the lower flows, but as the County expands to 1.0 mgd and beyond, the construction costs are equivalent.

The MBR system increases reliability and provides a smaller footprint at the Quill WWTF. In addition, the proposed alternative allows for optimized expansion/modularity of the MBR system to meet future population demands and permit requirements into the future since filtration is included.

The MBR enables the County to discharge to surface water, for example to the Rio Grande in exchange for water rights and provides the treatment required for possible aquifer storage recovery (ASR).



Appendices

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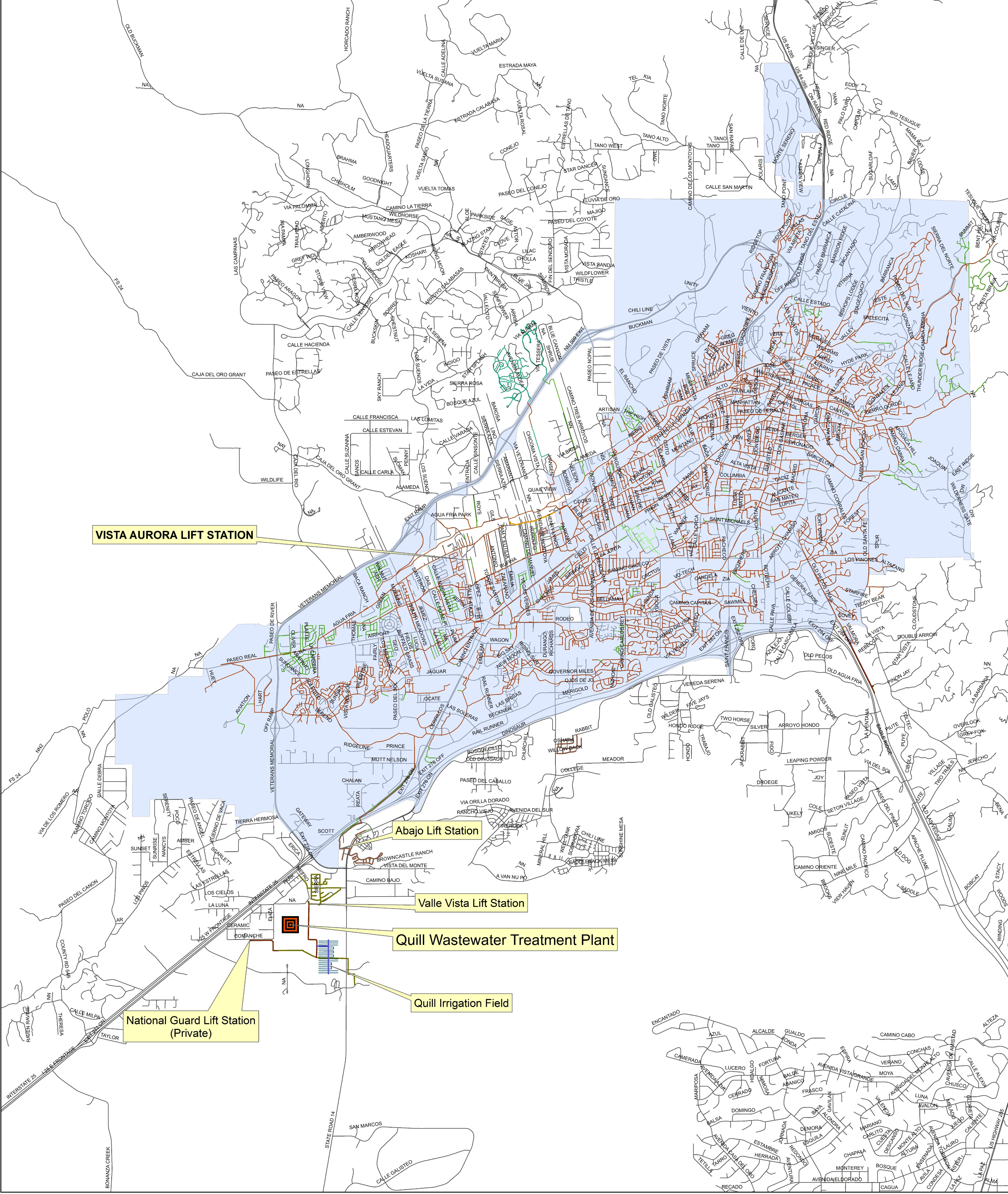


Appendix A.

County Wastewater Collection System

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SANTA FE COUNTY UTILITIES WASTEWATER COLLECTION



North arrow pointing up. Scale bar in miles: 0, 0.325, 0.65, 1.3.

Santa Fe County Wastewater Collection

- County File - Force Main
- County File - Gravity
- County File - Main Line
- County File - Private
- County File - Sewer
- County File - Irrigation

Legend

- SFCU Man Holes
- Roads
- City of Santa Fe

City of Santa Fe Wastewater Collection

- City File - Wastewater Collection
- City File - Private
- City File - Quasi
- City File - SF County

**Santa Fe County
Utilities Division**
May 2016



Appendix B.

Quill WWTF Data

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Analytical Report

Lab Order 1301189

Date Reported: 1/18/2013

Hall Environmental Analysis Laboratory, Inc.**CLIENT:** Santa Fe County Utilities**Project:** Santa Fe County Utilities**Lab ID:** 1301189-001**Client Sample ID:** Influent**Collection Date:** 1/8/2013 9:20:00 AM**Received Date:** 1/8/2013 12:10:00 PM**Matrix:** AQUEOUS

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
SM5210B: BOD						Analyst: JAL
Biochemical Oxygen Demand	270	2.0		mg/L	1	1/14/2013 4:18:00 AM
SM 4500 NORG C: TKN						Analyst: TAF
Nitrogen, Kjeldahl, Total	41	5.0		mg/L	1	1/10/2013 5:04:00 PM
SM 2540D: TSS						Analyst: KS
Suspended Solids	62	4.0		mg/L	1	1/8/2013 10:36:00 PM

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- E Value above quantitation range
- J Analyte detected below quantitation limits
- P Sample pH greater than 2
- RL Reporting Detection Limit

- B Analyte detected in the associated Method Blank
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- R RPD outside accepted recovery limits
- S Spike Recovery outside accepted recovery limits

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1302605

Date Reported: 3/1/2013

CLIENT: Santa Fe County Utilities

Client Sample ID: Influent

Project: Santa Fe County Utilities

Collection Date: 2/19/2013 10:00:00 AM

Lab ID: 1302605-001

Matrix: AQUEOUS

Received Date: 2/19/2013 11:35:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
SM5210B: BOD						Analyst: ECH
Biochemical Oxygen Demand	360	2.0		mg/L	1	2/25/2013 7:21:00 AM
SM 4500 NORG C: TKN						Analyst: TAF
Nitrogen, Kjeldahl, Total	50	5.0		mg/L	1	2/21/2013 5:45:00 AM
SM 2540D: TSS						Analyst: KS
Suspended Solids	270	8.0		mg/L	1	2/21/2013 1:57:00 PM

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- E Value above quantitation range
- J Analyte detected below quantitation limits
- P Sample pH greater than 2
- RL Reporting Detection Limit

- B Analyte detected in the associated Method Blank
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- R RPD outside accepted recovery limits
- S Spike Recovery outside accepted recovery limits

Analytical ReportLab Order **1303773**Date Reported: **4/10/2013****Hall Environmental Analysis Laboratory, Inc.****CLIENT:** Santa Fe County Utilities**Client Sample ID:** Influent**Project:** Santa Fe County Quill Plant @ State Pen**Collection Date:** 3/20/2013 10:45:00 AM**Lab ID:** 1303773-001**Matrix:** AQUEOUS**Received Date:** 3/20/2013 12:45:00 PM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
SM5210B: BOD						Analyst: SUB
Biochemical Oxygen Demand	230	5.0		mg/L	1	3/26/2013
SM 4500 NORG C: TKN						Analyst: IDC
Nitrogen, Kjeldahl, Total	46	1.0		mg/L	1	4/1/2013 10:45:00 AM
SM 2540D: TSS						Analyst: KS
Suspended Solids	53	4.0		mg/L	1	3/21/2013 12:48:00 PM

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- E Value above quantitation range
- J Analyte detected below quantitation limits
- P Sample pH greater than 2
- RL Reporting Detection Limit

- B Analyte detected in the associated Method Blank
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- R RPD outside accepted recovery limits
- S Spike Recovery outside accepted recovery limits

Analytical ReportLab Order **1304279**Date Reported: **4/22/2013****Hall Environmental Analysis Laboratory, Inc.****CLIENT:** Santa Fe County Utilities**Project:** Santa Fe County Utilities**Lab ID:** 1304279-001**Client Sample ID:** Influent**Collection Date:** 4/8/2013 9:50:00 AM**Received Date:** 4/8/2013 10:55:00 AM**Matrix:** AQUEOUS

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
SM5210B: BOD						Analyst: SUB
Biochemical Oxygen Demand	430	5.0		mg/L	1	4/14/2013
SM 4500 NORG C: TKN						Analyst: TMG
Nitrogen, Kjeldahl, Total	45	2.0		mg/L	1	4/19/2013 9:10:00 AM
SM 2540D: TSS						Analyst: KS
Suspended Solids	620	40		mg/L	1	4/10/2013 2:07:00 PM

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- E Value above quantitation range
- J Analyte detected below quantitation limits
- P Sample pH greater than 2
- RL Reporting Detection Limit

- B Analyte detected in the associated Method Blank
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- R RPD outside accepted recovery limits
- S Spike Recovery outside accepted recovery limits

Analytical ReportLab Order **1305959**Date Reported: **6/5/2013****Hall Environmental Analysis Laboratory, Inc.****CLIENT:** Santa Fe County Utilities**Client Sample ID:** Influent**Project:** Quill WWTP**Collection Date:** 5/23/2013 10:45:00 AM**Lab ID:** 1305959-001**Matrix:** AQUEOUS**Received Date:** 5/23/2013 12:31:00 PM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
SM5210B: BOD							Analyst: SUB
Biochemical Oxygen Demand	390	5.0		mg/L	1	5/29/2013	R11045
SM 4500 NORG C: TKN							Analyst: TMG
Nitrogen, Kjeldahl, Total	52	1.0		mg/L	1	6/4/2013 10:56:00 AM	7714
SM 2540D: TSS							Analyst: KS
Suspended Solids	240	8.0		mg/L	1	5/29/2013 4:14:00 PM	7617

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
	J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
	O	RSD is greater than RSDlimit	P	Sample pH greater than 2 for VOA and TOC only.
	R	RPD outside accepted recovery limits	RL	Reporting Detection Limit

Analytical ReportLab Order **1306540**Date Reported: **6/24/2013****Hall Environmental Analysis Laboratory, Inc.****CLIENT:** Santa Fe County Utilities**Client Sample ID:** Influent**Project:** Quill WWTP**Collection Date:** 6/13/2013 9:00:00 AM**Lab ID:** 1306540-001**Matrix:** AQUEOUS**Received Date:** 6/13/2013 10:42:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
SM5210B: BOD							Analyst: ECH
Biochemical Oxygen Demand	460	2.0		mg/L	1	6/18/2013 2:57:00 PM	7910
SM 4500 NORG C: TKN							Analyst: TMG
Nitrogen, Kjeldahl, Total	30	2.0		mg/L	1	6/19/2013 9:10:00 AM	7944
SM 2540D: TSS							Analyst: KS
Suspended Solids	340	8.0		mg/L	1	6/18/2013 3:18:00 PM	7978

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
	J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
	O	RSD is greater than RSDlimit	P	Sample pH greater than 2 for VOA and TOC only.
	R	RPD outside accepted recovery limits	RL	Reporting Detection Limit



SUMMIT

ENVIRONMENTAL TECHNOLOGIES, INC.
Analytical Laboratories

August 02, 2013

Client: Santa Fe County Utilities

Address: PO Box 276

Santa Fe, NM 87504

Received: 7/25/2013

Project #: Monthly

<u>Client ID#</u> Influent	<u>Lab ID#</u> 1312398-01	<u>Collected</u> 24-Jul-13	<u>Analyte</u> BOD	<u>Result</u> 223	<u>Units</u> mg/L	<u>Matrix</u> L	<u>Method</u> SM 5210B	<u>DF</u> 1	<u>LOQ</u> 5	<u>Run</u> 25-Jul-13	<u>Analys</u> SML
<u>Client ID#</u> Influent	<u>Lab ID#</u> 1312398-01	<u>Collected</u> 24-Jul-13	<u>Analyte</u> TKN	<u>Result</u> 30.5	<u>Units</u> mg/L	<u>Matrix</u> L	<u>Method</u> 351.2	<u>DF</u> 1	<u>LOQ</u> 1	<u>Run</u> 01-Aug-13	<u>Analys</u> NBX
<u>Client ID#</u> Influent	<u>Lab ID#</u> 1312398-01	<u>Collected</u> 24-Jul-13	<u>Analyte</u> TSS	<u>Result</u> 106.0	<u>Units</u> mg/L	<u>Matrix</u> L	<u>Method</u> SM2540 D	<u>DF</u> 1	<u>LOQ</u> 2	<u>Run</u> 26-Jul-13	<u>Analys</u> NBX
<u>Client ID#</u> Contact Chamber	<u>Lab ID#</u> 1312398-02	<u>Collected</u> 24-Jul-13	<u>Analyte</u> Nitrate-N	<u>Result</u> 1.9216	<u>Units</u> mg/L	<u>Matrix</u> L	<u>Method</u> 300.0	<u>DF</u> 1	<u>LOQ</u> 0.5	<u>Run</u> 28-Jul-13	<u>Analys</u> SG
<u>Client ID#</u> Contact Chamber	<u>Lab ID#</u> 1312398-02	<u>Collected</u> 24-Jul-13	<u>Analyte</u> TKN	<u>Result</u> 12.5	<u>Units</u> mg/L	<u>Matrix</u> L	<u>Method</u> 351.2	<u>DF</u> 1	<u>LOQ</u> 1	<u>Run</u> 01-Aug-13	<u>Analys</u> NBX
<u>Client ID#</u> Irrigation Pond (Effluent)	<u>Lab ID#</u> 1312398-03	<u>Collected</u> 24-Jul-13	<u>Analyte</u> BOD	<u>Result</u> 34	<u>Units</u> mg/L	<u>Matrix</u> L	<u>Method</u> SM 5210B	<u>DF</u> 1	<u>LOQ</u> 5	<u>Run</u> 25-Jul-13	<u>Analys</u> SML
<u>Client ID#</u> Irrigation Pond (Effluent)	<u>Lab ID#</u> 1312398-03	<u>Collected</u> 24-Jul-13	<u>Analyte</u> FECAL COLIFORM	<u>Result</u> 48.7MPN/100ml	<u>Units</u>	<u>Matrix</u> L	<u>Method</u> ST MTH 9222D	<u>DF</u> 1	<u>LOQ</u>	<u>Run</u> 24-Jul-13	<u>Analys</u> JT
Start: 7/24/2013@ 3:50 End: 7/25/2013 @11:04											
<u>Client ID#</u> Irrigation Pond (Effluent)	<u>Lab ID#</u> 1312398-03	<u>Collected</u> 24-Jul-13	<u>Analyte</u> Nitrate-N	<u>Result</u> ND	<u>Units</u> mg/L	<u>Matrix</u> L	<u>Method</u> 300.0	<u>DF</u> 1	<u>LOQ</u> 0.5	<u>Run</u> 28-Jul-13	<u>Analys</u> SG
<u>Client ID#</u> Irrigation Pond (Effluent)	<u>Lab ID#</u> 1312398-03	<u>Collected</u> 24-Jul-13	<u>Analyte</u> TDS	<u>Result</u> 354.0	<u>Units</u> mg/L	<u>Matrix</u> L	<u>Method</u> SM 2540-C	<u>DF</u> 1	<u>LOQ</u> 5	<u>Run</u> 26-Jul-13	<u>Analys</u> NBX
<u>Client ID#</u> Irrigation Pond (Effluent)	<u>Lab ID#</u> 1312398-03	<u>Collected</u> 24-Jul-13	<u>Analyte</u> TKN	<u>Result</u> 14.7	<u>Units</u> mg/L	<u>Matrix</u> L	<u>Method</u> 351.2	<u>DF</u> 1	<u>LOQ</u> 1	<u>Run</u> 01-Aug-13	<u>Analys</u> NBX



Summit Environmental Technologies, Inc.
3310 Win St.
Cuyahoga Falls, Ohio 44223
TEL: (330) 253-8211 FAX: (330) 253-4489
Website: <http://www.settek.com>

W/O#: 13080235
Date Reported: 8/19/2013
Company: Sangre de Christo Sciences
Address: 105 2nd St SE
Rio Rancho NM 87124
Received: 8/7/2013
Project#: Sante Fe County,

Client ID#	Lab ID#	Collected	Analyte	Result	Units	Qual	Matrix	Method	DF	LOD	LOQ	Run	Analyst
Influent	001	8/7/2013	Biochemical Oxygen Demand	170	mg/L		Non-Potable Water	SM 5210 B	1	5.0	5.0	8/9/2013 9:30:00 AM	SML
Influent	001	8/7/2013	TKN	27	mg/L		Non-Potable Water	EPA 351 2	1	0.50	1.0	8/19/2013	NBX
Influent	001	8/7/2013	TSS	370	mg/L		Non-Potable Water	SM 2540 D	1	1.0	2.0	8/9/2013	NBX

Client ID#	Lab ID#	Collected	Analyte	Result	Units	Qual	Matrix	Method	DF	LOD	LOQ	Run	Analyst
Contact Chamber	002	8/7/2013	Nitrate-N	ND	mg/L	J	Non-Potable Water	EPA 300.0	5	0.50	2.5	8/11/2013	SG
Contact Chamber	002	8/7/2013	TKN	10	mg/L		Non-Potable Water	EPA 351 2	1	0.50	1.0	8/19/2013	NBX

Client ID#	Lab ID#	Collected	Analyte	Result	Units	Qual	Matrix	Method	DF	LOD	LOQ	Run	Analyst
Irrigation Pond/Eff	003	8/7/2013	Fecal Coliform	1.0	CFU/100m		Non-Potable Water	SM 9222 D	1	1.0	1.0	8/7/2013	SUB
Irrigation Pond/Eff	003	8/7/2013	Nitrate-N	ND	mg/L	J	Non-Potable Water	EPA 300.0	5	0.50	2.5	8/11/2013 6:24:00 PM	SG
Irrigation Pond/Eff	003	8/7/2013	Biochemical Oxygen Demand	18	mg/L		Non-Potable Water	SM 5210 B	1	5.0	5.0	8/9/2013 9:30:00 AM	SML
Irrigation Pond/Eff	003	8/7/2013	TDS	490	mg/L		Non-Potable Water	SM 2540 C	1	2.0	5.0	8/8/2013	NBX
Irrigation Pond/Eff	003	8/7/2013	TKN	6.5	mg/L		Non-Potable Water	EPA 351 2	1	0.50	1.0	8/14/2013	NBX
Irrigation Pond/Eff	003	8/7/2013	TSS	150	mg/L		Non-Potable Water	SM 2540 D	1	1.0	2.0	8/9/2013	NBX



Summit Environmental Technologies, Inc.
3310 Win St.
Cuyahoga Falls, Ohio 44223
TEL: (330) 253-8211 FAX: (330) 253-4489
Website: <http://www.setek.com>

WO#: 13090089
Date Reported: 9/19/2013
Company: Sangre de Christo Sciences
Address: 105 2nd St SE
Rio Rancho NM 87124
Received: 9/4/2013
Project#:

Client ID#	Lab ID#	Collected	Analyte	Result	Units	Qual	Matrix	Method	DF	LOD	LOQ	Run	Analyst
Influent	001	9/4/2013	Biochemical Oxygen Demand	680	mg/L		Non-Potable Water	SM 5210 B	1	5.0	5.0	9/5/2013 10:00:00 AM	AYS
Influent	001	9/4/2013	TKN	50	mg/L		Non-Potable Water	EPA 351 2	1	0.50	1.0	9/17/2013	NBX
Influent	001	9/4/2013	Residue, Suspended	180	mg/L		Non-Potable Water	SM 2540 D	1	1.0	2.0	9/9/2013	NBX

Client ID#	Lab ID#	Collected	Analyte	Result	Units	Qual	Matrix	Method	DF	LOD	LOQ	Run	Analyst
Contact Chamber	002	9/4/2013	Nitrate-N	ND	mg/L	J	Non-Potable Water	EPA 300.0	5	0.50	2.5	9/9/2013	SG
Contact Chamber	002	9/4/2013	TKN	10	mg/L		Non-Potable Water	EPA 351 2	1	0.50	1.0	9/17/2013	NBX

Client ID#	Lab ID#	Collected	Analyte	Result	Units	Qual	Matrix	Method	DF	LOD	LOQ	Run	Analyst
Irrigation Pond	003	9/4/2013	Fecal Coliform	7.4	CFU/100ml		Non-Potable Water	SM 9222 D	1			9/4/2013	JT
Irrigation Pond	003	9/4/2013	Biochemical Oxygen Demand	37	mg/L		Non-Potable Water	SM 5210 B	1	5.0	5.0	9/5/2013 10:00:00 AM	AYS
Irrigation Pond	003	9/4/2013	TDS	430	mg/L		Non-Potable Water	SM 2540 C	1	2.0	5.0	9/9/2013	NBX



Summit Environmental Technologies, Inc.
3310 Wm St.
Cuyahoga Falls, Ohio 44223
TEL: (330) 253-8211 FAX: (330) 253-4489
Website: <http://www.settek.com>

WO#: 13100188
Date Reported: 10/14/2013
Company: Sangre de Christo Sciences
Address: 105 2nd St SE
Rio Rancho NM 87124
Received: 10/3/2013
Project#: Santa Fe County

Client ID#	Lab ID#	Collected	Analyte	Result	Units	Qual	Matrix	Method	DF	LOD	LOQ	Run	Analyst
Influent (sangro)	001	10/2/2013	Biochemical Oxygen Demand	400	mg/L		Non-Potable Water	SM 5210 B	1	5.0	5.0	10/4/2013 8:15:58 AM	AYS
Influent (sangro)	001	10/2/2013	TKN	35	mg/L		Non-Potable Water	EPA 351 2	1	0.50	1.0	10/7/2013	NBX
Influent (sangro)	001	10/2/2013	TSS	70	mg/L		Non-Potable Water	SM 2540 D	1	1.0	2.0	10/7/2013	NBX

Client ID#	Lab ID#	Collected	Analyte	Result	Units	Qual	Matrix	Method	DF	LOD	LOQ	Run	Analyst
Contact Chamber (Sangro)	002	10/2/2013	Nitrate-N	ND	mg/L	J	Non-Potable Water	EPA 300.0	5	0.50	2.5	10/5/2013	KRC
Contact Chamber (Sangro)	002	10/2/2013	TKN	9.0	mg/L		Non-Potable Water	EPA 351 2	1	0.50	1.0	10/7/2013	NBX

Client ID#	Lab ID#	Collected	Analyte	Result	Units	Qual	Matrix	Method	DF	LOD	LOQ	Run	Analyst
Irrigation Pond	003	10/2/2013	Fecal Coliform	30	CFU/100ml		Non-Potable Water	SM 9222 D	1			10/2/2013	JT
Irrigation Pond	003	10/2/2013	Nitrate-N	ND	mg/L	J	Non-Potable Water	EPA 300.0	5	0.50	2.5	10/5/2013 2:29:00 AM	KRC
Irrigation Pond	003	10/2/2013	Biochemical Oxygen Demand	41	mg/L		Non-Potable Water	SM 5210 B	1	5.0	5.0	10/4/2013 8:15:58 AM	AYS
Irrigation Pond	003	10/2/2013	TDS	330	mg/L		Non-Potable Water	SM 2540 C	1	2.0	5.0	10/4/2013	NBX
Irrigation Pond	003	10/2/2013	TKN	11	mg/L		Non-Potable Water	EPA 351 2	1	0.50	1.0	10/7/2013	NBX

Client Sample Results

Client: Sangre De Cristo Sciences, LLC
Project/Site: Santa Fe County Qtly Influent/Effluent

TestAmerica Job ID: 490-84550-1
SDG: Santa Fe County Quarterly Influent/Effluent 8/6/15

Client Sample ID: INFLUENT QUARTERLY

Lab Sample ID: 490-84550-2

Date Collected: 08/06/15 09:30

Matrix: Wastewater

Date Received: 08/07/15 09:00

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Kjeldahl Nitrogen as N	43.0		2.50		mg/L		08/17/15 12:38	08/18/15 12:45	10
Total Suspended Solids	169		10.0		mg/L			08/11/15 16:30	1
Biochemical Oxygen Demand	35.3	*	20.0		mg/L			08/07/15 15:34	1

Analytical ReportLab Order **1605760**

Date Reported: 6/1/2016

Hall Environmental Analysis Laboratory, Inc.**CLIENT:** Sangre De Cristo Sciences**Client Sample ID:** SFCU Quarterly Influent**Project:** SFCU Quarterly Influent**Collection Date:** 5/17/2016 8:30:00 AM**Lab ID:** 1605760-001**Matrix:** AQUEOUS**Received Date:** 5/17/2016 12:22:00 PM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
SM5210B: BOD							Analyst: SMS
Biochemical Oxygen Demand	280	2.0		mg/L	1	5/23/2016 1:39:00 PM	25374
SM 4500 NORG C: TKN							Analyst: CJS
Nitrogen, Kjeldahl, Total	53	2.0	D	mg/L	1	5/27/2016 3:00:00 PM	25522
SM 2540D: TSS							Analyst: KS
Suspended Solids	150	8.0	D	mg/L	1	5/22/2016 5:18:00 PM	25423

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank	Page 1 of 4
	D	Sample Diluted Due to Matrix	E	Value above quantitation range	
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits	
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range	
	R	RPD outside accepted recovery limits	RL	Reporting Detection Limit	
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified	

Analytical Report

Lab Order 1608131

Date Reported: 8/11/2016

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Sangre De Cristo Sciences

Client Sample ID: Quarterly Influent

Project: SFCU Quarterly Influent

Collection Date: 8/2/2016 8:45:00 AM

Lab ID: 1608131-001

Matrix: AQUEOUS

Received Date: 8/2/2016 2:45:00 PM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
SM5210B: BOD							Analyst: SMS
Biochemical Oxygen Demand	270	2.0		mg/L	1	8/8/2016 1:35:00 PM	26764
SM 4500 NORG C: TKN							Analyst: CJS
Nitrogen, Kjeldahl, Total	43	5.0	D	mg/L	1	8/8/2016 3:24:00 PM	26801
SM 2540D: TSS							Analyst: KS
Suspended Solids	140	8.0	D	mg/L	1	8/5/2016 2:53:00 PM	26791

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified



SUSANA MARTINEZ
Governor

JOHN A. SANCHEZ
Lieutenant Governor

NEW MEXICO
ENVIRONMENT DEPARTMENT

Ground Water Quality Bureau

Harold Runnels Building

1190 St. Francis Drive

P.O. Box 5469, Santa Fe, NM 87502-5469

Phone (505) 827-2918 Fax (505) 827-2965

www.nmenv.state.nm.us



DAVE MARTIN
Secretary

BUTCH TONGATE
Deputy Secretary

CERTIFIED MAIL – RETURN RECEIPT REQUESTED

August 15, 2012

Charles Gara, Division Director
State of New Mexico General Services Department
Property Control Division
1100 St. Francis Drive, Room 2022
Santa Fe, New Mexico 87501

RE: Discharge Permit Renewal, DP-234, Quill Wastewater Treatment Facility (formerly the State of New Mexico Penitentiary WWTF)

Dear Mr. Gara:

The New Mexico Environment Department (NMED) issues the enclosed Discharge Permit Renewal, DP-234, to the State of New Mexico, General Services Department-Property Control Division (permittee) pursuant to the New Mexico Water Quality Act (WQA), NMSA 1978 §§74-6-1 through 74-6-17, and the New Mexico Water Quality Control Commission (WQCC) Regulations, 20.6.2 NMAC.

The Discharge Permit contains terms and conditions that shall be complied with by the permittee and are enforceable by NMED pursuant to Section 20.6.2.3104 NMAC, WQA, NMSA 1978 §74-6-5 and §74-6-10. Please be aware that this Discharge Permit may contain conditions that require the permittee to implement operational, monitoring or closure actions by a specified deadline. Such conditions are listed at the beginning of the operational, monitoring and closure plans of this Discharge Permit.

Issuance of this Discharge Permit does not relieve the permittee of the responsibility to comply with the WQA, WQCC Regulations, and any other applicable federal, state and/or local laws and regulations, such as zoning requirements and nuisance ordinances.

August 15, 2012

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Pursuant to Paragraph (4) of Subsection H of 20.6.2.3109 NMAC, the term of the Discharge Permit shall be five years from the effective date. The term of this Discharge Permit will end on August 15, 2017.

NMED requests that the permittee submit an application for renewal (or renewal and modification) at least 180 days prior to the date the Discharge Permit term ends.

An invoice for the Discharge Permit Fee of \$4,600 is being sent under separate cover. Payment of the Discharge Permit Fee must be received by NMED within 30 days of the date the Discharge Permit is issued.

If you have any questions, please contact Steve Pedro at (505) 827-2957. Thank you for your cooperation during this Discharge Permit review.

Sincerely,

for 
Jerry Schoeppner, Chief
Ground Water Quality Bureau

JS:SP

Encs: Discharge Permit Renewal, DP-234
Ground Water Discharge Permit Monitoring Well Construction and Abandonment
Conditions, Revision 1.1, March 2011
Land Application Data Sheet (LADS; also available at the following website:
<http://www.nmenv.state.nm.us/gwb/forms/NewMexicoEnvironmentDepartment-GroundWaterQualityBureau-Forms.htm>)
Fertilizer Log

cc: Robert Italiano, District Manager, NMED District II (permit – electronic copy)
NMED Santa Fe Field Office (permit)
John Romero, Office of the State Engineer (permit – electronic copy)
Patricio Guerrerortiz, Utilities Division Director, Santa Fe County, P.O. Box 276, Santa Fe, New Mexico 87504 (permit)
Karen Torres, Hydrogeologist, Santa Fe County, P.O. Box 276, Santa Fe, New Mexico 87504 (permit/enclosures)
Robert Gutierrez, Wastewater Operator, Santa Fe County, P.O. Box 276, Santa Fe, New Mexico 87504 (permit)
Thomas Gurule, Chief, State of New Mexico General Services Department-Leasing and Property Management Bureau, 1100 St. Francis Drive, Santa Fe, New Mexico 87501
Michael Rodriguez, Project Manager, State of New Mexico General Services Department-Property Control Division, 1100 St. Francis Drive, Santa Fe, New Mexico 87501 (permit)

August 15, 2012

Page 3

Donna Martinez, Penitentiary of New Mexico, P.O. Box 1059, Santa Fe, New Mexico
87504 (permit)

Stanley Moya, Penitentiary of New Mexico, P.O. Box 1059, Santa Fe, New Mexico
87504 (permit)

Hanna Branning, US Environmental Protection Agency Region 6, Compliance Assurance
and Enforcement Division, 1445 Ross Ave, Suite 1200, Dallas, Texas 75202-2733
(permit)



Appendix C.

Quill WWTF NMED Permit

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GROUND WATER DISCHARGE PERMIT RENEWAL

Quill Wastewater Treatment Facility, DP-234

I. INTRODUCTION

The New Mexico Environment Department (NMED) issues this Discharge Permit Renewal (Discharge Permit), DP-234, to the State of New Mexico General Services Department-Property Control Division (permittee) pursuant to the New Mexico Water Quality Act (WQA), NMSA 1978 §§74-6-1 through 74-6-17, and the New Mexico Water Quality Control Commission (WQCC) Regulations, 20.6.2 NMAC.

NMED's purpose in issuing this Discharge Permit, and in imposing the requirements and conditions specified herein, is to control the discharge of water contaminants from the Quill Wastewater Treatment Facility (facility) into ground and surface water, so as to protect ground and surface water for present and potential future use as domestic and agricultural water supply and other uses and protect public health. In issuing this Discharge Permit, NMED has determined that the requirements of Subsection C of 20.6.2.3109 NMAC have been or will be met. Pursuant to Section 20.6.2.3104 NMAC, it is the responsibility of the permittee to comply with the terms and conditions of this Discharge Permit; failure may result in an enforcement action(s) by NMED (20.6.2.1220 NMAC).

The activities which produce the discharge, the location of the discharge, and the quantity, quality and flow characteristics of the discharge are briefly described as follows:

Up to 280,000 gallons per day (gpd) of domestic wastewater is received at the Quill wastewater treatment facility (WWTF). Domestic wastewater is treated in two synthetically lined aerated impoundments followed by two synthetically lined stabilization impoundments. Wastewater is disinfected, stored in a clay lined impoundment and discharged to a 95 acre land application area for irrigation.

The discharge contains water contaminants which may be elevated above the standards of Section 20.6.2.3103 NMAC and/or the presence of toxic pollutants as defined in Subsection WW of 20.6.2.7 NMAC.

The facility is located at 4311 NM Hwy 14, approximately five miles south of Santa Fe, in Section 35, Township 16 North, Range 08 East, Santa Fe County. Ground water most likely to be affected is at a depth of approximately 90 feet and has a total dissolved solids concentration of approximately 170 milligrams per liter.

The original Discharge Permit was issued on June 28, 1983 and subsequently renewed on July 5, 1988, June 27, 1994, modified on October 15, 1998, and renewed and modified on June 12, 2000 and November 20, 2006. The application (i.e., discharge plan) consists of the materials submitted by Charles Gara dated May 27, 2011, an amended application submitted by Karen Torres, Santa Fe County, on behalf of the State of New Mexico General Services Department-Property Control Division on July 18, 2011, and materials contained in the administrative record prior to issuance of this Discharge Permit. The discharge shall be managed in accordance with all conditions and requirements of this Discharge Permit.

Pursuant to Section 20.6.2.3109 NMAC, NMED reserves the right to require a Discharge Permit Modification in the event NMED determines that the requirements of 20.6.2 NMAC are being or may be violated or the standards of Section 20.6.2.3103 NMAC are being or may be violated. This may include a determination that structural controls and/or management practices approved under this Discharge Permit are not protective of ground water quality, and that more stringent requirements to protect ground water quality may be required by NMED. The permittee may be required to implement abatement of water pollution and remediate ground water quality.

Issuance of this Discharge Permit does not relieve the permittee of the responsibility to comply with the WQA, WQCC Regulations, and any other applicable federal, state and/or local laws and regulations, such as zoning requirements and nuisance ordinances.

The following acronyms and abbreviations may be used in this Discharge Permit:

Abbreviation	Explanation	Abbreviation	Explanation
BOD ₅	biochemical oxygen demand (5-day)	NTU	nephelometric turbidity units
CFR	Code of Federal Regulations	Org	organisms
Cl	chloride	TDS	total dissolved solids
EPA	United States Environmental Protection Agency	TKN	total Kjeldahl nitrogen
gpd	gallons per day	total nitrogen	= TKN + NO ₃ -N
LADS	land application data sheet(s)	TRC	Total Residual Chlorine
mg/L	milligrams per liter	TSS	total suspended solids
mL	milliliters	UPC	Uniform Plumbing Code
NMAC	New Mexico Administrative Code	WQA	New Mexico Water Quality Act
NMED	New Mexico Environment Department	WQCC	Water Quality Control Commission
NMSA	New Mexico Statutes Annotated	WWTF	Wastewater Treatment Facility
NO ₃ -N	nitrate-nitrogen		

II. FINDINGS

In issuing this Discharge Permit, NMED finds:

1. The permittee is discharging effluent or leachate from the facility so that such effluent or leachate may move directly or indirectly into ground water within the meaning of Section 20.6.2.3104 NMAC.
2. The permittee is discharging effluent or leachate from the facility so that such effluent or leachate may move into ground water of the State of New Mexico which has an existing concentration of 10,000 mg/L or less of TDS within the meaning of Subsection A of 20.6.2.3101 NMAC.

3. The discharge from the facility is not subject to any of the exemptions of Section 20.6.2.3105 NMAC.

III. AUTHORIZATION TO DISCHARGE

Pursuant to 20.6.2.3104 NMAC, it is the responsibility of the permittee to ensure that discharges authorized by this Discharge Permit are consistent with the terms and conditions herein.

The permittee is authorized to receive and treat up to 280,000 gpd of domestic wastewater at the Quill WWTF. Wastewater passes through a mechanical bar screen and flows to two primary aerated synthetically lined impoundments which may be operated in series or parallel. Wastewater overflows to two synthetically lined stabilization impoundments for polishing, which also may be operated in series or parallel and is pumped to a chlorine contact chamber for disinfection. Treated wastewater (reclaimed wastewater) is stored in a clay-lined storage impoundment prior to being discharged to a 95 acre land application area (i.e., re-use area; designated as South-38 acres and North-57 acres) by spray irrigation. [20.6.2.3104 NMAC, Subsection C of 20.6.2.3106 NMAC, Subsection C of 20.6.2.3109 NMAC]

IV. CONDITIONS

NMED issues this Discharge Permit for the discharge of water contaminants subject to the following conditions:

A. OPERATIONAL PLAN

#	Terms and Conditions
1.	The permittee shall implement the following operational plan to ensure compliance with Title 20, Chapter 6, Parts 1 and 2 NMAC. [Subsection C of 20.6.2.3109 NMAC]
2.	The permittee shall operate in a manner such that standards and requirements of Sections 20.6.2.3101 and 20.6.2.3103 NMAC are not violated. [20.6.2.3101 NMAC, 20.6.2.3103 NMAC, Subsection C of 20.6.2.3109 NMAC]

Operational Actions with Implementation Deadlines

#	Terms and Conditions
3.	Within 12 months following the effective date of this Discharge Permit (by August 15, 2013), the permittee shall replace the synthetic liner in the west primary impoundment. A minimum of 90 days prior to replacing the synthetic liner in the west primary impoundment and other impoundment liner(s) which may be replaced during the term of

#	Terms and Conditions
	<p>this Discharge Permit, the permittee shall submit preliminary construction plans and specifications to NMED for review. Prior to replacing the synthetic liner(s), the permittee shall submit final construction plans and specifications to NMED for review. The construction plans and specifications shall bear the seal and signature of a licensed New Mexico professional engineer (pursuant to New Mexico Engineering and Surveying Practice Act and the rules promulgated under that authority) and supporting design calculations, and shall be submitted for review by NMED. The submitted documentation shall include the following elements:</p> <ul style="list-style-type: none"> a) A plan for the removal and disposal of accumulated sludge within the impoundment. The plan shall comply with all local, state and federal regulations, including 40 CFR Part 503. <i>Note: A proposal that includes the surface disposal of sludge may be subject to Ground Water Discharge Permitting requirements pursuant to 20.6.2.3104 NMAC that are separate from the requirements of this Discharge Permit.</i> b) Details for the replacement and installation of synthetic liner(s) in the impoundment(s) system and a liner consistent with the attachment titled <i>Ground Water Discharge Permit Conditions for Synthetically Lined Lagoons – Liner Material and Site Preparation</i>, Revision 0.0, May 2007. c) Specifications for all equipment, materials and installation procedures to be used in the construction of the liner. <p>Prior to replacing the synthetic liner(s) and its associated components, the permittee shall obtain written verification from NMED that the final plans and specifications meet the requirements of this Discharge Permit.</p> <p>[Subsections A and C 20.6.2.1202 NMAC, Subsection C of 20.6.2.3106 NMAC, Subsection C of 20.6.2.3107 NMAC, NMSA 1978, §§ 61-23-1 through 61-23-32]</p>
4.	<p>Prior to discharging wastewater to any impoundment which has undergone a synthetic liner installation(s), the permittee shall complete construction in accordance with the final construction plans and specifications required by this Discharge Permit. The permittee shall notify NMED at least five working days prior to commencement of construction to allow NMED personnel to be onsite for inspection. The permittee shall submit record drawings that bear the seal and signature of a licensed New Mexico professional engineer (pursuant to the New Mexico Engineering and Surveying Practice Act and the rules promulgated under that authority) for the constructed impoundment(s) to NMED within 30 days of completion.</p> <p>[Subsections A and C 20.6.2.1202 NMAC, Subsection C of 20.6.2.3109 NMAC, NMSA 1978, §§ 61-23-1 through 61-23-32]</p>
5.	<p>Within 30 days following the effective date of this Discharge Permit (by September 14, 2012), the permittee shall post signs in English and Spanish at the east entrance (corral area) to the re-use area and at other locations where public exposure to reclaimed wastewater may occur. The signs shall state:</p>

#	Terms and Conditions
	<p style="text-align: center;">NOTICE: THIS AREA IS IRRIGATED WITH RECLAIMED WASTEWATER - DO NOT DRINK.</p> <p style="text-align: center;">AVISO: ESTA ÁREA ESTÁ REGADA CON AGUAS NEGRAS RECOBRADAS - NO TOMAR.</p> <p>Alternate wording and/or graphics may be submitted to NMED for approval.</p> <p>[Subsections B and C of 20.6.2.3109 NMAC, NMSA 1978, § 74-6-5.D]</p>
6.	<p>Within 180 days following the effective date of this Discharge Permit (by February 11, 2013), the permittee shall measure the thickness of the settled solids in all treatment impoundments and report the results of the solids depth measurements to NMED.</p> <p>The permittee shall measure the thickness of settled solids in accordance with the following procedure.</p> <ol style="list-style-type: none"> a) The total surface area of the treatment impoundment shall be divided into nine equal sub-areas. b) A settled solids measurement device (core sampler) shall be utilized to obtain one settled solids thickness measurement (to the nearest half-foot) per sub-area. c) The nine settled solids measurements shall be averaged. <p>In the event the average solids accumulation exceeds one-third of the maximum liquid depth in the impoundment(s), the permittee shall propose a plan for the removal and disposal of the solids from the treatment impoundment(s). The solids removal and disposal plan shall be submitted to NMED for approval within 120 days following the effective date of this Discharge Permit (by December 13, 2012), and shall include the following:</p> <ol style="list-style-type: none"> a) A method for removal of the solids to a depth of less than six inches throughout the treatment impoundment in a manner that is protective of the impoundment liner. b) A description of how the solids will be contained, transported, and disposed of in accordance with all local, state, and federal regulations, including 40 CFR Part 503. c) A schedule for completion of the solids removal and disposal project. <p>The permittee shall initiate implementation of the plan following approval by NMED. [Subsection A of 20.6.2.3107 NMAC, Subsection C of 20.6.2.3109 NMAC]</p>

Operating Conditions

#	Terms and Conditions																								
7.	<p>Reclaimed wastewater discharged from the clay-lined storage impoundment shall not exceed the following limitation:</p> <p>Total Nitrogen: 20 mg/L</p> <p>[Subsection C of 20.6.2.3109 NMAC]</p>																								
8.	<p>Reclaimed wastewater discharged from the clay-lined storage impoundment shall not exceed the following limitations:</p> <table><tr><th>Test</th><th>30-day geometric mean</th><th>30-day average</th><th>maximum</th></tr><tr><td>Total Nitrogen (TKN + NO₃-N)</td><td>N/A</td><td>N/A</td><td>20 mg/L</td></tr><tr><td>Fecal coliform bacteria:</td><td>200 Org/100 mL</td><td>N/A</td><td>400 Org/100 mL</td></tr><tr><td>BOD₅:</td><td>N/A</td><td>30 mg/L</td><td>45 mg/L</td></tr><tr><td>TSS:</td><td>N/A</td><td>30 mg/L</td><td>45 mg/L</td></tr><tr><td>TRC:</td><td>N/A</td><td>Monitor Only</td><td>Monitor Only</td></tr></table> <p>[Subsections B and C of 20.6.2.3109 NMAC, NMSA 1978, § 74-6-5.D]</p>	Test	30-day geometric mean	30-day average	maximum	Total Nitrogen (TKN + NO ₃ -N)	N/A	N/A	20 mg/L	Fecal coliform bacteria:	200 Org/100 mL	N/A	400 Org/100 mL	BOD ₅ :	N/A	30 mg/L	45 mg/L	TSS:	N/A	30 mg/L	45 mg/L	TRC:	N/A	Monitor Only	Monitor Only
Test	30-day geometric mean	30-day average	maximum																						
Total Nitrogen (TKN + NO ₃ -N)	N/A	N/A	20 mg/L																						
Fecal coliform bacteria:	200 Org/100 mL	N/A	400 Org/100 mL																						
BOD ₅ :	N/A	30 mg/L	45 mg/L																						
TSS:	N/A	30 mg/L	45 mg/L																						
TRC:	N/A	Monitor Only	Monitor Only																						
9.	<p>The permittee shall apply reclaimed wastewater to the re-use area such that the amount of total nitrogen applied does not exceed 200 pounds per acre in any 12-month period. Nitrogen content shall not be adjusted to account for volatilization or mineralization processes. Wastewater shall be distributed evenly throughout the entire re-use area. Excessive ponding shall be prevented.</p> <p>[Subsection C of 20.6.2.3109 NMAC]</p>																								
10.	<p>The permittee shall meet the following general requirements for above-ground use of reclaimed domestic wastewater:</p> <p>a) The permittee shall maintain signs in English and Spanish at all re-use areas such that they are visible and legible for the term of this Discharge Permit. The signs shall be posted at the entrance to re-use areas and at other locations where public exposure to reclaimed wastewater may occur. The signs shall state: NOTICE: THIS AREA IS IRRIGATED WITH RECLAIMED WASTEWATER - DO NOT DRINK. AVISO: ESTA ÁREA ESTÁ REGADA CON AGUAS NEGRAS RECOBRADAS - NO TOMAR. Alternate wording and/or graphics may be submitted to NMED for approval.</p> <p>b) The reclaimed wastewater systems shall have no direct or indirect cross connections with public water systems or irrigation wells pursuant to the latest revision of the</p>																								

#	Terms and Conditions
	<p>New Mexico Plumbing Code (14.8.2 NMAC) and New Mexico Mechanical Code (14.9.2 NMAC).</p> <ul style="list-style-type: none"> c) Above-ground use of reclaimed wastewater shall not result in excessive ponding of wastewater, and shall not exceed the water consumptive needs of the crop. Re-use shall not be conducted at times when the re-use area is saturated or frozen. d) The discharge of reclaimed wastewater shall be confined to the re-use area. e) The discharge of reclaimed domestic wastewater to crops for human consumption is prohibited. f) Water supply wells within 200 feet of a re-use area shall have adequate wellhead construction pursuant to 19.27.4 NMAC. Re-use shall be managed to ensure protection of ground water quality. g) Existing and accessible portions of the reclaimed wastewater distribution system (with the exception of application equipment such as sprinklers or pivots) shall be colored purple or clearly labeled as being part of a reclaimed wastewater distribution system. Piping, valves and outlets that are installed during the term of this Discharge Permit shall be colored purple pursuant to the latest revision of the New Mexico Plumbing Code (14.8.2 NMAC) and New Mexico Mechanical Code (14.9.2 NMAC) to differentiate piping or fixtures used to convey reclaimed wastewater from those intended for potable or other uses. Valves, outlets, and sprinkler heads used in reclaimed wastewater systems shall be accessible only to authorized personnel. <p>[Subsections B and C of 20.6.2.3109 NMAC, NMSA 1978, § 74-6-5.D]</p>
11.	<p>The permittee shall meet the following setbacks, access restrictions and equipment requirements for spray irrigation using Class 2 reclaimed domestic wastewater:</p> <ul style="list-style-type: none"> a) A minimum 100-foot setback shall be maintained between any dwellings or occupied establishments and the edge of the re-use area. b) Irrigation using reclaimed wastewater shall be postponed at times when windy conditions may result in drift of reclaimed wastewater outside the re-use area. c) Access to the re-use area shall be restricted by perimeter fencing using four-strand barbed wire and a locking gate, or other access controls approved by NMED. d) Public access shall be prohibited during times when reclaimed wastewater is being applied to the re-use area. e) The spray irrigation system shall be limited to low trajectory spray nozzles. <p>[Subsections B and C of 20.6.2.3109 NMAC, NMSA 1978, § 74-6-5.D]</p>
12.	<p>In the event that a cross-connection with fresh water exists, the permittee shall institute a backflow prevention method to protect wells and public water supply systems from contamination by reclaimed wastewater prior to discharging to the re-use area. Backflow prevention shall be achieved by a total disconnect (physical air gap separation between the discharge pipe and the liquid surface at least twice the diameter of the discharge pipe), or by a reduced pressure principal backflow prevention assembly (RP) installed on the line between the fresh water supply wells or public water supply and the</p>

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	<p>reclaimed wastewater delivery system. Backflow prevention shall be maintained at all times.</p> <p>RP devices shall be inspected and tested by a certified backflow prevention assembly tester at the time of installation, repair or relocation and at least on an annual basis thereafter. The backflow prevention assembly tester shall have successfully completed a 40-hour backflow prevention course based on the University of Southern California's Backflow Prevention Standards and Test Procedures, and obtained certification demonstrating completion. A malfunctioning RP device shall be repaired or replaced within 30 days of discovery, and use of all supply lines associated with the RP device shall cease until repair or replacement has been completed. Copies of the inspection and maintenance records and test results for each RP device associated with the backflow prevention program shall be maintained at a location available for inspection by NMED.</p> <p>[Subsection C of 20.6.2.3109 NMAC]</p>
13.	<p>The permittee shall maintain 18 to 24-inch berms around the re-use area to prevent surface water run-on and run-off. The berms shall be inspected on a regular basis and after any major precipitation event, and repaired as necessary.</p> <p>[Subsection C of 20.6.2.3109 NMAC]</p>
14.	<p>The permittee shall maintain fences around the WWTF to control access by the general public and animals. The fences shall consist of a minimum of six-foot chain link or field fencing and locking gates. Fences shall be maintained throughout the term of this Discharge Permit.</p> <p>[Subsections B and C of 20.6.2.3109 NMAC, NMSA 1978, § 74-6-5.D]</p>
15.	<p>The permittee shall maintain signs indicating that the wastewater at the facility is not potable. Signs shall be posted at the facility entrance and other areas where there is potential for public contact with wastewater. All signs shall be printed in English and Spanish remain visible and legible for the term of this Discharge Permit.</p> <p>[Subsections B and C of 20.6.2.3109 NMAC, NMSA 1978, § 74-6-5.D]</p>
16.	<p>The permittee shall maintain the impoundment liner(s) in such a manner as to avoid conditions which could affect the structural integrity of the impoundment(s) and/or impoundment liner(s). Such conditions include or may be characterized by the following:</p> <ul style="list-style-type: none"> • erosion damage; • animal burrows or other damage; • the presence of vegetation including aquatic plants, weeds, woody shrubs or trees growing within five feet of the top inside edge of a sub-grade impoundment, within five feet of the toe of the outside berm of an above-grade impoundment, or within the

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	<p>impoundment itself;</p> <ul style="list-style-type: none"> the presence of large debris or large quantities of debris in the impoundment; evidence of seepage; and evidence of berm subsidence. <p>Vegetation growing around the impoundment shall be routinely controlled by mechanical removal in a manner that is protective of the impoundment liner.</p> <p>The permittee shall visually inspect the impoundment(s) and surrounding berms on a monthly basis to ensure proper maintenance. In the event that inspection reveals any evidence of damage that threatens the structural integrity of an impoundment berm or liner, or that may result in an unauthorized discharge, the permittee shall enact the contingency plan set forth in this Discharge Permit.</p> <p>[Subsection A of 20.6.2.3107 NMAC, Subsection C of 20.6.2.3109 NMAC]</p>
17.	<p>The permittee shall preserve a minimum of two feet of freeboard between the liquid level in the impoundment(s) and the elevation of the top of the impoundment liner. In the event that the permittee determines that two feet of freeboard cannot be preserved in the impoundment, the permittee shall enact the contingency plan set forth in this Discharge Permit.</p> <p>[Subsection A of 20.6.2.3107 NMAC, Subsection C of 20.6.2.3109 NMAC]</p>
18.	<p>The permittee shall inspect the Valle Vista Subdivision lift station on a weekly basis (at a minimum), and clean as needed to prevent pump failure. The permittee shall maintain a record of lift station inspections, repairs and cleanings.</p> <p>[Subsection A of 20.6.2.3107 NMAC, Subsection C of 20.6.2.3109 NMAC]</p>
19.	<p>The permittee shall utilize operators, certified by the State of New Mexico at the appropriate level, to operate the wastewater collection, treatment and disposal systems. The operations and maintenance of all or any part of the wastewater system shall be performed by, or under the direct supervision of, a certified operator.</p> <p>[Subsection C of 20.6.2.3109 NMAC, 20.7.4 NMAC]</p>

B. MONITORING AND REPORTING

#	Terms and Conditions
20.	<p>The permittee shall conduct the following monitoring, reporting, and other requirements listed below in accordance with the monitoring requirements of this Discharge Permit.</p>

#	Terms and Conditions
	[Subsection A of 20.6.2.3107 NMAC, Subsection C of 20.6.2.3109 NMAC]
21.	<p>METHODOLOGY – Unless otherwise approved in writing by NMED, the permittee shall conduct sampling and analysis in accordance with the most recent edition of the following documents:</p> <ul style="list-style-type: none"> a) American Public Health Association, Standard Methods for the Examination of Water and Wastewater (18th, 19th or current) b) U.S. Environmental Protection Agency, Methods for Chemical Analysis of Water and Waste c) U.S. Geological Survey, Techniques for Water Resources Investigations of the U.S. Geological Survey d) American Society for Testing and Materials, Annual Book of ASTM Standards, Part 31. Water e) U.S. Geological Survey, et al., National Handbook of Recommended Methods for Water Data Acquisition f) Federal Register, latest methods published for monitoring pursuant to Resource Conservation and Recovery Act regulations g) Methods of Soil Analysis: Part 1. Physical and Mineralogical Methods; Part 2. Microbiological and Biochemical Properties; Part 3. Chemical Methods, American Society of Agronomy <p>[Subsection B of 20.6.2.3107 NMAC]</p>
22.	<p>The permittee shall submit quarterly monitoring reports to NMED for the most recently completed quarterly period by the 1st of February, May, August and November each year.</p> <p>Quarterly monitoring shall be performed during the following periods and submitted as follows:</p> <ul style="list-style-type: none"> • January 1st through March 31st (first quarter) – due by May 1st • April 1st through June 30th (second quarter) – due by August 1st • July 1st through September 30th (third quarter) – due by November 1st • October 1st through December 31st (fourth quarter) – due by February 1st <p>[Subsection A of 20.6.2.3107 NMAC]</p>

Monitoring Actions with Implementation Deadlines

#	Terms and Conditions
23.	<p>Within 90 days of the effective date of this Discharge Permit (by November 13, 2012), the permittee shall install the following new monitoring well.</p> <ul style="list-style-type: none"> • One monitoring well (MW-4) to be located 20 to 50 feet hydrologically downgradient of the north re-use area's irrigated boundary.

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	<p>The well shall be completed in accordance with the attachment titled <i>Ground Water Discharge Permit Monitoring Well Construction and Abandonment Conditions</i>, Revision 1.1, March 2011. Construction and lithologic logs shall be submitted to NMED within 30 days of well completion.</p> <p>Unless otherwise noted in this Discharge Permit, the requirement to install a monitoring well downgradient of a source is <u>not</u> contingent upon construction of or discharge of wastewater to that source, or discharge of wastewater from the facility.</p> <p>[Subsection A of 20.6.2.3107 NMAC]</p>
24.	<p>Following installation of the monitoring well required to be installed by this Discharge Permit, the permittee shall sample ground water in the well and analyze the samples for dissolved TKN, NO₃-N, TDS and Cl.</p> <p>Ground water sample collection, preservation, transport and analysis shall be performed according to the following procedure:</p> <ol style="list-style-type: none"> Measure the depth-to-most-shallow ground water from the top of the well casing to the nearest hundredth of a foot. Purge three well volumes of water from the well prior to sample collection. Obtain samples from the well for analysis. Properly prepare, preserve and transport samples. Analyze samples in accordance with the methods authorized in this Discharge Permit. <p>Depth-to-most-shallow ground water measurements, analytical results, including the laboratory QA/QC summary report, and a facility layout map showing the location and number of the well shall be submitted to NMED within 45 days of the installation of the monitoring well.</p> <p>[Subsection A of 20.6.2.3107 NMAC]</p>
25.	<p>Within 150 days following the effective date of this Discharge Permit (by January 12, 2013), the permittee shall survey all wells approved by NMED for Discharge Permit monitoring purposes to a U.S. Geological Survey (USGS) or other permanent benchmark. Survey data shall include northing, easting and elevation to the nearest hundredth of a foot or shall be in accordance with the "Minimum Standards for Surveying in New Mexico" (12.8.2 NMAC). A survey elevation shall be established at the top-of-casing, with a permanent marking indicating the point of survey. The survey shall bear the seal and signature of a licensed New Mexico professional surveyor (pursuant to the New Mexico Engineering and Surveying Practice Act and the rules promulgated under that authority).</p> <p>Depth-to-most-shallow ground water shall be measured to the nearest hundredth of a foot in all surveyed wells, and the data shall be used to develop a ground water elevation</p>

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	<p>contour map showing the location of all monitoring wells and the direction and gradient of ground water flow at the facility. The data and ground water elevation contour map shall be submitted to NMED within 30 days of survey completion.</p> <p>[Subsection A of 20.6.2.3107 NMAC, NMSA 1978, §§ 61-23-1 through 61-23-32]</p>
26.	<p>Once prior to the date that the term of this Discharge Permit ends, NMED shall have the option to perform downhole inspections of all monitoring wells identified in this Discharge Permit. NMED shall establish the inspection date and provide at least 60 days notice to the permittee by certified mail. The permittee shall have any existing dedicated pumps removed at least 48 hours prior to NMED inspection to allow adequate settling time of sediment agitated from pump removal.</p> <p>Should a facility not have existing dedicated pumps, but decide to install pumps in any of the monitoring wells, NMED shall be notified at least 90 days prior to pump installation so that a downhole well inspection(s) can be scheduled prior to pump placement.</p> <p>[Subsections A and D of 20.6.2.3107 NMAC]</p>

Ground Water Monitoring Conditions

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27.	<p>The permittee shall perform quarterly ground water sampling in the following monitoring wells and analyze the samples for dissolved TKN, NO₃-N, TDS and Cl:</p> <ul style="list-style-type: none"> • MW-1, intended to be located hydrologically upgradient and 50 feet northeast of stabilization impoundment #2. • MW-2, intended to be located hydrologically downgradient and 50 feet northwest of stabilization impoundment #1. • MW-3, intended to be located hydrologically downgradient and 40 feet west of stabilization impoundment #1. • MW-4, intended to be located hydrologically downgradient and within 20-50 feet west of the north re-use area's irrigated boundary. <p>Ground water sample collection, preservation, transport and analysis shall be performed according to the following procedure:</p> <ol style="list-style-type: none"> a) Measure the depth-to-most-shallow ground water from the top of the well casing to the nearest hundredth of a foot. b) Purge three well volumes of water from the well prior to sample collection. c) Obtain samples from the well for analysis. d) Properly prepare, preserve and transport samples. e) Analyze samples in accordance with the methods authorized in this Discharge Permit.

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	<p>Depth-to-most-shallow ground water measurements, analytical results, including the laboratory QA/QC summary report, and a facility layout map showing the location and number of each well shall be submitted to NMED in the quarterly monitoring report each year.</p> <p>[Subsection A of 20.6.2.3107 NMAC]</p>

Facility Monitoring Conditions

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28.	<p>The permittee shall measure the totalized, average daily and peak daily volume of wastewater discharged to the treatment facility each month using a primary measuring device (equipped with head sensing, totalizing and chart recording/data logging mechanisms) located at the WWTF entrance works. The totalized, average daily and peak daily discharge volumes for each month shall be submitted to NMED in the quarterly monitoring reports.</p> <p>[Subsection A of 20.6.2.3107 NMAC, Subsections C and H of 20.6.2.3109 NMAC]</p>
29.	<p>The permittee shall measure the monthly volume of reclaimed wastewater discharged from the clay-lined storage impoundment to the re-use area. The permittee shall obtain readings from a totalizing flow meter located on pump transfer line on a monthly basis and calculate the monthly and average daily discharge volume. The monthly volume discharged shall be used on the LADS to calculate nitrogen loading.</p> <p>The monthly meter readings, and calculated monthly and average daily discharge volumes shall be submitted to NMED in the quarterly monitoring reports each year.</p> <p>[Subsection A of 20.6.2.3107 NMAC, Subsections C and H 20.6.2.3109 NMAC]</p>
30.	<p>All flow meters shall be capable of having their accuracy ascertained under actual working (field) conditions. A field calibration method shall be developed for each flow meter and that method shall be used to check the accuracy of each respective meter. Field calibrations shall be performed upon repair or replacement of a flow measurement device and, at a minimum, on an annual basis.</p> <p>Flow meters shall be calibrated to within plus or minus 10 percent of actual flow, as measured under field conditions. Field calibrations shall be performed by an individual knowledgeable in flow measurement and in the installation/operation of the particular device in use. A flow meter calibration report shall be prepared for each flow measurement device at the frequency calibration is required. The flow meter calibration report shall include the following information:</p> <p>a) The location and meter identification.</p>

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	<p>b) The method of flow meter field calibration employed.</p> <p>c) The measured accuracy of each flow meter prior to adjustment indicating the positive or negative offset as a percentage of actual flow as determined by an in-field calibration check.</p> <p>d) The measured accuracy of each flow meter following adjustment, if necessary, indicating the positive or negative offset as a percentage of actual flow of the meter.</p> <p>e) Any flow meter repairs made during the previous year or during field calibration.</p> <p>The permittee shall maintain records of flow meter calibration(s) at a location accessible for review by NMED during facility inspections.</p> <p>[Subsection A of 20.6.2.3107 NMAC, Subsections C and H 20.6.2.3109 NMAC]</p>
31.	<p>The permittee shall visually inspect flow meters on a monthly basis for evidence of malfunction. If a visual inspection indicates a flow meter is not functioning as required by this Discharge Permit, the permittee shall repair or replace the meter within 30 days of discovery. For <i>repaired</i> meters, the permittee shall submit a report to NMED with the next monitoring report following the repair that includes a description of the malfunction; a statement verifying the repair; and a flow meter field calibration report completed in accordance with the requirements of this Discharge Permit. For <i>replacement</i> meters, the permittee shall submit a report to NMED with the next monitoring report following the replacement that includes a design schematic for the device and a flow meter field calibration report completed in accordance with the requirements of this Discharge Permit.</p> <p>[Subsection A of 20.6.2.3107 NMAC, Subsection C of 20.6.2.3109 NMAC]</p>
32.	<p>The permittee shall collect samples of reclaimed wastewater from the outlet of the clay-lined storage impoundment on a quarterly basis and analyze the samples for TKN, NO₃-N, TDS and Cl.</p> <p>In the event that discharge does not occur for an entire quarterly period, the permittee shall collect a composite wastewater sample from a representative location within the clay-lined storage impoundment and analyze the sample for TKN, NO₃-N, TDS and Cl. The composite sample shall consist of a minimum of six equal aliquots collected around the entire perimeter of the impoundment and thoroughly mixed.</p> <p>Samples shall be properly prepared, preserved, transported and analyzed in accordance with the methods authorized in this Discharge Permit. Analytical results shall be submitted to NMED in the quarterly monitoring reports.</p> <p>[Subsection A of 20.6.2.3107 NMAC, Subsections C and H of 20.6.2.3109 NMAC]</p>

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33.	<p>During any month that the discharge of reclaimed wastewater occurs, the permittee shall perform the following analyses on reclaimed wastewater samples collected from the outlet of the clay-lined storage impoundment using the following sampling method and frequency:</p> <ul style="list-style-type: none"> • Fecal coliform bacteria: grab sample once per month. • BODs: grab sample once per month. • TSS: grab sample once per month. • TRC concentrations: record whenever fecal coliform samples are collected. <p>Samples shall be properly prepared, preserved, transported and analyzed in accordance with the methods authorized in this Discharge Permit. Analytical results and a copy of the log of TRC concentrations shall be submitted to NMED in the quarterly monitoring reports.</p> <p>[Subsection A of 20.6.2.3107 NMAC, Subsections B, C and H of 20.6.2.3109 NMAC, NMSA 1978, § 74-6-5.D]</p>
34.	<p>On an annual basis, the permittee shall collect a grab sample of reclaimed wastewater from the outlet of the clay-lined storage impoundment and analyze the sample for the following inorganic constituents:</p> <ul style="list-style-type: none"> • aluminum • arsenic • barium • boron • cadmium • chromium • cobalt • copper • cyanide • fluoride • iron • lead • manganese • molybdenum • mercury • pH (instantaneous) • nickel • radioactivity: combined radium-226 & radium-228 • selenium • silver • sulfate • uranium • zinc <p>Samples shall be properly prepared, preserved, transported and analyzed in accordance with the methods authorized in this Discharge Permit. Analytical results shall be submitted to NMED in the monitoring reports due by August 1st each year.</p> <p>[Subsection A of 20.6.2.3107 NMAC, Subsections C and H of 20.6.2.3109 NMAC]</p>
35.	<p>Once during the term of this Discharge Permit, the permittee shall collect a grab sample of reclaimed wastewater from the outlet of the clay-lined storage impoundment and analyze the sample for the following organic constituents:</p>

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	<ul style="list-style-type: none"> benzene benzo-a-pyrene carbon tetrachloride chloroform 1,1-dichloroethane 1,2-dichloroethane (EDC) 1,1-dichloroethylene (1,1-DCE) ethylbenzene ethylene dibromide (EBD) methylene chloride <u>PAHs</u>: total naphthalene plus monomethylnaphthalenes Phenols Polychlorinated biphenyls (PCBs) toluene 1,1,2,2-tetrachloroethane 1,1,2,2-tetrachloroethylene (PCE) 1,1,1-trichloroethane 1,1,2-trichloroethane 1,1,2-trichloroethylene (TCE) vinyl chloride xylene (total) <p>Samples shall be properly prepared, preserved, transported and analyzed in accordance with the methods authorized in this Discharge Permit. Analytical results shall be submitted to NMED in the monitoring reports due by August 1st each year.</p> <p>[Subsection A of 20.6.2.3107 NMAC, Subsections C and H of 20.6.2.3109 NMAC]</p>
36.	<p>The permittee shall complete LADS (copy enclosed) on a monthly basis that document the amount of nitrogen applied to the re-use area during the most recent 12 months. The LADS shall reflect the total nitrogen concentration from the most recent wastewater analysis and the measured discharge volumes to the re-use area for each month. The LADS shall be completed with information above or shall include a statement that application of wastewater did not occur. The LADS shall be submitted to NMED in the quarterly monitoring reports.</p> <p>[Subsection A of 20.6.2.3107 NMAC, Subsection C of 20.6.2.3109 NMAC]</p>

C. CONTINGENCY PLAN

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37.	<p>In the event that ground water monitoring indicates that a ground water quality standard identified in Section 20.6.2.3103 NMAC is exceeded; the total nitrogen concentration in ground water is greater than 10 mg/L; or a toxic pollutant (defined in Subsection WW of 20.6.2.7 NMAC) is present in a ground water sample and in any subsequent ground water sample collected from a monitoring well required by this Discharge Permit, the permittee shall enact the following contingency plan:</p> <p>Within 60 days of the subsequent sample analysis date, the permittee shall propose</p>

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	<p>measures to ensure that the exceedance of the standard or the presence of a toxic pollutant will be mitigated by submitting a corrective action plan to NMED for approval. The corrective action plan shall include a description of the proposed actions to control the source and an associated completion schedule. The plan shall be enacted as approved by NMED.</p> <p>Once invoked (whether during the term of this Discharge Permit; or after the term of this Discharge Permit and prior to the completion of the Discharge Permit closure plan requirements), this condition shall apply until the permittee has fulfilled the requirements of this condition and ground water monitoring confirms for a minimum of two years of consecutive ground water sampling events that the standards of Section 20.6.2.3103 NMAC are not exceeded and toxic pollutants are not present in ground water.</p> <p>The permittee may be required to abate water pollution pursuant to Sections 20.6.2.4000 through 20.6.2.4115 NMAC, should the corrective action plan not result in compliance with the standards and requirements set forth in Section 20.6.2.4103 NMAC within 180 days of confirmed ground water contamination.</p> <p>[Subsection A of 20.6.2.3107 NMAC, Subsection E of 20.6.2.3109 NMAC]</p>
38.	<p>In the event that information available to NMED indicates that a well(s) is not constructed in a manner consistent with the attachment titled <i>Ground Water Discharge Permit Monitoring Well Construction and Abandonment Conditions</i>, Revision 1.1, March 2011; contains insufficient water to effectively monitor ground water quality; or is not completed in a manner that is protective of ground water quality, the permittee shall install a replacement well(s) within 120 days following notification from NMED.</p> <p>The permittee shall survey the replacement monitoring well(s) within 150 days following notification from NMED.</p> <p>Replacement well location(s) shall be approved by NMED prior to installation and completed in accordance with the attachment titled <i>Ground Water Discharge Permit Monitoring Well Construction and Abandonment Conditions</i>, Revision 1.1, March 2011. The permittee shall submit construction and lithologic logs, survey data and a ground water elevation contour map to NMED within 60 days following well completion.</p> <p>Upon completion of the replacement monitoring well(s), the monitoring well(s) requiring replacement shall be properly plugged and abandoned. Well plugging, abandonment and documentation of the abandonment procedures shall be completed in accordance with the attachment titled <i>Ground Water Discharge Permit Monitoring Well Construction and Abandonment Conditions</i>, Revision 1.1, March 2011, and all applicable local, state, and federal regulations. The well abandonment documentation shall be submitted to NMED within 60 days of completion of well plugging activities.</p>

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	[Subsection A of 20.6.2.3107 NMAC]
39.	<p>In the event that ground water flow information obtained pursuant to this Discharge Permit indicates that a monitoring well(s) is not located hydrologically downgradient of the discharge location(s) it is intended to monitor, the permittee shall install a replacement well(s) within 120 days following notification from NMED. The permittee shall survey the replacement monitoring well(s) within 150 days following notification from NMED.</p> <p>Replacement well location(s) shall be approved by NMED prior to installation and completed in accordance with the attachment titled <i>Ground Water Discharge Permit Monitoring Well Construction and Abandonment Conditions</i>, Revision 1.1, March 2011. The permittee shall submit construction and lithologic logs, survey data and a ground water elevation contour map within 30 days following well completion.</p> <p>[Subsection A of 20.6.2.3107 NMAC]</p>
40.	<p>In the event that analytical results of a quarterly treated wastewater sample indicate an exceedance of the total nitrogen limitation set in this Discharge Permit, the permittee shall collect and analyze a second sample within 30 days of the first sample analysis date. In the event the second sample results indicate that the limitation is continuing to be exceeded, the following contingency plan shall be enacted:</p> <ol style="list-style-type: none"><li>a) Within 15 days of the second sample analysis date indicating that the limitation is continuing to be exceeded, the permittee shall<ol style="list-style-type: none"><li>i) notify NMED that the contingency plan is being enacted; and<li>ii) submit a copy of the first and second analytical results indicating an exceedance to NMED.<li>b) The permittee shall increase the frequency of total nitrogen wastewater sampling and analysis of treated wastewater to once per month.<li>c) The permittee shall examine the operation and maintenance log, required by the Record Keeping conditions of this Discharge Permit, for improper operational procedures.<li>d) The permittee shall conduct a physical inspection of the treatment system to detect abnormalities. Any abnormalities discovered shall be corrected. A report detailing the corrections made shall be submitted to NMED within 30 days of correction.<li>e) In the event that any analytical results from monthly wastewater sampling indicate an exceedance of the total nitrogen limitation, the permittee shall propose to modify operational procedures and/or upgrade the treatment process to achieve the total nitrogen limit by submitting a corrective action plan to NMED for approval. The plan shall include a schedule for completion of corrective actions and shall be submitted within 90 days of the second sample analysis date indicating that the limitation is continuing to be exceeded. The permittee shall initiate implementation of the plan following approval by NMED.

#	Terms and Conditions
	<p>When analytical results from three consecutive months of wastewater sampling do not exceed the limitation, the permittee is authorized to return to a quarterly monitoring frequency.</p> <p>[Subsection A of 20.6.2.3107 NMAC, Subsection C of 20.6.2.3109 NMAC]</p>
41.	<p>In the event that analytical results of a reclaimed domestic wastewater sample indicates an exceedance of any of the maximum limitations for BOD₅, TSS, or fecal coliform bacteria set by this Discharge Permit, the permittee shall collect and analyze a second sample within 24 hours after becoming aware of the exceedance. In the event the second sample results indicate that any maximum limitation is continuing to be exceeded (i.e., confirmed exceedance), the contingency plan below shall be enacted.</p> <p style="text-align: center;">AND / OR</p> <p>In the event that analytical results of a reclaimed domestic wastewater sample indicates an exceedance of any of the 30-day average limitations for BOD₅, TSS, or fecal coliform bacteria set by this Discharge Permit (i.e., confirmed exceedance), the contingency plan below shall be enacted.</p> <p><u>Contingency Plan</u></p> <ul style="list-style-type: none"> a) Within 48 hours of becoming aware of a confirmed exceedance (as identified above), the permittee shall: <ul style="list-style-type: none"> i) notify NMED that the contingency plan is being enacted; and ii) submit copies of the recent analytical results indicating an exceedance to NMED. b) The permittee shall examine the operation and maintenance log, required by the Record Keeping conditions of this Discharge Permit, for improper operational procedures. c) The permittee shall conduct a physical inspection of the treatment system to detect abnormalities. Any abnormalities discovered shall be corrected. A report detailing the corrections made shall be submitted to NMED within 30 days following correction. <p>If a facility is required to enact the contingency plan more than two times in a 12-month period, the permittee shall propose to modify operational procedures and/or upgrade the treatment process to achieve consistent compliance with the maximum and 30-day average limitations by submitting a corrective action plan for NMED approval. The plan shall include a schedule for completion of corrective actions and shall be submitted within 60 days following the second sample analysis date. The permittee shall initiate implementation of the plan following approval by NMED. Additional sampling of any stored reclaimed wastewater may be required by NMED in response to the submitted corrective action plan.</p>

#	Terms and Conditions
	[Subsection A of 20.6.2.3107 NMAC, Subsection C of 20.6.2.3109 NMAC]
42.	<p>In the event that the LADS show that the amount of nitrogen in wastewater applied in any 12-month period exceeds 200 pounds per acre, the permittee shall propose the reduction of nitrogen loading to the re-use area by submitting a corrective action plan to NMED for approval. The plan shall include a schedule for completion of corrective actions and shall be submitted within 90 days following the end of the monitoring period in which the exceedance occurred. The permittee shall initiate implementation of the plan following approval by NMED.</p> <p>[Subsection A of 20.6.2.3107 NMAC, Subsection C of 20.6.2.3109 NMAC]</p>
43.	<p>In the event that inspection findings reveal significant damage likely to affect the structural integrity of the lined impoundment(s) or its ability to contain contaminants, the permittee shall propose the repair or replacement of the impoundment liner(s) by submitting a corrective action plan to NMED for approval. The plan shall be submitted to NMED within 30 days after discovery by the permittee or following notification from NMED that significant liner damage is evident. The corrective action plan shall include a schedule for completion of corrective actions and the permittee shall initiate implementation of the plan following approval by NMED.</p> <p>[Subsection A of 20.6.2.3107 NMAC, Subsection C of 20.6.2.3109 NMAC]</p>
44.	<p>In the event that a minimum of two feet of freeboard cannot be preserved in the impoundment(s), the permittee shall take actions authorized by this Discharge Permit and all applicable local, state, and federal regulations to restore the required freeboard.</p> <p>In the event that two feet of freeboard cannot be restored within a period of 72 hours following discovery, the permittee shall propose actions to be immediately implemented to restore two feet of freeboard by submitting a short-term corrective action plan to NMED for approval. Examples of short-term corrective actions include: removing excess wastewater from the impoundment through pumping and hauling; or reducing the volume of wastewater discharged to the impoundment. The plan shall include a schedule for completion of corrective actions and shall be submitted within 15 days following the date when the two feet of freeboard limit was initially discovered. The permittee shall initiate implementation of the plan following approval by NMED.</p> <p>In the event that the short-term corrective actions failed to restore two feet of freeboard, the permittee shall propose permanent corrective actions in a long-term corrective action plan submitted to NMED within 90 days following failure of the short-term corrective action plan. Examples include: the installation of an additional storage impoundment, or a significant/permanent reduction in the volume of wastewater discharged to the impoundment. The plan shall include a schedule for completion of corrective actions and implementation of the plan shall be initiated following approval by NMED.</p>

#	Terms and Conditions
	[Subsection A of 20.6.2.3107 NMAC]
45.	<p>In the event that a release (commonly known as a “spill”) occurs that is not authorized under this Discharge Permit, the permittee shall take measures to mitigate damage from the unauthorized discharge and initiate the notifications and corrective actions required in Section 20.6.2.1203 NMAC and summarized below.</p> <p>Within <u>24 hours</u> following discovery of the unauthorized discharge, the permittee shall verbally notify NMED and provide the following information:</p> <ol style="list-style-type: none"> The name, address, and telephone number of the person or persons in charge of the facility, as well as of the owner and/or operator of the facility. The name and address of the facility. The date, time, location, and duration of the unauthorized discharge. The source and cause of unauthorized discharge. A description of the unauthorized discharge, including its estimated chemical composition. The estimated volume of the unauthorized discharge. Any actions taken to mitigate immediate damage from the unauthorized discharge. <p>Within <u>one week</u> following discovery of the unauthorized discharge, the permittee shall submit written notification to NMED with the information listed above and any pertinent updates.</p> <p>Within <u>15 days</u> following discovery of the unauthorized discharge, the permittee shall submit a corrective action report/plan to NMED describing any corrective actions taken and/or to be taken relative to the unauthorized discharge that includes the following:</p> <ol style="list-style-type: none"> A description of proposed actions to mitigate damage from the unauthorized discharge. A description of proposed actions to prevent future unauthorized discharges of this nature. A schedule for completion of proposed actions. <p>In the event that the unauthorized discharge causes or may with reasonable probability cause water pollution in excess of the standards and requirements of Section 20.6.2.4103 NMAC, and the water pollution will not be abated within 180 days after notice is required to be given pursuant to Paragraph (1) of Subsection A of 20.6.2.1203 NMAC, the permittee may be required to abate water pollution pursuant to Sections 20.6.2.4000 through 20.6.2.4115 NMAC.</p> <p>Nothing in this condition shall be construed as relieving the permittee of the obligation to comply with all requirements of Section 20.6.2.1203 NMAC.</p> <p>[20.6.2.1203 NMAC]</p>

#	Terms and Conditions
46.	<p>In the event that NMED or the permittee identifies any failures of the discharge plan or this Discharge Permit not specifically noted herein, NMED may require the permittee to submit a corrective action plan and a schedule for completion of corrective actions to address the failure(s). Additionally, NMED may require a Discharge Permit modification to achieve compliance with 20.6.2 NMAC.</p> <p>[Subsection A of 20.6.2.3107 NMAC, Subsection E of 20.6.2.3109 NMAC]</p>

D. CLOSURE PLAN

Permanent Facility Closure Conditions

#	Terms and Conditions
47.	<p>In the event a facility, or a component of a facility, is proposed to be permanently closed, upon ceasing discharging, the permittee shall perform the following closure measures:</p> <p>Within <u>60 days</u> of ceasing discharging to the impoundment(s), the line leading to the impoundments shall be plugged so that a discharge can no longer occur.</p> <p>Within <u>60 days</u> of ceasing discharging to the impoundment(s), wastewater shall be discharged from the impoundment and any other wastewater system components to the re-use area, as authorized by this Discharge Permit. The discharge of accumulated solids (sludge) from the impoundment to the re-use area is prohibited.</p> <p>Within <u>90 days</u> of ceasing discharging to the impoundment(s), the permittee shall submit a sludge removal and disposal plan to NMED for approval. The permittee shall initiate implementation of the plan within 30 days following approval by NMED. The sludge removal and disposal plan shall include the following:</p> <ol style="list-style-type: none"> The estimated volume and dry weight of sludge to be removed and disposed, including measurements and calculations. Analytical results for samples of the sludge taken from the impoundment for TKN, NO₃-N, percent total solids, and any other parameters tested (reported in mg/kg, dry weight basis). The method(s) of <i>sludge removal</i> from the impoundment(s). The method(s) of <i>disposal</i> for all of the sludge (and its contents) removed from the impoundment(s). The method(s) shall comply with all local, state and federal regulations, including 40 CFR Part 503. <i>Note: A proposal that includes the surface disposal of sludge may be subject to Ground Water Discharge Permitting requirements pursuant to 20.6.2.3104 NMAC that are separate from the requirements of this Discharge Permit.</i> A schedule for completion of sludge removal and disposal not to exceed two years from the date discharge to the impoundment(s) ceased.

#	Terms and Conditions
	<p>Within one year following completion of the sludge removal and disposal, the permittee shall complete the following closure measures:</p> <ol style="list-style-type: none"> Remove all lines leading to and from the impoundment(s), or permanently plug and abandon them in place. Remove or demolish any other wastewater system components and re-grade area with suitable fill to blend with surface topography, promote positive drainage and prevent ponding. Perforate or remove the impoundment liner(s). Fill the impoundment(s) with suitable fill. Re-grade the impoundment site to blend with surface topography, promote positive drainage and prevent ponding. <p>The permittee shall continue ground water monitoring until the requirements of this condition have been met and ground water monitoring confirms for a minimum of two years of consecutive ground water sampling events that the standards of Section 20.6.2.3103 NMAC are not exceeded and toxic pollutants are not present in ground water.</p> <p>If monitoring results show that a ground water quality standard in Section 20.6.2.3103 NMAC is exceeded; the total nitrogen concentration in ground water is greater than 10 mg/L; or a toxic pollutant (defined in Subsection WW of 20.6.2.7 NMAC) is present in ground water, the permittee shall implement the contingency plan required by this Discharge Permit.</p> <p>Following notification from NMED that post-closure monitoring may cease, the permittee shall plug and abandon the monitoring well(s) in accordance with the attachment titled <i>Ground Water Discharge Permit Monitoring Well Construction and Abandonment Conditions</i>, Revision 1.1, March 2011.</p> <p>When all closure and post-closure requirements have been met, the permittee may submit a written request for termination of the Discharge Permit to NMED.</p> <p>[Subsection A of 20.6.2.3107 NMAC, 40 CFR Part 503]</p>

E. GENERAL TERMS AND CONDITIONS

#	Terms and Conditions
48.	<p>RECORD KEEPING - The permittee shall maintain a written record of the following information:</p> <ol style="list-style-type: none"> Information and data used to complete the application for this Discharge Permit. Records of any releases (commonly known as "spills") not authorized under this Discharge Permit and reports submitted pursuant to 20.6.2.1203 NMAC.

#	Terms and Conditions
	<p>c) Records of the operation, maintenance, and repair of all facilities/equipment used to treat, store or dispose of wastewater.</p> <p>d) Facility record drawings (plans and specifications) showing the actual construction of the facility and bear the seal and signature of a licensed New Mexico professional engineer.</p> <p>e) Copies of monitoring reports completed and/or submitted to NMED pursuant to this Discharge Permit.</p> <p>f) The volume of wastewater or other wastes discharged pursuant to this Discharge Permit.</p> <p>g) Ground water quality and wastewater quality data collected pursuant to this Discharge Permit.</p> <p>h) Copies of construction records (well log) for all ground water monitoring wells required to be sampled pursuant to this Discharge Permit.</p> <p>i) Records of the maintenance, repair, replacement or calibration of any monitoring equipment or flow measurement devices required by this Discharge Permit.</p> <p>j) Data and information related to field measurements, sampling, and analysis conducted pursuant to this Discharge Permit. The following information shall be recorded and shall be made available to NMED upon request:</p> <ul style="list-style-type: none"> i) The dates, location and times of sampling or field measurements; ii) The name and job title of the individuals who performed each sample collection or field measurement; iii) The sample analysis date of each sample; iv) The name and address of the laboratory, and the name of the signatory authority for the laboratory analysis; v) The analytical technique or method used to analyze each sample or collect each field measurement; vi) The results of each analysis or field measurement, including raw data; vii) The results of any split, spiked, duplicate or repeat sample; and viii) A copy of the laboratory analysis chain-of-custody as well as a description of the quality assurance and quality control procedures used. <p>The written record shall be maintained by the permittee at a location accessible during a facility inspection by NMED for a period of at least five years from the date of application, report, collection or measurement and shall be made available to the department upon request.</p> <p>[Subsections A and D of 20.6.2.3107 NMAC]</p>
49.	<p>INSPECTION and ENTRY – The permittee shall allow inspection by NMED of the facility and its operations which are subject to this Discharge Permit and the WQCC regulations. NMED may upon presentation of proper credentials, enter at reasonable times upon or through any premises in which a water contaminant source is located or in which are located any records required to be maintained by regulations of the federal government or the WQCC.</p>

#	Terms and Conditions
	<p>The permittee shall allow NMED to have access to and reproduce for their use any copy of the records, and to perform assessments, sampling or monitoring during an inspection for the purpose of evaluating compliance with this Discharge Permit and the WQCC regulations.</p> <p>Nothing in this Discharge Permit shall be construed as limiting in any way the inspection and entry authority of NMED under the WQA, the WQCC Regulations, or any other local, state or federal regulations.</p> <p>[Subsection D of 20.6.2.3107 NMAC, NMSA 1978, §§ 74-6-9.B and 74-6-9.E]</p>
50.	<p>DUTY to PROVIDE INFORMATION - The permittee shall, upon NMED's request, allow NMED's inspection/duplication of records required by this Discharge Permit and/or furnish to NMED copies of such records.</p> <p>[Subsection D of 20.6.2.3107 NMAC]</p>
51.	<p>MODIFICATIONS and/or AMENDMENTS – In the event the permittee proposes a change to the facility or the facility's discharge that would result in a change in the volume discharged; the location of the discharge; or in the amount or character of water contaminants received, treated or discharged by the facility, the permittee shall notify NMED prior to implementing such changes. The permittee shall obtain approval (which may require modification of this Discharge Permit) by NMED prior to implementing such changes.</p> <p>[Subsection C of 20.6.2.3107 NMAC, Subsections E and G of 20.6.2.3109 NMAC]</p>
52.	<p>PLANS and SPECIFICATIONS – In the event the permittee is proposing to construct a wastewater system or change a process unit of an existing system such that the quantity or quality of the discharge will change substantially from that authorized by this Discharge Permit, the permittee shall submit construction plans and specifications to NMED for the proposed system or process unit prior to the commencement of construction.</p> <p>In the event the permittee implements changes to the wastewater system authorized by this Discharge Permit which result in only a minor effect on the character of the discharge, the permittee shall report such changes (including the submission of record drawings, where applicable) as of January 1 and June 30 of each year to NMED.</p> <p>[Subsections A and C of 20.6.2.1202 NMAC, NMSA 1978, §§ 61-23-1 through 61-23-32]</p>
53.	<p>CIVIL PENALTIES - Any violation of the requirements and conditions of this Discharge Permit, including any failure to allow NMED staff to enter and inspect records or facilities, or any refusal or failure to provide NMED with records or information, may</p>

#	Terms and Conditions
	<p>subject the permittee to a civil enforcement action. Pursuant to WQA 74-6-10(A) and (B), such action may include a compliance order requiring compliance immediately or in a specified time, assessing a civil penalty, modifying or terminating the Discharge Permit, or any combination of the foregoing; or an action in district court seeking injunctive relief, civil penalties, or both. Pursuant to WQA 74-6-10(C) and 74-6-10.1, civil penalties of up to \$15,000 per day of noncompliance may be assessed for each violation of the WQA 74-6-5, the WQCC Regulations, or this Discharge Permit, and civil penalties of up to \$10,000 per day of noncompliance may be assessed for each violation of any other provision of the WQA, or any regulation, standard, or order adopted pursuant to such other provision. In any action to enforce this Discharge Permit, the permittee waives any objection to the admissibility as evidence of any data generated pursuant to this Discharge Permit.</p> <p>[20.6.2.1220 NMAC, NMSA 1978, §§ 74-6-10 and 74-6-10.1]</p>
54.	<p>CRIMINAL PENALTIES – No person shall:</p> <ol style="list-style-type: none"> 1) make any false material statement, representation, certification or omission of material fact in an application, record, report, plan or other document filed, submitted or required to be maintained under the WQA; 2) falsify, tamper with or render inaccurate any monitoring device, method or record required to be maintained under the WQA; or 3) fail to monitor, sample or report as required by a permit issued pursuant to a state or federal law or regulation. <p>Any person who knowingly violates or knowingly causes or allows another person to violate the requirements of this condition is guilty of a fourth degree felony and shall be sentenced in accordance with the provisions of NMSA 1978, § 31-18-15. Any person who is convicted of a second or subsequent violation of the requirements of this condition is guilty of a third degree felony and shall be sentenced in accordance with the provisions of NMSA 1978, § 31-18-15. Any person who knowingly violates the requirements of this condition or knowingly causes another person to violate the requirements of this condition and thereby causes a substantial adverse environmental impact is guilty of a third degree felony and shall be sentenced in accordance with the provisions of NMSA 1978, § 31-18-15. Any person who knowingly violates the requirements of this condition and knows at the time of the violation that he is creating a substantial danger of death or serious bodily injury to any other person is guilty of a second degree felony and shall be sentenced in accordance with the provisions of NMSA 1978, § 31-18-15.</p> <p>[20.6.2.1220 NMAC, NMSA 1978, §§ 74-6-10.2.A through 74-6-10.2.F]</p>
55.	<p>COMPLIANCE with OTHER LAWS - Nothing in this Discharge Permit shall be construed in any way as relieving the permittee of the obligation to comply with all applicable federal, state, and local laws, regulations, permits or orders.</p>


#	Terms and Conditions
	[NMSA 1978, § 74-6-5.L]
56.	<p>RIGHT to APPEAL - The permittee may file a petition for review before the WQCC on this Discharge Permit. Such petition shall be in writing to the WQCC within thirty days of the receipt of postal notice of this Discharge Permit and shall include a statement of the issues to be raised and the relief sought. Unless a timely petition for review is made, the decision of NMED shall be final and not subject to judicial review.</p> <p>[20.6.2.3112 NMAC, NMSA 1978, § 74-6-5.O]</p>
57.	<p>TRANSFER of DISCHARGE PERMIT - Prior to the transfer of any ownership, control, or possession of this facility or any portion thereof, the permittee shall:</p> <ol style="list-style-type: none"> 1) notify the proposed transferee in writing of the existence of this Discharge Permit; 2) include a copy of this Discharge Permit with the notice; and 3) deliver or send by certified mail to NMED a copy of the notification and proof that such notification has been received by the proposed transferee. <p>Until both ownership and possession of the facility have been transferred to the transferee, the permittee shall continue to be responsible for any discharge from the facility.</p> <p>[20.6.2.3111 NMAC]</p>
58.	<p>PERMIT FEES - Payment of permit fees is due at the time of Discharge Permit approval. Permit fees shall be paid in a single payment or shall be paid in equal installments on a yearly basis over the term of the Discharge Permit. Single payments shall be remitted to NMED no later than 30 days after the Discharge Permit effective date. Initial installment payments shall be remitted to NMED no later than 30 days after the Discharge Permit effective date; subsequent installment payments shall be remitted to NMED no later than the anniversary of the Discharge Permit effective date.</p> <p>Permit fees are associated with <u>issuance</u> of this Discharge Permit. Nothing in this Discharge Permit shall be construed as relieving the permittee of the obligation to pay all permit fees assessed by NMED. A permittee that ceases discharging or does not commence discharging from the facility during the term of the Discharge Permit shall pay all permit fees assessed by NMED. An approved Discharge Permit shall be suspended or terminated if the facility fails to remit an installment payment by its due date.</p> <p>[Subsection F of 20.6.2.3114 NMAC, NMSA 1978, § 74-6-5.K]</p>

V. PERMIT TERM & SIGNATURE

EFFECTIVE DATE: August 15, 2012

TERM ENDS: August 15, 2017

[Subsection H of 20.6.2.3109 NMAC, NMSA 1978, § 74-6-5.I]

FOR 
JERRY SCHOEPPNER
Chief, Ground Water Quality Bureau
New Mexico Environment Department



New Mexico Environment Department Ground Water Quality Bureau Discharge Permit Summary

Facility Information

Facility Name
Discharge Permit Number

Quill Wastewater Treatment Facility
DP-234

Legally Responsible Party

Charles Gara, Division Director
State of New Mexico General Services Department
Property Control Division
1100 St. Francis Drive Rm. 2022
Santa Fe, New Mexico 87501
(505) 827-2141

Treatment, Disposal and Site Information

Primary Waste Type
Facility Type

Domestic Wastewater
Aerated Impoundment System

Treatment Methods

Type	Designation	Description & Comments
Wastewater Treatment System	Solids Separation	Mechanical Bar Screen. Screenings are disposed of in a dumpster and hauled to a landfill for disposal.
	Primary Treatment Impoundments	Consists of two synthetically (hypalon) lined, aerated cells designated as East and West <ul style="list-style-type: none">• May be operated in series or parallel• Cell Capacity: 843,600 gallons each• Surface Area: 0.41 acres (note: The West Impoundment's synthetic liner will be replaced during the term of this Discharge Permit)
	Secondary Stabilization Impoundments	Consists of two synthetically (hypalon) lined cells, designated as East and West <ul style="list-style-type: none">• May be operated in series or parallel• Cell Capacity: 2,888,800 gallons each• Surface Area: 1.98 acres
	Disinfection Unit	Chlorine Contact Chamber equipped with a Sodium Hypochlorite (HTH) tablet dispensing system

Discharge Locations

Type	Designation	Description & Comments
Impoundment	Storage for Irrigation	Clay-lined with concrete sidewalls <ul style="list-style-type: none">• Cell Capacity: 19,953,000 gallons• Surface Area: 5.56 acres
Re-use Area	South Field	38 acres of rangeland
Re-use Area	North Field	57 acres of rangeland



New Mexico Environment Department Ground Water Quality Bureau Discharge Permit Summary

Flow Metering Locations

Type	Designation	Description & Comments
Primary Measurement Device	Influent Entrance Works	Parshall flume equipped with head sensing ultrasonic flow meter and chart recording
Totalizing Flow Meter	Reuse pump station	Transit time flow meter

Ground Water Monitoring Locations

Type	Designation	Description & Comments
Monitoring Well 1	MW-1	Intended to be located hydrologically upgradient and 50 feet northeast of stabilization impoundment #2
Monitoring Well 2	MW-2	Intended to be located hydrologically downgradient and 50 feet northwest of stabilization impoundment #1.
Monitoring Well 3	MW-3	Intended to be located hydrologically downgradient and 40 feet west of stabilization impoundment #1
Monitoring Well 4	MW-4	Intended to be located hydrologically downgradient and within 20-50 feet west of the north re-use area's irrigated boundary (To Be Installed)

Depth-to-Ground Water 90 feet
Total Dissolved Solids (TDS) 170 mg/L

Permit Information

Application Received May 27, 2011 and July 18, 2011
Public Notice Published April 27, 2012
Discharge Permit Issued August 15, 2012
Discharge Permit Term Ends August 15, 2017
Permitted Discharge Volume 280,000 gallons per day

NMED Contact Information

Mailing Address Ground Water Quality Bureau
P.O. Box 5469
Santa Fe, New Mexico 87502-5469

GWQB Telephone Number (505) 827-2900

NMED Lead Staff Steve Pedro
Lead Staff Telephone Number (505) 827-2957
Lead Staff Email steven.pedro@state.nm.us

NMED GROUND WATER QUALITY BUREAU GUIDANCE:

ABOVE GROUND USE OF RECLAIMED DOMESTIC WASTEWATER

January 2007

PURPOSE

This document provides guidance for the above ground use of reclaimed domestic wastewater necessary to ensure protection of public health and the environment. The New Mexico Environment Department (NMED) has developed this guidance document to promote the safe use of reclaimed wastewater to offset the use of limited potable water resources in the State. This guidance document is intended to provide direction for any person seeking to submit an application for a Ground Water Discharge Permit that includes the above ground use of reclaimed wastewater. This document is used by NMED technical staff to ensure consistency in the application review process and in the development of permit requirements. This guidance document will also be made available to the regulated community and their consultants to provide a basis for future facility planning.

Ground Water Discharge Permit applications for above ground use of reclaimed domestic wastewater that follow this guidance document will be approved. However, applicants may make alternative demonstrations to NMED that the existing or proposed discharge of reclaimed domestic wastewater at a specific facility is protective of public health and the environment. NMED encourages the development and implementation of new processes and equipment, and will favorably consider them on a case by case basis.

The generator of the reclaimed wastewater is responsible for discharges of reclaimed wastewater unless this responsibility is assumed by a separate entity pursuant to an approved Ground Water Discharge Permit. Implementation of the requirements for existing dischargers will be determined on an individual facility basis at the time of permit renewal and/or modification.

Finally, the discharge of reclaimed wastewater may also be regulated by the New Mexico Construction Industries Division (CID). For example, the use of reclaimed wastewater for indoor plumbing (e.g., toilet flushing, fire suppression) requires approval from CID.

DEFINITIONS

The following definitions are used in this guidance document:

Agronomic Rate: the rate of application of nutrients to plants that is necessary to satisfy the plants' nutritional requirements while strictly minimizing the amount of nutrients that run off to surface waters or which pass below the root zone of the plants.

Class 1A Reclaimed Wastewater: the highest quality reclaimed wastewater described in this guidance document and can be most broadly utilized except for direct consumption. [approved uses listed in Table 1]

Class 1B Reclaimed Wastewater: the second highest quality reclaimed wastewater described in this guidance document and is suitable for uses in which public exposure is likely. [approved uses listed in Table 1]

Class 2 Reclaimed Wastewater: reclaimed wastewater suitable for uses in which public access and exposure is restricted. [approved uses listed in Table 1]

Class 3 Reclaimed Wastewater: reclaimed wastewater suitable for uses in which public access and exposure is prohibited. [approved uses listed in Table 1]

Domestic wastewater: wastewater containing human excreta and water-carried waste from typical residential plumbing fixtures and activities, including but not limited to wastes from toilets, sinks, bath fixtures, clothes or dishwashing machines and floor drains.

Dwelling unit: a structure which contains bedrooms.

Establishment: a structure used as a place of business, education, or assembly.

Flood Irrigation: land application of reclaimed wastewater by ditches, furrows, pipelines, low flow emitters and other non-sprinkler methods.

Food Crops: any crop intended for human consumption.

Grab Sample: an individual sample collected in less than 15 minutes.

Major WWTP: any treatment plant with a maximum design capacity of 1,000,000 gallons or more per day.

Minor WWTP: any treatment plant with a maximum design capacity of less than 1,000,000 gallons per day.

Monthly Geometric Mean: value calculated by taking the sum of the logarithms (sum log x) of each of the data points from the previous calendar month, dividing the sum by the number of data points and then taking the anti-logarithm of the result (10^y = anti-logarithm of 'y').

NTU: nephelometric turbidity units, measured by a nephelometer.

Occupied establishment: any establishment that is occupied regularly at the time of irrigation.

Peak hourly flow: the highest hourly flow rate within a 24 hour period.

Reclaimed wastewater: domestic wastewater that has been treated to the specified levels for the defined uses set forth in this guidance document and other applicable local, state, or federal regulations.

Spray Irrigation: land application of reclaimed wastewater by dispersing it in the air utilizing equipment which provides a low trajectory application and which minimizes misting of the reclaimed wastewater.

3-hour Composite Sample: three effluent portions collected no closer together than one hour (collected between 8:00 am and 4:00 pm) and composited in proportion to flow.

6-hour Composite Sample: six effluent portions collected no closer together than one hour (collected between 8:00 am and 4:00 pm) and composited in proportion to flow.

24-hour Composite Sample: twenty-four effluent portions collected no closer together than one hour and composited in proportion to flow.

30-day Average:

For fecal coliform bacteria: the geometric mean of the values for all effluent samples collected during a calendar month.

For other than for fecal coliform bacteria: the arithmetic mean of the daily values for all effluent samples collected during a calendar month, calculated as the sum of all daily discharges measured during a calendar month divided by the number of daily discharges measured during that month.

BACKGROUND

This guidance document supersedes the New Mexico Environmental Improvement Division (NMEID) 1985 Policy for the Use of Domestic Wastewater Effluent for Irrigation and NMED's 2003 Policy for the Above Ground Use of Reclaimed Domestic Wastewater. This guidance document establishes reclaimed wastewater quality levels, site restrictions, management practices, and uses for different categories of reclaimed wastewater that are approvable by NMED. Unless an alternative demonstration is proposed by the applicant and accepted by NMED, NMED will propose Ground Water Discharge Permit conditions for above ground discharges of reclaimed wastewater based on the recommendations set forth in this guidance document. While the requirements set forth in this guidance document are deemed protective of public health and the environment, the guidance document does not prevent communities from adopting more stringent requirements.

WASTEWATER TREATMENT PROCESSES

The specified quality levels for Class 1B, Class 2, and Class 3 assume a minimum of conventional secondary wastewater treatment plus disinfection. Class 1A assumes treatment to remove colloidal organic matter, color, and other substances that interfere with disinfection, thereby allowing for the use of the reclaimed wastewater for urban landscaping adjacent to dwelling units or occupied establishments.

GENERAL ABOVE GROUND USE PERMIT CONDITIONS

A. ALL APPROVED USES

1. Whenever reclaimed wastewater is used for any use approved in this guidance document, the wastewater should meet the minimum requirements set forth in this guidance document, unless a demonstration is made that an alternate requirement offers an equivalent protection of public health. The burden of proof for an alternative demonstration rests upon the discharger.
2. Whenever reclaimed wastewater other than Class 1A is used in areas with public access, it should be applied at times and in a manner that minimizes public contact.
3. Whenever reclaimed wastewater is used in areas with restricted public access, the public should be excluded from entering the area.
4. Reclaimed wastewater should only be used for soil compaction or dust control in construction areas where application procedures minimize aerosol drift to public areas.
5. Reclaimed wastewater quality requirements should be measured at the discharge point of the wastewater treatment plant.
6. Signs (in English and Spanish) should be placed at the entrance to areas receiving reclaimed wastewater, and other locations where public access may occur stating: **"NOTICE – THIS AREA IS IRRIGATED WITH RECLAIMED WASTEWATER – DO NOT DRINK"**; **"AVISO – ESTA ÁREA ESTÁ REGADA CON AGUAS NEGRAS RECOBRADAS – NO TOMAR"**. Alternate wording may be approved by NMED.
7. All piping, valves and outlets should be color-coded in purple pursuant to the latest revision of the New Mexico Plumbing and Mechanical Code to differentiate piping or fixtures used to convey reclaimed wastewater from piping or fixtures used for potable or other water. All valves, outlets, and sprinkler heads used in reclaimed wastewater systems should be of a type that can only be operated by authorized personnel. Those

portions of reclaimed wastewater systems that are underground and were installed prior to the adoption of this guidance document are exempt from the purple color-coding requirement if all accessible portions of the reclaimed wastewater system are colored purple or clearly labeled as being part of a reclaimed wastewater distribution system.

8. Reclaimed wastewater systems should have no direct or indirect cross connections with potable water systems pursuant to the latest revision of the New Mexico Plumbing and Mechanical Code. For reclaimed wastewater systems that were installed prior to the adoption of this guidance document, the absence of cross connections may be demonstrated via hydrostatic testing or as-built drawings, supported by an affidavit under oath that no cross connection exists.
9. Above ground use of reclaimed wastewater should not result in excessive standing or pooling of wastewater, and should be applied at the appropriate agronomic rate. Irrigation should not be conducted at times when the receiving area is saturated or frozen.
10. The discharge of reclaimed wastewater should be confined to the area designated and approved for receiving the wastewater. Irrigation should be postponed at times when windy conditions may result in drift of reclaimed wastewater outside the designated area of application.
11. Treatment facilities that provide reclaimed wastewater to parks, golf courses, schools and other areas where human exposure is likely must have an emergency storage pond or alternate disposal method where reclaimed wastewater can be diverted during periods when conditions are unfavorable for approved uses or when the quality requirements defined in this guidance document cannot be met.

B. IRRIGATION OF FOOD CROPS

1. Reclaimed wastewater should not be used for the spray irrigation of food crops.
2. Reclaimed wastewater should not be used for surface irrigation of food crops except where there is no contact between the edible portion of the crop and the wastewater, and the wastewater should have a level of quality no less than Class 1B Reclaimed Wastewater (Table 2).

C. IRRIGATION OF FODDER, FIBER AND SEED CROPS

1. Reclaimed wastewater used for the irrigation of pasture to which milking cows or goats have access should have a level of quality no less than Class 2 Reclaimed Wastewater (Table 2).
2. Except pasture for milk-producing animals, reclaimed wastewater used for the irrigation of fodder, fiber and seed crops should have a level of quality no less than Class 3 Reclaimed Wastewater (Table 2).

D. IRRIGATION OF LANDSCAPES

1. Reclaimed wastewater used for irrigation should be applied such that direct and windblown spray is confined to the area designated and approved for application.
2. Reclaimed wastewater used for the irrigation of freeway landscapes and landscapes in other areas where the public has similarly limited access or exposure should have a level of quality no less than Class 2 Reclaimed Wastewater (Table 2). Public access to the irrigation site must be restricted during the period of application.

3. Reclaimed wastewater used for the irrigation of parks, playgrounds, schoolyards, golf courses, cemeteries and other areas where the public has similarly open access should have a level of quality no less than Class 1B Reclaimed Wastewater (Table 2), and the irrigation system should have low trajectory spray nozzles. *Areas which are spray irrigated and located within 100 feet of a dwelling unit or occupied establishment should only receive Class 1A Reclaimed Wastewater (Tables 2 & 3).*

CLASSIFICATION AND USES OF RECLAIMED WASTEWATER

This guidance document identifies four classes of reclaimed wastewater (Class 1A, Class 1B, Class 2, and Class 3) based on reclaimed wastewater quality and the likelihood of public exposure. Table 1 presents the approved uses.

Table 1. Approved Uses for Reclaimed Wastewater by Class

Class of Reclaimed Wastewater	Approved Uses
Class 1A	All Class 1 uses. <i>No setback limit</i> to dwelling unit or occupied establishment.
	Backfill around potable water pipes
	Irrigation of food crops ¹
Class 1B	Impoundments (recreational or ornamental)
	Irrigation of parks, school yards, golf courses ²
	Irrigation of urban landscaping ²
	Snow making
	Street cleaning
	Toilet flushing
	Backfill around non-potable piping
Class 2	Concrete mixing
	Dust control
	Irrigation of fodder, fiber, and seed crops for milk-producing animals
	Irrigation of roadway median landscapes
	Irrigation of sod farms
	Livestock watering
	Soil compaction
Class 3	Irrigation of fodder, fiber, and seed crops for non-milk-producing animals
	Irrigation of forest trees (silviculture)

¹ Irrigation of food crops should only be allowed for food crops when there is no contact between the edible portion of the crop and the wastewater. Spray irrigation is prohibited for food crops.

² If reclaimed wastewater is applied using spray irrigation, the setback limitation of Table 3 “Spray Irrigation” should be observed.

Class 1A reclaimed wastewater may be used for any purpose except direct consumption, food handling and processing, and spray irrigation of food crops. Class 1B reclaimed wastewater may be used where public exposure is likely, and where the appropriate setback requirements are met (Table 3, page 9). Class 2 and Class 3 reclaimed wastewater may be used where public access is restricted with correspondingly less stringent requirements for treatment and disinfection. Any reclaimed wastewater treated to higher quality than the lower classes may be used for the purposes established for the lower classes. *Other uses of reclaimed wastewater not included in Table 1 will be evaluated on a case by case basis by NMED to determine the appropriate water quality classification for the given use.*

WASTEWATER QUALITY LEVELS AND MONITORING PROTOCOL

This section identifies minimum wastewater quality levels and monitoring frequencies for the various classes of reclaimed wastewater. The frequency of wastewater quality monitoring is patterned after U.S. Environmental Protection Agency (USEPA) requirements for discharges of treated and disinfected wastewater to surface waters. Monitoring requirements are dependent on the quality of reclaimed wastewater produced at the treatment plant and the design capacity of the treatment plant. For example, a “major” wastewater treatment plant (having a maximum design capacity of 1 million gallons or more per day) producing Class 1A Reclaimed Wastewater has the most stringent monitoring requirements. The wastewater quality levels and monitoring frequencies for the various classes of reclaimed wastewater are presented in Table 2. In the event that a facility proposes alternative wastewater quality levels and/or monitoring frequencies, it is the responsibility of the facility owner/operator to demonstrate that the alternative proposal provides an equivalent measure of public health protection as the measures set forth in this guidance document.

Table 2. Wastewater Quality Requirements and Monitoring Frequencies by Class of Reclaimed Wastewater

Class of Reclaimed Wastewater	Wastewater Quality Parameter	Wastewater Quality Requirements		Wastewater Monitoring Requirements	
		30-Day Average	Maximum	Sample Type	Measurement Frequency
Class 1A	BOD ₅	10 mg/l	15 mg/l	Minimum of 6-hour composite	3 tests per week for major WWTP ¹ ; 1 test per 2 weeks for minor WWTP
	Turbidity	3 NTU	5 NTU	Continuous	Continuous
	Fecal Coliform	5 per 100 ml	23 per 100 ml	Grab sample at peak flow	3 tests per week for major WWTP; 1 test per week for minor WWTP
	TRC or UV Transmissivity	Monitor Only	Monitor Only	Grab sample or reading at peak flow	Record values at peak hourly flow when Fecal Coliform samples are collected
Class 1B	BOD ₅	30 mg/l	45 mg/l	Minimum of 6-hour composite	3 tests per week for major WWTP ¹ ; 1 test per 2 weeks for minor WWTP
	TSS	30 mg/l	45 mg/l	Minimum of 6-hour composite	3 tests per week for major WWTP ¹ ; 1 test per 2 weeks for minor WWTP
	Fecal Coliform	100 organisms per 100 ml	200 organisms per 100 ml	Grab sample at peak flow	3 tests per week for major WWTP; 1 test per week for minor WWTP
	TRC or UV Transmissivity	Monitor Only	Monitor Only	Grab sample or reading at peak flow	Record values at peak hourly flow when Fecal Coliform samples are collected

Table 2. Wastewater Quality Requirements and Monitoring Frequencies by Class of Reclaimed Wastewater (continued)

Class of Reclaimed Wastewater	Wastewater Quality Parameter	Wastewater Quality Requirements		Wastewater Monitoring Requirements	
		30-Day Average	Maximum	Sample Type	Measurement Frequency
Class 2	BOD ₅	30 mg/l	45 mg/l	Minimum of 6-hour composite for major WWTP; Grab sample for minor WWTP	1 test per week for major WWTP; 1 test per month for minor WWTP
	TSS	30 mg/l	45 mg/l	Minimum of 6-hour composite for major WWTP; Grab sample for minor WWTP	1 test per week for major WWTP; 1 test per month for minor WWTP
	Fecal Coliform	200 organisms per 100 ml	400 organisms per 100 ml	Grab sample at peak hourly flow	1 test per week for major WWTP; 1 test per month for minor WWTP
	TRC or UV Transmissivity	Monitor Only	Monitor Only	Grab sample or reading at peak hourly flow	Record values at peak hourly flow when Fecal Coliform samples are collected
Class 3	BOD ₅	30 mg/l	45 mg/l	Minimum of 3-hour composite for major WWTP ⁵ ; Grab sample for minor WWTP	1 test per week for major WWTP; 1 test per month for minor WWTP
	TSS	75 mg/l	90 mg/l	Minimum of 3-hour composite for major WWTP; Grab sample for minor WWTP	1 test per week for major WWTP; 1 test per month for minor WWTP
	Fecal Coliform	1,000 organisms per 100 ml	5,000 organisms per 100 ml	Grab sample at peak hourly flow	1 test per week for major WWTP; 1 test per month for minor WWTP
	TRC or UV Transmissivity	Monitor Only	Monitor Only	Grab sample or reading at peak hourly flow	Record values at peak hourly flow when Fecal Coliform samples are collected

Note: *E. coli* may be used in place of Fecal Coliform as an indicator organism, once an equivalency has been established.

ACCESS RESTRICTIONS AND SET-BACK REQUIREMENTS

Table 3 presents the access controls and setback distances necessary to minimize direct and indirect public exposure to reclaimed wastewater. Setback distances recommended in this guidance document are in all cases the distance from the edge of any area receiving reclaimed wastewater to well casings, dwelling units, or occupied establishments.

In addition to the setbacks described in Table 3, all water supply wells within 200 feet of a wetted irrigation area must be evaluated for adequate well head construction and irrigation practices to ensure protection of ground water. NMED may impose additional setbacks as needed to make certain that the application of reclaimed wastewater does not threaten ground water resources.

Table 3. Access Restrictions and Set Back Requirements

Class of Reclaimed Wastewater	Spray Irrigation	Flood Irrigation and Surface Drip Irrigation
Class 1A	<ul style="list-style-type: none"> • No access control • No setback to dwelling unit or occupied establishment • Low pressure/low trajectory irrigation system only 	<ul style="list-style-type: none"> • No access control
Class 1B	<ul style="list-style-type: none"> • No access control; irrigate at times when public exposure is unlikely • 100 ft set-back from dwelling unit or occupied establishment • Low pressure/low trajectory irrigation system only 	<ul style="list-style-type: none"> • No access control; irrigate at times when public exposure is unlikely
Class 2	<ul style="list-style-type: none"> • Access restricted by perimeter fencing using 4-strand barbed wire and locking gate or other NMED approved access controls • 100 ft set-back from dwelling unit or occupied establishment • Low pressure/low trajectory irrigation system only 	<ul style="list-style-type: none"> • Access restricted by perimeter fencing using 4-strand barbed wire and locking gate, or other NMED approved access controls
Class 3	<ul style="list-style-type: none"> • Access restricted by perimeter fencing using 4-strand barbed wire and locking gate • 500 ft set-back from dwelling unit or occupied establishment • Low pressure/low trajectory irrigation system only 	<ul style="list-style-type: none"> • Access restricted by perimeter fencing using 4-strand barbed wire and locking gate • 100 ft set-back to dwelling unit or occupied establishment.



Appendix D.

Manufacturer Information

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MemPulse™ Membrane Bioreactor System

SANTA FE COUNTY QUILL WWTF
DECEMBER 15, 2016

BUDGETARY PROPOSAL NO. 17P1833MBR

Submitted to
Ed DuBois, PE
HDR, Inc.



MEMCOR®
an eVOQUA brand

EXECUTIVE SUMMARY

Thank you for your interest in Evoqua Water Technologies' new MEMCOR® MemPulse MBR system. Our MBR technology uses the latest advances in filtration and biological treatment in a combination specifically designed to create highly efficient aeration in conjunction with the absolute barrier of membrane filtration. The MEMCOR MBR has several key advantages over both conventional treatment processes and competitive MBR membrane systems.

MemPulse™ Air Scour System

- Evoqua's MemPulse MBR system was the first low-energy, high-efficiency aeration system to be introduced to the MBR marketplace, and our competition is still trying to catch up!
- MemPulse uses a simple device with no moving parts to randomly release pulses of high-energy air. MemPulse provides industry-leading cost-to-operate along with leading scour air effectiveness.



Advanced Process

- The Title 22 approved membranes enable effluent from the MEMCOR membranes to meet the most demanding effluent requirements and can be designed to meet stringent permit requirements or beneficial reuse such as urban irrigation, cooling tower make water or indirect reuse.
- Evoqua can provide a process warranty for the entire treatment process, ensuring compatibility between the biological process and membrane filtration system, and providing a single source of responsibility for any issues with the system.

Minimizing Maintenance Requirements

- MemPulse™ provides uniform distribution of mixed liquor and air across the entire membrane tank ensuring a consistent mixed liquor environment for each sub-module preventing preferential fouling of membranes.
- Separate membrane tanks adjacent to the biological tanks provides the ability to independently control the membrane environment and biological process operations, allowing flexibility in operation.

1-800-MEMCOR4

- MEMCOR's Global Service Organization allows us to provide, free of charge to our customers, 24/7 process support via our global MEMCOR helpline.
- If you call this number any time, day or night, you will be connected to a certified MEMCOR Process Technician with real answers to your process challenges.
- This service is available to you as long as you operate a MEMCOR plant at no additional cost.

Remote Monitoring

- Remote monitoring capability allows for real time analysis of critical system parameters to help troubleshoot and support local service people.
- Remote monitoring data logging system allows Evoqua process engineers to analyze system performance and optimize the system configuration for your specific application.

Modular Design/Small Footprint

- MEMCOR's modular design allows our MBR system to fit into nearly any size tank be it new, existing, or designed around competitive systems.
- Due to the elevated mixed liquor suspended solids up to 10,000mg/L, the biological volume required decreases by up to 70% when compared to secondary clarification.

Service Capabilities

Evoqua combines our in-depth system knowledge with our extensive company owned service organization to provide you with qualified local personnel that can manage the preventive and on-going service needs of the proposed MBR system. Our service programs are individually designed to meet the needs of each customer situation. Our service programs can be designed to provide any of the following services:

- Remote data analysis with actionable summary reports
- Completion of on-site membrane clean-in-place procedures
- Treatment system audits and membrane fiber analysis
- Completion of preventive maintenance and parts replacement

We would like to thank you again for your interest in Evoqua's line of MEMCOR Products. We believe that every MEMCOR product comes with more than just equipment – it includes the expansive knowledge of MEMCOR's dedicated team of membrane scientists, engineers, and technicians who stand behind every installation. We are eager to share this expertise with those responsible for providing the world with clean, consistent, and high-quality water.

Should you have any questions regarding this quotation, or would like to request any additional information please contact us the Technical Sales Manager or the Evoqua Regional Representative listed below.

Evoqua Water Technologies LLC:

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Technical Sales Manager, MEMCOR Products
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Facsimile: 978-323-0854
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1 DESIGN INFORMATION

The proposed MBR system is sized to provide consistent filtrate quality based upon the hydraulic and feed water characteristics specified below.

1.1 Influent flows

Hydraulic Conditions	Value	Units
Average Daily Flow	1.0	Millions of gallons per day (MGD)

Note: The plant is not designed for peak flow conditions.

1.2 Influent Water Quality

Influent Water Quality	Value	Units
Biochemical Oxygen Demand (BOD ₅)	323	milligrams/liter (mg/L)
Chemical Oxygen Demand (COD)	*	mg/L
Total Suspended Solids (TSS)	215	mg/L
Ammonia Nitrogen (NH ₃ -N)	25 (assumed)	mg/L
Total Kjeldahl Nitrogen (TKN)	42	mg/L
Total Phosphorus	9	mg/L
Alkalinity	350(assumed)	mg/L as CaCO ₃
Fats, Oils & Grease (FOG), Freon extractable	*	mg/L
Maximum Influent Temperature	*	degrees Celsius (°C)
Minimum Influent Temperature	15 (Assumed)	degrees Celsius (°C)

Notes:

- (1) * Denotes a value which was not specified in the RFQ. All values must be confirmed for any associated process guarantee and membrane warranty.

1.3 Effluent Water Quality

Effluent Water Quality	Value	Units
BOD ₅	<5	mg/L
Total Suspended Solids	<5	mg/L
Ammonia Nitrogen (NH ₃ -N)	<1	mg/L
Total Nitrogen	<3	mg/L
Total Phosphorus	<1	mg/L
Turbidity	<1	NTU

2 DESIGN BASIS

2.1 System Design Basis

The Membrane Bioreactor (MBR) has been designed around the following parameters.

Design Parameter	Value
Membrane Pre-Screening	< 2.0 mm perforated System designed to prevent screen bypass under all conditions
Grit Removal	> 95 % of particles > 150 micron @ SG = 2.0 > 95 % of particles 100 micron, @ SG = 2.6 > 50 % of particles 100-150 micron @ SG = 2.6 Removal efficiency shall meet or exceed these values across a flow range of 25 - 100 % of PHF. System designed to prevent Grit removal bypass under all conditions
Raw Sewage	>90% Municipal
ML Capillary Suction Time (CST)	< 50 seconds
Sludge Retention Time (SRT)	10 days to 22 days
Raw Sewage: Fats, Oils and Greases (FOG) Hydrocarbons	< 80 mg/L < 5 mg/L
MLSS Temperature Range	15 – 35° C
Site Elevation	~100 ft above MSL
Effluent Soluble BOD ₅	< 5 mg/L
Effluent Ammonia	< 1.5 mg/L
Biological Mixed Liquor Suspended Solids (MLSS)	6,000 to 8,000 mg/L
Biological Seed Screening	Through membrane pre-screen or temporary screen of < 1 mm perforated plate or 0.75 mm mesh
Filtrate Pump and Pipework Design	> 9.5 PSI TMP
Bioreactor Foam / Scum Removal	Required Foam / scum removal to be carried out to control coverage to < 30 % of surface area
Bioreactor Waste Streams	WAS and grit dewatering system/s to achieve 95 % removal of > 50 um particles. Scum / Foam to be discharged to WAS dewatering system. Supernatant returned to the headworks prior to grit removal
CIP Waste Disposal	Return to influent balance tank

Notes

- (1) Any additional requirement for neutralization to be decided during detailed design.
- (2) If the wastewater alkalinity is less than the Table value, supplemental alkalinity may be required to ensure the pH does not inhibit bacterium growth.
- (3) Inhibitory Matter and Heavy Metals must be less than the threshold limits (or within any ranges specified), as defined on page 227 of WPCF Manual of Practice No. 8, 1977 Edition (See Appendix II) The wastewater shall also be free of any substance toxic or inhibitory to the biological treatment process as determined by treatability

tests using Method 302B; OECD Guideline for Testing of Chemicals, Adopted 17 July 1992 or International Organization of Standardization, Evaluation of the Ultimate Aerobic Biodegradability of Organic Compounds, ISO/DIS 7827, IOS, Washington, D.C, 1983.

2.2 BioNutra™ Biological Design Information

The following sections outline the design basis for the biological system. The parameters detailed below are based on Average Daily flow conditions and the average wastewater concentrations outlined above in this proposal.

2.2.1 Configuration Information

The proposed biological system is designed with two trains each consisting of an anaerobic, an anoxic and an aerobic tank.

System Configuration	Trains
Number of Parallel Aeration Trains	2
Number of Tanks per train	4

The adjacent tanks use common intermediate walls with the following tank configuration. The proposed configuration of each train is:

Tank	Value	Units
Bioreactor		
Anaerobic volume per Train	21,500	Gal
Anoxic volume per train	40,000	Gal
Anoxic/Aerobic volume per train	40,000	Gal
Aerobic volume per train (Fine Bubble)	40,000	Gal
Post Anoxic volume per train	21,500	Gal
Total Bioreactor volume per train	163,000	Gal
Total Bioreactor volume (Volume 2X 50%)	326,000	Gal
Total HRT	7.82	Hours

Tank	Total Quantity	Dimension/Train		
		Length (ft)	Width (ft)	SWD (ft)
Anaerobic	2	12	15	15.8
Anoxic	2	23	15	15.5
Anoxic/Aerobic	2	23	15	15.5
Aerobic (Fine Bubble)	2	23.8	15	15
Membrane Tank	2	13.85	8.9	10.42

2.2.2 Biological Design Parameters

The following design parameters were used as the basis of design for sizing the proposed biological system.

Design Parameters	Value	Units
Mixed Liquor Suspended Solids (MLSS)	8,000	mg/L
Aerobic Solids Retention Time (SRT)	9	d
Return Sludge Pumping Rate (MOS to Anoxic)	250	% of ADF
Return sludge pumping rate (Aeration tank to Anoxic)	300	% of ADF
Internal Recycle Rate (Anoxic to Anaerobic)	100	% of ADF
Sludge Produced @ 1% consistency	396	Gal/d
Aeration Blower capacity	4839	Lb/day
Aeration Blower capacity	1700	SCFM

2.3 Membrane Operating System Design

This section outlines the design basis for the MemPulse™ membrane system.

Design Criteria	Value for 1MGD	Value for 0.5MGD	Units
Module Type	B40N + MemPulse™	B40N + MemPulse™	-
Modules per Rack	16	16	Nos
Weight of Wet Rack Assembly ¹	1250	1250	lbs
Weight of Fouled Rack Assembly ¹	1800	1800	lbs
Total Number of Membrane Tanks	2	2	Nos
Number of Racks per Tank (installed)	7	3	Nos
Spare Racks Slots per Tank	0	4	Nos
No. of modules installed per Tank	112	48	Nos
Tank Weir Depth	8.3	8.3	ft

Notes:

- (1) Weight provided includes weight of spreader bar.

2.3.1 Membrane System Operation

	ADF	ADF DURING 0.5MGD	UNITS
Flow Condition	1	0.5	MGD
No. of Membrane Tanks in Operation	2	2	—
No. of membrane Tanks in Standby	0	0	—
Net Flux	10.4	12.1	gfd

2.3.2 Membrane System Mixed Liquor Feed Requirements

The following table summarizes the mixed liquor feed flow during average and peak flow events. The feed flow requirements are based on maintaining a MLSS concentration below the maximum allowable concentration in the membrane tank.

PARAMETER	ADF	UNITS
Max MLSS in Membrane Tank	10,500	mg/L
Total Mixed Liquor Feed Flow Required	8,000	gpm

2.3.3 Membrane System Air Scour Requirements

The following table summarizes the air scour requirements during average and peak flow events.

PARAMETER	AVERAGE	UNITS
Air Flow per Tank: Installed Modules	322	SCFM (68°F)
Air Flow per Tank: Max Modules	380	SCFM (68°F)
Discharge pressure	4.6	psi

Notes:

- (1) The actual annual air usage will be dependent upon the frequency and duration of any peak flow events. This is because the aeration flow/module on the Evoqua MemPulse™ is flux dependent.
- (2) Units in short term storage (< 1 day and remaining in Mixed Liquor) must be aerated for 10 minutes every hour.
- (3) Upon the provision of expected annual & daily flow pattern an annual air usage value can be calculated.

2.3.4 Maintaining Membrane Performance

The following table summarizes the maintenance procedures to ensure optimal performance of the MemPulse™ membrane system at average dry weather flow (ADWF).

Parameter	Relaxation	Maintenance Clean	Sodium Hypochlorite CIP	Citric Acid / Sulfuric Acid CIP
Interval Between Cycle	12 min	7 days	90 days	180 days
Cleaning Cycle Duration	60 sec	50 min	480 min	480 min

The expected chemical usage for Average Daily Flow (ADF), including design margin is:

PURPOSE	CHEMICAL	BULK CHEMICAL CONC.	REQ'D SOLUTION CONC.	BULK CHEMICAL PER CIP ¹	DESIGN FREQUENCY	USAGE@ ADF GAL/YR ^{1,2}
Chlorine Maintenance Clean	Sodium Hypochlorite	12.5% w/v Liquid	200 ppm	4 gal	7 days	390
Chlorine Clean-In-Place	Sodium Hypochlorite	12.5% w/v Liquid	1,000 ppm	50 gal	90 days	400
Citric Acid Clean-In-Place	Citric Acid	50.0% w/w Liquid	1% w/w Liquid	119 gal	180 days	483

Notes:

- (1) Excludes chemicals for neutralization (if required).
- (2) Based on continuous operation at ADF during the testing period.

2.3.5 Filtered Water Specification

The equipment offered will provide the following "Filtered Water" quality:

Parameter	Units	Quality (90 percentile) ¹	Quality (Maximum) ¹
Suspended Solids	mg/L	≤ 5	N/S
Turbidity	NTU	≤ 0.2	0.5
Bacteria ²	Log Removal	≥ 4	N/A
Virus ²	Log Removal	≥ 2.0	N/A

Notes:

- (1) Sufficient samples to be taken such that two or more non-conforming results are required to demonstrate non-conformance.
- (2) As measured by filtrate turbidity.

Please find the *MemPulse™ Membrane Bioreactor (MBR) System* brochure and *MEMCOR® B40N Membrane Filtration Module Specification* sheet attached with this proposal.

3 MBR SCOPE OF SUPPLY

The following equipment is included with the proposed scope of supply.

Biological Process Equipment

Qty.	Description
1	Fine bubble diffusers.
1	DO Probe.
2	Mounting Kits for Probes.
1	Controller for Probes.
3	Butterfly valves.
2	Blower discharge valves.
1	Blower discharge pressure transmitter.
2	Blowers.

Membrane Operating System Equipment

Qty.	Description
112	B40N membrane submodules fabricated of oxidant-resistant polyvinylidene fluoride (PVDF) membrane material.
112	MemPulse™ devices.
14	Rack assembly (16 module capacity) consisting of header assemblies, guide racks, mixing skirt, and air dropper tube.
1 Lot	Stainless Steel Cell kit for mounting racks.
3	Centrifugal filtrate suction pump controlled by Variable Frequency Drive. Two (2) duty and one (1) shelf spare.
3	Centrifugal mixed liquor RAS pump designed to return the mixed liquor from the membrane tanks. Two (2) duty and One (1) stand-by.
3	Centrifugal mixed liquor Internal RAS pump designed to return the mixed liquor from the membrane tanks. Two (2) duty and One (1) stand-by.
3	Positive displacement membrane air scour blower designed to meet average and peak air flow requirements. Two (2) duty and One (1) stand-by.
1 lot	Instrumentation integral to monitor and control the membrane system including level transmitters, level switches, flow meters, pressure transmitters, and pressure gauges.
2	Turbidimeter to measure the turbidity of the filtrate from each membrane tank.
1 lot	Valves required for equipment isolation and control of the membrane system including manual and automated valves with pneumatic actuators, check valves, and solenoid valves.
2	Filtrate air release systems.
1	Compressed air system to operate Evoqua supplied valves and leak testing with one air receiver and lead/lag rotary screw compressors.

CIP Chemical Dosing System Equipment

Qty.	Description
1	Sodium hypochlorite dosing system skid. Includes Two (2) dosing pumps and valves and instruments necessary for proper operation and calibration.
1	Citric acid dosing system skid. Includes One (1) dosing pump and valves and instruments necessary for proper operation and calibration.
1 lot	All valves and instruments necessary to monitor and control the CIP process, including: pneumatic valves, chemical injection quills, turbidimeter, pH probe analyzer, etc.

MBR Control System Equipment

Qty.	Description
1	Allen Bradley Compact Logix PLC.
1	Siemens touch screen Human Machine Interface (HMI) with compact flash data storage card.
1	Master Control Panel (MCP).
4	Slave Control Panels for O/I.
1	Remote monitoring system (i.e. Memlog). Includes modem, software, and hardware.
1 lot	Digital and Analog I/O (Input/Output) modules.

Engineering Support

In addition to the mechanical components, instruments, electrical components and control system supplied, the proposed MemPulse™ MBR will be supported by Evoqua Water Technologies' experienced engineering team. The following table details the personal support your MemPulse™ MBR project will receive.

Qty.	Description
3 copies	<p>Standard MEMCOR MemPulse system submittal including:</p> <ul style="list-style-type: none"> - Submittal Approval Form - Process Overview - Valve, Equipment and Instrumentation List - Manufacturer's Cut Sheets - Mechanical Drawings <ul style="list-style-type: none"> o Membrane System P&ID (showing Evoqua supplied equipment) o MBR Tank General Arrangement (including location of termination points) - I/O List - Electrical Bill of Materials - Electrical Drawings <ul style="list-style-type: none"> o Control Single Line o Three Phase Power Single Line o Field Interface Connections o Process Control Panel diagrams
3 copies	<p>Operation and maintenance manuals are included. Manuals will be to Evoqua's commercial standards. This shall include detailed project specific manufacturer drawings, equipment, valves, instruments and pipe schedules. No drawings, except those used internally by consultant/customer are to be reproduced without the expressed, written permission of Evoqua.</p>
1 Lot	<p>Eight hour service-days for manufacturer's services at regular intervals during the project to ensure proper installation and assembly procedures are followed as well as commissioning and training of the MEMCOR MemPulse system. Additional services may be retained at MEMCOR scheduled rates of US\$1650.00 per day, per person plus travel expenses at cost plus 5% mark up. The services included are:</p> <ul style="list-style-type: none"> - On-site supervision that includes MEMCOR installation support and plant pre-commissioning, - On-site services for plant commissioning which includes startup, completion of functional test and initial performance test, <p>Training of operators and technical staff in conjunction of startup. Training will include; equipment description, field instrumentation, control panels, detailed component description, preventive maintenance and troubleshooting.</p>

Equipment and Services Provided by Others

All other works and equipment necessary to complete the project and not shown as being supplied by Evoqua shall be supplied by others, including but not limited to:

- Civil works and any and all building modifications or construction to house the MEMCOR membrane filtration system equipment including all concrete work related with construction, grouting of equipment and else as applicable.
- Unloading, unpacking, storage (according to Evoqua's recommendation), installation, assembly and field erection of the MEMCOR system.
- Interconnecting pipework between the MEMCOR units, between the MEMCOR units and the ancillary equipment (including air scour, compressed air, and chemical cleaning systems), between the MEMCOR units or ancillary equipment and equipment Supplied By Others and between the ancillary equipment.
- Pipe support including pipe hangers for all piping supplied outside the MEMCOR units.
- Pneumatic lines supplying air to the pneumatic actuators.
- Floor drains.
- Safety showers.
- Neutralization system to process the chemical cleaning waste prior to disposal (if applicable)
- Chemical transfer systems for services other than related to the chemical cleaning of the membrane modules, specifically coagulant transfer systems.
- Headworks Equipment (Grit removal and fine screen).
- Mixed liquor re-screening.
- Biological system c/w ancillary equipment.
- Effluent disinfection.
- Disposal system for rinse and CIP waste.
- Filtered water conditioning (if required) and storage.
- Waste activated sludge (WAS) equipment or solids handling system.
- Supply and storage of all chemicals required for MEMCOR membrane filtration system cleaning, maintenance, and/or operation.
- SCADA system.
- Supply and installation of all VFDs, motor control centers, and disconnects, unless otherwise specified.
- Supply and installation of all control wiring, power cabling including cabling tray, conduits, fittings and supports as necessary.
- Installation of control panels not mounted on the MEMCOR units.
- Building power, lighting, main disconnect, power distribution.
- Instrumentation not specifically listed in the MEMCOR scope as specified herein.
- Spare Parts.
- Pump alignment and vibration analysis.
- Lubricants.
- Engineering services other than listed in the MEMCOR scope above including structural or foundation design.
- Supervision of installation.
- Permits and approvals.
- Anchor bolt and anchor bolt calculations (if required by the Engineer) for all equipment supplied in the MEMCOR scope.
- Walkways, handrail, stairways and ladders as required.
- Grouting.

4 PROJECT OVERVIEW

The following table summarizes the contents of this quotation:

MEMCOR® Model:	2 x 112B40N
BioNutre Biological System	Biological Blowers
2 x 112B40N Modules	Filtrate and Air Headers
Filtrate Pumping System	RAS Pumping System
Clean-in-Place (CIP) System	Membrane System Blowers
Chemical Transfer System	Custom Tool Package
Compressed Air System	Manufacturing Services (Commissioning and Training)
O&M Manuals	Warranties
Budgetary Proposal Price for 1MGD:	USD \$1,875,000 (USD One Million Eight Hundred and Seventy Five Thousand only)

Please note that the pricing above does not include insurance, bonds, or any applicable taxes.

The scope of supply and pricing are based on Evoqua's standard equipment selection, standard terms of sale and warranty terms as described herein. Any variations from these standards may affect this budgetary quotation. Additionally, please note that this budgetary quotation is for review and informational purposes only and does not constitute an offer for acceptance.

Payment Terms: 10% on Order, net 30
 15% on Engineering Submittals, staged submittals allowed, net 30
 25% on Order of major rotating equipment, net 30
 45% on Delivery, partial deliveries accepted, net 30
 5% on Start-up, net 30
 Full payment not to exceed 120 days after shipment

Freight: F.O.B. shipping point, with freight prepaid to the jobsite.

Shipments: Estimated 26 weeks after receipt of full information and approved drawings when required.

Drawings: Three (3) sets of submittal drawings, if required, will be issued approximately 12 weeks after receipt and approval of purchase order.

Manuals: Three (3) copies of English language owner's manuals are included. Additional manuals will cost \$150 each.

5 EVOQUA WATER TECHNOLOGIES LLC – STANDARD TERMS OF SALE

1. **Applicable Terms.** These terms govern the purchase and sale of equipment, products, related services, leased products, and media goods if any (collectively herein "Work"), referred to in Seller's proposal ("Seller's Documentation"). Whether these terms are included in an offer or an acceptance by Seller, such offer or acceptance is expressly conditioned on Buyer's assent to these terms. Seller rejects all additional or different terms in any of Buyer's forms or documents.
2. **Payment.** Buyer shall pay Seller the full purchase price as set forth in Seller's Documentation. Unless Seller's Documentation specifically provides otherwise, freight, storage, insurance and all taxes, levies, duties, tariffs, permits or license fees or other governmental charges relating to the Work or any incremental increases thereto shall be paid by Buyer. If Seller is required to pay any such charges, Buyer shall immediately reimburse Seller. If Buyer claims a tax or other exemption or direct payment permit, it shall provide Seller with a valid exemption certificate or permit and indemnify, defend and hold Seller harmless from any taxes, costs and penalties arising out of same. All payments are due within 30 days after receipt of invoice. Buyer shall be charged the lower of 1 ½% interest per month or the maximum legal rate on all amounts not received by the due date and shall pay all of Seller's reasonable costs (including attorneys' fees) of collecting amounts due but unpaid. All orders are subject to credit approval by Seller. Back charges without Seller's prior written approval shall not be accepted.
3. **Delivery.** Delivery of the Work shall be in material compliance with the schedule in Seller's Documentation. Unless Seller's Documentation provides otherwise, delivery terms are ExWorks Seller's factory (Incoterms 2010). Title to all Work shall pass upon receipt of payment for the Work under the respective invoice. Unless otherwise agreed to in writing by Seller, shipping dates are approximate only and Seller shall not be liable for any loss or expense (consequential or otherwise) incurred by Buyer or Buyer's customer if Seller fails to meet the specified delivery schedule.
4. **Ownership of Materials and Licenses.** All devices, designs (including drawings, plans and specifications), estimates, prices, notes, electronic data, software and other documents or information prepared or disclosed by Seller, and all related intellectual property rights, shall remain Seller's property. Seller grants Buyer a non-exclusive, non-transferable license to use any such material solely for Buyer's use of the Work. Buyer shall not disclose any such material to third parties without Seller's prior written consent. Buyer grants Seller a non-exclusive, non-transferable license to use Buyer's name and logo for marketing purposes, including but not limited to, press releases, marketing and promotional materials, and web site content.
5. **Changes.** Neither party shall implement any changes in the scope of Work described in Seller's Documentation without a mutually agreed upon change order. Any change to the scope of the Work, delivery schedule for the Work, any Force Majeure Event, any law, rule, regulation, order, code, standard or requirement which requires any change hereunder shall entitle Seller to an equitable adjustment in the price and time of performance.
6. **Force Majeure Event.** Neither Buyer nor Seller shall have any liability for any breach or delay (except for breach of payment obligations) caused by a Force Majeure Event. If a Force Majeure Event exceeds six (6) months in duration, the Seller shall have the right to terminate the Agreement without liability, upon fifteen (15) days written notice to Buyer, and shall be entitled to payment for work performed prior to the date of termination. "Force Majeure Event" shall mean events or circumstances that are beyond the affected party's control and could not reasonably have been easily avoided or overcome by the affected party and are not substantially attributable to the other party. Force Majeure Event may include, but is not limited to, the following circumstances or events: war, act of foreign enemies, terrorism, riot, strike, or lockout by persons other than by Seller or its sub-suppliers, natural catastrophes or (with respect to on-site work), unusual weather conditions.
7. **Warranty.** Subject to the following sentence, Seller warrants to Buyer that the (i) Work shall materially conform to the description in Seller's Documentation and shall be free from defects in material and workmanship and (ii) the Services shall be performed in a timely and workmanlike manner. Determination of suitability of treated water for any use by Buyer shall be the sole and exclusive responsibility of Buyer. The foregoing warranty shall not apply to any Work that is specified or otherwise demanded by Buyer and is not manufactured or selected by Seller, as to which (i) Seller hereby assigns to Buyer, to the extent assignable, any warranties made to Seller and (ii) Seller shall have no other liability to Buyer under warranty, tort or any other legal theory. The Seller warrants the Work, or any components thereof, through the earlier of (i) eighteen (18) months from delivery of the Work or (ii) twelve (12) months from initial operation of the Work or ninety (90) days from the performance of services (the "Warranty Period"). If Buyer gives Seller prompt written notice of breach of this warranty within the Warranty Period, Seller shall, at its sole option and as Buyer's sole and exclusive remedy, repair or replace the subject parts, re-perform the Service or refund the purchase price. Unless otherwise agreed to in writing by Seller, (i) Buyer shall be responsible for any labor required to gain access to the Work so that Seller can assess the available remedies and (ii) Buyer shall be responsible for all costs of installation of repaired or replaced Work. If Seller determines that any claimed breach is not, in fact, covered by this warranty, Buyer shall pay Seller its then customary charges for any repair or replacement made by Seller. Seller's warranty is conditioned on Buyer's (a) operating and maintaining the Work in accordance with Seller's instructions, (b) not making any

unauthorized repairs or alterations, and (c) not being in default of any payment obligation to Seller. Seller's warranty does not cover (i) damage caused by chemical action or abrasive material, misuse or improper installation (unless installed by Seller) and (ii) media goods (such as, but not limited to, resin, membranes, or granular activated carbon media) once media goods are installed. THE WARRANTIES SET FORTH IN THIS SECTION 7 AND THE WARRANTY SET FORTH IN THE "EXTENDED LOW PRESSURE MEMBRANE MODULE WARRANTY" SECTION OF EVOQUA'S PROPOSAL ARE THE SELLER'S SOLE AND EXCLUSIVE WARRANTIES AND ARE SUBJECT TO THE LIMITATION OF LIABILITY PROVISION BELOW. SELLER MAKES NO OTHER WARRANTIES OF ANY KIND, EXPRESS OR IMPLIED, INCLUDING WITHOUT LIMITATION, ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR PURPOSE.

8. Indemnity. Seller shall indemnify, defend and hold Buyer harmless from any claim, cause of action or liability incurred by Buyer as a result of third party claims for personal injury, death or damage to tangible property, to the extent caused by Seller's negligence. Seller shall have the sole authority to direct the defense of and settle any indemnified claim. Seller's indemnification is conditioned on Buyer (a) promptly, within the Warranty Period, notifying Seller of any claim, and (b) providing reasonable cooperation in the defense of any claim.

9. Assignment. Neither party may assign this Agreement, in whole or in part, nor any rights or obligations hereunder without the prior written consent of the other party; provided, however, the Seller may assign its rights and obligations under these terms to its affiliates or in connection with the sale or transfer of the Seller's business and Seller may grant a security interest in the Agreement and/or assign proceeds of the agreement without Buyer's consent.

10. Termination. Either party may terminate this agreement, upon issuance of a written notice of breach and a thirty (30) day cure period, for a material breach (including but not limited to, filing of bankruptcy, or failure to fulfill the material obligations of this agreement). If Buyer suspends an order without a change order for ninety (90) or more days, Seller may thereafter terminate this Agreement without liability, upon fifteen (15) days written notice to Buyer, and shall be entitled to payment for work performed, whether delivered or undelivered, prior to the date of termination.

11. Dispute Resolution. Seller and Buyer shall negotiate in good faith to resolve any dispute relating hereto. If, despite good faith efforts, the parties are unable to resolve a dispute or claim arising out of or relating to this Agreement or its breach, termination, enforcement, interpretation or validity, the parties will first seek to agree on a forum for mediation to be held in a mutually agreeable site. If the parties are unable to resolve the dispute through mediation, then *any dispute, claim or controversy arising out of or relating to this Agreement or the breach, termination, enforcement, interpretation or validity thereof, including the determination of the scope or applicability of this agreement to arbitrate, shall be determined by arbitration in Pittsburgh, Pennsylvania before three arbitrators who are lawyers experienced in the discipline that is the subject of the dispute and shall be jointly selected by Seller and Buyer. The arbitration shall be administered by JAMS pursuant to its Comprehensive Arbitration Rules and Procedures. The Arbitrators shall issue a reasoned decision of a majority of the arbitrators, which shall be the decision of the panel.* Judgment may be entered upon the arbitrators' decision in any court of competent jurisdiction. The substantially prevailing party as determined by the arbitrators shall be reimbursed by the other party for all costs, expenses and charges, including without limitation reasonable attorneys' fees, incurred by the prevailing party in connection with the arbitration. For any order shipped outside of the United States, any dispute shall be referred to and finally determined by the International Center for Dispute Resolution in accordance with the provisions of its International Arbitration Rules, enforceable under the New York Convention (Convention on the Recognition and Enforcement of Foreign Arbitral Awards) and the governing language shall be English.

12. Export Compliance. Buyer acknowledges that Seller is required to comply with applicable export laws and regulations relating to the sale, exportation, transfer, assignment, disposal and usage of the Work provided under this Agreement, including any export license requirements. Buyer agrees that such Work shall not at any time directly or indirectly be used, exported, sold, transferred, assigned or otherwise disposed of in a manner which will result in non-compliance with such applicable export laws and regulations. It shall be a condition of the continuing performance by Seller of its obligations hereunder that compliance with such export laws and regulations be maintained at all times. BUYER AGREES TO INDEMNIFY AND HOLD SELLER HARMLESS FROM ANY AND ALL COSTS, LIABILITIES, PENALTIES, SANCTIONS AND FINES RELATED TO NON-COMPLIANCE WITH APPLICABLE EXPORT LAWS AND REGULATIONS.

13. LIMITATION OF LIABILITY. NOTWITHSTANDING ANYTHING ELSE TO THE CONTRARY, SELLER SHALL NOT BE LIABLE FOR ANY CONSEQUENTIAL, INCIDENTAL, SPECIAL, PUNITIVE OR OTHER INDIRECT DAMAGES, AND SELLER'S TOTAL LIABILITY ARISING AT ANY TIME FROM THE SALE OR USE OF THE WORK, INCLUDING WITHOUT LIMITATION ANY LIABILITY FOR ALL WARRANTY CLAIMS OR FOR ANY BREACH OR FAILURE TO PERFORM ANY OBLIGATION UNDER THE CONTRACT, SHALL NOT EXCEED THE PURCHASE PRICE PAID FOR THE WORK. THESE LIMITATIONS APPLY WHETHER THE LIABILITY IS BASED ON CONTRACT, TORT, STRICT LIABILITY OR ANY OTHER THEORY.

14. Rental Equipment / Services. Any leased or rented equipment ("Leased Equipment") provided by Seller shall at all times be the property of Seller with the exception of certain miscellaneous installation materials purchased by the Buyer, and no right or property interest is transferred to the Buyer, except the right to use any such Leased Equipment as provided herein. Buyer agrees that it shall not pledge, lend, or create a security interest in, part with possession of, or relocate the Leased Equipment. Buyer shall be responsible to maintain the Leased Equipment in good and efficient working order. At the end of the initial term specified in the order, the terms shall automatically renew for the identical period unless canceled in writing by Buyer or Seller not sooner than three (3) months nor later than one (1) month from termination of the initial order or any renewal terms. Upon any renewal, Seller shall have the right to issue notice of increased pricing which shall be effective for any renewed terms unless Buyer objects in writing within fifteen (15) days of issuance of said notice. If Buyer timely cancels service in writing prior to the end of the initial or any renewal term this shall not relieve Buyer of its obligations under the order for the monthly rental service charge which shall continue to be due and owing. Upon the expiration or termination of this Agreement, Buyer shall promptly make any Leased Equipment available to Seller for removal. Buyer hereby agrees that it shall grant Seller access to the Leased Equipment location and shall permit Seller to take possession of and remove the Leased Equipment without resort to legal process and hereby releases Seller from any claim or right of action for trespass or damages caused by reason of such entry and removal.

15. Miscellaneous. These terms, together with any Contract Documents issued or signed by the Seller, comprise the complete and exclusive statement of the agreement between the parties (the "Agreement") and supersede any terms contained in Buyer's documents, unless separately signed by Seller. No part of the Agreement may be changed or cancelled except by a written document signed by Seller and Buyer. No course of dealing or performance, usage of trade or failure to enforce any term shall be used to modify the Agreement. To the extent the Agreement is considered a subcontract under Buyer's prime contract with an agency of the United States government, in case of Federal Acquisition Regulations (FARs) flow down terms, Seller will be in compliance with Section 44.403 of the FAR relating to commercial items and those additional clauses as specifically listed in 52.244-6, Subcontracts for Commercial Items (OCT 2014). If any of these terms is unenforceable, such term shall be limited only to the extent necessary to make it enforceable, and all other terms shall remain in full force and effect. The Agreement shall be governed by the laws of the Commonwealth of Pennsylvania without regard to its conflict of laws provisions. Both Buyer and Seller reject the applicability of the United Nations Convention on Contracts for the international sales of goods to the relationship between the parties and to all transactions arising from said relationship.

6 EXTENDED LOW PRESSURE MEMBRANE MODULE WARRANTY

1. Term of the Membrane Module Warranty
 - a. This Warranty shall commence ("Commencement Date") on the earlier of:
 - i) wet start up of the equipment, or
 - ii) 6 months after the delivery of the membrane modules to the Owner.
 - b. This Warranty shall continue for a period of five (5) years from the Commencement Date (the "Module Warranty Period").
2. Repair and Replacement Conditions
 - a. In the event an individual membrane module(s) exhibits defects in material or workmanship, as defined in Paragraph 2.b. below, the Seller shall, at its sole option and as the Owner's sole remedy, conduct either of the following:
 - i) Repair the membrane module at no cost to Owner; or
 - ii) Provide replacement membrane modules per the warranty replacement schedule listed in Paragraph 5 below.
 - b. Membrane modules shall be deemed to be exhibiting defects in material or workmanship under the following conditions:
 - i) If the membrane module(s) fails Seller's standard integrity test for MBR and cannot be repaired by the Owner; or
 - ii) If the membrane module(s) fail to meet the filtrate flow capacity, as outlined in the Design Basis in the Contract Documents; or
 - iii) If the membrane module(s) cause the system to exceed the effluent turbidity and/or total suspended solids requirements for this project, as outlined in the Design Basis in the Contract Documents.
 - c. Owner will return to Seller the end of each membrane module with the serial number to qualify for a replacement module.
3. Membrane Module Warranty Exclusions: The Owner recognizes that damage resulting from any of the following shall be excluded from coverage under the low pressure membrane module warranty:
 - a. Any person other than an employee or representative of Seller has altered the membrane operating system without prior written approval by Seller;
 - b. OWNER causing or permitting the membrane modules to dry or to have moisture content below that specified in the operating instructions either during storage or operation. Shutdown, storage, maintenance and start-up procedures of membranes must be as specified in the Operation & Maintenance Manual;
 - c. Mixed liquor suspended solids concentration exceeding a maximum of 14,500 mg/L in the membrane tank;
 - d. Unusual plant upsets, presence of other potential transients or other undefined operating conditions that can affect membrane performance or life. This includes but is not limited to polymer "dumps", fats, oil and grease content in excess of 100 mg/L entering the biological system, the use, malfunction or by-pass of any equipment which allows the accumulation of non-biodegradable material in the membrane tanks, any

bypass of the pre-screen ahead of the aeration basins and/or basket strainers on the membrane tank inlet, rags or debris that fall into the biological or membrane tanks, toxic wastes entering the plant that upset the biological process;

- e. Any damage/defect caused by chemical or physical conditions such as (but not limited to) pH, temperature, chemicals, effluent COD is greater than 50 mg/L or climatic factors outside the recommended operating parameters in the appropriate section of the Operation & Maintenance Manual;
- f. Any damage directly or indirectly related to PLC and/or HMI/SCADA modifications without Seller's express written consent.
- g. Improper maintenance or operation of equipment (including failure to perform periodic chemical cleans) as defined in Seller supplied operating and maintenance manual.
- h. Neutralization and/or reduction of chemical cleaning solutions are performed in the membrane tank without written authorization from Seller;
- i. Supply of influent water exhibiting parameters inconsistent with the parameters determined or specified at time of bid and/or pilot testing.
- j. Sludge retention time (SRT) is:
 - less than 4 days over a 2-day history; or
 - less than as determined by the equation below over any 30-day period:

$$SRT = 12 / 1.029^{(T-20)}$$

Where: SRT = minimum SRT for biological process (average for any 30-day period)

 T = wastewater temperature (°C); or
 - greater than 80 days over a 30-day period.

4. Warranty Conditions: This warranty is conditioned upon Owner:

- a. Not being in default of any payment obligations to Seller; and
- b. Maintaining hand-written or electronic operational logs and providing such logs to Seller in the event of a warranty claim.
- c. Unless the capillary suction time (CST) is less than 20 seconds for mixed liquor before the membrane tank, the CST method should be as defined in Standard Methods for the Examination of Wastewater Treatment (latest edition), except that a 10-mm diameter stainless steel reservoir should be utilized rather than an 18-mm diameter.

5. Warranty Replacement Schedule

- a. **First 12 Months:** If a membrane module shall require replacement under the repair and replacement conditions described in section 2 above during the first twelve (12) months of the "Module Warranty Period", a replacement will be supplied by Seller at no charge.
- b. **Next 84 Months:** If a low pressure membrane module shall require replacement under the repair and replacement conditions described in section 2 above during the next eighty-four (84) months of the Module Warranty Period, a replacement will be supplied by Seller and invoiced based upon a pro-rata value of a

total of ninety-six (96) months. The pro-rata value shall be determined using a replacement price of US\$1,400.00 per module adjusted by the increase in the North American Consumer Price Index (CPI) All Urban Consumers (US City Average), and reducing this price by 1/60th for each month remaining in the 60-month period.

- c. Replacement modules supplied by the Seller to Owner under warranty shall assume the balance of the membrane module warranty that remained on the defective membrane module that was replaced under warranty.
 - d. Freight costs associated with the furnishing of replacement modules provided under the membrane module warranty is not included in the warranty replacement price. Accordingly, the shipping/delivery terms for replacement modules supplied under the membrane module warranty shall be "Ex Works Seller's Facility" and Seller shall arrange, and Owner shall pay for, transportation of replacement membrane modules to Owner's facility.
6. IN NO EVENT SHALL SELLER BE LIABLE FOR ANY INDIRECT, CONSEQUENTIAL, INCIDENTAL, SPECIAL, PUNITIVE OR OTHER DAMAGES AND SELLER'S TOTAL LIABILITY UNDER THIS MEMBRANE MODULE WARRANTY, WHEN ADDED TO ALL LIABILITY OF SELLER TO THE OWNER AND ANY END USER OF THE SYSTEM, IF DIFFERENT FROM THE OWNER, UNDER THE SYSTEM SALE CONTRACT, SHALL NOT EXCEED THE LIMITATION ON LIABILITY SET FORTH IN THE SYSTEM SALE CONTRACT. THE FOREGOING LIMITATIONS APPLY REGARDLESS OF WHETHER THE LIABILITIES OR DAMAGES ARISE OR ARE ALLEGED TO ARISE UNDER CONTRACT, TORT, STRICT LIABILITY OR ANY OTHER THEORY. The Warranty is expressly excluded from any performance bond(s) which may be furnished by the Seller.



Project Name: Santa Fe County, NM

Prepared For: Edward Dubois - HDR

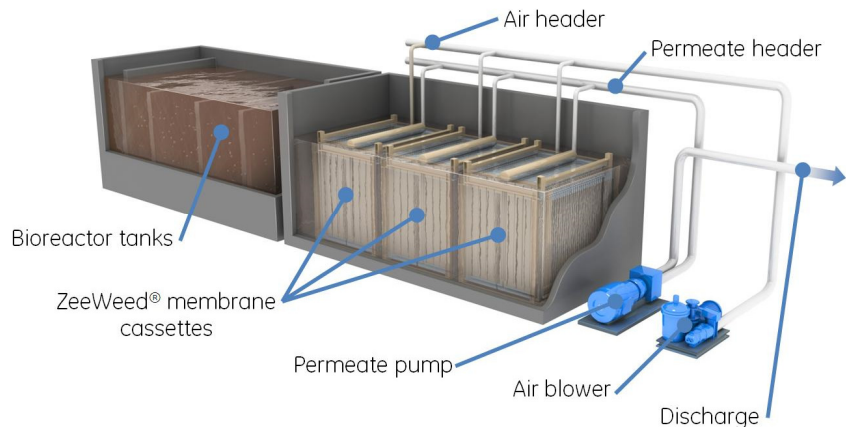
Date: December 7, 2016

GE Contact: Grant MacInnis, Regional Manager (Grant.MacInnis@ge.com)

The ZeeWeed® Membrane Bioreactor Process

The ZeeWeed® Membrane Bioreactor (MBR) process consists of a suspended growth biological reactor integrated with a membrane filtration system, using the ZeeWeed® hollow fiber ultrafiltration membrane. The membrane filtration system essentially replaces the solids separation function of secondary clarifiers and sand filters used in a conventional activated sludge process.

ZeeWeed® ultrafiltration membranes are immersed, in direct contact with mixed liquor. Through the use of a permeate pump, a vacuum is applied to a header connected to the membranes. The vacuum draws the treated water through the hollow fiber membranes. Permeate is then directed to downstream disinfection or discharge facilities. Air, in the form of large bubbles, is introduced below the bottom of the membrane modules, producing turbulence that scours the outer surface of the hollow fibers to keep them clean.



The proposed MBR design includes LEAPmbr, GE's latest technology advancement for wastewater treatment, which offers the lowest cost of ownership in the industry. LEAPmbr incorporates several innovations, including the latest ZeeWeed® 500 module with increased membrane surface area, increased productivity through proven MBR design flux improvements, an optimized membrane tank design, along with a more efficient membrane aeration system (known as LEAPmbr Aeration Technology) that simplifies the aeration system and reduces aeration requirements. These innovations combine to offer:

- 15% productivity improvement
- 20% footprint reduction
- 50% reduction in membrane aeration equipment
- 30% energy savings



Scope of Supply by GE

- ZeeWeed® 500 Membrane Cassettes and Modules
- Bioreactor equipment – aerators, mixers, process air blowers, etc.
- Permeate and Air Scour Header Piping
- Permeate and Backpulse Pumps
- Backpulse Tank
- Membrane Air Scour Blowers
- Membrane Cleaning System
- Electrical and Control Equipment
- Compressed Air System
- Instrumentation Integral to ZeeWeed® System
- Electrical and Mechanical Engineering Submittals
- Operation & Maintenance Manuals
- Installation, Commissioning & Start-up Assistance
- Operator Training

Scope of Supply by Others

- Concrete and civil work, assembly of loose-ship equipment, interconnecting piping, balance of plant design and construction, etc.

Design Assumptions:

Assumed Temperature	15	Deg C
MMF	0.5	MGD

Ultrafiltration System Design

The ultrafiltration design of this system is described in the table below where membrane modules are assembled into cassettes and cassettes are installed in concrete tanks.

Type of Membrane	ZeeWeed® 500d
Number of Trains	2
Number of Cassette Spaces per Train	1
Type of Module	370 ft2
Membrane Tank Dimensions (each)	8'5" x 9' x 13'H



Option 1 – TN < 10 – MLE Design

Pre-Anoxic Volume	25,000 gal
Aerobic Volume	125,000 gal

Budgetary Price for the System Described Above

USD \$ 550,000

Option 2 – TN < 6.9, TP < 3.1 – MLE Design with a 2nd recycle and coagulant trimming

Pre-Anoxic Volume	38,000 gal
Aerobic Volume	165,000 gal

ZeeWeed® Membrane Bioreactor System Pricing

Budgetary Price for the System Described Above

USD \$ 590,000

Option 3 – TN < 3, TP < 1 – Pre-Anox / Aerobic / Post Anox with a 2nd recycle and coagulant trimming

Pre-Anoxic Volume	25,000 gal
Aerobic Volume	195,000 gal
Post-anoxic Volume	17,000 gal

ZeeWeed® Membrane Bioreactor System Pricing

Budgetary Price for the System Described Above

USD \$ 630,000

For Earth, For Life



Budgetary Proposal for

Santa Fe County

Quill WWTF

New Mexico

Membrane Bioreactor System

December 09, 2016



Prepared By:

Kubota Membrane USA

11807 North Creek Parkway S, Suite B-109

Bothell, WA 98011

425-898-2858

Local Representation By:

Goble Sampson Associates

Josh Ziembiec

480-271-0519

jziembiec@goblesampson.com

December 09, 2016

HDR
Attn: Ed DuBois, PE
2155 Louisian Blvd NE
Suite 9500
Albuquerque, NM 87110



Dear Mr. Ed DuBois:

I am pleased to present the attached materials for consideration regarding the proposed Kubota membrane bioreactor (MBR) system for the Quill WWTF project in Santa Fe County, NM. Kubota Membrane USA is a company with a strong history in the U.S., backed by Kubota Corporation's extensive wastewater experience worldwide. Our Kubota MBR System brings unique features to save your client time and hassle. Most importantly, our product saves money over the life-cycle of the treatment system because of our high quality membrane.

A compelling feature of the Kubota MBR System is the simplicity of daily operations and periodical maintenance. Both the membrane unit itself and the MBR system are designed for the operator's convenience. Cleaning is performed in place, with no routine membrane unit removal required. Also, because the Kubota MBR System uses a flat sheet membrane, it offers straightforward troubleshooting and easy replacement in the unlikely event that problems arise.

Kubota Membrane USA offers first class service. Our technicians have operational experience and are well trained in wastewater analysis and membrane inspection. This sets us apart from other membrane manufacturers who do not design, build, or operate treatment plants, and system integrators who do not manufacture parts or operate plants. We are responsive to operator concerns and knowledgeable about the Kubota MBR System from top to bottom.

With the Kubota name comes a long history of excellence in MBR wastewater treatment. We are happy to put you in touch with operators and engineers who can share their experience with our product. If you have any questions regarding our proposal, please feel free to contact us or our local representative, **Josh Ziembiec** of **Goble Sampson Associates**, at **480-271-0519** or **jziembiec@goblesampson.com**.

Best regards,

Kenna Foster
Application Engineer | Kubota Membrane USA Corporation
Office: 425-898-2858 ext. 108
Cell: 425-686-2705
Email: kenna.foster@kubota.com

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1 Introduction

In response to the membrane bioreactor (MBR) information requested for the Santa Fe County Quill WWTF, we have prepared a budgetary proposal for your review. We have included two options: Option A will treat provide effluent that meets NPDES Tier 1 requirements, and Option B will provide effluent that meets NPDES Tier 2 requirements.

2 Company Background

2.1 History

Kubota Corporation has been designing and building wastewater treatment plants since the early 1960s. Long before building wastewater treatment plants, the company became involved with water engineering projects in 1893 as a manufacturer of iron piping, which was used for clean water distribution. As the largest engineering contractor for wastewater treatment plants in Japan, Kubota has the capability to design, build and operate municipal and industrial wastewater treatment plants.

In the 1980s, Kubota developed its own MBR technology using an external tubular type of ultrafiltration membrane. After the initial installation of these membranes in a soil treatment plant in Japan, Kubota realized these membranes lacked energy efficiency, had short life spans, and required frequent maintenance. This prompted Kubota to find an alternative to the external tubular membranes. In 1989, Kubota pioneered the energy-efficient, long-lasting, and easy-to-use flat sheet membrane with its Submerged Membrane Unit. Kubota's Submerged Membrane Unit was designed specifically for wastewater treatment applications, and is currently installed in wastewater treatment plants around the world, making Kubota a leader in the flat sheet MBR technology market.

The first installation of the Kubota flat sheet Submerged Membrane Unit was for a mechanical tool equipment manufacturer in Hiroshima in 1990. Kubota has refined and improved the membrane product for over 25 years (*Figure 1*). Kubota membranes were first introduced to the U.S. in 2002. Today, MBR systems using the Kubota membrane have been installed all over the world for numerous applications in addition to sewage treatment, such as brewery, dairy, food processing, pharmaceutical and chemical, laundry, leachate, and electrical industry wastes, as well as for sludge liquor treatment and water reuse.

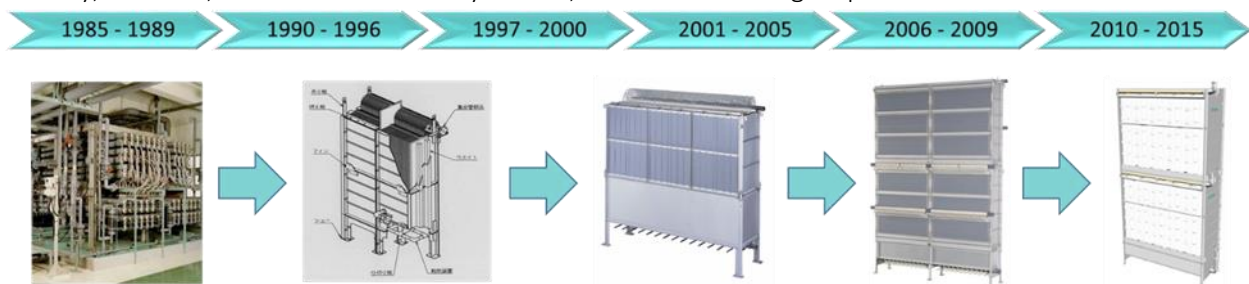


Figure 1: Progression of the Kubota membrane, from the tubular type to the most recent SP600

2.2 Design Support and After-Sales Service

Kubota Membrane USA has technical staff in Washington State and Ohio who can help the customer with any design or operational needs of this project. Kubota staff members are available to provide technical support to consulting engineers, WWTP operators, and WWTP owners.

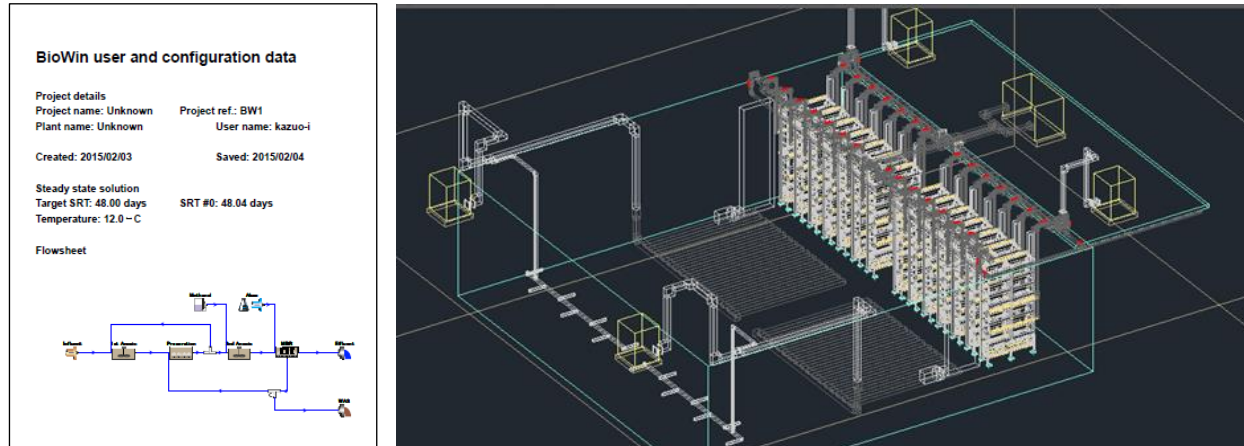


Figure 2: Examples of Kubota Design Support Capabilities

Kubota provides a staff on a regular basis for service and support of construction activities and throughout the warranty period. The service provided includes delivery inspection, installation certification, training, commissioning and ongoing technical support. Kubota will also provide operation and maintenance (O&M) manuals and 24/7 customer support.



Figure 3: Kubota's Experienced and Knowledgeable Service and Support Team

Kubota Industrial Equipment in the state of Georgia has five certified operators who operate the industrial MBR system for the factory's wastewater. Additionally, Kubota has a Research and Development Center in Canton, OH, which focuses on optimizing the design and performance of Kubota membrane systems for the North American market.

2.3 Kubota's Experience

Kubota has extensive experience in all facets of an MBR system project including designing, building, and operating MBR systems. Kubota has over 300 Design-Build projects, operates over 30 plants, and has over 150 maintenance contracts. Kubota also designed, operates, and maintains the 80,000 GPD MBR treatment facility for the Kubota Tractor Factory in Georgia, USA.

As of December 2015, Kubota MBR systems have been installed at over 5,300 facilities worldwide, making Kubota the top supplier in the world. Even prior to the first U.S. MBR installations, Kubota had already been designing, building, and operating MBR systems around the world for many years.

Table 1: Kubota Submerged Membrane Unit installations worldwide as of December 2015

Region	Number of Installations
North America	378
Europe & Africa	564
Middle East	76
Asia (Except Japan) & Oceania	510
Japan	3,863
Total MBR Plants	5,391

3 Technology Description

3.1 Membrane Product Information

For the Quill WWTF, we are proposing to Kubota's SP Series of Submerged Membrane Units. The SP Series, developed in 2011, improves energy efficiency and reduces assembly time while still maintaining the reliable and simple operation that is characteristic of Kubota's MBR systems. Kubota's philosophy of learning from our extensive experience is one of our greatest advantages, setting us apart from more newly developed membrane manufacturers.



Figure 5: Kubota SP300 (left), and SP600 (right)

Kubota's membrane sheet is made from chlorinated polyethylene, has an average pore size of 0.2 micron (maximum 0.4 micron), is much thicker than other membranes to provide long-lasting durability, and features high porosity to enable high flow. This pore size has been designed as the optimum balance between water quality and quantity. Kubota's membrane sheet has Title 22 approval for water reuse in California.

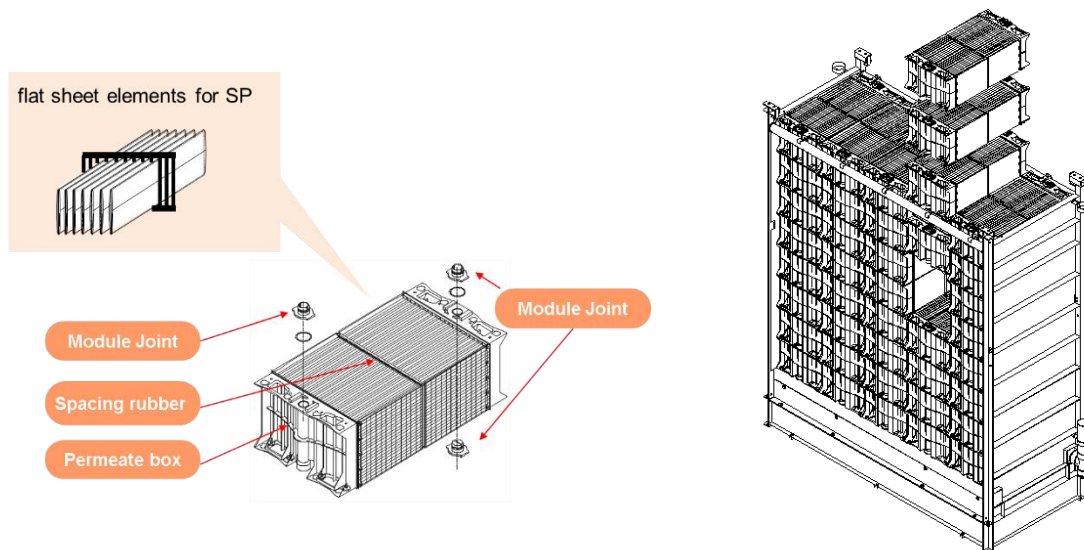


Figure 4: Membrane Module Structure (left), and SP Series Unit Structure (right))

Kubota's proposed MBR system will provide straightforward and economical phasing for future expansion to double capacity. The SP300, offered for Phase 1, is a single-deck Submerged Membrane Unit that contains 30 membrane modules within the stacked membrane block. Adding an upper membrane block upgrades the SP300 units to the double-deck SP600 units, which will double the hydraulic capacity.

3.2 MBR Process Description

The MBR treatment process is capable of meeting strict nutrient removal requirements while still maintaining a small footprint. MBR is the combined process of activated sludge (secondary treatment) and membrane filtration (tertiary treatment). Membrane units are installed in the activated sludge reactor, where sludge and treated water are separated by means of physical filtration. Other treatment processes, such as conventional activated sludge, require gravity sedimentation through the use of final clarifiers. MBRs eliminate the need for gravity sedimentation, thereby eliminating the need for final clarifiers.

Conventional Activated Sludge (CAS)

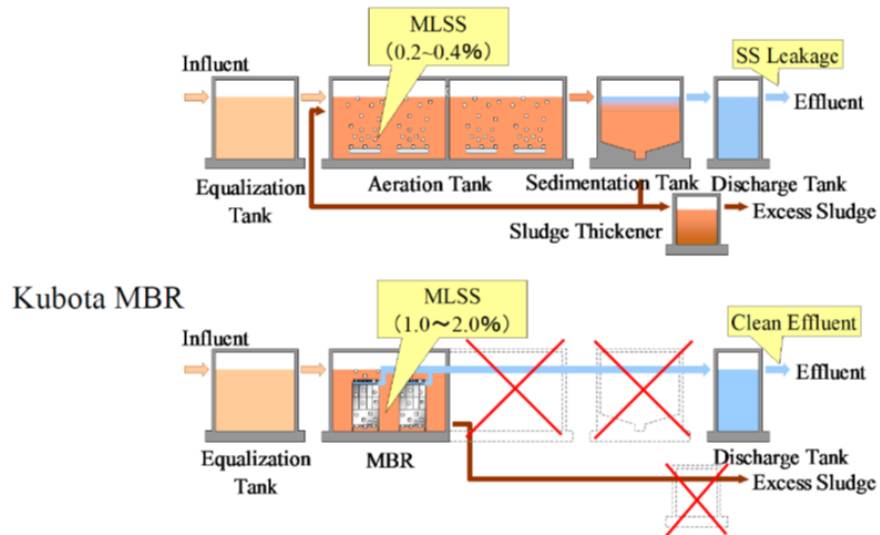


Figure 6: Typical CAS Process (top) vs. Kubota MBR Process (bottom)

Additionally, the Kubota MBR tank can operate at a mixed liquor concentrations ranging from 5,000 mg/L and 13,000 mg/L, which is much higher than that of a conventional activated sludge basin. This reduces the required aeration volume and the volume of waste sludge produced, and also gives the system increased ability to withstand influent load fluctuations.

The Kubota MBR tank works as both a solid-liquid separation tank and an aeration tank to support the biological process. Because of Kubota's stable air scour and infrequent in-situ chemical cleaning, aeration from the air scour can be considered as oxygen supply for biological treatment. This helps to reduce the oxygen requirement in the aeration tank and thus helps decrease the total operational energy cost of the treatment process.

3.3 Operation and Maintenance

The Kubota MBR system offers simple design, simple operation, and simple maintenance. Despite being able to operate at a wide range of MLSS concentrations, there is no concern of sludge bulking that could result in violation of the effluent quality requirements. This helps keep operations simple for the operator.

While the primary method of membrane cleaning for the Kubota MBR system is the air scour provided by the medium/fine bubble diffusers at the base of the membrane units, the chemical cleaning system is extremely simple and eliminates the need for separate, lined tanks for immersive cleaning. The system consists of a chemical tank and a feed pump or venturi system, which feeds the cleaning solution through the permeate piping. The venturi system can be skid-mounted on a wall, as shown in the photograph below.

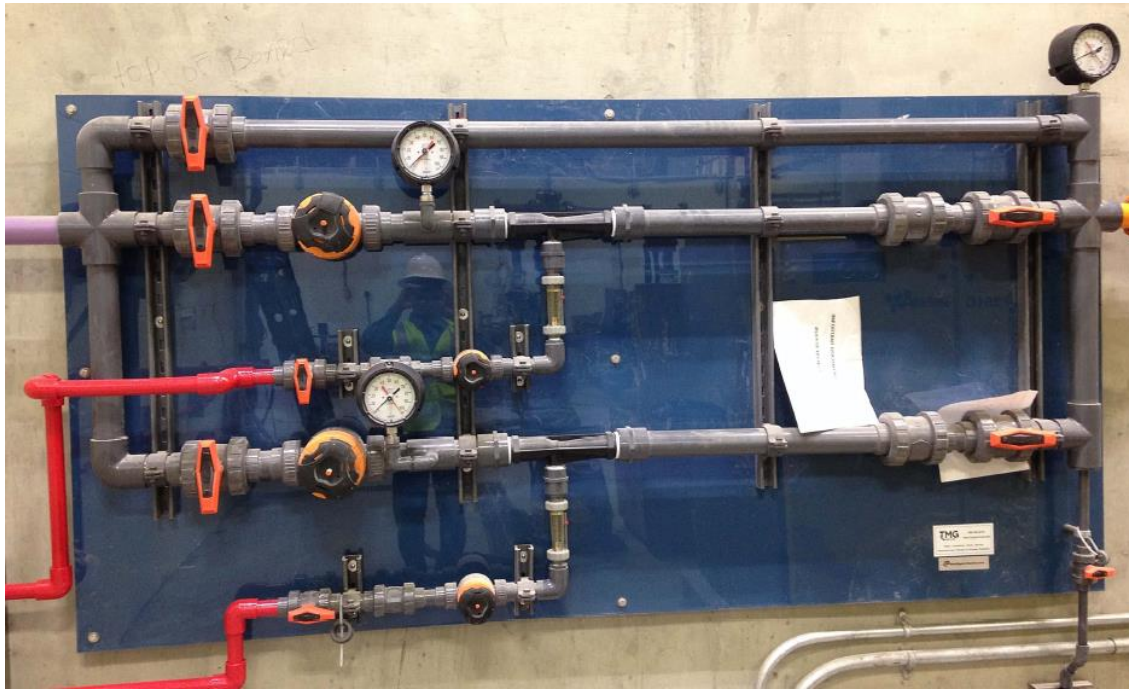


Figure 7: Skid-Mounted Clean-In-Place System

To perform chemical cleaning, there is no need to drain the tanks or remove the membrane units. All that is required is stopping the operation, opening a vent, injecting a chemical solution, and allowing that solution to soak in the membrane units for 2 to 4 hours.

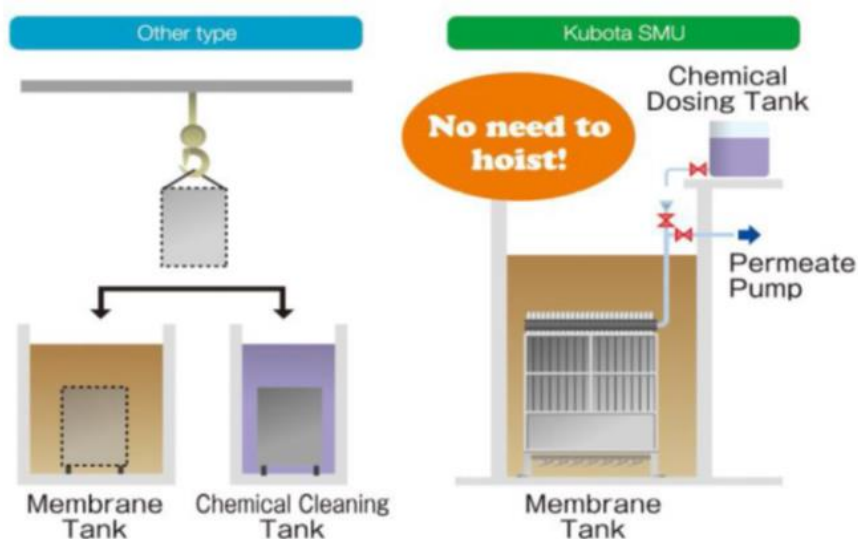


Figure 8: Chemical Cleaning for Other Manufacturers (left) vs. Kubota Membrane Units (right)

Organic fouling can be cleaned with sodium hypochlorite (NaClO). This is typically done two to four times per year. Inorganic fouling such as iron or aluminum can be cleaned by oxalic or citric acid and is typically needed once a year or less. This simple and infrequent maintenance cleaning is the only chemical cleaning required; no recovery cleaning is necessary for operation of the Kubota MBR system.

The Kubota MBR system was developed in 1990 to be low-maintenance and easy to operate. Since then, Kubota MBR package plants have been installed in many remote communities to treat small flows. Many of these plants run without constant operator attention and are visited only once every two weeks. This illustrates the ease of operation and reliability of the Kubota MBR system.

Kubota takes pride in the simplicity of our MBR systems, and we strive to build long-term relationships with our customers. We are committed to the U.S. market, and will provide excellent support through all phases of our projects.

4 Design Overview

The MBR system for the Santa Fe County Quill WWTF project was designed based on the following influent flow data (*Tables 2 and 3*).

4.1 Influent Design Flow

We used the following flow conditions to design the capacity of both options for the proposed MBR system.

Table 2: Design Flow Conditions

Condition	Phase 1 Design Flow	Phase 2 Design Flow	Unit
Design Max Month Flow	0.5	1.0	MGD
Assumed Peak Hour Flow	1.0	2.0	MGD

The wastewater characteristics used for preliminary design, based on emails from November 22 and November 27, 2016, are listed in the table below. We are proposing two options: Option A will meet Santa Fe's pending NPDES Tier 1 discharge permit, and Option B will meet Santa Fe's pending NPDES Tier 2 discharge permit.

Table 3: Influent and Effluent Characteristics

Constituent	Design Influent	Option A NPDES Tier 1	Option B NPDES Tier 2
BOD (mg/L)	323	< 10	< 10
TSS (mg/L)	215	-	-
TN (mg/L)	42	< 6.9	< 3.0
TP (mg/L)	9.0	< 3.1	< 1.0

4.2 MBR Specifications

The proposed MBR system will allow for straightforward expansion to double capacity. Option A and Option B use the same MBR tank configuration and number of Submerged Membrane Units.

Table 4: Membrane Equipment Specifications

Component	Phase 1	Phase 2
Membrane Model	SP300	SP600
Membrane Surface Area per Unit	3,229 ft ²	6,458 ft ²
Design MLSS in MBR Tanks	12,000 mg/L	12,000 mg/L
Number of MBR Tanks	2	2
Total Number of Submerged Membrane Units	12 units (6 units per tank)	12 units (6 units per tank)
Assumed Minimum Wastewater Temperature	13°C	13°C

4.3 Preliminary Layout – Option A

The proposed MBR system for Option A includes an anaerobic tank to provide biological phosphorus removal and an anoxic tank for single-stage denitrification. The proposed process flow diagram for Option A is shown in the following figure.

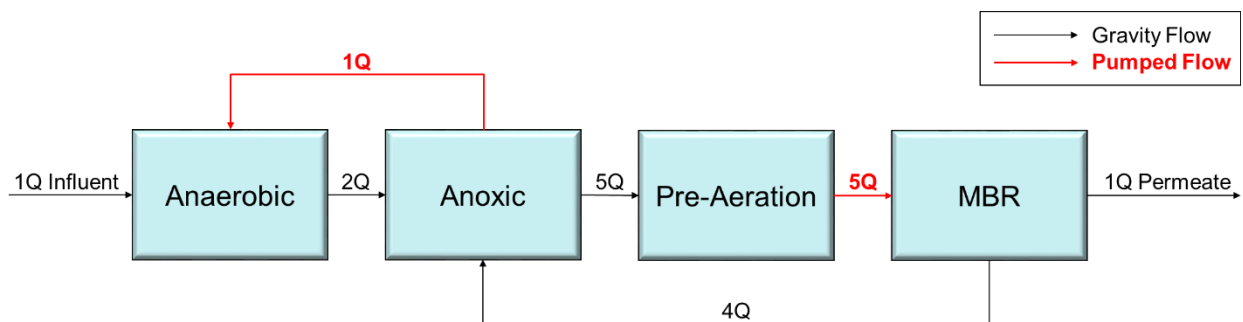


Figure 9: Option A Process Flow Diagram

The table below describes the dimensions and nominal HRT of each tank for Phase 1 of Option A. For future expansion, the sidewater depths of each tank can be increased in order to double the biological capacity without requiring additional tank construction.

Table 5: Option A – Tank Dimensions and Hydraulic Retention Times for Phase 1 (0.5 MGD)

Tank Name	Dimensions (L' x W' x SWD')	Volume per Tank (gallons)	Number of Tanks	Total Tank Volume (gallons)	Nominal HRT at 0.5 MGD (hours)
Anaerobic (AN)	15.6' x 29.7' x 9.0'	31,250	1	31,250	1.5
Anoxic (AX)	35.0 x 29.7' x 8.5'	66,096	1	66,096	3.2
Pre-Aeration (PA)	58.0' x 29.7' x 8.5'	109,531	1	109,531	5.3
MBR	23.6' x 9.8' x 9.4'	16,262	2	32,525	1.6
TOTAL	-	-	-	239,401 gallons	11.5 hours

The figure below shows a rough layout of the proposed system for Option A.



Figure 10: Option A Tank Layout

4.4 Preliminary Layout – Option B

The proposed MBR system for Option B uses a pre-anoxic and post-anoxic basin for double denitrification. The proposed process flow diagram for Option B is shown in the following figure.

The table below describes the dimensions and nominal HRT of each tank for Phase 1. For future expansion, the sidewater depths of each tank can be doubled in order to double the biological capacity without requiring additional tank construction.

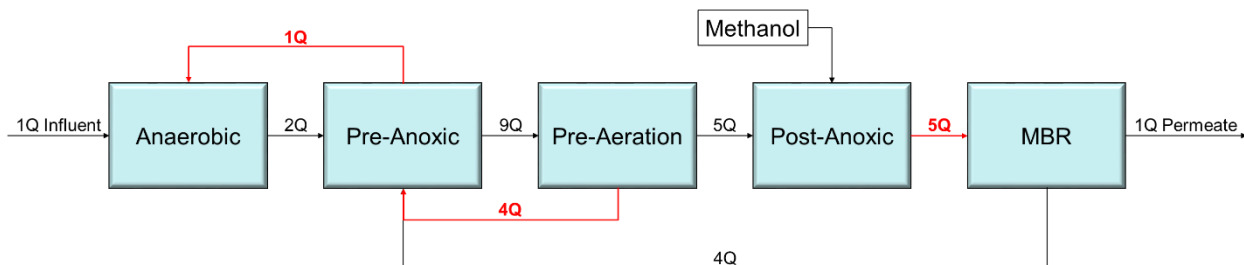


Figure 11: Option B Process Flow Diagram

Table 6: Option B – Tank Dimensions and Hydraulic Retention Times for Phase 1 (0.5 MGD)

Tank Name	Dimensions (L' x W' x SWD')	Volume per Tank (gallons)	Number of Tanks	Total Tank Volume (gallons)	Nominal HRT at 0.5 MGD (hours)
Anaerobic (AN)	15.6' x 29.7' x 9.0'	31,250	1	31,250	1.5
Pre-Anoxic (Pre-AX)	35.0 x 29.7' x 8.5'	66,096	1	66,096	3.2
Pre-Aeration (PA)	70.0' x 29.7' x 8.5'	132,192	1	132,192	6.3
Post-Anoxic (Post-AX)	15.7' x 29.7' x 8.3'	28,814	1	28,814	1.4
MBR	23.6' x 9.8' x 9.4'	16,262	2	32,525	1.6
TOTAL	-	-	-	290,877 gallons	14.0 hours

The figure below shows a rough layout of the proposed system for Option B.



Figure 12: Option B Tank Layout

4.5 Operation and Maintenance Estimates

The table below shows our estimated energy consumption and chemical requirements during Average Day Flow.

Table 7: Design Flow Conditions

Condition	Option A – Tier 1 Effluent	Option B – Tier 2 Effluent
Estimated Energy Consumption	2058 kWh/day	2205 kWh/day
Estimated 12.5% Sodium Hypochlorite Usage for Chemical Cleaning	304 gallons/year	304 gallons/year
Estimated 100% Oxalic Acid Powder Usage for Chemical Cleaning	318 lb/year	318 lb/year
Estimated Methanol Addition for 2 nd Stage Denitrification	N/A	49 gallons/day

5 Scope of Supply

The following proposed items will be supplied by Kubota Membrane USA, and are included in the budgetary prices that are listed in Section 7. We have described our proposed scope for Options A and B in separate tables. Both options include two phases as described above in Section 4.1.

5.1 Major Equipment and Instrumentation – Option A

Table 8: Option A Major Equipment and Instrumentation in Kubota's Scope of Supply

Name	Type	Option A, Phase 1 Quantity	Option A, Phase 2 Quantity
Anaerobic Zone (AN) Equipment			
Anaerobic Mixer	Submersible	1	1
Level Switch	Float	2 (1 LL + 1 HL)	0
Anoxic Zone (AX) Equipment			
Anoxic Mixer	Submersible	1	1
Level Switch	Float	2 (1 LL + 1 HL)	0
Level Transmitter	Hydrostatic	1	0
Internal Recycle Pump (AX to AN)	Submersible	2 (1 duty + 1 spare)	1
Internal Recycle Flow Meter (AX to AN)	Magnetic	1	1
Pre-Aeration Zone (PA) Equipment			
Pre-Aeration Diffuser Grid	Fine Bubble	1 set	0
DO Meter	LDO Probe and Transmitter	1	0
Level Switch	Float	2 (1 LL + 1 HL)	0
Level Transmitter	Hydrostatic	1	0
RAS Feed Forward Pump (PA to MBR)	Submersible	2 (1 duty + 1 spare)	1
RAS Feed Forward Flow Meter (PA to MBR)	Magnetic	1	1
Pre-Aeration Blower	Positive Displacement	1	0
Air Flow Meter	Mass Air Flow	1	0
Membrane Zone (MBR) Equipment			
Submerged Membrane Unit	SP300 Flat Plate	12	0
Membrane Block	SP300	0	12
Submerged Membrane Unit Guide Set	Guide Pipes and Stabilizer Pipes	12 sets	0
Level Switch	Float	4 (2 LL + 2 HL)	0
Valves	Manual	Various	Various

Name	Type	Option A, Phase 1 Quantity	Option A, Phase 2 Quantity
Piping Inside Process Tanks	All Piping <3" Inside Process Tanks	Various	Various
WAS Pump	Self-Priming	1	0
WAS Flow Meter	Electromagnetic	1	0
MBR Air Scour Blower	Positive Displacement	3 (2 duty + 1 installed common standby)	0
Air Flow Meter	Mass Air Flow	2	0
Permeate System Equipment			
Permeate Pump	Self-Priming Centrifugal	3 (2 duty + 1 installed standby)	2
Pressure Transmitter	Diaphragm	2	2
Permeate Flow Meter	Electromagnetic	2	2
Permeate Flow Control Valve	Automated Ball Valve	2	2
Turbidity Meter	Optical Meter and Transmitter	2	2
Other Equipment			
Clean-In-Place System	Chemical Injection System	1	0
MBR Control Panel, HMI, SCADA	MBR Control System	1	0

5.2 Major Equipment and Instrumentation – Option B

Table 9: Option B Major Equipment and Instrumentation in Kubota's Scope of Supply

Name	Type	Option B, Phase 1 Quantity	Option B, Phase 2 Quantity
Anaerobic Zone (AN) Equipment			
Anaerobic Mixer	Submersible	1	1
Level Switch	Float	2 (1 LL + 1 HL)	0
Pre-Anoxic Zone (Pre-AX) Equipment			
Pre-Anoxic Mixer	Submersible	1	1
Level Switch	Float	2 (1 LL + 1 HL)	0
Level Transmitter	Hydrostatic	1	0
Internal Recycle Pump (Pre-AX to AN)	Submersible	2 (1 duty + 1 spare)	1
Internal Recycle Flow Meter (Pre-AX to AN)	Magnetic	1	1
Pre-Aeration Zone (PA) Equipment			
Pre-Aeration Diffuser Grid	Fine Bubble	1 set	0

Name	Type	Option B, Phase 1 Quantity	Option B, Phase 2 Quantity
DO Meter	LDO Probe and Transmitter	1	0
Level Transmitter	Hydrostatic	1	0
NO _x Recycle Pump (PA to Pre-AX)	Submersible	2 (1 duty + 1 spare)	1
NO _x Recycle Flow Meter (PA to Pre-AX)	Magnetic	1	1
Pre-Aeration Blower	Positive Displacement	1	0
Air Flow Meter	Mass Air Flow	1	0
Post-Anoxic Zone (Post-AX) Equipment			
Post-Anoxic Mixer	Submersible	1	1
Level Switch	Float	2 (1 LL + 1 HL)	0
Level Transmitter	Hydrostatic	1	0
RAS Feed Forward Pump (Post-AX to MBR)	Submersible	2 (1 duty + 1 spare)	1
RAS Feed Forward Flow Meter (Post-AX to MBR)	Magnetic	1	1
Membrane Zone (MBR) Equipment			
Submerged Membrane Unit	SP300 Flat Plate	12	0
Membrane Block	SP300	0	12
Submerged Membrane Unit Guide Set	Guide Pipes and Stabilizer Pipes	12 sets	0
Level Switch	Float	4 (2 LL + 2 HL)	0
Valves	Manual	Various	Various
Piping Inside Process Tanks	All Piping <3" Inside Process Tanks	Various	Various
WAS Pump	Self-Priming	1	0
WAS Flow Meter	Electromagnetic	1	0
MBR Air Scour Blower	Positive Displacement	3 (2 duty + 1 installed common standby)	0
Air Flow Meter	Mass Air Flow	2	0
Permeate System Equipment			
Permeate Pump	Self-Priming Centrifugal	3 (2 duty + 1 installed standby)	2
Pressure Transmitter	Diaphragm	2	2
Permeate Flow Meter	Electromagnetic	2	2
Permeate Flow Control Valve	Automated Ball Valve	2	2

Name	Type	Option B, Phase 1 Quantity	Option B, Phase 2 Quantity
Turbidity Meter	Optical Meter and Transmitter	2	2
Other Equipment			
Clean-In-Place System	Chemical Injection System	1	0
Methanol Addition System	Chemical Injection System	1	0
Alum Addition System	Chemical Injection System	1	0
MBR Control Panel, HMI, SCADA	MBR Control System	1	0

5.3 Direct Services

The following services are included in Kubota's scope of supply:

Commissioning

- 10 days on-site for start-up and commissioning.
- Additional days are available as needed for an additional cost.

Training

- Mechanical Inspection and Equipment Installation Verification
- Operator Training (Please see Table 10 below)

Table 10: Training and Workshops Included in Kubota's Scope of Supply

Training/Workshop	Brief Summary
SCADA and HMI	<ol style="list-style-type: none"> 1. Navigation of all HMI screens and menus. 2. Review of automatic operations and controls. 3. Changing process set points. 4. Overriding controls from the HMI. 5. Manual operation of the system in the event of a power failure.
CIP training	<ol style="list-style-type: none"> 1. Navigation of CIP (Clean-In-Place), in-situ maintenance chemical cleaning. 2. Control from HMI and operation of manual valve. 3. Adjust set points of chemical flow.
Troubleshooting	<ol style="list-style-type: none"> 1. Case study of troubleshooting 2. Recovery from trouble 3. "Fish bone" approach
Daily testing	<ol style="list-style-type: none"> 1. Filterability test 2. Viscosity measurement

Workshop/Additional Training Available (No Charge)

- In addition to our standard training at commissioning, Kubota Membrane USA will host an annual operator workshop in which operators meet to exchange ideas and learn about the latest developments in MBR technology.
- Customized individual training, such as membrane disassembling training, is also available upon request.

Remote Monitoring Available (No Charge for First Year)

○ Support by Remote Monitoring

The Kubota membrane system as proposed includes a SCADA system that can be remotely monitored and controlled, provided wireless connectivity is available. Technical support staff can monitor the status of your system to proactively address potential problems. Whenever a call is placed to our service staff, that person will be able to log in to the SCADA system and easily see what is happening at the plant.

5.4 Exclusions to Kubota Scope of Supply

The following items are not currently included in the Kubota scope of supply:

- Equalization System (Pump, Mixer, Level Transmitters)
- Pretreatment/Headworks (Fine Screen, Grit Removal, DAF, etc.)
- Solids Handling Equipment
- Disinfection System
- Concrete Tanks, Building Construction
- All piping that is outside of the MBR tanks, including header pipes
- Civil Works, installation and connection of piping/wiring
- VFDs and motor controllers

6 Warranty

Equipment Warranty

Kubota's standard 2-year membrane warranty, and 1-year mechanical equipment warranty is included in the main budgetary price proposed (Table 9) and goes into effect at the commencement date of commissioning. The warranty included is a guarantee that the products supplied by Kubota are free from defect in material or workmanship.

7 Budgetary Price

The estimated budgetary price for the equipment and instrumentation described herein is shown below (Table 9).

Table 11: Budgetary Price for Proposed Kubota MBR Equipment and Equipment

Budgetary Price – MBR Equipment, Instrumentation, and Services	
Option A – Tier 1 Effluent	Phase 1: \$1,141,000
	Phase 2: \$567,000
Option B – Tier 2 Effluent	Phase 1: \$1,280,000
	Phase 2: \$636,000

Freight is excluded from the price. The pricing herein is for budgetary purposes only and does not constitute an offer of sale. Taxes or duties are not included.

8 24/7 Technical Support (Always Free of Charge)

24/7 phone support is available in addition to support during regular business hours. 24-hour technical support calls are shared within the Kubota staff so that you can rest assured knowing that knowledgeable engineers and technicians are just a phone call away.

9 Additional Services (Optional)

The following service plans are optional and may be added to Kubota's scope of supply if desired for an additional cost.

Kubota Membrane Protection Plan

Under this plan, Kubota Membrane USA warrants against any membrane failure for 10 years when the system is operated in accordance with the O&M manual. This plan includes annual onsite membrane inspection with membrane examination and inspection report, periodic replacement of parts and damaged membranes (if any), and phone support during the 10-year period. With this plan, Kubota will replace each cartridge at least once during the 10-year span, regardless of necessity.

Kubota Custom Membrane Support Plan

Kubota can customize your support/service package to meet your needs.

The following table shows a variety of our available services:

Table 12: Kubota's Available Services

Service	Note
Periodical technical support	Monthly, Quarterly, Annually
Phone support	Available 24/7
SCADA monitoring	Weekly, Monthly, Quarterly
Periodical site visit	Quarterly, Semi-annually, Annually
Membrane inspection	Annual, Semi-annual, 3x per year
Membrane protection (10-year contract)	Select annual or semi-annual inspections
Program (SCADA, etc.) update	Based on hydraulic changes, such as increases in flow or changes in operation.

(End of Document)

OMNIFLO® SEQUENCING BATCH REACTOR PROPOSAL

FOR
SANTA FE COUNTY, NM



December 12, 2016

2607 N. Grandview Blvd. Suite 130
Waukesha, WI 53188

Re: Santa Fe County WWTP **Omniflo®** SBR

Dear Mr. Ed DuBois, P.E.:

We are pleased to present our proposal for a Jet Tech **Omniflo®** SBR from Evoqua. The **Omniflo®** SBR system utilizes activated sludge process. Some key advantages include:

- **Simplicity**. All unit process steps occur within the reactors. The need for secondary clarifiers and a sludge recycle system are eliminated. This provides simplicity in the design and operation of the system when compared to other biological processes.
- **Efficiency**. The SBR process utilizes a time based process which allows aeration times to be adjusted based on current organic loads to minimize energy usage.
- **Inherent BNR capability**. Since the SBR is a time based process, Biological Nutrient Removal (BNR) is achievable by utilizing anoxic, anaerobic, and aerobic steps within the reactors. Unlike other processes, no separate anoxic or anaerobic tank compartments are required.
- **Decanter**. Evoqua uses a floating decanter that pulls from 18" below the surface to exclude floatables. The decanter is controlled by an effluent valve located outside of the tank. Conversely, other SBR manufacturers use fixed decanter or units that require electromechanical actuation inside the tank making maintenance more difficult and unsafe.
- **Controls**. Evoqua offers state of the art flow proportional controls strategy. This strategy automatically adjusts cycle times and aeration based on the plant influent flow rate, allowing cycle structure and aeration to match real time conditions. The controls also include an automatic failure response strategy in which a critical failure can automatically take the effected tank out of service and automatically adjust the operation of the remaining tank. Other manufacturers do not offer this level of operator protection.

There are several equipment variations, configurations, and options that can be used with the **Omniflo®** SBR system, all of which are designed to provide the necessary treatment for each specific project. Equipment selection most suitable for a specific project is dependent on the customer's effluent requirement, desired ease of maintenance and operation, power consumption, expected future expansion, and initial cost. We welcome the opportunity to pursue equipment options for selection of the most efficient and economical system that meets the project requirements.



We very much appreciate the opportunity to offer our equipment and services for this project. If you have any questions, or desire additional information, please do not hesitate to contact us. Thank you for considering Evoqua Water Technologies LLC.

Sincerely,

A handwritten signature in black ink, appearing to read "Nick Barczewski". The signature is fluid and cursive, with a small dot at the end.

Nick Barczewski
Applications Engineer

cc: Dennis Emrie, Misco
Tracey Mayer, Evoqua

PROJECT DESIGN CRITERIA

Influent Flows

Parameter	Value	Units
Phase I Average Daily Flow (ADF)	0.5	MGD
Peak Daily Flow	1.0	MGD

Influent Water Quality

Parameter	Value	Units
Biochemical Oxygen Demand (BOD ₅)	323	mg/L
Total Suspended Solids (TSS)	215	mg/L
Ammonium Nitrogen (NH ₄ -N)	34	mg/L
Total Kjeldahl Nitrogen (TKN)	42	mg/L
Total Phosphorus (TP)	9	mg/L
Maximum Water Temperature	20	Deg C
Minimum Water Temperature	12	Deg C

Effluent from SBR System

Parameter	Value	Units
BOD ₅	≤ 10	mg/l
TSS	≤ 10	mg/l
Total Nitrogen (TN)	< 5 - 6.9	mg/l
Total Phosphorus (TP) Bio-P	≤ 2	mg/l

Tier 2 Effluent from Tertiary Continuous Backwash Sand Filter

Parameter	Value	Units
TSS	≤ 5	mg/l
Total Nitrogen (TN)	< 3	mg/l
Total Phosphorus (TP)	< 1	mg/l

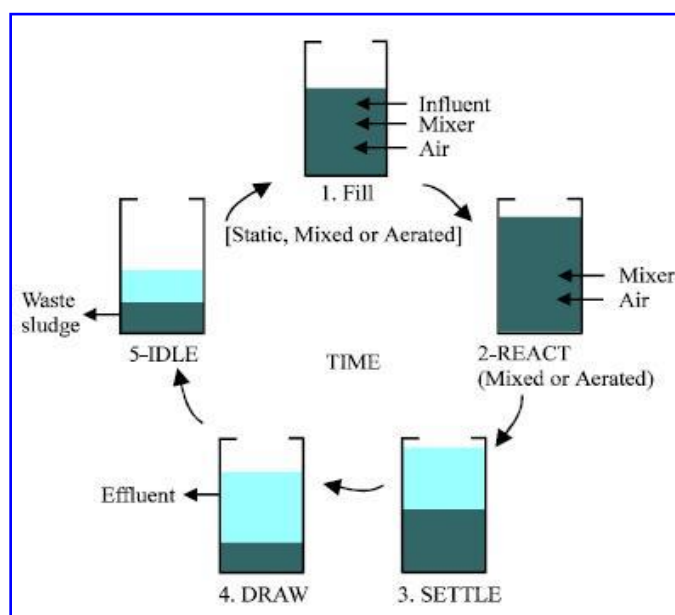
Tier 1 Effluent from Tertiary Forty-X Disc Filter

Parameter	Value	Units
TSS	≤ 5	mg/l
Total Phosphorus (TP)	< 1	mg/l

OMNIFLO® SYSTEM DESCRIPTION

The **Omniflo®** SBR system utilizes the Sequencing Batch Reactor (SBR) activated sludge process, which completes all unit process steps within the same reactor, eliminating the need for both secondary clarifiers and a sludge recycle system. The SBR process provides for inherent flow equalization and flow blending, and greatly reduces operator skill and attention requirements.

In a true batch SBR, there are five basic cycles in each batch.



During **Anoxic Fill**, the basin is loaded with food and the soluble BOD is absorbed and stored by the facultative, rapid settling biomass. In these anoxic conditions poor settling filamentous bacteria cannot readily absorb the soluble BOD creating an inherent advantage for the facultative bacteria. The selective pressures exhibited on the biomass of zero D.O. in Anoxic Fill allows good settling, facultative organisms to predominate. If given enough time, Anoxic Fill will turn anaerobic triggering phosphorus release from the PAO's, a precursor for phosphorus luxury uptake during the aerated portions of the cycle maximizing bio-P removal.

During **Aerated Fill** the blowers and pumps are automatically turned on to provide air and complete mixing. This initiates the "feast" environment for the biomass. The biomass begins to metabolize the food they have absorbed. They utilize the oxygen provided very rapidly with high D.O. uptake rates and low residual D.O. values. Simultaneous nitrification / de-nitrification occurs when aerated fill is initiated since both anoxic and aerobic zones are present within the reactor.

React begins after the basin has completed filling, and the influent flow has been diverted to another SBR tank. No more food (influent) enters the reactor basin during React. This forces the organisms to scour for any remaining BOD. Aeration continues in the full reactor until complete biodegradation is achieved. React continues until the food is consumed and the

biomass enters its "famine" state. True batch React (no influent, no effluent) is critical to achieve intense famine conditions for optimum organism selection.

Next, the biomass is allowed to **Settle** in perfect quiescent conditions; no influent is introduced during settle and no effluent is decanted. Since the reactor is under true quiescent conditions during settle, 100% of the reactor capacity is available for liquid/solids separation.

Following the Settle cycle, the **Decant** cycle begins. Decant is initiated by opening an automatic valve and treated effluent is discharged through the decanter from 18 inches below the surface, avoiding discharge of any surface contaminants. Decant continues until approximately the upper 1/5th of the basin is discharged. While the reactor waits in **Idle** to receive the next batch, settled sludge is wasted from the reactor.

FLOATING EFFLUENT DECANTER

The Jet Tech Floating Effluent Decanter from Evoqua is a "solids excluding" decanter that prohibits suspended solids from entering the effluent piping. The flexible "knee joint" mechanism allows vertical travel and is braced to eliminate any lateral movement. There are no electro mechanical components in the reactor increasing safety and ease of maintenance.



JET AERATION



The jet aeration system used for the diffusion of oxygen in the **Omniflo®** SBR process has the flexibility to either aerate or mix independently, without the need for additional equipment. Air to the system can be varied, or completely shut off, and the pumps will provide the required mixing action, enhancing process control. Jet aeration is a very low maintenance option and can last in excess of 20 years with no replacement or reduction in OTE unlike fine bubble diffusers.

INFLUENT DISTRIBUTION MANIFOLDS

The Jet Tech **Influent Distribution Manifold (ID)** from Evoqua is designed to distribute the influent flow evenly across the reactor floor during the "anoxic fill" portion of the operating cycle. This feature ensures that the influent comes in intimate contact with the concentrated biomass, offering better



organism selection and settling control as well as added flexibility in the anoxic cycle for phosphorus removal. This manifold also greatly increases the system's flexibility by allowing for a "filled decant" mode during single-tank operation or high-flow conditions, without disturbing the sludge blanket. Other SBR systems using baffle walls and fixed volume "anoxic contact zones" decrease anoxic times at increased flows, causing process problems. Conversely, the **Omniflo®** SBR process from Evoqua preserves the anoxic fill time during increased flow rates with the ID manifold.

CONTROLS

The **Omniflo® SBR Operating Strategy and Control System** from Evoqua is unique to the industry because of its flow proportional capability. The various process steps are controlled by a microprocessor which receives continuous signals from level monitoring devices in each reactor basin. Based on the fill time between adjustable set points, the microprocessor determines the influent flow rate and controls the process accordingly. The control system operates the plant according to a preset treatment strategy which is field adjustable to meet changing conditions or requirements. The **Omniflo®** SBR Strategy maintains true batch characteristics up to peak hydraulic flows of 3 times design.

The controls also include *Failure Response* which provides a safety net when the operators are away. *Failure Response* continuously monitors the system for critical failures. If a critical failure is observed, the controls will alarm and activate a simple set point countdown timer. When this timer ends, if the operator has not acknowledged or fixed the failure, the *Failure Response* will take the affected basin out of service and automatically readjust the cycle structure until the operator completes the necessary repairs thus avoiding decanting a bad batch.

DESIGN BASIS

The design was based on the influent flows and loads as well as the required effluents outlined on page 1. We are proposing a two (2) tank SBR system with Jet Aeration that will be utilized for both Tier 1 and Tier 2 effluent requirements. Due to the strict TN limit of the Tier 2 requirements the SBR system will need to be followed by a Denite Filter (continuous backwash sand filter) in order to reliably meet the 3 mg/l TN limit. This will have the added benefit of helping achieve the 1 mg/l TP requirement through further TSS removal. The Tier 1 effluent limits can be achieved from the SBR system, but a Forty-X Disc filter is recommended as extra protection.

Phase I will operate as a standard 2-tank SBR system, but the influent and effluent equipment have been sized for Phase II (1 MGD ADF & 2 MGD Peak day). Phase II will operate as a 4-tank SBR system with identical equipment. Finally, for the ultimate expansion to 2 MGD (4 MGD Peak) the flow will require a flow splitter where 50% goes to the existing Phase II 4-tank system, and the other 50% goes to an additional Phase III 4-tank system with identical equipment from Phase I & II. The end result will be a 2-train system each operating with (4) SBR basins.

Sizing for a Post Equalization basin, if done for the ultimate flow of 2 MGD, will be very nearly equal to the footprint of a single SBR basin as seen on the provided design calculations. The design spreadsheet also shows details regarding the process steps, equipment sizing, and estimated power costs. The design includes assumed values that will need to be confirmed as the project moves forward.

SBR Process Layout and Dimensions		
Parameter	Value	Units
Number of SBR basins	2	
Normal Top Water Level at ADF	22	Feet
Bottom Water Level at Design	18.67	Feet
Maximum High Water Level	23.5	Feet
Recommended TOW Elevation	24	Feet
Length	50	Feet
Width	50	Feet
Total SBR Volume at ADF	0.83	MG

Design Parameters		
Parameter	Value	Units
Aerobic Solids Retention Time (SRT)	10.3	days
Hydraulic Retention Time (HRT)	39.7	hours
Mixed Liquor Suspended Solids (MLSS)	3,500	mg/l
Site Elevation	7,000	feet
Cycles per day	8	
Length of Cycles at ADF	6	Hours

Process Operation		
Parameter	Value	Units
Lbs O2 per lb BOD removed	1.34	lbs
Lbs O2 per lb TKN oxidized	4.6	lbs
Denitrification Oxygen Credit (80%)	291	lbs
Actual Oxygen Required (AOR)	2,056	lbs/day
D.O.	2.0	mg/l
Alpha	0.85	
Beta	0.95	
Temperature	20	C
SOR	4,034	lbs/day
Hours per day aeration per basin	10.8	Hours/basin
Oxygenation rate	187	SOR Lbs/Hr/Basin
SOTR	25.7	%
Air rate per basin	700	SCFM

SCOPE OF SUPPLY

SBR Process Equipment:

Aeration Header: Two (2) JET TECH Model BDM1240-16 Aeration Headers shall be provided. Each header will include sixteen (16) Model 40 jet aerators, and will be constructed of FRP. Header liquid manifold shall terminate with a 12" flanged connection. In-basin vertical air drop pipe is included, and will be constructed of 6" FRP. In-basin drop pipe will begin at the top of the tank wall, immediately above the aeration header, with a 6" flanged connection, and terminate at the air duct of the aeration header. All other in-basin air and liquid piping shall be provided by others.

Blowers and Accessories: Two (2) Rotary Positive Displacement Blowers (one as a standby) shall be provided. Each blower will be selected to deliver 700 SCFM at 9.55 PSIG when operated at 95°F and 7,000 ft. ASL. Each blower will be furnished complete with inlet filter, inlet silencer, discharge silencer, inlet and discharge sleeve type expansion joints, butterfly valve, check valve, pressure relief valve, base plate, V-belt drive, and a 60 Hp, 1800 RPM, 460 volt, 3 ph, 60 hz, TEFC, horizontal motor.

Jet Motive Liquid Pump: Two (2) Horizontal, Centrifugal Dry-Pit Pumps shall be provided. Each pump will be selected to deliver 2,929 GPM at a total pump head of 21 ft. Each pump will be furnished complete with mechanical seals, mounting plate, 10" discharge flange, and a 25 Hp, 460 volt, 3 ph, 60 hz, TEFC motor. Water lubrication lines shall be furnished by others. Pumps shall also be capable of Vacflush® operation when used in conjunction with the valves listed in the valve section of this proposal.

Decanter: Two (2) JET TECH Model FLED10-1800 Floating Effluent Decanters shall be provided. Also included will be decanter supports, automatic control valves, and in-basin discharge piping. The in-basin discharge piping of the decanter shall terminate with a 10" flange and connect to the flanged wall penetration supplied by others.

Influent Distribution Manifold: Two (2) JET TECH Model ID10-1400 Manifolds including supports shall be provided, and will be 10" diameter constructed of FRP. Manifold shall terminate with a 10" flange and connect the flanged wall penetration supplied by others.

Suction Bell: Two (2) 14" suction bells, one for each jet motive pump, shall be provided, and will be constructed of FRP. Suction bell shall terminate with a 14" flange and connect to the flanged wall penetration by others.

Waste Sludge Pump: Two (2) Submersible Sewage Pumps shall be provided for sludge wasting (one per SBR). Each pump will be selected to deliver between 250 GPM at a total pump head of 16 ft. Each pump will be furnished complete with a 4" discharge connection, 30 ft. power cable, thermal overload protection, retrieval guide bars and guide bar brackets, stainless steel lifting cable, and a 460 volt, 3 ph, 60 hz, submersible motor.

Vacflush® Aerator Cleaning System: Two (2) Vacflush® Header Cleaning Systems shall be utilized. All necessary valves for operation of the Vacflush® System shall be provided by Evoqua and shall be as described in the below valve section. All out-of-basin liquid piping and accessories, including the crossover pipe, air release valve, connection hardware and supports to complete the system are not included, and shall be furnished by others.

Valves: Valves shall be DeZurik and furnished per the following schedule. All automatic valves will have 460 volt 3 phase AUMA actuators with local control buttons. Power for valves shall be provided by the installing contractor. Valves shall not be powered by the SBR control panel.

Two (2) 8" automatic plug valves (influent control).

Two (2) 10" automatic butterfly valves (effluent control).

Two (2) 6" automatic butterfly valves (air control).

Four (4) 12" manual plug valves (pump isolation).

Four (4) 10" manual plug valves (Vacflush®)

Note: WAS piping, basin drains, and Post-EQ piping valves are by others

Field Joint Material: Materials necessary to complete field joints of the in-basin FRP process equipment supplied by Evoqua shall be supplied in sufficient quantity and quality for the intended application. Labor for completing field joints shall be provided by the installing contractor.

Supports: All necessary supports for the in-basin equipment supplied by Evoqua and described above are included. Supports will be constructed of Type 304 stainless steel. Field welding of supports shall be by the installing contractor.

Hardware: Necessary anchor bolts, gaskets, and fastening hardware for mounting and connecting in-basin equipment supplied by Evoqua are included. Anchor bolts and connecting hardware shall be Type 18-8 stainless steel. Note: Not included in our scope of supply are the hardware and gaskets at Evoqua/Contractor interfacing flanged connections, which shall be supplied by the installing contractor.

Post Equalization Equipment:

Effluent Transfer Pump: Three (3) Submersible Sewage Pumps shall be provided (1 as a standby). Each pump will be selected to deliver 350 GPM at a total pump head of 16 ft. Each operating pump will be furnished complete with 4" discharge connection, 30 ft. of power cable, thermal overload protection, retrieval guide bars and guide bar brackets, stainless steel lifting cable, and a 460 volt, 3 ph, 60 hz, submersible motor.

Ancillary Equipment & Services:

Manufacturer Service: Eighteen (18) man-days of start-up and operator training service are included. Service will be provided in six (6) trips to the job site. Service shall consist of dry installation inspection, wet start-up, controls start-up, and operator process training.

Process Control Panel: One (1) Pre-programmed process control panel capable of directing operation of all SBR functions shall be provided. Features include the following:

- NEMA 12 Enclosure
- Allen Bradley PLC, I/O modules, and power supply
- Color touchscreen HMI
- Control / Monitoring for Equipment listed in this proposal (including Post-EQ pumps)
- HOA Switches
- Indicating Lights
- Remote Access Modem
- (3) Level Transducers with stilling well for (1 per basin including Post-EQ)
- (5) Level Floats (including 3 for Post-EQ)
- Flow Proportional Control Software
- Failure Response

Submittals and O&M Manuals: Six (6) Equipment Submittals and four (4) O&M Manuals shall be provided.

BUDGETARY PRICING

Budgetary Pricing	
Item	Price
Equipment and Services as described in this Proposal	\$610,000
<i>Adder for Blower Sound Enclosures</i>	<i>+\$20,000</i>

The scope of supply and pricing are based on Evoqua's standard equipment selection, standard terms of sale and warranty terms. Any variations from these standards may affect this budgetary quotation. Additionally, please note that this budgetary quotation is for review and informational purposes only and does not constitute an offer for acceptance.

Items Not Included:

This proposal includes equipment of Evoqua standard design, and materials of construction as stated herein. Other materials of construction can be used upon request at additional costs. This proposal does not include:

- Tertiary Filters
- Post-EQ aeration or mixing equipment or controls for such equipment
- Installation.
- Sales or use taxes.
- Tanks and tank wall penetrations.
- Out-of-basin air or liquid piping.
- Chemical feed equipment.
- Interconnecting electrical wiring.
- Hardware at in-basin/out-of-basin interfacing flange connection.
- Motor starters & related electrical controls.
- Any items not specifically listed in this proposal.

CLARIFICATIONS:

- Decanter wall penetrations must be cast in place (not link seal). Contractor must provide a 3/4" hose connection to be tapped between the basin wall and effluent valve to submerge decanter. Decanter outlet piping must be designed with a submerged outlet or traps to prevent air from entering.
- Basin floor / walls must be designed to accommodate a 5-5/8" anchor bolt embedment.
- All equipment is quoted with manufacturer's standard coatings.
- Power for all valve actuators shall be the responsibility of the installing contractor. Provisions for valve power through the SBR control panel have not been included. Voltage requirements for automatic valves are noted in the valve section of this proposal.
- All welding shall be per AWS standards (ASME welding procedures for pressure piping do not apply).
- Pricing is based on providing Evoqua's standard controls package. Control and/or monitoring for other system components can be readily incorporated into the SBR control panel. Any additional control and/or monitoring will result in an increase to the quoted price.
- Chemical feed equipment has not been included. Any required chemical feed systems for nutrient addition, chemical P removal, alkalinity supplementation, pH adjustment, or methanol addition can be provided at additional cost.
- Contractor shall be responsible for providing 120V power to the blower enclosure vent fan motor.
- Freeze protection is not included. Contractor shall be responsible for providing freeze protection for any piping subject to freezing.

SCHEDULE:

Approval Drawings: 8-12 weeks* after signature of Agreement by Evoqua and Purchaser.

Shipment: 14-18 weeks* after approval

*Schedules for submittals and equipment delivery to be adjusted at time of order based upon existing order backlog.

Evoqua Water Technologies LLC Confidential Information

All of the information set forth in this quotation (including drawings, designs and specifications) is confidential and/or proprietary and has been prepared for your use solely in considering the purchase of the equipment and/or services described herein. Transmission of all or any part of this information to others, or use by you, for other purposes is expressly prohibited without our prior written consent.

PHASE I DESIGN CALCULATIONS

Omniflo® Sequencing Batch Reactor Design Calculations

Project: Santa Fe County WWTP
 Engineer: HDR

Date: 12-Dec-2016
 Designer: N. Barczewski

2 Basin SBR System with Jets - Phase I

I. DESIGN PARAMETERS:

Influent & Effluent Characteristics

Average Daily Flow (ADF)	=	0.50 MGD	1,893 m3/day
Peak Daily Flow	=	1.00 MGD	3,785 m3/day
BOD to SBR	=	323 mg/l *	
	=	1,347 lbs/day	611 kg/day
Effluent BOD	<	10 mg/l	
TSS to SBR	=	215 mg/l *	
	=	897 lbs/day	407 kg/day
Inert TSS fraction	=	40 % *	
Effluent TSS	<	10 mg/l	
Influent dissolved solids, TDS	=	500 mg/l *	
Influent NH4-N	=	34 mg/l *	
	=	140 lbs/day	64 kg/day
Influent TKN	=	42 mg/l	
	=	175 lbs/day	79 kg/day
Effluent NH3-N	<	not required	Summer
	<	not required	Winter
Effluent Total Nitrogen	<	5 mg/l	
		Assumed standard uninhibited nitrification rate*	
Influent Phosphorus	=	9 mg/l	
	=	38 lbs/day	17 kg/day
Effluent Phosphorus	<	1.0 mg/l with Chemical addition	
Min. Water Temperature	=	12 °C	
Max. Water Temperature	=	20 °C	

Omniflo® Sequencing Batch Reactor Design Calculations

Project: Santa Fe County WWTP

Date: 12-Dec-2016

Engineer: HDR

Designer: N. Barczewski

Reactor & Process Characteristics

Design MLSS	=	3,500 mg/l @ Top Water Level	
		4,123 mg/l @ Bottom Water Level	
Hydr. Retention Time provided	=	1.65 Days	39.7 Hours
Aerobic Sludge Age (SRT _{ox})	=	10.3 Days min. SRT _{ox}	
System SRT	=	22.9 Days	
Biosolids yield factor	=	0.54 gVSS/gBOD _r /d	
Aerobic or Oxidic F:M	=	0.12 gBOD/gMLSS/d	
System F:M	=	0.06 gBOD/gMLSS/d	
Elevation	=	7,000 ft. MSL*	2133.6 m MSL*
Average barometric pressure	=	11.33 psia*	78.14 kPa*

II. PROCESS PARAMETERS:

Avg net sludge yield (bio+inerts)	=	1,057 lbs/d based on BOD _r *	479 kg/day
Required aerobic mass	=	10,869 lbs MLSS	kg MLSS
Required aerobic volume	=	0.37 MG	1,409 m ³
Aerated portion of cycle	=	45.0 %	
Required total SBR volume	=	0.83 MG	3,132 m ³

III. SBR BASIN DESIGN:

Number of SBR basins	=	2	
<i>If Rectangular Basins are used :</i>			
Length/Width Ratio	=	1.00 : 1	
Length	=	50 ft	15.28 m
Width	=	50 ft	15.28 m
<i>If Round Tanks are used :</i>			
Diameter	=	57 ft	17.25 m
Normal Top Water Level	=	22.0 ft	6.71 m
Nominal Bottom Water Level	=	18.7 ft	5.69 m
Total Volume in SBR's	=	0.83 MG	3,132 m ³
Total Retention Time in SBR's	=	39.7 Hours	
		1.65 Days	

Omniflo® Sequencing Batch Reactor Design Calculations

Project: Santa Fe County WWTP
Engineer: HDR

Date: 12-Dec-2016
Designer: N. Barczewski

IV. OXYGEN REQUIREMENT:

lbs. O ₂ /lb. BOD removed	=	1.34	1.34 kg O ₂ /kg
lbs. O ₂ /lb. TKN oxidized	=	4.60	4.60 kg O ₂ /kg
lbs. O ₂ /lb. NO ₃ x denitrified	=	-2.86 (Denite efficiency = 80%)	-2.86 kg O ₂ /kg
Actual Oxygen Required, AOR	=	2,056 lbs./Day	932 kg/Day
DESIGN AOR	=	2,056 lbs. O₂/Day	932 kg O₂/Day

Convert Process, or Actual Oxygen Requirement (AOR), to Standard Oxygen (SOR) :

Conversion Formula from ASCE Manual of Practice :

$$SOR = \frac{AOR * C_s}{a * (\beta C_{sd} - DO) * \theta^{(T-20)}}$$

Where:

C_s = DO saturation at Std Conditions
= 9.07*(1+0.4*D/34)
= 11.45 mg/l

C_{sd} = DO saturation at design conditions

C_{sd} = C_{st}*(Fe+0.4*D/34)

where : C_{st} = DO saturation at liquid Temp & 1 sea level

C_{st} = 9.07 mg/l

Fe = 0.77

Elevation Factor

Therefore, C_{sd} = 9.33 mg/l

Alpha, a = 0.85 *

SWD, D = 22.0 ft

D.O., mg/l = 2.0 mg/l

Beta, β = 0.95 *

Liquid Temp, T = 20 °C

Theta, θ = 1.024

Therefore:

Standard Oxygen Required, SOR = 4,034 lbs. O₂/Day

V. PROCESS DESIGN:

CYCLE TIMES

No. of batches/day/SBR	=	4 per SBR	
Maximum Fill time	=	3.0 Hours per basin	
Fill time at ADF	=	3.0 Hours	
Anoxic Fill time	=	1.5 Hours	50% of Fill is anoxic.
Aerated Fill	=	1.5 Hours	45% of Cycle is aerated.
React time	=	1.2 Hours	
Settle time	=	1.00 Hours	
Decant time	=	0.60 Hours	
Idle time	=	0.20 Hours	
Complete Cycle time	=	6.0 Hours per basin	

Omniflo® Sequencing Batch Reactor Design Calculations

Project: Santa Fe County WWTP
Engineer: HDR

Date: 12-Dec-2016
Designer: N. Barczewski

VI. AERATION SYSTEM DESIGN:

Aerator elevation	=	2.50 ft	0.76 m
Nozzle Cant	=	30 °	
Avg aerator submergence	=	19.04 ft	5.80 m
Total aeration time	=	2.70 Hours/cycle	
	=	10.80 Hours/Basin/Day	
SOR for aeration design	=	187 lb/hr/basin	85 kg/hr/basin
Design gassing rate	=	43.8 SCFM/jet	74.5 Nm ³ /hr/jet
Site gassing rate	=	50.7 ICFM/jet	86.2 m ³ /hr/jet
Absorption efficiency	=	25.7 %	
Design air flow	=	701 SCFM	1,192 Nm ³ /hr
Jets required per basin	=	16 Model 40 Jets	
Jet headers per basin	=	1 Type : Bi-Directional Orientation : Length	
Jets per header	=	16 Model 40 Jets	

VII. BLOWER DESIGN CALCULATIONS:

Operating blowers	=	1 per aerating basin	
Type of Blowers :	=	Rotary, Positive Displacement	
Total Number of Blowers	=	2 (1) Duty, (1) Stand-by	
Air flow per blower	=	701 SCFM	1,192 Nm ³ /hr
Inlet losses	=	0.30 psig *	2.07 kPa (gauge) *
Net inlet pressure	=	11.03 psia	76.07 kPa (absolute)
Discharge piping losses	=	0.70 psig *	4.83 kPa (gauge) *
Static head + Aerator loss	=	8.34 psig average	57.52 kPa (gauge)
	=	8.54 psig @ Max. WL	58.89 kPa (gauge)
	=	7.10 psig @ Min. WL	48.97 kPa (gauge)
Total discharge pressure	=	9.34 psig Average	64.41 kPa (gauge)
		9.54 psig Maximum	65.79 kPa (gauge)
		8.10 psig Minimum	55.87 kPa (gauge)
Design ambient temp.	=	95 °F Maximum	35.0 °C
		0 °F Minimum	-17.8 °C

Omniflo® Sequencing Batch Reactor Design Calculations

Project: Santa Fe County WWTP
Engineer: HDR

Date: 12-Dec-2016
Designer: N. Barczewski

Site air flow required	=	982 ICFM Average	1,669 m ³ /hr
Equiv. sea level pressure	=	12.87 psig Average	88.71 kPa (gauge)
Nominal blower efficiency	=	64 % *	
BHp per blower	=	48.5 BHp/Blower	36.2 BkW 38.5 kW @ 94% ME

VIII. PUMP DESIGN CALCULATIONS:

Number of pumps	=	1 per basin	
Type of Pumps :	=	Dry Pit Centrifugal	
Total number of pumps	=	2	
Flow per pump	=	2,929 GPM	665.3 m ³ /hr
Required jet head	=	17.0 ft	5.18 m
System headloss	=	4.0 ft *	1.22 m*
Total pump head	=	21.0 ft	6.40 m
Assumed pump efficiency	=	76 % *	
BHp per pump	=	20.4 BHp/Pump	15.2 BkW 16.2 kW @ 94% ME

IX. AERATION SYSTEM SUMMARY:

Standard Oxygen Required	=	4,034 lbs./Day	1,829 kg/Day
Avg. BHp for 24 hrs.	=	62 BHp**	49 kW
Assume Cost of Power	=	0.06 \$/kW	
Max. Annual Cost of Power**	=	\$25,176 assuming 94% motor efficiencies	

**Actual power draw is typically less due to Demand-Proportional aeration process control

X. DECANTER SIZING:

Cycles per day	=	8.0	
Volume per decant	=	62,500 Gallons at ADF	237 m ³
		62,500 Gallons Decantable	237 m ³
Decant time	=	0.60 Hours	
Average decant flow	=	1,736 GPM	394.3 m ³ /hr
Decanters per basin	=	1	
Flow per decanter	=	1,736 GPM	394.3 m ³ /hr

Omniflo® Sequencing Batch Reactor Design Calculations

Project: Santa Fe County WWTP
 Engineer: HDR

Date: 12-Dec-2016
 Designer: N. Barczewski

XI. PHOSPHORUS REMOVAL:

BOD vs Phosphorus :

Assume TSSi inert fraction is as shown under 'DESIGN PARAMETERS'.

Check BOD to P ratios :

Based on total influent values : BODi:P = 35:1

Based on soluble influent values : SBODi:P = 23:1

Approximate mg BODi/mg P required = 29:1 at oxic SRT selected

Assuming only bio-P removal :

Effluent P conc. achievable biologically = < 1 mg/l

*Although an adequate BODi:P ratio may exist to achieve desired effluent P limits, we recommend a chemical backup system for any P limit <2.0 mg/l

XII. ALKALINITY REQUIREMENT CALCULATIONS:

Assume waste biosolids contain 10% N. Also, 7.14 mg/l alkalinity per 1 mg/l nitrate generated and 3.57 mg/l alkalinity recovered per 1 mg/l nitrate denitrified.

Total TKN oxidized to nitrate	=	28 mg/l	mg/l @ TKNi - (0.10*dXv)
	or =	118 lbs./Day	54 kg/Day
Alkalinity req'd for nitrification	=	202 mg/l	
Alkalinity recovered from denite	=	81 mg/l	80 % Denitrification Eff.
Alkalinity lost in process	=	121 mg/l	
Influent alkalinity concentration	=	200 mg/l *	
Alkalinity as buffer	=	75 mg/l	
Additional alkalinity required	=	0 mg/l *	

XIII. ULTIMATE POST EQ SIZING:

Batches per Day	=	8	
Batch Size for Phase III 2 MGD	=	125,000 Gallons	473 m ³
Suggested Safety Factor	=	2	
Suggested EQ Basin Volume	=	0.25 MG	946 m ³
HRT	=	0.50 Days @ Phase I ADF (0.5 MGD)	12.0 Hours
Top Water Level	=	15 ft	4.57 m
<i>If Rectangular Basins are used :</i>			
Length/Width Ratio	=	1.0 : 1	
Length	=	47 ft	14.39 m
Width	=	47 ft	14.39 m
<i>If Round Tanks are used :</i>			
Diameter	=	53 ft	16.24 m

PHASE II DESIGN CALCULATIONS

Omniflo® Sequencing Batch Reactor Design Calculations

Project: Santa Fe County WWTP
 Engineer: HDR

Date: 12-Dec-2016
 Designer: N. Barczewski

4 Basin SBR System with Jets - Phase II

I. DESIGN PARAMETERS:

Influent & Effluent Characteristics

Average Daily Flow (ADF)	=	1.00 MGD	3,785 m ³ /day
Peak Daily Flow	=	2.00 MGD	7,570 m ³ /day
BOD to SBR	=	323 mg/l *	
	=	2,694 lbs/day	1,222 kg/day
Effluent BOD	<	10 mg/l	
TSS to SBR	=	215 mg/l *	
	=	1,793 lbs/day	813 kg/day
Inert TSS fraction	=	40 % *	
Effluent TSS	<	10 mg/l	
Influent dissolved solids, TDS	=	500 mg/l *	
Influent NH ₄ -N	=	34 mg/l *	
	=	280 lbs/day	127 kg/day
Influent TKN	=	42 mg/l	
	=	350 lbs/day	159 kg/day
Effluent NH ₃ -N	<	not required	Summer
	<	not required	Winter
Effluent Total Nitrogen	<	5 mg/l	
		Assumed standard uninhibited nitrification rate*	
Influent Phosphorus	=	9 mg/l	
	=	77 lbs/day	35 kg/day
Effluent Phosphorus	<	1.0 mg/l with Chemical addition	
Min. Water Temperature	=	12 °C	
Max. Water Temperature	=	20 °C	

Omniflo® Sequencing Batch Reactor Design Calculations

Project: Santa Fe County WWTP

Date: 12-Dec-2016

Engineer: HDR

Designer: N. Barczewski

Reactor & Process Characteristics

Design MLSS	=	3,500 mg/l @ Top Water Level 4,123 mg/l @ Bottom Water Level	
Hydr. Retention Time provided	=	1.65 Days	39.7 Hours
Aerobic Sludge Age (SRT _{ox})	=	10.3 Days min. SRT _{ox}	
System SRT	=	22.9 Days	
Biosolids yield factor	=	0.54 gVSS/gBOD _r /d	
Aerobic or Oxidic F:M	=	0.12 gBOD/gMLSS/d	
System F:M	=	0.06 gBOD/gMLSS/d	
Elevation	=	7,000 ft. MSL*	2133.6 m MSL*
Average barometric pressure	=	11.33 psia*	78.14 kPa*

II. PROCESS PARAMETERS:

Avg net sludge yield (bio+inerts)	=	2,113 lbs/d based on BOD _r *	958 kg/day
Required aerobic mass	=	21,738 lbs MLSS	kg MLSS
Required aerobic volume	=	0.74 MG	2,819 m ³
Aerated portion of cycle	=	45.0 %	
Required total SBR volume	=	1.65 MG	6,264 m ³

III. SBR BASIN DESIGN:

Number of SBR basins	=	4	
<i>If Rectangular Basins are used :</i>			
Length/Width Ratio	=	1.00 : 1	
Length	=	50 ft	15.28 m
Width	=	50 ft	15.28 m
<i>If Round Tanks are used :</i>			
Diameter	=	57 ft	17.25 m
Normal Top Water Level	=	22.0 ft	6.71 m
Nominal Bottom Water Level	=	18.7 ft	5.69 m
Total Volume in SBR's	=	1.65 MG	6,264 m ³
Total Retention Time in SBR's	=	39.7 Hours 1.65 Days	

Omniflo® Sequencing Batch Reactor Design Calculations

Project: Santa Fe County WWTP
Engineer: HDR

Date: 12-Dec-2016
Designer: N. Barczewski

IV. OXYGEN REQUIREMENT:

lbs. O ₂ /lb. BOD removed	=	1.34	1.34 kg O ₂ /kg
lbs. O ₂ /lb. TKN oxidized	=	4.60	4.60 kg O ₂ /kg
lbs. O ₂ /lb. NO ₃ x denitrified	=	-2.86 (Denite efficiency = 80%)	-2.86 kg O ₂ /kg
Actual Oxygen Required, AOR	=	4,111 lbs./Day	1,865 kg/Day
DESIGN AOR	=	4,111 lbs. O₂/Day	1,865 kg O₂/Day

Convert Process, or Actual Oxygen Requirement (AOR), to Standard Oxygen (SOR) :

Conversion Formula from ASCE Manual of Practice :

$$SOR = \frac{AOR * C_s}{a * (\beta C_{sd} - DO) * \theta^{(T-20)}}$$

Where:

C_s = DO saturation at Std Conditions
= 9.07*(1+0.4*D/34)
= 11.45 mg/l

C_{sd} = DO saturation at design conditions

C_{sd} = C_{st}*(Fe+0.4*D/34)

where : C_{st} = DO saturation at liquid Temp & 1 sea level

C_{st} = 9.07 mg/l

Fe = 0.77

Elevation Factor

Therefore, C_{sd} = 9.33 mg/l

Alpha, a = 0.85 *

SWD, D = 22.0 ft

D.O., mg/l = 2.0 mg/l

Beta, β = 0.95 *

Liquid Temp, T = 20 °C

Theta, θ = 1.024

Therefore:

Standard Oxygen Required, SOR = 8,068 lbs. O₂/Day

V. PROCESS DESIGN:

CYCLE TIMES

No. of batches/day/SBR	=	4 per SBR	
Maximum Fill time	=	1.5 Hours per basin	
Fill time at ADF	=	1.5 Hours	
Anoxic Fill time	=	1.5 Hours	100% of Fill is anoxic.
Aerated Fill	=	0.0 Hours	45% of Cycle is aerated.
React time	=	2.7 Hours	
Settle time	=	1.00 Hours	
Decant time	=	0.60 Hours	
Idle time	=	0.20 Hours	
Complete Cycle time	=	6.0 Hours per basin	

Omniflo® Sequencing Batch Reactor Design Calculations

Project: Santa Fe County WWTP
 Engineer: HDR

Date: 12-Dec-2016
 Designer: N. Barczewski

VI. AERATION SYSTEM DESIGN:

Aerator elevation	=	2.50 ft	0.76 m
Nozzle Cant	=	30 °	
Avg aerator submergence	=	19.50 ft	5.94 m
Total aeration time	=	2.70 Hours/cycle	
	=	10.80 Hours/Basin/Day	
SOR for aeration design	=	187 lb/hr/basin	85 kg/hr/basin
Design gassing rate	=	42.6 SCFM/jet	72.4 Nm ³ /hr/jet
Site gassing rate	=	49.2 ICFM/jet	83.6 m ³ /hr/jet
Absorption efficiency	=	26.5 %	
Design air flow	=	681 SCFM	1,157 Nm ³ /hr
Jets required per basin	=	16 Model 40 Jets	
Jet headers per basin	=	1 Type : Bi-Directional	
		Orientation : Length	
Jets per header	=	16 Model 40 Jets	

VII. BLOWER DESIGN CALCULATIONS:

Operating blowers	=	1 per aerating basin	
Type of Blowers :	=	Rotary, Positive Displacement	
Total Number of Blowers	=	3 (2) Duty, (1) Stand-by	
Air flow per blower	=	681 SCFM	1,157 Nm ³ /hr
Inlet losses	=	0.30 psig *	2.07 kPa (gauge) *
Net inlet pressure	=	11.03 psia	76.07 kPa (absolute)
Discharge piping losses	=	0.70 psig *	4.83 kPa (gauge) *
Static head + Aerator loss	=	8.54 psig average	58.89 kPa (gauge)
	=	8.54 psig @ Max. WL	58.89 kPa (gauge)
	=	7.10 psig @ Min. WL	48.97 kPa (gauge)
Total discharge pressure	=	9.54 psig Average	65.79 kPa (gauge)
		9.54 psig Maximum	65.79 kPa (gauge)
		8.10 psig Minimum	55.87 kPa (gauge)
Design ambient temp.	=	95 °F Maximum	35.0 °C
		0 °F Minimum	-17.8 °C

Omniflo® Sequencing Batch Reactor Design Calculations

Project: Santa Fe County WWTP
 Engineer: HDR

Date: 12-Dec-2016
 Designer: N. Barczewski

Site air flow required	=	954 ICFM Average	1,621 m ³ /hr
Equiv. sea level pressure	=	13.14 psig Average	90.63 kPa (gauge)
Nominal blower efficiency	=	64 % *	
BHp per blower	=	47.9 BHp/Blower	35.7 BkW 38.0 kW @ 94% ME

VIII. PUMP DESIGN CALCULATIONS:

Number of pumps	=	1 per basin	
Type of Pumps :	=	Dry Pit Centrifugal	
Total number of pumps	=	4	
Flow per pump	=	2,929 GPM	665.3 m ³ /hr
Required jet head	=	17.0 ft	5.18 m
System headloss	=	4.0 ft *	1.22 m*
Total pump head	=	21.0 ft	6.40 m
Assumed pump efficiency	=	76 % *	
BHp per pump	=	20.4 BHp/Pump	15.2 BkW 16.2 kW @ 94% ME

IX. AERATION SYSTEM SUMMARY:

Standard Oxygen Required	=	8,068 lbs./Day	3,659 kg/Day
Avg. BHp for 24 hrs.	=	123 BHp**	98 kW
Assume Cost of Power	=	0.06 \$/kW	
Max. Annual Cost of Power**	=	\$49,935 assuming 94% motor efficiencies	

**Actual power draw is typically less due to Demand-Proportional aeration process control

X. DECANTER SIZING:

Cycles per day	=	16.0	
Volume per decant	=	62,500 Gallons at ADF	237 m ³
		62,500 Gallons Decantable	237 m ³
Decant time	=	0.60 Hours	
Average decant flow	=	1,736 GPM	394.3 m ³ /hr
Decanters per basin	=	1	
Flow per decanter	=	1,736 GPM	394.3 m ³ /hr

Omniflo® Sequencing Batch Reactor Design Calculations

Project: Santa Fe County WWTP
Engineer: HDR

Date: 12-Dec-2016
Designer: N. Barczewski

XI. PHOSPHORUS REMOVAL:

BOD vs Phosphorus :

Assume TSSi inert fraction is as shown under 'DESIGN PARAMETERS'.

Check BOD to P ratios :

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	or =	236 lbs./Day	107 kg/Day
Alkalinity req'd for nitrification	=	202 mg/l	
Alkalinity recovered from denite	=	81 mg/l	80 % Denitrification Eff.
Alkalinity lost in process	=	121 mg/l	
Influent alkalinity concentration	=	200 mg/l *	
Alkalinity as buffer	=	75 mg/l	
Additional alkalinity required	=	0 mg/l *	

XIII. ULTIMATE POST EQ SIZING

Batches per Day	=	16	
Batch Size for Phase III 2 MGD	=	125,000 Gallons	473 m ³
Suggested Safety Factor	=	2	
Suggested EQ Basin Volume	=	0.25 MG	946 m ³
HRT	=	0.25 Days @ Phase II ADF (1 MGD)	6.0 Hours
Top Water Level	=	15 ft	4.57 m
<i>If Rectangular Basins are used :</i>			
Length/Width Ratio	=	1.0 : 1	
Length	=	47 ft	14.39 m
Width	=	47 ft	14.39 m
<i>If Round Tanks are used :</i>			
Diameter	=	53 ft	16.24 m

PLAN VIEW

OMNIFLO[®] INFORMATION

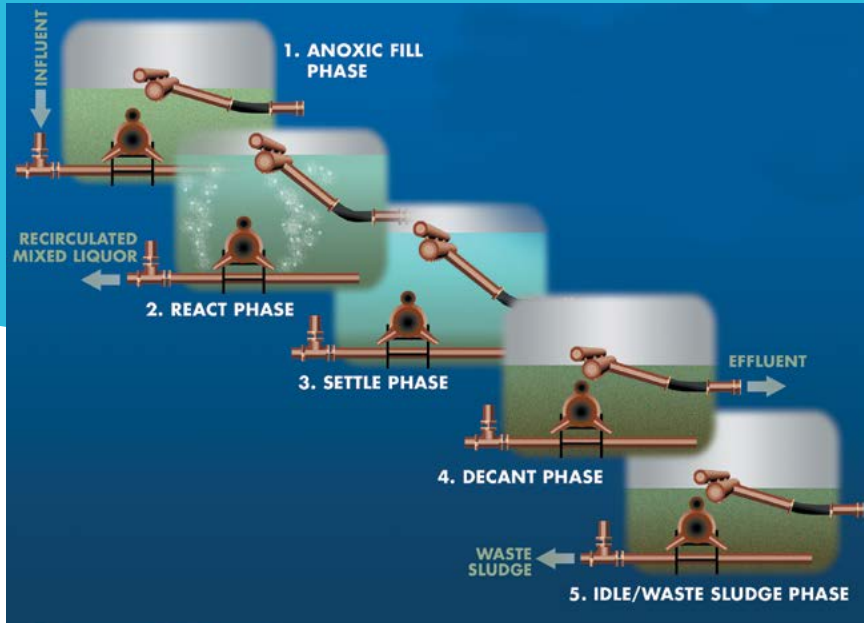


evoqua
WATER TECHNOLOGIES



OMNIFLO® SEQUENCING BATCH REACTOR (SBR) JET TECH SBR TECHNOLOGY

PROVEN PERFORMANCE UNDER DEMANDING CONDITIONS



The OMNIFLO® SBR Cycle effectively utilizes a single reactor

OMNIFLO® SBR Benefits

- Biological Nutrient Removal (BNR)
- High quality effluent at widely varying flows and loadings
- No sludge recycle system
- Perfect quiescent settling
- Optimum energy efficiency
- No clarifiers
- No short circuiting
- Small footprint
- Flexible design
- Retrofits of existing tanks
- Biological phosphorous removal

SUPERIOR TECHNOLOGY IN WASTEWATER TREATMENT

The OMNIFLO® Sequencing Batch Reactor (SBR) utilizes state-of-the-art equipment and controls to deliver superior performance under the most demanding conditions, while offering important benefits to plant owners and operators.

Operating Principles

The OMNIFLO SBR is a fill-and-draw, non-steady state activated sludge process in which one or more reactor basins are filled with wastewater during a discrete time period, and then operated in a batch treatment mode. In a single reactor basin the OMNIFLO SBR accomplishes equalization, aeration, and clarification in a timed sequence. In a conventional continuous flow process, multiple structures are required to obtain the same treatment objectives.

A single cycle for each reactor consists of five discrete periods, Fill, React, Settle, Decant, and Idle. The OMNIFLO SBR system is unique in its ability to handle influent flows and a wide range of organic loads and industrial pollutants. The OMNIFLO SBR is ideally suited when nitrification, denitrification and biological phosphorous removal are necessary.

The operating strategy provides process control over a wide range of flows. By varying the operating strategy, aerobic or anoxic conditions can be achieved to encourage the growth of desirable microorganisms. Microorganisms can also be acclimated to a wide range of industrial and chemical processing wastes.

OMNIFLO® SBR Cycle

Anoxic Fill Phase

During Anoxic fill influent is distributed throughout the settled sludge through the Influent Distribution/Sludge Collection Manifold (ID/SC) and biodegradation is initiated. The reactor is filled with wastewater and fill can be aerated, anoxic, or a combination of aerated and anoxic.

React Phase

Influent flow is terminated. Aeration and mixing continue in the full reactor until complete biodegradation is achieved.

Settle Phase

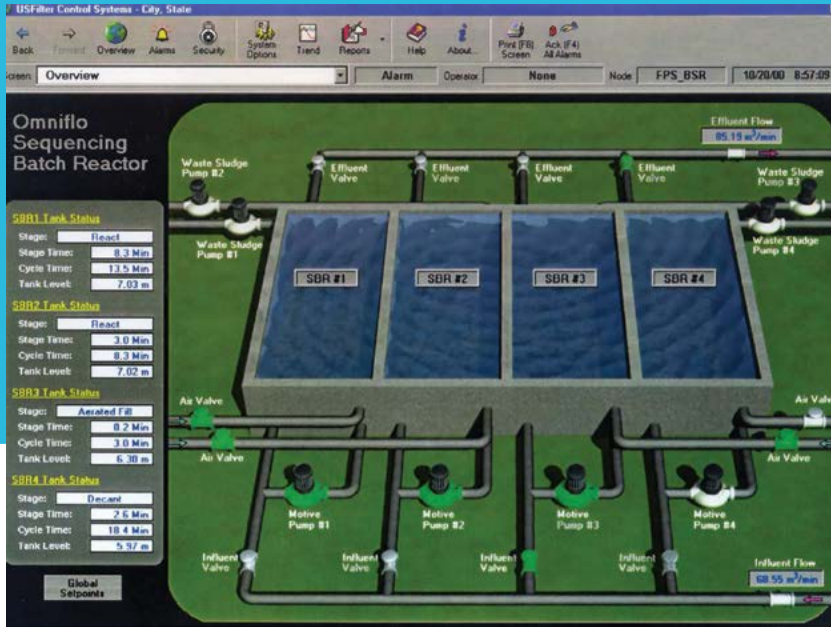
Aeration and mixing are turned off and perfect quiescent conditions allow the biomass to settle, leaving the treated supernatant above.

Decant Phase

Effluent is removed from just below the liquid surface by the Floating Solids Excluding Decanter.

Idle/Waste Sludge Phase

The reactor waits to receive flow. Settled sludge is drawn through the ID/SC and removed from the SBR reactor.



These types of state-of-the-art control strategies meet specific needs.

OMNIFLO® SBR Control Features

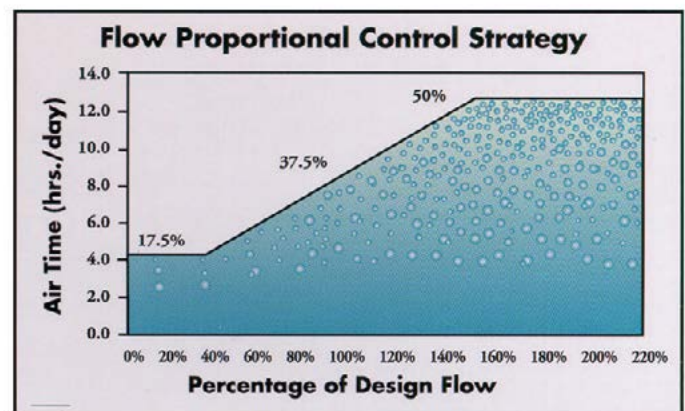
- Reduction of operator time (fully automated)
- Consistent, efficient process
- Additional PC/SCADA systems (optional)
- Equipment failure alarms and automated responses
- Phone modem for remote process service capability (standard)
- Continuous liquid level indication (standard on flow proportional)
- D.O. control (optional)
- Surge protection
- Flexibility for operator to change set points

OMNIFLO® SBR System Controls

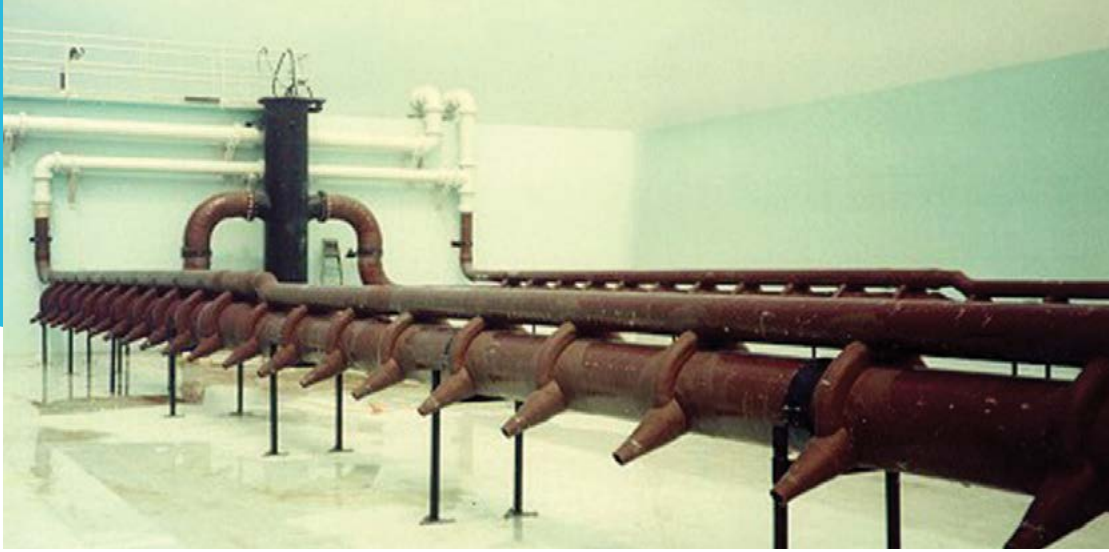
The heart of the OMNIFLO® SBR is the control system. The control system focuses on an operating strategy that optimizes the SBR process capabilities while minimizing required operator time and decision making. We currently offer three types of control systems:

Flow Proportional Control – This state-of-the-art control system features a PLC with a simple to use operator interface. Pressure transducers are used to continuously monitor the rate of fill in each SBR reactor. As the flow changes, the aeration time is adjusted proportional to the flow. This strategy ensures that oxygen is available when needed, but does not waste power during low flow periods. The flow proportional control system also provides automatic alarm and failure response. For example, if an influent valve fails to open, the influent pump station would be pumping against a closed valve. This feature would place the affected reactor out of service and divert the flow to another in-service basin until the failure is manually acknowledged and corrected. The controls adjust the operating strategy and setpoints to provide optimal treatment with the remaining reactors.

~~**Slug Feed Control** – The slug feed control strategy utilizes intermittent, rapid fill periods, which maximizes available aeration time during each cycle. This PLC based control system is applicable for treatment plants that have adequate influent holding capacity (influent equalization basin) prior to the SBR.~~



Aeration time is adjusted proportionally to flow to ensure the right amount of oxygen is available when needed.



VARI-CANT® Jet
Aeration System

SUPERIOR EQUIPMENT FOR PROCESS PERFORMANCE

Jet Aeration Designs

The VARI-CANT® jet aeration system from Evoqua utilizes proven principles of jet aeration, combined with state-of-the-art design and materials, resulting in a system with superior performance, efficiency and trouble-free operation. The jet aeration system operates by intermixing air with a motive liquid and injecting the stream into the wastewater. The motive liquid – recirculated mixed liquor – is discharged from an inner nozzle into an outer nozzle. Compressed atmospheric air is introduced, and sheared into tiny bubbles which are entrained in the motive liquid stream and injected back into the basin.

~~Diffused Aeration Designs~~

~~We offer both fine and coarse bubble SBR installations with fixed and retrievable diffuser assemblies available. Most fine and coarse bubble designs used in SBR's require some sort of mixing device to achieve complete mix in the basin during aeration. OMNIFLO® SBR systems are designed without a mixing device when the density of the diffusers achieve full floor coverage and the ID/SC manifold is used to distribute the influent evenly across the basin floor. Reliable and durable floating surface aerators and mixers are also available for special applications with SBR technology.~~

AERATION/ MIXING OPTIONS

- Jets with submersible or dry pit pumps
- Full floor coverage with fine & coarse bubble diffusers
- High-speed floating aerators
- Fixed fine and coarse bubble diffusers with mixers
- Mixers
- Retrievable fine and coarse bubble diffusers with mixers



OMNIFLO® SBR with Fine Bubble Diffusers



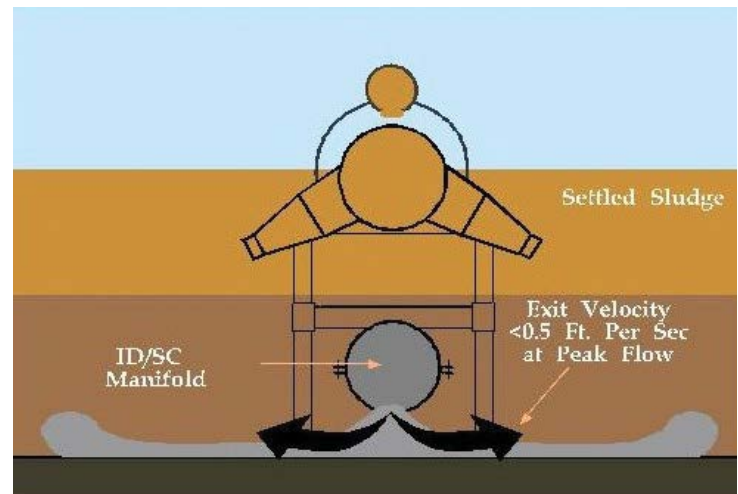
OMNIFLO® SBR with Fine Bubble Diffusers



Influent distribution manifold

Influent Distribution/ ~~Sludge Collection~~ Manifold (ID/SC)

The ID/SC manifold allows intimate contact of the influent (food) with the settled biomass in the sludge blanket throughout the length of the basin. During this time, the soluble BOD is absorbed and stored by the facultative biomass until air is received to metabolize the food. The selective pressures exerted on the biomass assists in good settling and facultative organisms to predominate. ~~The ID/SC manifold is also used to withdraw sludge from multiple points across the basin floor. This yields the thickest sludge possible, reducing side stream sludge treatment operation and maintenance.~~ Finally, the ID/SC prevents disruption of the sludge blanket during Filled Decant periods necessitated by high flow rates or emergency single tank operation.



OMNIFLO® SBR KEY ADVANTAGES

- Licensed plant operators available for customer service 24 hrs/day, 7 days/week
- Choice of aeration / mixing devices
- Influent distribution / sludge collection manifold (ID/SC)
- Non-Electro mechanical solids excluding floating decanter
- State-of-the-art controls
- Retrofits available for any basin geometry
- Experience, Reputation, & Reliability



Floating solids excluding decanter



Draw tube with solids excluding plug valves.

Floating Solids Excluding Decanter

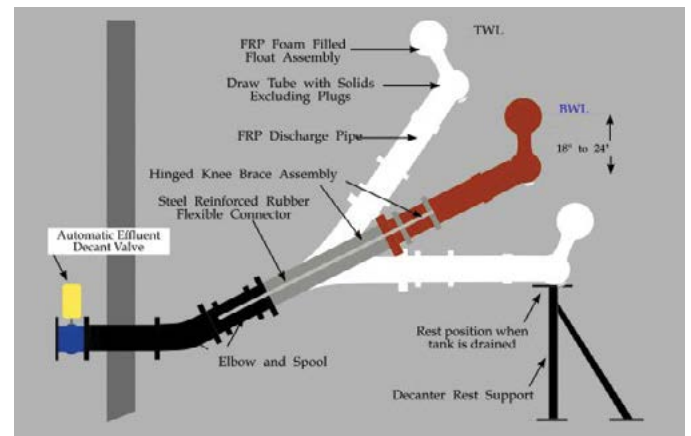
The Jet Tech™ floating solids excluding decanter is the only true solids excluding decanter in the industry that does not utilize electro-mechanical equipment in the basin. This state-of-the-art design utilizes multiple orifices to keep velocities at a minimum, and pulls treated effluent from below the surface to eliminate the possibility of entraining floatables. The decanters are constructed of high quality, durable, corrosive resistant materials with a manual override that is unique in the industry and requires no routine maintenance.

~~Fixed Decanter~~

~~The fixed decanter operates similarly to the floating decanter, except it is attached to the basin wall at a fixed elevation below the bottom water level. This eliminates the flexible hose connector, knee brace and decanter rest support. In SBR systems, the fixed decanter requires the availability of a longer settling time since the solids must settle below the bottom water level before decanting.~~

~~Non Solids Excluding Decanter~~

~~The non solids excluding decanter is constructed similarly to the solids excluding decanter, however it does not contain the spring loaded valves. This type of decanter is installed in applications when it is not important if some solids are left in the decanted effluent.~~



Jet Tech™ decanters are unique in the industry and require no routine maintenance.

DECANTER ADVANTAGES

- Innovative designs, engineered specifically for each project.
- Simple safe operation
- No in-basin electromechanical devices requiring maintenance
- Consistent quality performance
- Years of reliable operating experience in the field with installations worldwide



The 2.4 MGD Pima Utility Wastewater Treatment Plant meets Title 22 effluent quality standards.

PROVEN TECHNOLOGY AND EXPERIENCE

Pima Utility

The Pima Utility Wastewater Treatment Plant located in a retirement community in Arizona was designed to treat 2.4 million gallons per day (MGD), and produce a high quality effluent with disinfection, low turbidity and nitrogen levels to meet Title 22 effluent quality standards. The rectangular process basins were designed to be low profile and covered for environmental aesthetics with mechanical equipment installed in an enclosed building to eliminate any noise.

Rahr Malting

The Rahr Malting Company located in Shakopee, MN is one of the world's largest malt producers. Since 1999, an OMNIFLO® SBR has been installed which has consistently met their wastewater treatment requirements. The Rahr Malting Co., also worked with the Minnesota Pollution Control Agency in cleaning up the river where the wastewater effluent is discharged to make sure oxygen consuming compounds were removed.

Fruitland, Maryland

The City of Fruitland, Maryland installed an OMNIFLO® SBR system to expand its capacity of its wastewater treatment plant and to meet the requirements for the Chesapeake Bay initiative. The OMNIFLO SBR system was selected because of its compact footprint and ability to achieve enhanced nutrient removal within a two-tank layout. This system also includes the patented VARI-CANT® Jet Aeration system from Evoqua as well.

OMNIFLO® SBR PRIMARY MARKETS

- Municipal
- Food & Beverage
- Pulp & Paper
- Petrochemical & Oil Refining
- Pharmaceutical
- Chemical / CPI
- Landfill /Leachate Applications
- Textile Industry



OMNIFLO® SBR installed at Rahr Malting



Fruitland, Maryland Wastewater Treatment Plant



Visit www.evoqua.com/omniflo
to connect with an expert.

2607 N. Grandview Blvd, Suite 130, Waukesha, Wisconsin 53188

+1 (866) 926-8420 (toll-free) **+1 (978) 614-7233** (toll)

www.evoqua.com

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Subject to change without notice

BC-SBR-BR-0914

EVOQUA FORTY-X DISC FILTER BUDGET PROPOSAL

Project Name:	Santa Fe County, NM	Date:	12/13/2016
Proposal Number:	170072-A0		

Process Performance Requirements:

Avg. Daily Flow:	0.5	mgd =	347 gpm
Peak Daily Flow:	1	mgd =	694 gpm
Influent Avg. TSS:	10	mg/l	
Influent Peak TSS:	10	mg/l	
Effluent TSS:	5	mg/l	

Forty-X Filter Sizing and Selection:

Number of Filters:	2		(1 duty, 1 standby)
Filter Model Number:	E1403T		
Avg. Hydraulic Loading Rate:	2.57	gpm	
Avg. Solids Loading Rate at Avg. Flow:	0.31	mg/l	
Max Solids Loading Rate at Avg. Flow:	0.31	mg/l	
Peak Hydraulic Loading Rate:	5.15	gpm	
Avg. Solids Loading Rate at Peak Flow:	0.62	mg/l	
Max Solids Loading Rate at Peak Flow:	0.62	mg/l	

Forty-X Filter Specs:

Submergence:	65%		
Effective Filter Surface Area	135	ft ² / filter	
Drum Rotational Speed	1-3	rpm	
Drum Drive Motor	2	Hp, 480V, 3ph, 60Hz	
Backwash Pump	38	gpm at 100+ psi	
Backwash Pump Motor	5	Hp, 480V, 3ph, 60Hz	
Material of Construction:			
Filter Frame	304	SS	
Central drum	304	SS	
Sliding Cover	304	SS	
Filter Cloth	Polyester		
Filter Panel Box	ABS / PPE		
Backwash Trough	304	SS	
Spray Manifold	304	SS	

Evoqua Additional Scope:

Each filter to have individual control panel (of Evoqua's standard design and components).
 Control Panel mounted by others.

Level probe for automatic backwash operation

Standard equipment spare parts including 7 filter panels and 10 spray nozzles

Equipment startup and operator training, 2 days on site, 1 trip

Supplied by Others

Civil construction and installation; including piping, concrete works, and electrical connections
Other instrumentations not described herein
Control Panel stands or mounting
Effluent/ Bypass Weirs
Equipment Access Platform or Grating
Equipment Freeze Protection
Any necessary bid bonding requirements
Influent feed pumps or influent isolation valves
Any other items not explicitly indicated in this proposal

Equipment Budget Pricing:

Two (2) Evoqua Forty-X Disc Filter and scope as defined above..... \$ 280,000 US Dollars
F.O.B. Thomasville, Georgia. Freight is included. Budget is +/- 5%
Taxes and Duties are Not Included.
Price and delivery estimate valid only for 90 days from date of this proposal.

Delivery:

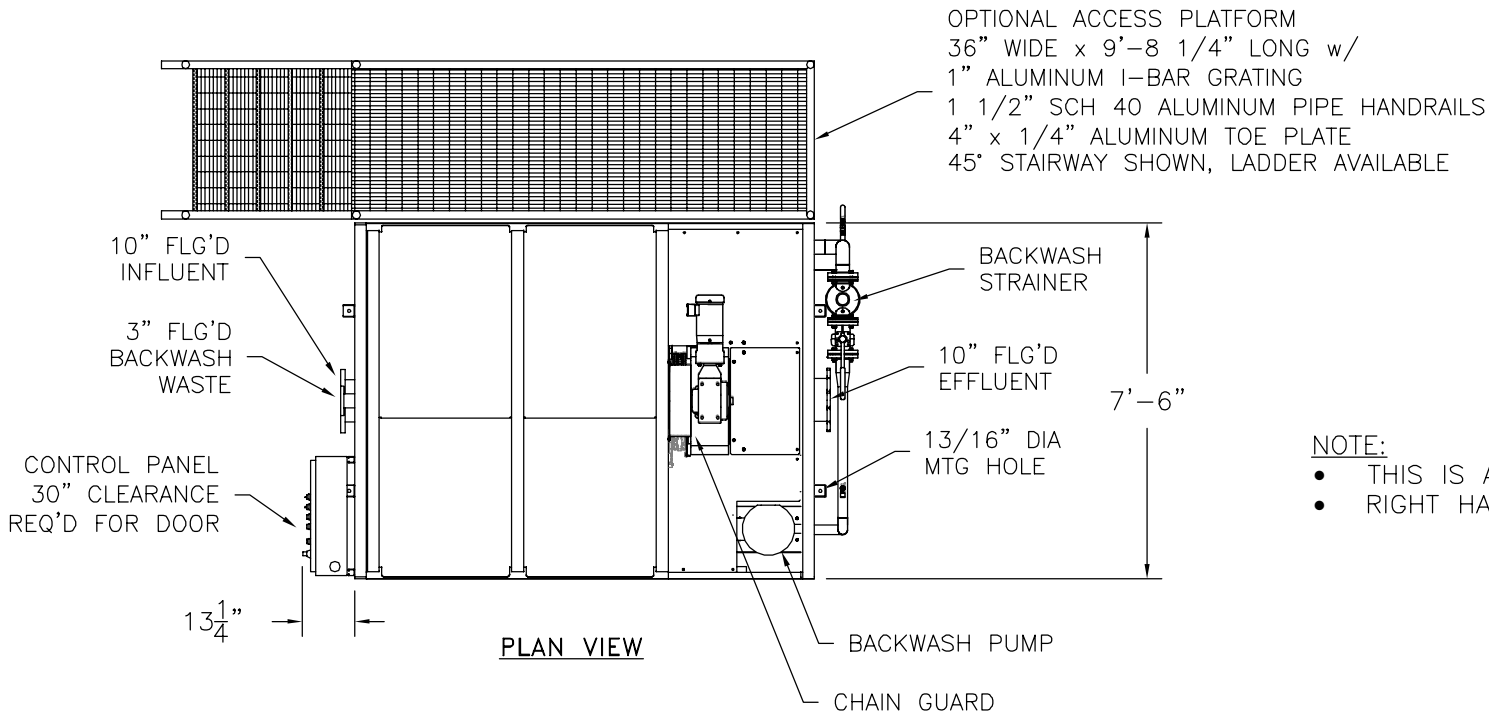
Submittals: 4-6 weeks from mutually agreed upon and signed contract for submittal delivery.
Equipment: 20-22 weeks from approved submittals for equipment delivery.

The scope of supply and pricing are based on Evoqua's standard equipment selection, standard terms of sale and warranty terms. Any variations from these standards may affect this budgetary quotation. Additionally, please note that this budgetary quotation is for review and informational purposes only and does not constitute an offer for acceptance.

BAR = 1" AT PLOT SCALE

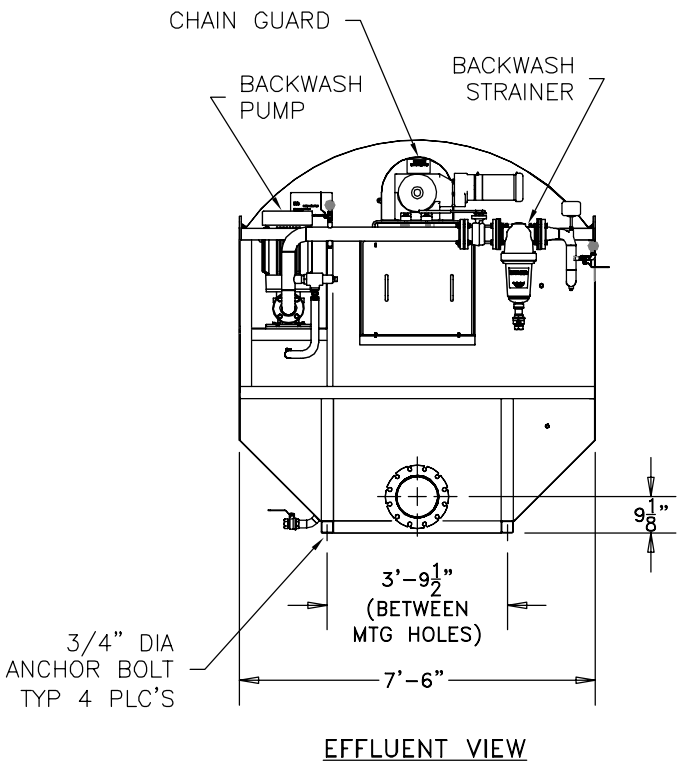
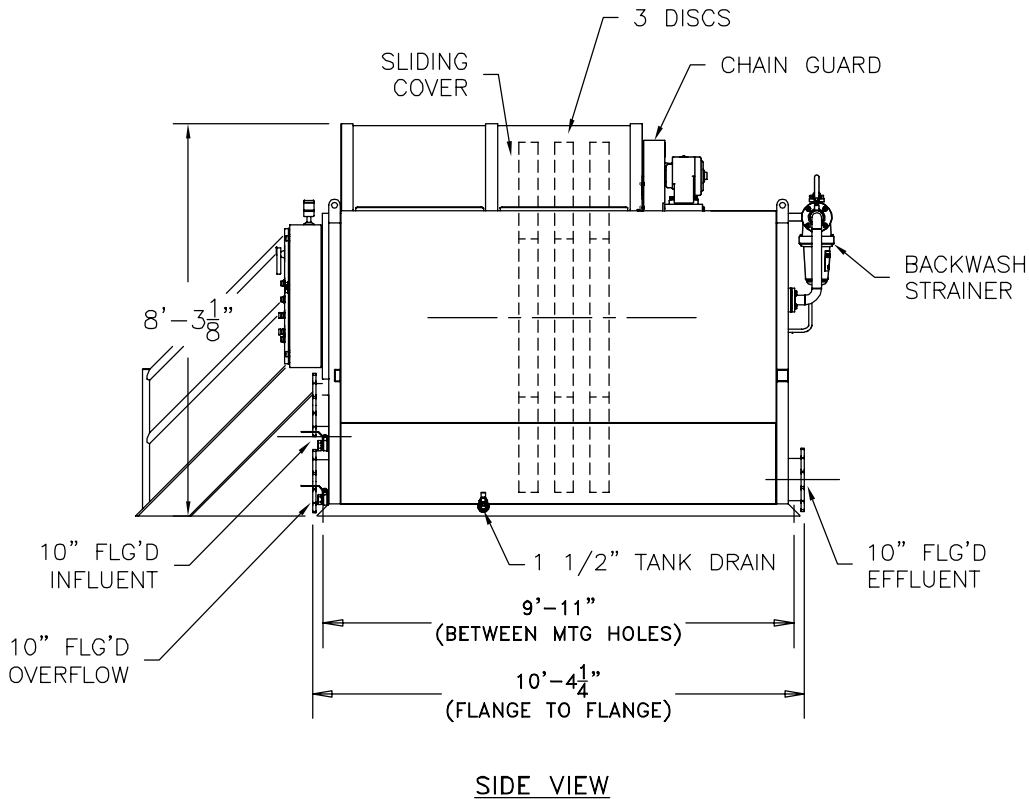
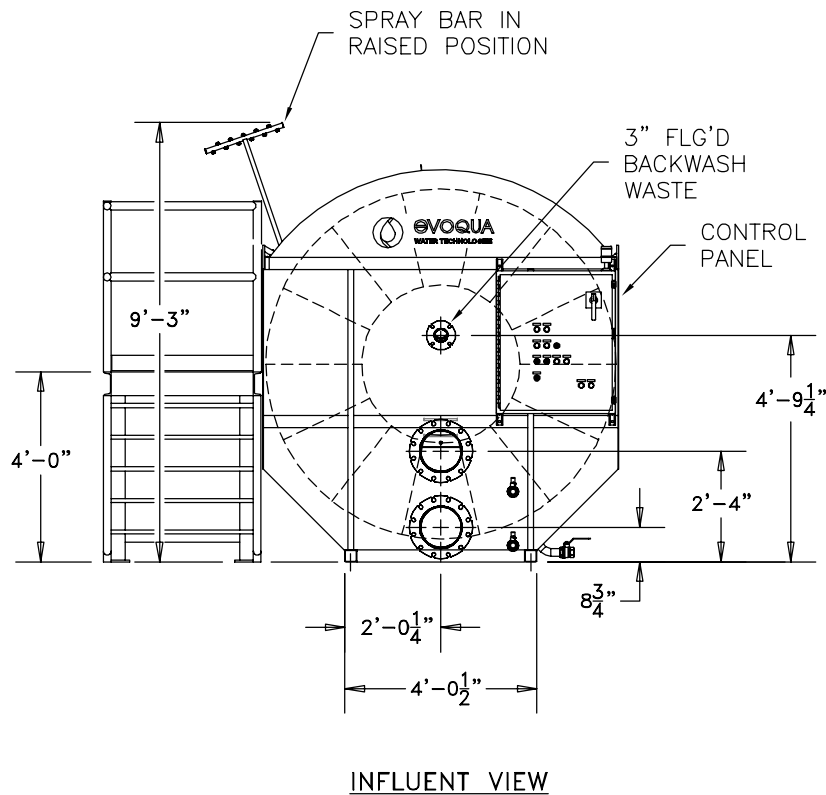
DATA

- 1) 3 DISCS, 134 SQ FT
- 2) BACKWASH PUMP, 5 HP
- 3) BACKWASH RATE, 33 GPM @ 100+ PSI
- 4) DRIVE, 1.5 HP VFD
- 5) DRY WEIGHT, 6,800 LBS
- 6) OPERATING WEIGHT, 15,700 LBS
- 7) ALL FLANGES ARE 150 LB
- 8) UNIT IS SHIPPED FULLY ASSEMBLED




NOTE:

- THIS IS A LEFT HAND UNIT.
- RIGHT HAND UNIT IS MIRROR IMAGE.



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	BAC	7/28/14			
	CHECKER	DATE	CLIENT		
	ENGINEER	DATE			
REV	MANAGER	DATE	<div><div></div><div><div>EVOQUA</div><div>WATER TECHNOLOGIES</div></div><div>THOMASVILLE, GA 1-800-841-1550</div></div>		
	FILE:	SCALE: 48			
	PROJECT	CODE	DRAWING PF1403TL	SHEET	REV 000



Continuous Backwash Sand Filter Budget Proposal

Project Name: Santa Fe County, NM
Date: 12/13/16

We would suggest providing concrete tanks with our 50 ft² modules.

Process Requirements:

- peak flow 1042 gpm
- filtration area required 200ft²
- hydraulic loading 5.21 gpm/ft²
- average flow 347 gpm
- hydraulic loading 1.74 gpm/ft²

To accommodate the requirement for a redundant filter train, we would suggest two (2) filter modules in three (3) filter trains, resulting in 6 total filter modules. Standard operation will have 4 filters online and 1 train is off.

Equipment Budget Pricing:

Six (6) CB465-20 Filters (arranged in 3 cells of 2 filters each) _____ \$300,000

Scope includes:

- Internals for 8 CB465-20 Filters
- Filter Media
- Weir Plates
- Supports and Grating / Covers over filter cells
- Pneumatic Control Panels
- Air Compressor
- Freight
- Startup, Warranty, Manuals

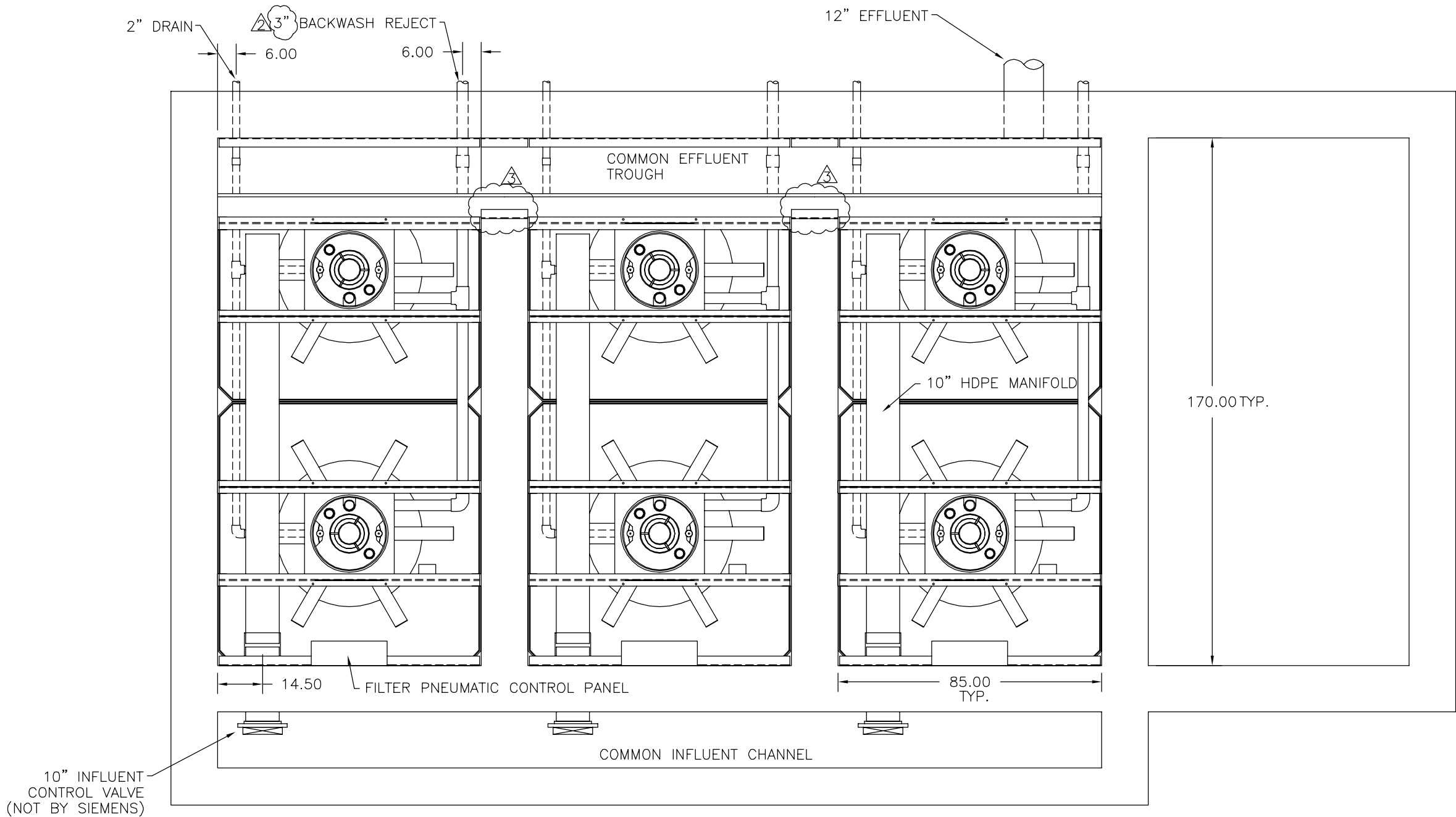
Does not include any concrete tankage of any kind.

Does not include any piping, chemical feed, instrumentation or installation.

See attached drawings for reference of a prior job that is arranged in 3 cells of 2 modules each.

BAR = 1" AT PLOT SCALE


BILL OF MATERIAL				
ITEM	PART	DESCRIPTION		UNITQTY



PLAN VIEW

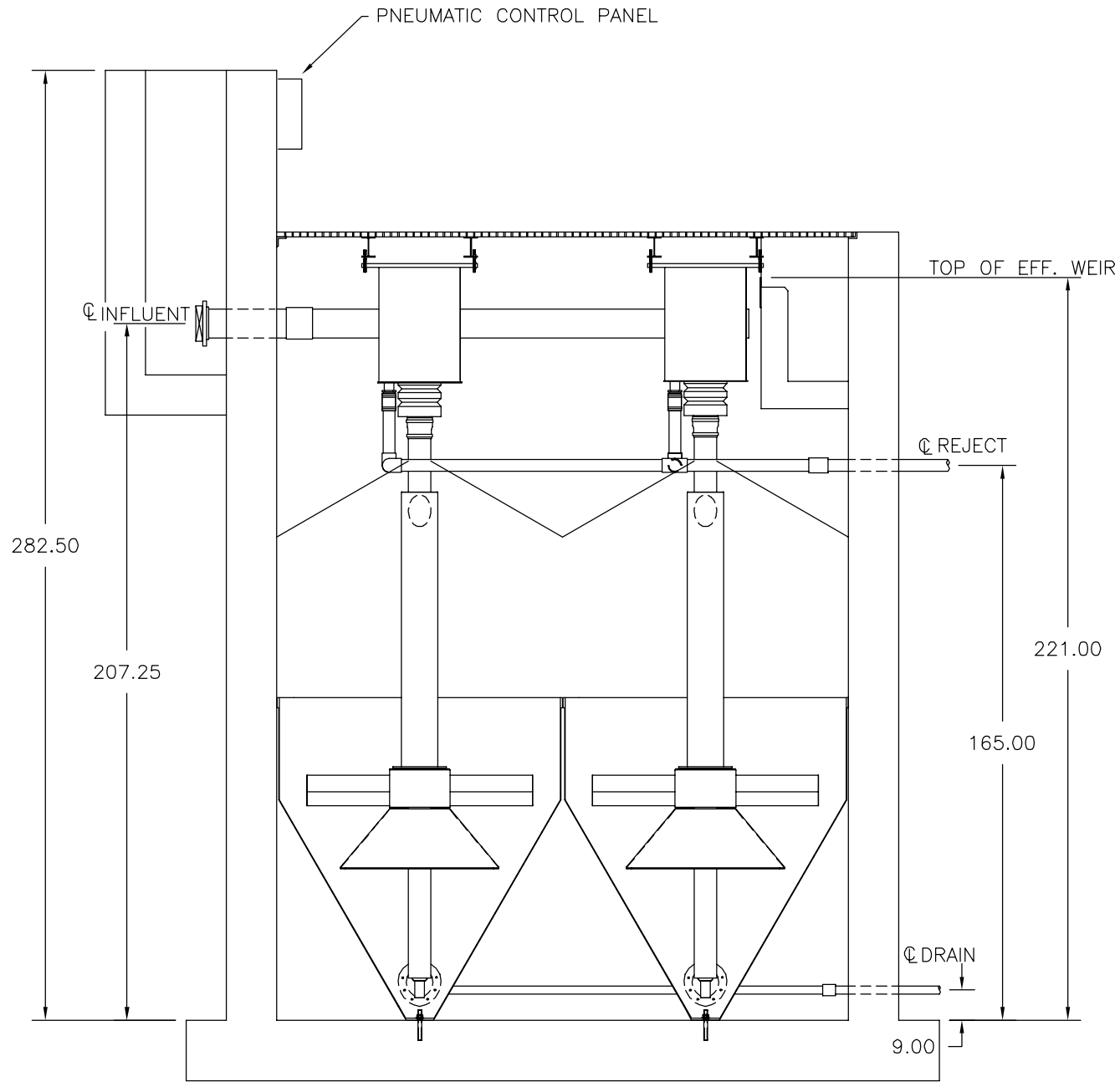
003	REV WALL CONFIGURATION @ EFFLUENT TROUGH	JHB	09/23/2013
002	REV LABEL OF BACKWASH REJECT PIPING TO 3"	JHB	01/10/2013
001	ADDED HORIZONTAL DIMENSIONS TO NOZZLES	JHB	08/23/2012
REV	DESCRIPTION	BY	DATE

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	J.BEATY	02/10/2012
	CHECKER	DATE
	ENGINEER	DATE
	MANAGER	DATE
FILE:	UPDATE:	
SCALE: 40	SIZE: B	

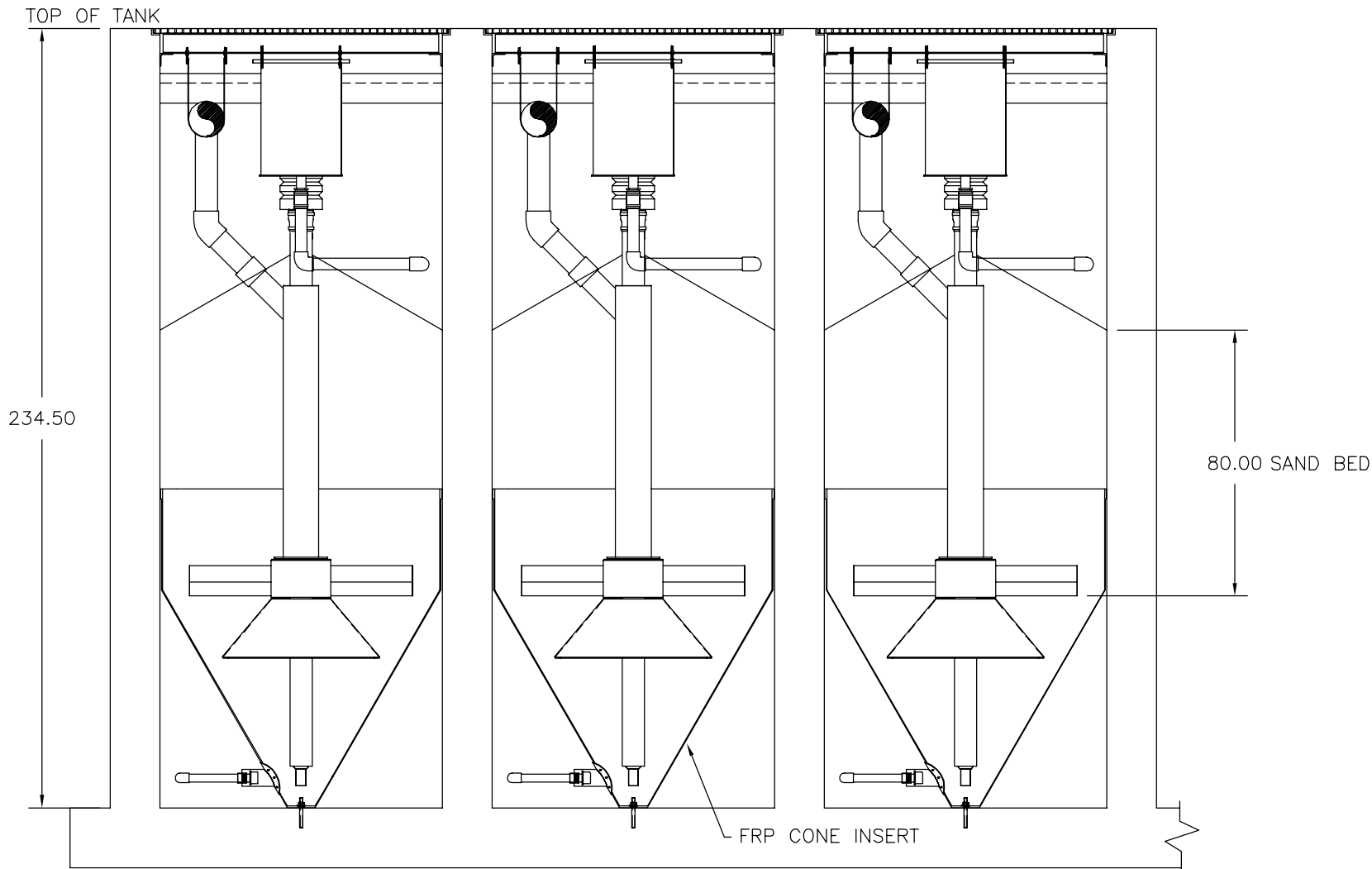
TITLE		PLAN VIEW (3) CELLS OF (2) 50 SQ. FT. MODULES		
CLIENT		RISING SUN WWTP		
		WATER TECHNOLOGIES WAUKESHA, WI 262-547-0141		
PROJECT	CODE	DRAWING	SHEET	REV
		2033-44-B1		003

BAR = 1" AT PLOT SCALE

BILL OF MATERIAL				
ITEM	PART	DESCRIPTION		UNITQTY



SECTION A-A




SECTION B-B

DIMENSIONS IN INCHES UNLESS SPECIFIED	
TOLERANCES UNLESS OTHERWISE SPECIFIED	
TWO (2) PLACE DEC.	±.06
THREE (3) PLACE DEC.	±.005
ANGULAR	±.50
STRUCTURAL DIMENSIONS	±1/16
MACHINED SURFACES	250/√

ESTIMATED WEIGHT ??????? LBS.
COPY ROUTINGS FROM DWG # ???????

001	REVISED GRATING FITUP PER AS BUILT TANKS	J.BEATY	05/02/2013
REV	DESCRIPTION	BY	DATE

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		CHECKER	DATE
		ENGINEER	DATE
		MANAGER	DATE
		FILE:	UPDATE:
		SCALE: 50	SIZE: B

TITLE CONTINUOUS BACKWASH FILTER SECTIONAL ELEVATIONS 2 METER SAND BED DEPTH	
CLIENT RISING SUN WWTP	
 evoqua WATER TECHNOLOGIES WAUKESHA, WI 262-547-0141	
PROJECT	CODE
DRAWING 2033.44B-2	SHEET REV 001

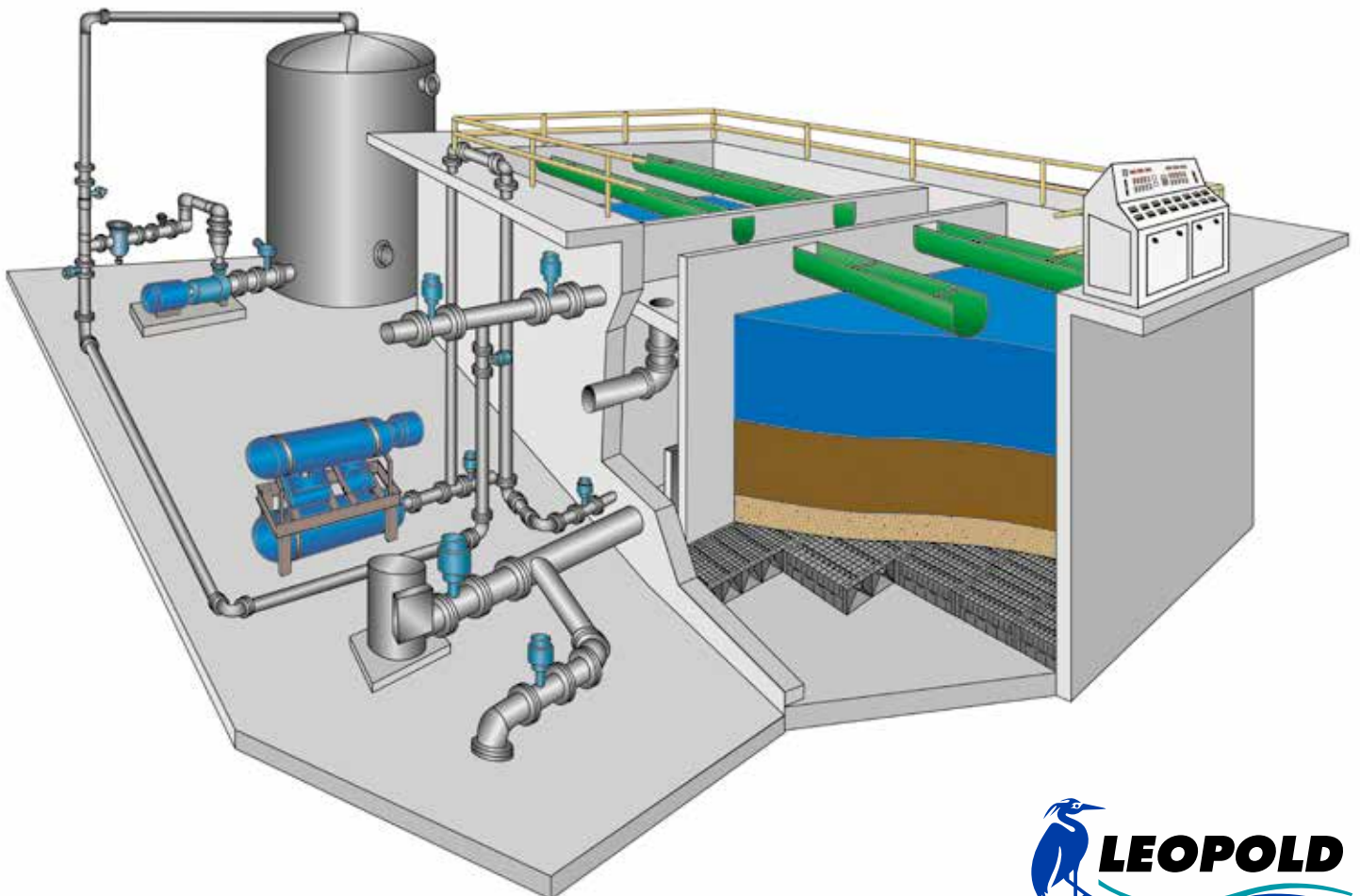
Leopold elimi-NITE® 2.0 denitrification system

THE NEXT GENERATION IN NUTRIENT REMOVAL



The Leopold elimi-NITE® 2.0 system is the next step in reducing nutrients in the effluent stream of a wastewater treatment plant. The elimi-NITE® 2.0 system builds on the existing elimi-NITE® denitrification system by adding additional features and increased efficiency as follows:

- Feedback control of the carbon source
- Several types of level control
- Optimum media selection
- Backwash optimization
- Run time optimization



The next generation in nutrient removal

The Leopold® elimi-NITE® 2.0 denitrification system is an effective method of reducing nitrogen in the effluent stream of a wastewater treatment plant by converting nitrate nitrogen to nitrogen gas. The biological conversion is done in an attached growth, downflow, deep bed, mono-media filter. Particulate matter is removed so insoluble phosphorus is removed as well. Since free oxygen will inhibit the activity of the denitrifying process, dissolved oxygen is biologically removed first, thereby creating an anoxic environment for denitrification. A supplemental carbon source or microbiological food is needed because the preceding wastewater treatment processes have removed nearly all of the degradable carbonaceous material from the wastewater. The elimi-NITE® 2.0 system features the following:

Feedback control of the carbon source

The carbon source can be fed based on a mass basis using the filter influent flow rate and nitrate concentration or feed-forward control. Another control loop measuring the filter effluent nitrate concentration can be used in a feedback control system. The elimi-NITE® 2.0 system offers feed-forward control coupled with feedback control to provide an optimal use of methanol that can surpass a feed-forward only control scheme. The elimi-NITE® 2.0 methanol consumption can be near 100% of theoretical values and generally doesn't exceed 110% of overall consumption. As an added benefit, the feedback portion of the unique elimi-NITE® 2.0 control algorithm can achieve and control effluent nitrate concentration at a desired set-point under variable hydraulic and nitrate influent loads. In other words, a desired effluent nitrate concentration can be set and held.

Several types of level control

Constant water level control affords the least amount of dissolved oxygen gain in the feed-water by avoiding splashing of the influent flow. This lowers the overall amount of carbon source needed to achieve process goals. Variable level, while at most times increases the overall methanol usage due to influent splash, can result in somewhat longer run times. The elimi-NITE® 2.0 system design uses variable level and the selection is determined by contaminant loadings and media selection.

Media selection

After comprehensive testing using a state-of-the-art pilot unit and full scale operation, Leopold has the expertise to select the "proper" media for the process application and to meet the treatment goals by balancing regulatory requirements with filter performance.

Backwash optimization

Since media fluidization is not necessary, the filter can use very low backwash rates, sometimes as low as 6 gpm/ ft² (15 m/h). Air scour rates to augment the backwash cycle can be as low as 5 SCFM/ ft² (91 m/h).

Run time optimization

Depending on overall system design, run times can approach 100% of theoretical filter bed loading limits.



Leopold is a brand of Xylem, whose 12,000 employees are addressing the most complex issues in the global water market.

www.xyleminc.com

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Tel. (724) 452-6300
Fax (724) 452-1377
www.fbleopold.com

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Appendix E.

Estimate of Probable Construction Costs

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Santa Fe County
Quill Wastewater Treatment Facility Upgrades
Preliminary Estimate of Probable Construction Costs

SUMMARY including NMGRT/CONSTRUCTION/DESIGN	ESTIMATED TOTAL COST
1.0 MGD - MBR WWTF	\$ 10,933,226
0.5 MGD - MBR WWTF	\$ 8,582,670
1.0 MGD - SBR WWTF	\$ 10,850,045
0.5 MGD - SBR WWTF	\$ 7,175,597



Santa Fe County
Quill Wastewater Treatment Facility Upgrades
Preliminary Estimate of Probable Construction Costs
MBR Summary - 0.5 MGD

SYSTEM COMPONENT	ESTIMATED COST
MBR WWTF (not including Additive Alternates)	\$ 5,907,955
Contingency - 20%	\$ 1,181,591
Total Estimated Construction Cost	\$ 7,089,546
Engineering Design - 10%	\$ 708,955
Survey & Geotechnical	\$ 10,000
Construction Related Services - 3%	\$ 212,686
Subtotal Estimated Project Cost	\$ 8,021,187
NMGRT at 7%	\$ 561,483
Total Estimated Project Cost	\$ 8,582,670



Santa Fe County
Quill Wastewater Treatment Facility Upgrades
Preliminary Estimate of Probable Construction Costs
MBR WWTF - 0.5 MGD

ITEM No.	DESCRIPTION	UNIT	EST. QTY.	UNIT PRICE	ESTIMATED COST
1.0	GENERAL				
1	Mobilization/Demobilization	LS	1	5%	\$ 280,855
Subtotal for 1.0 Bid Items					\$ 280,855

0

2.0	SITE WORK				
1	Erosion Control	LS	1	\$ 10,000	\$ 10,000
2	Site Clearing and Grubbing	AC	4	\$ 1,300	\$ 5,200
3	Yard Piping	LS	1	\$ 250,000	\$ 250,000
4	Backup Generator	LS	1	\$ 125,000	\$ 125,000
5	Site Electrical	LS	1	\$ 50,000	\$ 50,000
6	Base Course	SY	5,400	\$ 7	\$ 37,800
Subtotal for 2.0 Bid Items					\$ 478,000

3.0	EXISTING WASTEWATER PONDS				
1	Existing Aeration Lagoon No. 2, remove and dispose, including liner and regrading, compl.	LS	1	\$ 20,000	\$ 20,000
Subtotal for 3.0 Bid Items					\$ 20,000



Santa Fe County
Quill Wastewater Treatment Facility Upgrades
Preliminary Estimate of Probable Construction Costs
MBR WWTF - 0.5 MGD

ITEM No.	DESCRIPTION	UNIT	EST. QTY.	UNIT PRICE	ESTIMATED COST
4.0	FINE SCREEN AND GRIT BUILDING				
1	Metal Building (50' x 50')	SF	2,500	\$ 100	\$ 250,000
2	Fine Screen - 1 MGD; (2 MGD = \$205k each)	EA	2	\$ 165,000	\$ 330,000
3	Installation	LS	1	\$ 16,500	\$ 16,500
4	Grit Removal Equipment (2 MGD)	LS	1	\$ 135,000	\$ 135,000
5	Installation	LS	1	\$ 13,500	\$ 13,500
6	HVAC / Plumbing	LS	1	\$ 25,000	\$ 25,000
7	Electrical	LS	1	\$ 50,000	\$ 50,000
8	Influent Lift Station - 1.0 MGD duplex equipment \$70k; 2.0 MGD duplex equipment \$118k	LS	1	\$ 225,000	\$ 225,000
9	Influent Splitter Box	EA	1	\$ 50,000	\$ 50,000
Subtotal for 4.0 Bid Items					\$ 1,095,000

*Included in MBR Equipment, Bid Item 7.0, Line 2

5.0	OPERATIONS BUILDING				
1	Metal Building (50' x 100')	SF	5,000	\$ 100	\$ 500,000
2	Blowers*	EA			\$ -
3	RAS Pumps*	EA			\$ -
4	Sodium Hypochlorite/Citric Acid Equipment*	EA			\$ -
5	Air Piping	LS	1	\$ 40,000	\$ 40,000
6	UV Equipment - 1.0 MGD with redundancy; (2.0 MGD \$208k no redundancy; \$288k-300k)	LS	1	\$ 181,000	\$ 181,000
7	Installation	LS	1	\$ 18,100	\$ 18,100
8	HVAC / Plumbing	LS	1	\$ 50,000	\$ 50,000
9	Electrical	LS	1	\$ 200,000	\$ 200,000
Subtotal for 5.0 Bid Items					\$ 989,100



Santa Fe County
Quill Wastewater Treatment Facility Upgrades
Preliminary Estimate of Probable Construction Costs
MBR WWTF - 0.5 MGD

ITEM No.	DESCRIPTION	UNIT	EST. QTY.	UNIT PRICE	ESTIMATED COST
6.0	BIOLOGICAL BASINS				
1	Biological Trains - 0.5 MGD; (1.0 MGD = \$600k)	CY	300	\$ 1,000	\$ 300,000
2	Air Piping	LS	1	\$ 80,000	\$ 80,000
3	Bridge/Handrails	LS	1	\$ 25,000	\$ 25,000
4	Electrical	LS	1	\$ 35,000	\$ 35,000
Subtotal for 6.0 Bid Items					\$ 440,000

7.0	MBR BASIN				
1	(2) MBR Basins	CY	52	\$ 1,000	\$ 52,000
2	MBR Equipment - 0.5 MGD with one train/reduction in membranes; 0.5 MGD = \$1.55M for two trains BNR/reduction in membranes; 1.0 MGD = \$1.725M	LS	1	\$ 1,300,000	\$ 1,300,000
3	Installation	LS	1	\$ 130,000	\$ 130,000
4	Bridge Crane	LS	1	\$ 80,000	\$ 80,000
5	Misc Process Piping	LS	1	\$ 100,000	\$ 100,000
6	Electrical	LS	1	\$ 50,000	\$ 50,000
Subtotal for 7.0 Bid Items					\$ 1,712,000

8.0	AEROBIC DIGESTERS				
1	(1) Basins - 0.5 MGD (1.0 MGD = \$455,000)	CY	228	\$ 1,000	\$ 227,500
2	Coarse Bubble Aeration	LS	1	\$ 50,000	\$ 50,000
3	Installation	LS	1	\$ 7,500	\$ 7,500
4	Submersible Pumps	EA	1	\$ 20,000	\$ 20,000
5	Installation	LS	1	\$ 5,000	\$ 5,000
6	Electrical	LS	1	\$ 20,000	\$ 20,000
Subtotal for 8.0 Bid Items					\$ 330,000

9.0	SLUDGE DRYING BEDS				
1	(2) Sludge Drying Beds Concrete	LS	1	\$ 268,000	\$ 268,000
Subtotal for 9.0 Bid Items					\$ 268,000



Santa Fe County
Quill Wastewater Treatment Facility Upgrades
Preliminary Estimate of Probable Construction Costs
MBR WWTF - 0.5 MGD

ITEM No.	DESCRIPTION	UNIT	EST. QTY.	UNIT PRICE	ESTIMATED COST
10.0	MISCELLANEOUS				
1	SWPPP Permit	LS	1	\$ 5,000	\$ 5,000
2	Contractor's Bond	LS	1	\$ 50,000	\$ 50,000
3	Insurance	LS	1	\$ 20,000	\$ 20,000
4	Start-Up	LS	1	\$ 10,000	\$ 10,000
5	Testing Allowance	LS	1	\$ 10,000	\$ 10,000
6	Instrumentation	LS	1	\$ 200,000	\$ 200,000
Subtotal for 10.0 Bid Items					\$ 295,000

Subtotal of Bid Items		\$ 5,907,955
------------------------------	--	---------------------

11.0	ADDITIVE ALTERNATES				
1	Existing Aeration Lagoon No. 1, remove and dispose, including liner and regrading, compl.	SY	2,600	\$ 10	\$ 26,000
2	Existing Aeration Lagoon No. 1, sludge removal and dewatering, remove and dispose, compl.	GAL	1,265,000	\$ 0.07	\$ 88,550
3	Existing Secondary Pond, remove and dispose, including liner and regrading, compl.	SY	11,000	\$ 10	\$ 110,000
4	Existing Secondary Pond, sludge removal and dewatering, remove and dispose, compl.	GAL	2,720,000	\$ 0.07	\$ 190,400
5	Existing Primary Pond, remove and dispose, including liner and regrading, compl.	SY	11,000	\$ 10	\$ 110,000
6	Existing Primary Pond, sludge removal and dewatering, remove and dispose, compl.	GAL	2,720,000	\$ 0.07	\$ 190,400
Subtotal for 11.0 Bid Items					\$ 715,350



Santa Fe County
Quill Wastewater Treatment Facility Upgrades
Preliminary Estimate of Probable Construction Costs
SBR Summary - 0.5 MGD

SYSTEM COMPONENT	ESTIMATED COST
SBR WWTF (not including Additive Alternates)	\$ 4,938,175
Contingency - 20%	\$ 987,635
Total Estimated Construction Cost	\$ 5,925,810
Engineering Design - 10%	\$ 592,581
Survey & Geotechnical	\$ 10,000
Construction Related Services - 3%	\$ 177,774
Subtotal Estimated Project Cost	\$ 6,706,165
NMGRT at 7%	\$ 469,432
Total Estimated Project Cost	\$ 7,175,597



Santa Fe County
Quill Wastewater Treatment Facility Upgrades
Preliminary Estimate of Probable Construction Costs
SBR WWTF - 0.5 MGD

ITEM No.	DESCRIPTION	UNIT	EST. QTY.	UNIT PRICE	ESTIMATED COST
1.0	GENERAL				
1	Mobilization/Demobilization	LS	1	5%	\$ 234,675
Subtotal for 1.0 Bid Items					\$ 234,675

0

2.0	SITE WORK				
1	Erosion Control	LS	1	\$ 10,000	\$ 10,000
2	Site Clearing and Grubbing	AC	4	\$ 1,300	\$ 5,200
3	Yard Piping	LS	1	\$ 300,000	\$ 300,000
4	Backup Generator	LS	1	\$ 125,000	\$ 125,000
5	Site Electrical	LS	1	\$ 50,000	\$ 50,000
6	Base Course	SY	12,100	\$ 7	\$ 84,700
Subtotal for 2.0 Bid Items					\$ 574,900

3.0	EXISTING WASTEWATER PONDS				
1	Existing Aeration Lagoon No. 2, remove and dispose, including liner and regrading, compl.	LS	1	\$ 20,000	\$ 20,000
Subtotal for 3.0 Bid Items					\$ 20,000



Santa Fe County
Quill Wastewater Treatment Facility Upgrades
Preliminary Estimate of Probable Construction Costs
SBR WWTF - 0.5 MGD

ITEM No.	DESCRIPTION	UNIT	EST. QTY.	UNIT PRICE	ESTIMATED COST
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4.0	GRIT BUILDING				
1	Metal Building (25' x 25')	SF	625	\$ 100	\$ 62,500
2	Grit Removal Equipment (2 MGD)	LS	1	\$ 135,000	\$ 135,000
3	Installation	LS	1	\$ 13,500	\$ 13,500
4	HVAC / Plumbing	LS	1	\$ 25,000	\$ 25,000
5	Electrical	LS	1	\$ 50,000	\$ 50,000
6	Influent Lift Station - 1.0 MGD duplex equipment \$70k; 2.0 MGD duplex equipment \$118k	LS	1	\$ 225,000	\$ 225,000
7	Influent Splitter Box	EA	1	\$ 50,000	\$ 50,000
Subtotal for 4.0 Bid Items					\$ 561,000

5.0	OPERATIONS BUILDING				
1	Metal Building (40' x 60')	SF	2,400	\$ 100	\$ 240,000
2	Blowers*	EA			-
3	Air Piping	LS	1	\$ 40,000	\$ 40,000
4	HVAC / Plumbing	LS	1	\$ 50,000	\$ 50,000
5	Electrical	LS	1	\$ 125,000	\$ 125,000
Subtotal for 5.0 Bid Items					\$ 455,000

*Included in SBR Equipment, Bid Item 7.0, Line 2

6.0	UV BUILDING				
1	Metal Building (30' x 30')	SF	900	\$ 100	\$ 90,000
2	UV Equipment - 1.0 MGD with redundancy; (2.0 MGD \$208k no redundancy; \$288k-300k)	LS	1	\$ 181,000	\$ 181,000
3	Installation	LS	1	\$ 18,100	\$ 18,100
4	HVAC / Plumbing	LS	1	\$ 25,000	\$ 25,000
5	Electrical	LS	1	\$ 25,000	\$ 25,000
Subtotal for 6.0 Bid Items					\$ 339,100



Santa Fe County
Quill Wastewater Treatment Facility Upgrades
Preliminary Estimate of Probable Construction Costs
SBR WWTF - 0.5 MGD

ITEM No.	DESCRIPTION	UNIT	EST. QTY.	UNIT PRICE	ESTIMATED COST
7.0	SBR / BIOLOGICAL BASIN				
1	(1) SBR Trains - 0.5 MGD (1.0 MGD = \$1,630,000)	CY	815	\$ 1,000	\$ 815,000
2	SBR Equipment - 0.5 MGD (1.0 MGD = \$1,260,000)	LS	1	\$ 630,000	\$ 630,000
3	Installation	LS	1	\$ 63,000	\$ 63,000
4	Misc Process Piping	LS	1	\$ 70,000	\$ 70,000
5	Electrical	LS	1	\$ 40,000	\$ 40,000
Subtotal for 7.0 Bid Items					\$ 1,618,000

8.0	EFFLUENT FILTER				
1	(3) Basins - 0.5 MGD (1.0 MGD = \$50k)	CY	100	\$ 500	\$ 50,000
2	Sand Filter Equipment - 0.5 MGD (1.0 MGD = \$300k)	LS	1	\$ 150,000	\$ 150,000
3	Installation	LS	1	\$ 22,500	\$ 22,500
4	Misc Process Piping	LS	1	\$ 20,000	\$ 20,000
Subtotal for 8.0 Bid Items					\$ 242,500

9.0	AEROBIC DIGESTERS				
1	(1) Basins - 0.5 MGD (1.0 MGD = \$455,000)	CY	228	\$ 1,000	\$ 227,500
2	Coarse Bubble Aeration	LS	1	\$ 50,000	\$ 50,000
3	Installation	LS	1	\$ 7,500	\$ 7,500
4	Submersible Pumps	EA	1	\$ 20,000	\$ 20,000
5	Installation	LS	1	\$ 5,000	\$ 5,000
6	Electrical	LS	1	\$ 20,000	\$ 20,000
Subtotal for 9.0 Bid Items					\$ 330,000

10.0	SLUDGE DRYING BEDS				
1	(2) Sludge Drying Beds Concrete	LS	1	\$ 268,000	\$ 268,000
Subtotal for 10.0 Bid Items					\$ 268,000



Santa Fe County
Quill Wastewater Treatment Facility Upgrades
Preliminary Estimate of Probable Construction Costs
SBR WWTF - 0.5 MGD

ITEM No.	DESCRIPTION	UNIT	EST. QTY.	UNIT PRICE	ESTIMATED COST
11.0	MISCELLANEOUS				
1	SWPPP Permit	LS	1	\$ 5,000	\$ 5,000
2	Contractor's Bond	LS	1	\$ 50,000	\$ 50,000
3	Insurance	LS	1	\$ 20,000	\$ 20,000
4	Start-Up	LS	1	\$ 10,000	\$ 10,000
5	Testing Allowance	LS	1	\$ 10,000	\$ 10,000
6	Instrumentation	LS	1	\$ 200,000	\$ 200,000
Subtotal for 11.0 Bid Items					\$ 295,000

Subtotal of Bid Items	\$ 4,938,175
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12.0	ADDITIVE ALTERNATIVES				
2	Existing Aeration Lagoon No. 1, sludge removal and dewatering, remove and dispose, compl.	GAL	1,265,000	\$ 0.07	\$ 88,550
3	Existing Secondary Settling Pond, remove and dispose, including liner and regrading, compl.	SY	11,000	\$ 10	\$ 110,000
4	Existing Secondary Settling Pond, sludge removal and dewatering, remove and dispose, compl.	GAL	2,720,000	\$ 0.07	\$ 190,400
5	Existing Primary Settling Pond, remove and dispose, including liner and regrading, compl.	SY	11,000	\$ 10	\$ 110,000
6	Existing Primary Settling Pond, sludge removal and dewatering, remove and dispose, compl.	GAL	2,720,000	\$ 0.07	\$ 190,400
Subtotal for 12.0 Bid Items					\$ 689,350



Santa Fe County
Quill Wastewater Treatment Facility Upgrades
Preliminary Estimate of Probable Construction Costs
MBR Summary - 1.0 MGD

SYSTEM COMPONENT	ESTIMATED COST
MBR WWTF (not including Additive Alternates)	\$ 7,528,000
Contingency - 20%	\$ 1,505,600
Total Estimated Construction Cost	\$ 9,033,600
Engineering Design - 10%	\$ 903,360
Survey & Geotechnical	\$ 10,000
Construction Related Services - 3%	\$ 271,008
Subtotal Estimated Project Cost	\$ 10,217,968
NMGRT at 7%	\$ 715,258
Total Estimated Project Cost	\$ 10,933,226



Santa Fe County
Quill Wastewater Treatment Facility Upgrades
Preliminary Estimate of Probable Construction Costs
MBR WWTF - 1.0 MGD

ITEM No.	DESCRIPTION	UNIT	EST. QTY.	UNIT PRICE	ESTIMATED COST
1.0	GENERAL				
1	Mobilization/Demobilization	LS	1	5%	\$ 358,000
Subtotal for 1.0 Bid Items					\$ 358,000

0

2.0	SITE WORK				
1	Erosion Control	LS	1	\$ 10,000	\$ 10,000
2	Site Clearing and Grubbing	AC	4	\$ 1,300	\$ 5,200
3	Yard Piping	LS	1	\$ 250,000	\$ 250,000
4	Backup Generator	LS	1	\$ 125,000	\$ 125,000
5	Site Electrical	LS	1	\$ 50,000	\$ 50,000
6	Base Course	SY	5,400	\$ 7	\$ 37,800
Subtotal for 2.0 Bid Items					\$ 478,000

3.0	EXISTING WASTEWATER PONDS				
1	Existing Aeration Lagoon No. 2, remove and dispose, including liner and regrading, compl.	LS	1	\$ 20,000	\$ 20,000
Subtotal for 3.0 Bid Items					\$ 20,000



Santa Fe County
Quill Wastewater Treatment Facility Upgrades
Preliminary Estimate of Probable Construction Costs
MBR WWTF - 1.0 MGD

ITEM No.	DESCRIPTION	UNIT	EST. QTY.	UNIT PRICE	ESTIMATED COST
4.0	FINE SCREEN AND GRIT BUILDING				
1	Metal Building (50' x 50')	SF	2,500	\$ 100	\$ 250,000
2	Fine Screen (2 MGD)	EA	2	\$ 205,000	\$ 410,000
3	Installation	LS	1	\$ 20,500	\$ 20,500
4	Grit Removal Equipment (2 MGD)	LS	1	\$ 135,000	\$ 135,000
5	Installation	LS	1	\$ 13,500	\$ 13,500
6	HVAC / Plumbing	LS	1	\$ 25,000	\$ 25,000
7	Electrical	LS	1	\$ 50,000	\$ 50,000
8	Influent Lift Station (2 MGD)	LS	1	\$ 250,000	\$ 250,000
9	Influent Splitter Box	EA	1	\$ 50,000	\$ 50,000
Subtotal for 4.0 Bid Items					\$ 1,204,000

*Included in MBR Equipment, Bid Item 7.0, Line 2

5.0	OPERATIONS BUILDING				
1	Metal Building (50' x 100')	SF	5,000	\$ 100	\$ 500,000
2	Blowers*	EA			\$ -
3	RAS Pumps*	EA			\$ -
4	Sodium Hypochlorite/Citric Acid Equipment*	EA			\$ -
5	Air Piping	LS	1	\$ 40,000	\$ 40,000
6	UV Equipment (2 MGD)	LS	1	\$ 235,000	\$ 235,000
7	Installation	LS	1	\$ 23,500	\$ 23,500
8	HVAC / Plumbing	LS	1	\$ 50,000	\$ 50,000
9	Electrical	LS	1	\$ 200,000	\$ 200,000
Subtotal for 5.0 Bid Items					\$ 1,048,500



Santa Fe County
Quill Wastewater Treatment Facility Upgrades
Preliminary Estimate of Probable Construction Costs
MBR WWTF - 1.0 MGD

ITEM No.	DESCRIPTION	UNIT	EST. QTY.	UNIT PRICE	ESTIMATED COST
6.0	BIOLOGICAL BASINS				
1	(2) Biological Trains	CY	600	\$ 1,000	\$ 600,000
2	Air Piping	LS	1	\$ 100,000	\$ 100,000
3	Bridge/Handrails	LS	1	\$ 50,000	\$ 50,000
4	Electrical	LS	1	\$ 50,000	\$ 50,000
Subtotal for 6.0 Bid Items					\$ 800,000

7.0	MBR BASIN				
1	(2) MBR Basins	CY	52	\$ 1,000	\$ 52,000
2	MBR Equipment	LS	1	\$ 1,725,000	\$ 1,725,000
3	Installation	LS	1	\$ 172,500	\$ 172,500
4	Bridge Crane	LS	1	\$ 80,000	\$ 80,000
5	Misc Process Piping	LS	1	\$ 100,000	\$ 100,000
6	Electrical	LS	1	\$ 50,000	\$ 50,000
Subtotal for 7.0 Bid Items					\$ 2,179,500

8.0	AEROBIC DIGESTERS				
1	(2) Basins	CY	455	\$ 1,000	\$ 455,000
2	Coarse Bubble Aeration	LS	2	\$ 50,000	\$ 100,000
3	Installation	LS	1	\$ 15,000	\$ 15,000
4	Submersible Pumps	EA	2	\$ 20,000	\$ 40,000
5	Installation	LS	1	\$ 5,000	\$ 5,000
6	Electrical	LS	1	\$ 30,000	\$ 30,000
Subtotal for 8.0 Bid Items					\$ 645,000

9.0	SLUDGE DRYING BEDS				
1	(3) Sludge Drying Beds Concrete	LS	1	\$ 400,000	\$ 400,000
Subtotal for 9.0 Bid Items					\$ 400,000



Santa Fe County
Quill Wastewater Treatment Facility Upgrades
Preliminary Estimate of Probable Construction Costs
MBR WWTF - 1.0 MGD

ITEM No.	DESCRIPTION	UNIT	EST. QTY.	UNIT PRICE	ESTIMATED COST
10.0	MISCELLANEOUS				
1	SWPPP Permit	LS	1	\$ 5,000	\$ 5,000
2	Contractor's Bond	LS	1	\$ 50,000	\$ 50,000
3	Insurance	LS	1	\$ 20,000	\$ 20,000
4	Start-Up	LS	1	\$ 10,000	\$ 10,000
5	Testing Allowance	LS	1	\$ 10,000	\$ 10,000
6	Instrumentation	LS	1	\$ 300,000	\$ 300,000
Subtotal for 10.0 Bid Items					\$ 395,000

Subtotal of Bid Items					\$ 7,528,000
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11.0	ADDITIVE ALTERNATES				
1	Existing Aeration Lagoon No. 1, remove and dispose, including liner and regrading, compl.	SY	2,600	\$ 10	\$ 26,000
2	Existing Aeration Lagoon No. 1, sludge removal and dewatering, remove and dispose, compl.	GAL	1,265,000	\$ 0.07	\$ 88,550
3	Existing Secondary Pond, remove and dispose, including liner and regrading, compl.	SY	11,000	\$ 10	\$ 110,000
4	Existing Secondary Pond, sludge removal and dewatering, remove and dispose, compl.	GAL	2,720,000	\$ 0.07	\$ 190,400
5	Existing Primary Pond, remove and dispose, including liner and regrading, compl.	SY	11,000	\$ 10	\$ 110,000
6	Existing Primary Pond, sludge removal and dewatering, remove and dispose, compl.	GAL	2,720,000	\$ 0.07	\$ 190,400
Subtotal for 11.0 Bid Items					\$ 715,350



Santa Fe County
Quill Wastewater Treatment Facility Upgrades
Preliminary Estimate of Probable Construction Costs
SBR Summary - 1.0 MGD

SYSTEM COMPONENT	ESTIMATED COST
SBR WWTF (not including Additive Alternates)	\$ 7,470,670
Contingency - 20%	\$ 1,494,134
Total Estimated Construction Cost	\$ 8,964,804
Engineering Design - 10%	\$ 896,480
Survey & Geotechnical	\$ 10,000
Construction Related Services - 3%	\$ 268,944
Subtotal Estimated Project Cost	\$ 10,140,229
NMGRT at 7%	\$ 709,816
Total Estimated Project Cost	\$ 10,850,045



Santa Fe County
Quill Wastewater Treatment Facility Upgrades
Preliminary Estimate of Probable Construction Costs
SBR WWTF - 1.0 MGD

ITEM No.	DESCRIPTION	UNIT	EST. QTY.	UNIT PRICE	ESTIMATED COST
1.0	GENERAL				
1	Mobilization/Demobilization	LS	1	5%	\$ 355,270
Subtotal for 1.0 Bid Items					\$ 355,270

0

2.0	SITE WORK				
1	Erosion Control	LS	1	\$ 10,000	\$ 10,000
2	Site Clearing and Grubbing	AC	4	\$ 1,300	\$ 5,200
3	Yard Piping	LS	1	\$ 300,000	\$ 300,000
4	Backup Generator	LS	1	\$ 125,000	\$ 125,000
5	Site Electrical	LS	1	\$ 50,000	\$ 50,000
6	Base Course	SY	12,100	\$ 7	\$ 84,700
Subtotal for 2.0 Bid Items					\$ 574,900

3.0	EXISTING WASTEWATER PONDS				
1	Existing Aeration Lagoon No. 2, remove and dispose, including liner and regrading, compl.	LS	1	\$ 20,000	\$ 20,000
Subtotal for 3.0 Bid Items					\$ 20,000



Santa Fe County
Quill Wastewater Treatment Facility Upgrades
Preliminary Estimate of Probable Construction Costs
SBR WWTF - 1.0 MGD

ITEM No.	DESCRIPTION	UNIT	EST. QTY.	UNIT PRICE	ESTIMATED COST
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4.0	GRIT BUILDING				
1	Metal Building (25' x 25')	SF	625	\$ 100	\$ 62,500
2	Grit Removal Equipment (2 MGD)	LS	1	\$ 135,000	\$ 135,000
3	Installation	LS	1	\$ 13,500	\$ 13,500
4	HVAC / Plumbing	LS	1	\$ 25,000	\$ 25,000
5	Electrical	LS	1	\$ 50,000	\$ 50,000
6	Influent Lift Station (2 MGD)	LS	1	\$ 250,000	\$ 250,000
7	Influent Splitter Box	EA	1	\$ 50,000	\$ 50,000
Subtotal for 4.0 Bid Items					\$ 586,000

5.0	OPERATIONS BUILDING				
1	Metal Building (40' x 60')	SF	2,400	\$ 100	\$ 240,000
2	Blowers*	EA			\$ -
3	Air Piping	LS	1	\$ 40,000	\$ 40,000
4	HVAC / Plumbing	LS	1	\$ 50,000	\$ 50,000
5	Electrical	LS	1	\$ 125,000	\$ 125,000
Subtotal for 5.0 Bid Items					\$ 455,000

*Included in SBR Equipment, Bid Item 7.0, Line 2

6.0	UV BUILDING				
1	Metal Building (30' x 30')	SF	900	\$ 100	\$ 90,000
2	UV Equipment	LS	1	\$ 235,000	\$ 235,000
3	Installation	LS	1	\$ 23,500	\$ 23,500
4	HVAC / Plumbing	LS	1	\$ 25,000	\$ 25,000
5	Electrical	LS	1	\$ 25,000	\$ 25,000
Subtotal for 6.0 Bid Items					\$ 398,500



Santa Fe County
Quill Wastewater Treatment Facility Upgrades
Preliminary Estimate of Probable Construction Costs
SBR WWTF - 1.0 MGD

ITEM No.	DESCRIPTION	UNIT	EST. QTY.	UNIT PRICE	ESTIMATED COST
7.0	SBR / BIOLOGICAL BASIN				
1	(2) SBR Trains	CY	1,630	\$ 1,000	\$ 1,630,000
2	SBR Equipment	LS	1	\$ 1,260,000	\$ 1,260,000
3	Installation	LS	1	\$ 126,000	\$ 126,000
4	Misc Process Piping	LS	1	\$ 100,000	\$ 100,000
5	Electrical	LS	1	\$ 50,000	\$ 50,000
Subtotal for 7.0 Bid Items					\$ 3,166,000

8.0	EFFLUENT FILTER				
1	(6) Basins	CY	100	\$ 1,000	\$ 100,000
2	Sand Filter Equipment	LS	1	\$ 300,000	\$ 300,000
3	Installation	LS	1	\$ 45,000	\$ 45,000
4	Misc Process Piping	LS	1	\$ 30,000	\$ 30,000
Subtotal for 8.0 Bid Items					\$ 475,000

9.0	AEROBIC DIGESTERS				
1	(2) Basins	CY	455	\$ 1,000	\$ 455,000
2	Coarse Bubble Aeration	LS	2	\$ 50,000	\$ 100,000
3	Installation	LS	1	\$ 15,000	\$ 15,000
4	Submersible Pumps	EA	2	\$ 20,000	\$ 40,000
5	Installation	LS	1	\$ 5,000	\$ 5,000
6	Electrical	LS	1	\$ 30,000	\$ 30,000
Subtotal for 9.0 Bid Items					\$ 645,000

10.0	SLUDGE DRYING BEDS				
1	(3) Sludge Drying Beds Concrete	LS	1	\$ 400,000	\$ 400,000
Subtotal for 10.0 Bid Items					\$ 400,000



Santa Fe County
Quill Wastewater Treatment Facility Upgrades
Preliminary Estimate of Probable Construction Costs
SBR WWTF - 1.0 MGD

ITEM No.	DESCRIPTION	UNIT	EST. QTY.	UNIT PRICE	ESTIMATED COST
11.0	MISCELLANEOUS				
1	SWPPP Permit	LS	1	\$ 5,000	\$ 5,000
2	Contractor's Bond	LS	1	\$ 50,000	\$ 50,000
3	Insurance	LS	1	\$ 20,000	\$ 20,000
4	Start-Up	LS	1	\$ 10,000	\$ 10,000
5	Testing Allowance	LS	1	\$ 10,000	\$ 10,000
6	Instrumentation	LS	1	\$ 300,000	\$ 300,000
Subtotal for 11.0 Bid Items					\$ 395,000

Subtotal of Bid Items	\$ 7,470,670
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12.0	ADDITIVE ALTERNATIVES				
2	Existing Aeration Lagoon No. 1, sludge removal and dewatering, remove and dispose, compl.	GAL	1,265,000	\$ 0.07	\$ 88,550
3	Existing Secondary Settling Pond, remove and dispose, including liner and regrading, compl.	SY	11,000	\$ 10	\$ 110,000
4	Existing Secondary Settling Pond, sludge removal and dewatering, remove and dispose, compl.	GAL	2,720,000	\$ 0.07	\$ 190,400
5	Existing Primary Settling Pond, remove and dispose, including liner and regrading, compl.	SY	11,000	\$ 10	\$ 110,000
6	Existing Primary Settling Pond, sludge removal and dewatering, remove and dispose, compl.	GAL	2,720,000	\$ 0.07	\$ 190,400
Subtotal for 12.0 Bid Items					\$ 689,350



Appendix F.

Quill WWTF Staffing

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STAFFING ESTIMATE WORKSHEET FOR EXISTING WWTF (Aerated Lagoons)

DATE: 4/17

LOCATION: Santa Fe County Quill WWTF

Avg Design Flow = 0.28 MGD

Reference: Based on the Estimating Staffing for Municipal Wastewater Treatment Facilities (US EPA)

I. ADJUSTMENT FOR LOCAL CONDITIONS

LOCAL CONDITION	COMMENT	ADJUSTMENT					
		OPERATIONS	MAINTENANCE	SUPERVISORY	CLERICAL	LABORATORY	YARDWORK
PLANT LAYOUT	Average; Minimal Grass	-10%	-	-	-	-	-50%
UNIT PROCESSES	Standard	-	-	-	-	-	-
LEVEL OF TREATMENT	Secondary	-	-	-	-	-	-
TYPE OF WASTE REMOVAL REQUIREMENT	BOD 30/TSS 30	-	-	-	-	-	-
INDUSTRIAL WASTES	None	-	-	-	-	-	-
PRODUCTIVITY	Average	-	-	-	-	-	-
CLIMATE	Moderate Winters	-	-	-	-	-	-
TRAINING	Certification	-	-	-	-	-	-
AUTO. MONITORING	None	-	-	-	-	-	-
AUTO. SAMPLING	None	-	-	-	-	-	-
OFF-PLANT LABORATORY	For Permit Compliance	-	-	-	-	-90%	-
OFF-PLANT MAINTENANCE	Corrective Maintenance Only	-	-25%	-	-	-	-
AGE OF EQUIPMENT	Relatively old; Well cared for	-	10%	-	-	-	-
STORM INFILTRATION	None	-	-	-	-	-	-
TOTAL		-10%	-15%	0%	0%	-90%	-50%

II. ANNUAL MANHOURS FOR MBR

UNIT PROCESS	(FROM TABLES D-5 TO D-33)		(FROM TABLES D-1 TO D-4)			
	OPERATIONS	MAINTENANCE	SUPERVISORY	CLERICAL	LABORATORY	YARDWORK
RAW SEWAGE PUMPING AT PLANT	40	300	-	-	-	-
SCREENING AND GRINDING	40	40	-	-	-	-
AERATED LAGOONS	400	200	-	-	-	-
SETTLING PONDS	200	200	-	-	-	-
CHLORINATION	200	100	-	-	-	-
TOTAL	880	840	400	80	250	400
ADJUSTMENT (FROM I)	-88	-126	0	0	-225	-200
ADJUSTED TOTAL	792	714	400	80	25	200
TOTAL HOURS COMBINED	2,211					

III. STAFFING SUGGESTION FOR EXISTING

	TOTAL HOURS PER YEAR *	ESTIMATED COST	NUMBER OF STAFF
III. STAFFING SUGGESTION FOR MBR	792	\$ 15,840	0.5
MAINTENANCE	714	\$ 14,280	0.5
SUPERVISORY	400	\$ 8,000	0.3
CLERICAL	80	\$ 1,600	0.1
LABORATORY	25	\$ 500	0.0
YARDWORK	200	\$ 4,000	0.1
TOTAL	2,211	\$ 44,220	1

*ASSUMES 1500 HOURS PER YEAR PER STAFF (EPA) AT \$20/HR

STAFFING ESTIMATE WORKSHEET FOR PROPOSED MBR

DATE: 4/17

LOCATION: Santa Fe County Quill WWTF

Avg Design Flow = 0.50 MGD

Reference: Based on the Estimating Staffing for Municipal Wastewater Treatment Facilities (US EPA)

I. ADJUSTMENT FOR LOCAL CONDITIONS

LOCAL CONDITION	COMMENT	ADJUSTMENT					
		OPERATIONS	MAINTENANCE	SUPERVISORY	CLERICAL	LABORATORY	YARDWORK
PLANT LAYOUT	Average; Minimal Grass	-10%	-	-	-	-	-50%
UNIT PROCESSES	Standard	20%	20%	-	-	-	-
LEVEL OF TREATMENT	Secondary/Advanced	20%	20%	-	-	10%	-
TYPE OF WASTE REMOVAL REQUIREMENT	TN 3/TP 1	20%	20%	-	-	10%	-
INDUSTRIAL WASTES	None	-	-	-	-	-	-
PRODUCTIVITY	Average	-	-	-	-	-	-
CLIMATE	Moderate Winters	-	-	-	-	-	-
TRAINING	Certification	10%	-	10%	-	-	-
AUTO. MONITORING	Monitoring with Feedback	-	5%	-	-	-	-
AUTO. SAMPLING	Of Influent and Effluent	-5%	-	-	-	-	-
OFF-PLANT LABORATORY	For Permit Compliance	-	-	-	-	-75%	-
OFF-PLANT MAINTENANCE	Corrective Maintenance Only	-	-25%	-	-	-	-
AGE OF EQUIPMENT	New	-	-	-	-	-	-
STORM INFILTRATION	None	-	-	-	-	-	-
TOTAL		55%	40%	10%	0%	-55%	-50%

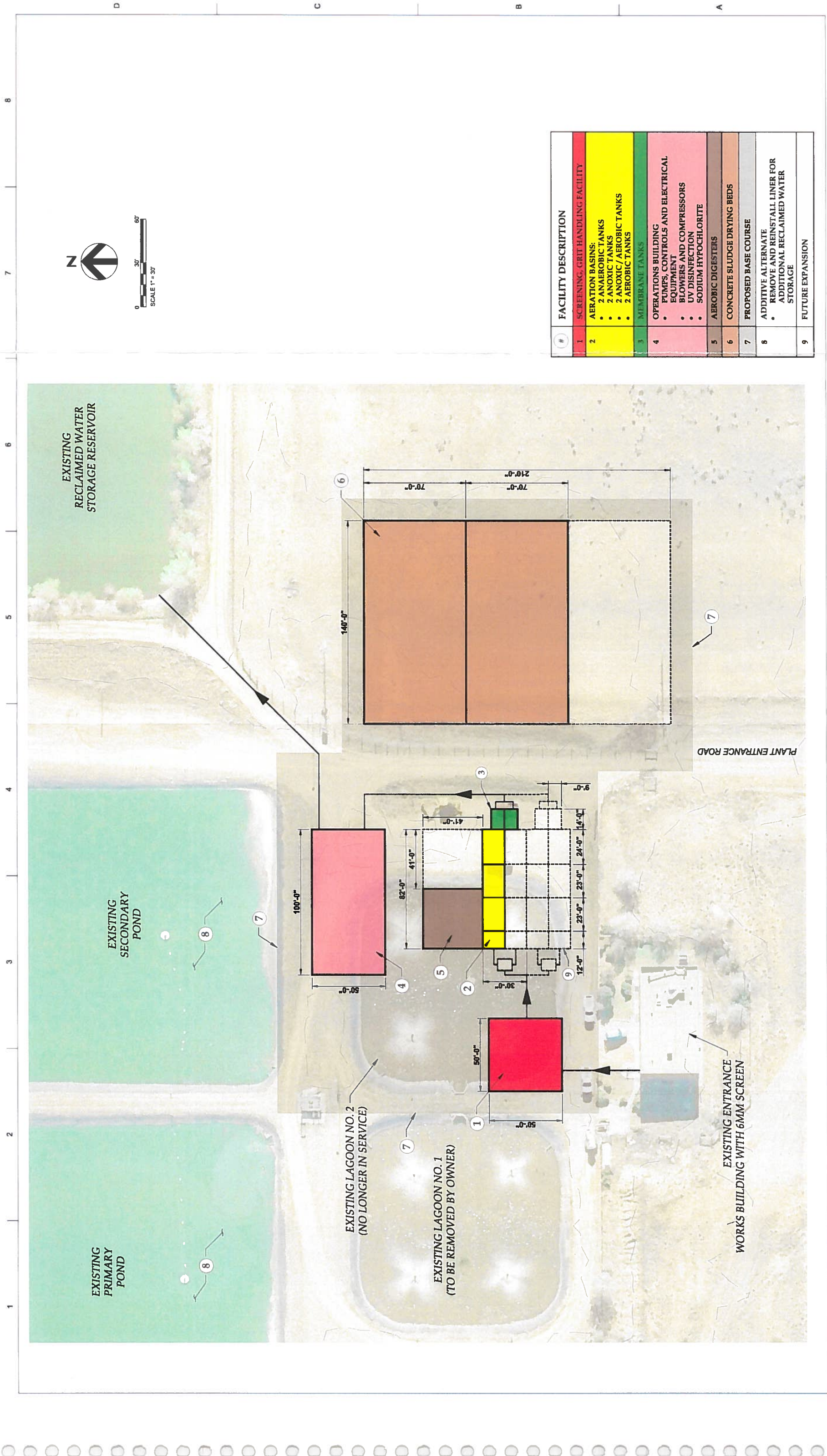
II. ANNUAL MANHOURS FOR MBR

UNIT PROCESS	(FROM TABLES D-5 TO D-33)		(FROM TABLES D-1 TO D-4)			
	OPERATIONS	MAINTENANCE	SUPERVISORY	CLERICAL	LABORATORY	YARDWORK
RAW SEWAGE PUMPING AT PLANT	40	300	-	-	-	-
SCREENING AND GRINDING	80	40	-	-	-	-
GRIT REMOVAL	120	20	-	-	-	-
AERATION BASINS	400	300	-	-	-	-
MBR	200	100	-	-	-	-
UV DISINFECTION	200	100	-	-	-	-
AEROBIC DIGESTION	50	10	-	-	-	-
SLUDGE DRYING BEDS	200	-	-	-	-	-
NITRIFICATION/DENITRIFICATION	3,000	400	-	-	-	-
TOTAL	4,290	1,270	500	160	500	400
ADJUSTMENT (FROM I)	2,360	508	50	0	-275	-200
ADJUSTED TOTAL	6,650	1,778	550	160	225	200
TOTAL HOURS COMBINED	9,563					

III. STAFFING SUGGESTION FOR MBR

	TOTAL HOURS PER YEAR *	ESTIMATED COST	NUMBER OF STAFF
OPERATIONS	6,650	\$ 132,990	4.4
MAINTENANCE	1,778	\$ 35,560	1.2
SUPERVISORY	550	\$ 11,000	0.4
CLERICAL	160	\$ 3,200	0.1
LABORATORY	225	\$ 4,500	0.2
YARDWORK	200	\$ 4,000	0.1
TOTAL	9,563	\$ 191,250	6

*ASSUMES 1500 HOURS PER YEAR PER STAFF (EPA) AT \$20/HR



#	FACILITY DESCRIPTION
1	SCREENING, GRIT HANDLING FACILITY
2	AERATION BASINS: <ul style="list-style-type: none">• 2 ANAEROBIC TANKS• 2 ANOXIC TANKS• 2 AEROBIC TANKS
3	MEMBRANE TANKS
4	OPERATIONS BUILDING <ul style="list-style-type: none">• PUMPS, CONTROLS AND ELECTRICAL EQUIPMENT• BLOWERS AND COMPRESSORS• UV DISINFECTION• SODIUM HYPOCHLORITE
5	AEROBIC DIGESTERS
6	CONCRETE SLUDGE DRYING BEDS
7	PROPOSED BASE COURSE
8	ADDITIVE ALTERNATE <ul style="list-style-type: none">• REMOVE AND REINSTALL LINER FOR ADDITIONAL RECLAIMED WATER STORAGE
9	FUTURE EXPANSION



PROJECT MANAGER E DUBOIS

DESIGNED BY M. FALK

DRAWN BY D. HUERTA

CHECKED BY W. CHACON

ISSUE

DATE

DESCRIPTION

PROJECT NUMBER 235241

FILENAME EX-03.dwg

SCALE 1" = 30'



SANTA FE COUNTY, NM

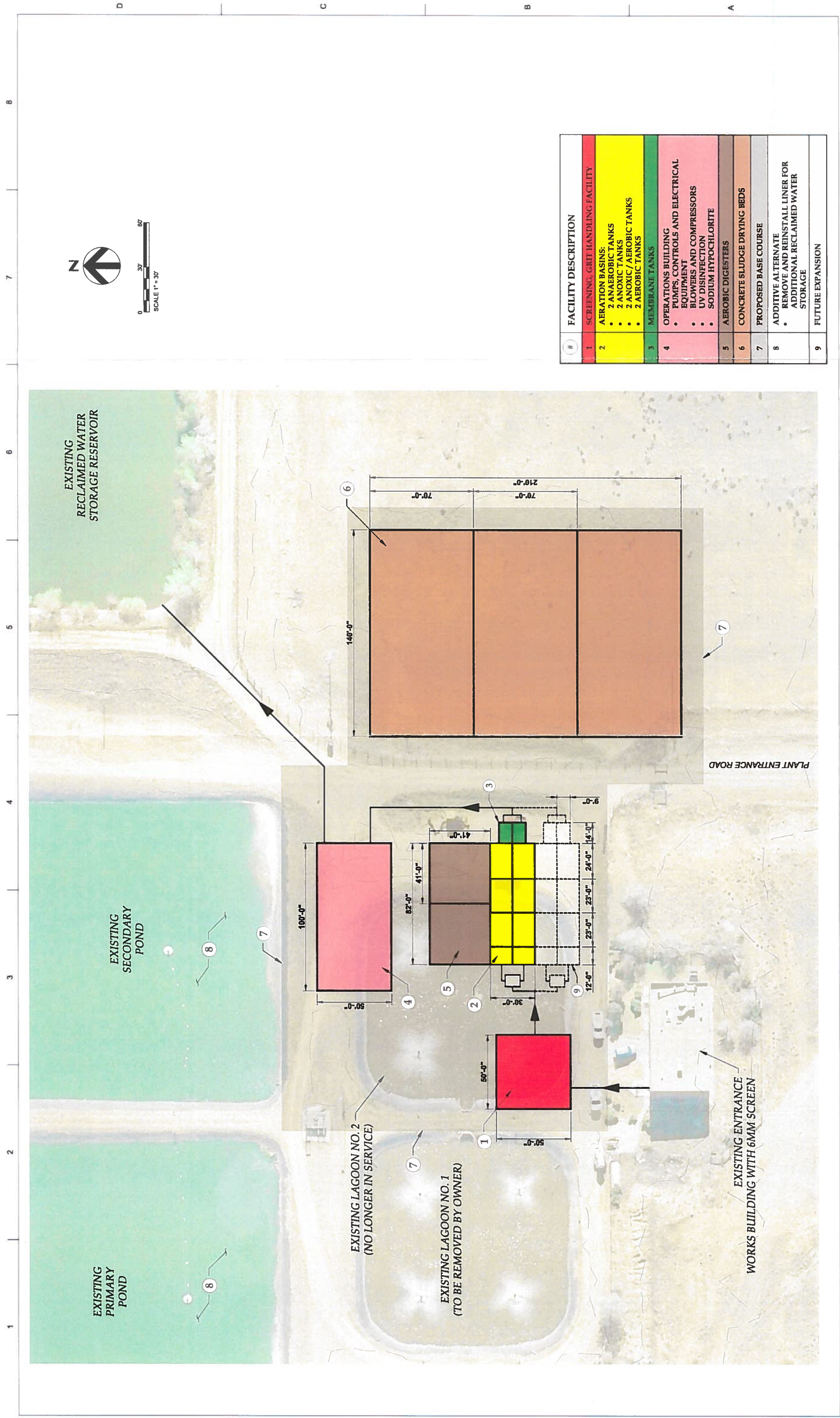
QUILL PER

PROPOSED MBR SITE PLAN - 0.5 MGD

QUILL WWTF PRELIMINARY ENGINEERING REPORT

CONCEPTUAL DESIGN

FIGURE 10



#	FACILITY DESCRIPTION
1	SCREENING, GRT HANDLING FACILITY
2	AERATION BASINS: <ul style="list-style-type: none"> • 2 ANAEROBIC TANKS • 2 ANOXIC TANKS • 2 ANOXIC/AEROBIC TANKS • 2 AEROBIC TANKS
3	MEMBRANE TANKS
4	OPERATIONS BUILDING <ul style="list-style-type: none"> • PUMPS, CONTROLS AND ELECTRICAL EQUIPMENT • BLOWERS AND COMPRESSORS • UV DISINFECTION • SODIUM HYPOCHLORITE
5	AEROBIC DIGESTERS
6	CONCRETE SLUDGE DRYING BEDS
7	PROPOSED BASE COURSE
8	ADDITIVE ALTERNATE <ul style="list-style-type: none"> • REMOVE AND REINSTALL LINER FOR ADDITIONAL RECLAIMED WATER STORAGE
9	FUTURE EXPANSION

FIGURE 11

Operations Building

Pumps, Controls and Electrical Equipment
Blowers and Compressors
UV Disinfection
Sodium Hypochlorite

Headworks Building

Screening/Grit Handling

Sludge Drying Beds

Aerobic Digesters

Membrane Basins

Aeration Basins

Anaerobic Basins
Anoxic Basins

Splitter Boxes

Quill Wastewater Treatment Facility Proposed Site Layout

Operations Building

Pumps, Controls and Electrical Equipment
Blowers and Compressors
UV Disinfection
Sodium Hypochlorite

Sludge Drying Beds

Aerobic Digesters

Headworks Building

Screening/Grit Handling

Membrane Basins

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Quill Wastewater Treatment Facility Proposed Site Layout