

City of Hays, Kansas

**Wastewater Treatment
Plant
Design-Build Procurement**

***Request for Proposals
For the
City of Hays Wastewater
Treatment Plant Upgrade and
Expansion Project***

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Request for Proposals

Section 1. Background

1.1 Introduction

This request for proposals (RFP) for the **Hays Wastewater Treatment Plant Upgrade and Expansion Project** (Project) invites Proposals from the short-listed Respondents listed in Section 1.4, according to the requirements set forth in this RFP, including the format and content guidelines in Section 5. The Proposals will be reviewed and evaluated using the best-value selection process described in Section 6. The capitalized terms in this RFP have the meanings as first used in the text of this RFP and as defined in Attachment A (Definition of Terms).

The Project is to be designed and constructed in two phases using the progressive design-build delivery method:

- Phase One: Prepare design to **90%** complete, as defined in Attachment B (Scope of Design-Builder Services), develop and negotiate a guaranteed maximum price (GMP) proposal.
- Phase Two: Complete design, construction and post-construction tasks, including performance testing, startup commissioning and operator training and support (if a GMP is approved by the Owner in Phase One).

At completion of the evaluation process, **The City of Hays Kansas** (Owner) will select the highest ranked Proposer to award, or enter into negotiation for award of, the Progressive Design-Build Contract. Attachment C to this RFP provides the Draft Progressive Design-Build Contract.

This RFP is subject to revision after the date of issuance via written addenda. Any such addenda will be posted on the Owner's web site. It is each Proposer's responsibility to obtain all RFP addenda prior to submitting its Proposal.

In no event would the Owner be liable for any costs incurred by any Proposer or any other party in developing or submitting a Proposal.

1.2 RFP Organization

This RFP consists of seven Sections and seven Attachments:

- Section 1: Background
- Section 2: Project Overview

- Section 3: Progressive Design-Build Services
- Section 4: Procurement Process
- Section 5: Proposal Submission Requirements
- Section 6: Proposal Evaluation and Selection
- Section 7: Conditions for Proposers
- Attachment A: Definition of Terms
- Attachment B: Scope of Design-Builder Services
- Attachment C: Draft Progressive Design-Build Contract
- Attachment D: Project Background Documents
- Attachment E: Project Technical Requirements
- Attachment F: Fee and Rate Proposal Form
- Attachment G: Forms for Affirmation of Compliance

The contents of the RFP Attachments take priority over any conflicting statements in the RFP Sections.

Certain project background documents are being made available as Attachment D, Project Background Documents for the purpose of preparing Proposals. The Owner is providing these documents only for the purpose of obtaining Proposals for the Project and does not confer a license or grant for any other use. The extent to which the Design-Builder may rely on such background documents is set forth in Attachment C (Draft Progressive Design-Build Contract).

1.3 Owner's Objectives

The Owner's objectives for delivery of the Project are as follows:

- **Single Point of Accountability:** To have the Design-Builder provide the Owner with a single point of contract accountability for design, construction, commissioning and project performance . The single point of accountability is responsible for providing the Owner with complete resolutions to design and construction issues that may arise during all phases of project execution.
- **Quality Design and Construction:** Provide treatment facilities and equipment that will be sustainable and will reliably produce treated effluent in full compliance with federal and state regulations and contractual standards as set forth in Attachment D (Project Technical Requirements).
- **Guaranteed Project Cost:** Design and construction of the project at an agreed price within the Owner's \$27.6 million budget.
- **Ability to Meet the Project Schedule:** Achieve the scheduled substantial completion date of December 29, 2017 for design, construction and performance testing .
- **Minimizing Risk for Change Orders:** Achieve an optimal balance of risk allocation between the Owner and the Design-Builder and manage risks to reduce the likelihood of change orders.

- **Competitive Bidding of Qualified Subcontractors and Equipment Suppliers:** To have the ability to select or reject Subcontractors and Equipment Vendors bids based on cost or non-cost factors.
- **Selection of Qualified Design-Builder:** Selection of an experienced Design-Build firm that understands the Owner's objectives, has experience in the design-build marketplace, and can design and construct the project to or under budget.
- **Collaboration with Design Elements:** Review and participate with Design-Builder's selection of design elements that will minimize overall future operation concerns and maintenance costs.
- **Innovative Solutions:** Select a Design-Builder that can develop and implement innovative solutions for accelerated project scheduling, maximum cost control, improved constructability and minimization of operations and maintenance costs to ensure the project fits within the Owner's \$27.6 million budget.

By selecting the progressive design-build delivery method for the Project, the Owner is committed to working in close collaboration with the Design-Builder so during Phase One, development of the Project's design will achieve the Project objectives and result in a mutually-agreeable GMP for construction of the Project in Phase 2. As set forth in Attachment E, Project Technical Requirements, the Owner has certain technical requirements and standards that apply to the Project's design.

1.4 Proposers

The Proposers invited to respond to this RFP include:

- Black & Veatch / Garney
- Burns & McDonnell / CAS
- CDM Smith

Section 2. Project Overview

2.1 Project Scope

Improvements shall make the Hays WWTP capable of efficiently meeting effluent discharge limits and Total Nitrogen and Total Phosphorous goals defined in the Owner's June 1, 2014 NPDES Discharge Permit. The Project shall also include the upgrade of existing and aging equipment and structures to a state-of-the-art facility, with the flexibility to anticipate and adapt to future regulations.

The following summarizes the general scope of the project:

- New influent pump station utilizing submersible style pumps.
- New headworks facility consisting of fine screening and washer/compactor equipment as well as grit removal equipment. Fine screening equipment scope will vary based upon activated sludge process selected by Design/Builder and the City.
- New activated sludge basins consisting of a minimum of two parallel trains. Treatment systems that may be considered by Design/Builders shall consist of Option 1, 5-Stage activated sludge treatment with secondary clarifiers and filters or Option 2, 4-Stage activated sludge system with membrane bioreactor (MBR).
- New secondary clarification consisting of two clarifiers, if Option 1 is selected.
- Modifications to existing RAS/WAS pump station to include new pumping equipment and miscellaneous facility improvements if Option 1 is selected.
- Modifications to existing granular media tertiary filters to include new filtration equipment and miscellaneous facility improvements if conventional activated sludge is selected.
- Modifications to existing intermediate pump station to include new pumping equipment and miscellaneous facility improvements to pump filtered effluent through UV disinfection. Inclusion of this unit process will be based upon the hydraulic profile of the selected activated sludge option.
- New UV disinfection system to provide disinfection of effluent directed to receiving stream as well as to effluent reclaimed water system. A liquid hypochlorite system shall be provided for algae control where reclaimed effluent is stored.
- New effluent reaeration structure.
- Modifications to existing trickling filter structure(s) to provide for storage of effluent reclaimed water and non-potable and water reclamation pumps.
- Modifications to existing activated sludge basins to convert to repurposed aerobic digestion basins with new coarse bubble diffused aeration system and Digested Sludge Pump Station.
- Modifications to existing dewatering building to include new dewatering equipment of screw press type with associated pumping and polymer feed equipment.

- Modifications to existing dissolved air flotation (DAF) thickening building to convert to administration, laboratory, controls, break room, lockers, and parts storage areas.
- Improvements to existing electricity source and backup generator system to provide required power supply and 100% backup during power supply outage.
- New septage receiving station near influent pump station.
- Associated instrumentation and controls, piping, structures, non-potable water system, electrical and site work.

In addition, Owner is interested in considering the following project enhancements:

- Mechanical screen, with ½" openings, ahead of fine screens required with MBR option (Option 2).
- In lieu of rehabilitating existing blowers and blower building, install new blowers in weather/sound enclosures near the aerobic digester.

The Project scope, design standards and performance requirements are described in more detail in Attachment E, Project Technical Requirements.

2.2 Project Budget and Funding

The cost for design and construction of the Project is currently **budgeted at \$27.6 million**. This **budget is fixed for the project** and the selected Design-Builder shall be expected to deliver the project for the indicated amount, or less. The budget does not include Owner's other Project costs, such as professional advisory services, property or access rights, limited geotechnical site investigations, environmental studies, certain limited governmental approvals, taxes, financing costs, interest during construction, and Owner Representative services. The Owner intends to fund the project through the Kansas Water Pollution Control Revolving Fund Program (SRF).

2.3 Project Schedule

It is anticipated the Phase One section of the Progressive Design-Build Contract will be executed on or about **December 23, 2015**. As indicated in Section 4, it is anticipated that the Phase Two section of the Progressive Design-Build Contract will be executed on or about **May 31, 2016**. The design, permitting, construction and performance testing of the completed Project are expected to be substantially completed no later than **December 29, 2017**, with final completion **March 30, 2018**.

Completion Date	Milestone Activity
Phase 1	
December, 2015	Contract Execution, Phase 1
January 4, 2016	Notice-to-Proceed
January 29, 2016	Preliminary Pricing Information on Option 1 and Option 2, Activated Sludge Processes
February 29, 2016	30% Design Milestone
March 31, 2016	60% Design Milestone
April 29, 2016	90% Design Milestone
May 16, 2016	Negotiate GMP
Phase 2	
May 31, 2016	Contract Execution, Phase 2
November 15, 2017	Liquid Phase Improvements
December 29, 2017	Substantial Completion
March 30, 2018	Final Completion

Section 3. Progressive Design-Build Services

3.1 General

As noted in Section 1 and more fully described in Attachment B, Scope of Design-Builder Services, the Design-Builder will provide services in two distinct phases.

Phase One services generally consist of preliminary engineering, geotechnical investigations and design development, as well as preparation, in close collaboration with the Owner, of a proposed GMP and schedule. The proposed price and schedule include the Project's design (developed to the Owner's required level of completion), a GMP, Project schedule, and supporting documentation, such as detailed open-book costing for the GMP. Phase Two services generally encompass completing the Project's design and undertaking construction and performance testing. Permitting activities are included in each Phase.

Phase One services, in general, shall include:

- Develop the Project execution plan, including Project schedule.
- Perform engineering studies (such as subsurface investigations, pilot studies, wastewater analyses, etc.) to support design and cost estimating.
- Identify Project permitting requirements and initiate certain permitting activities.
- Produce the basis-of-design report. As part of the report, include a cost evaluation of two activated sludge options for consideration by Owner. Owner will review and direct Design-Builder which option to move forward into design.
- Develop the engineering design (including preparing and submitting intermediate design review packages) perform value-engineering and constructability review activities in collaboration with Owner.
- Prepare a project cost model and provide detailed cost estimates as the design and design alternatives are advanced.
- Submit and negotiate a GMP proposal for the Phase Two services.

Phase Two services, in general, shall include:

- Complete final design.
- Procure equipment and subcontractors.
- Secure necessary permits.
- Construct the Project.
- Conduct startup, commissioning and performance testing.
- Provide operator training.
- Provide warranty coverage.

3.2 Roles and Responsibilities

Owner: Owner responsibilities include:

- Review submissions and provide comments to Design-Builder. As part of this, direct Design-Builder which activated sludge option that Design-Builder shall use to establish the GMP
- Furnish existing studies and provide data and information regarding the Project, including record drawings of the WWTP that are available, preliminary studies, and the August 2015 Facility Plan for the proposed project.
- Provide funding equal to the mutually-agreed to Contract Price.
- Provide access to the Project site and any necessary easements.
- Obtain the governmental approvals and permit (discharge permit, etc.) Owner is responsible for, and assist Design-Builder in obtaining governmental approvals and permits Design-Builder is responsible for.
- Provide Design-Builder with available influent pollutant loadings, flows from existing flow meters, and applicable NPDES permits.

Design-Builder: The Design-Builder will cooperate with the Owner and will provide in accordance with the Contract Documents the Phase One and Phase Two services necessary to complete the Project scope specified in this RFP. Design-Builder responsibilities include, but are not limited to:

- Implementation of Project health and safety practices.
- Prepare design and construction documents.
- Supervise subcontractors and Design-Builder personnel.
- Obtain governmental approvals and permits.
- Maintain site security.
- Conduct, and be responsible for performance testing.
- Implement quality-management procedures.
- Be responsible for warranty management and completion.
- Obtain all necessary construction permits and approvals
- Construct the work within the limits of the GMP

The roles and responsibilities of the Owner and the Design-Builder are more fully described in Attachment C, Draft Progressive Design-Build Contract.

Section 4. Procurement Process

4.1 Acknowledgement of RFP

Each Proposer must provide the Owner, within **5** (five) calendar days of receipt of this RFP, an acknowledgement that it has received this RFP and intends to submit a fully compliant proposal. Such acknowledgement shall identify and provide full contact information for the Proposer Contact, who shall be the Proposer's single point of contact for the receipt of any future documents, notices and addenda associated with this RFP. Such acknowledgement must be sent in writing and a copy electronically transmitted to the Owner Contact.

4.2 Communications and Owner Contact

On behalf of the Owner, **Stan Christopher with HDR Engineering, Inc.** will act as the sole point of contact for this RFP and shall administer the RFP process. All communications shall be submitted in writing, by fax, or by email, and shall specifically reference the RFP. All questions or comments should be directed to the Owner Contact as follows:

Stan Christopher, PE
Owner's Representative
HDR Engineering Inc.
3741 NE Troon Drive
Lee's Summit, MO 64064
Email: Stan.Christopher@hdrinc.com
Phone: (816) 347-1113
Fax: (816) 347-1198

No oral communications from the Owner Contact or other individual shall be binding. No contact with Owner staff, commission members, or any public official concerning the Project during the procurement process is permitted, other than communication at the proprietary meetings and/or interviews conducted by the Owner. A violation of this provision may result in disqualification of Proposer.

4.3 Procurement Schedule

The current procurement schedule is as follows:

- Announcement of short-listed Proposers September 11, 2015
- Post and Distribute RFP September 14, 2015
- RFP receipt acknowledgement September 18, 2015
- Deadline for questions October 5, 2015

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|--|-----------------------------|
| • Conduct proprietary meetings | October 13 and 14, 2015 |
| • RFP Addenda posted | October 22, 2015 |
| • Deadline for Submission of Proposals | November 3, 2015; 3:00 p.m. |
| • Interviews | November 18, 2015 |
| • Award of Contract | December 11, 2015 |
| • Execution of Contract | December 23, 2015 |

4.4 Pre-Proposal Proprietary Meeting and Site Tour

Owner will conduct individual, proprietary meetings with the Proposers. **Attendance at such meetings is recommended, but not required.** The date, time and location of the proprietary meeting will be arranged by the Owner Contact. Access to the project site may also be arranged for each Proposer during the proposal process. Proposer should notify the Owner Contact to request a date and time for a site visits.

Section 5. Proposal Submission Requirements

5.1 Submittal Place and Deadline

Twelve paper documents (one original and **11** copies), as well as **two** electronic versions of the Proposal on CD-ROMs in PDF format, must be received no later than **3:00 pm on Tuesday November 3, 2015**, addressed to:

City of Hays, Kansas
ATTN: Brenda Kitchen, City Clerk
1507 Main Street
Hays, KS 67601

Each Proposer assumes full responsibility for timely delivery of its Proposal at the required location. Any Proposal received after the submittal deadline will be deemed non-responsive and returned. The delivered packaging containing the Proposal documents must note "Proposal Enclosed – Wastewater Treatment Facility Expansion and Upgrade" on its face.

Please note, however, that the fee and rate proposal (including the completed Fee and Rate Proposal Form and the Part 7 description of the Fee and Rate Proposal) must be presented in a separate, sealed envelope and should not be included on the CD-ROMs.

5.2 Submission Format

The Proposal must not exceed **30** total pages (most or all 8½ x 11 inch with 1-inch or greater margins), excluding the transmittal letter, index or table of contents, front and back covers, title pages/separation tabs, and appendices. A maximum of **four** of the total pages may be 11 x 17-inch tri-fold format and each page is counted as two 8½ x 11 inch pages. Twelve-point font or larger must be used in Proposal Parts 1–5.

5.3 Submission Content

The content requirements set forth in this RFP represent the minimum content requirements for the Proposal. It is the Proposer's responsibility to include information in its Proposal to address all aspects of the proposal submission content in order to accurately and succinctly communicate Proposers understanding and approach to the Project. It is the Proposer's responsibility to develop such materials so that only directly relevant information is included in the Proposal.

The Proposal must include the following information in the order listed:

- Transmittal Letter
- Part 1 – Executive Summary
- Part 2 – Project Approach
- Part 3 – Draft Progressive Design-Build Contract
- Part 4 – Fee and Rate Proposal
- Part 5 – Updated SOQ
- Appendix A – Progressive Design-Build Contract Markup
- Appendix B – Fee and Rate Proposal
- Appendix C – Additional Resumes (if required)
- Appendix D – Forms for Affirmation of Compliance

5.3.1 Transmittal Letter

Proposers must submit a transmittal letter (maximum two pages) on the Proposer's letterhead. It must be signed by a representative of the Proposer who is authorized to sign such material and to commit the Proposer to the obligations contained in the RFP. The transmittal letter must include the name, address, phone number and e-mail address for the Proposer's Contact and must specify who would be the Design-Builder's signatory to any contract documents executed with the Owner. The transmittal letter may include other information deemed relevant by the Proposer.

5.3.2 Part 1 – Executive Summary

The executive summary (maximum three pages) must include a concise overview of the key elements of the Proposal. The executive summary shall not be used to convey additional information not found elsewhere in the Proposal.

5.3.3 Part 2 – Project Approach

Provide a conceptual description (maximum 21 pages) of the Design-Builder's approach for managing and performing its services during Phase One and Phase Two of the Project. The following items should be addressed:

- Discuss how a collaborative relationship with the Owner would be established during Phase One design development, scheduling and cost estimating.
- Identify the Proposer's field and office principals assigned to both phases of the project. Provide the names, titles, and home office locations for each individual identified. If the principals vary between phases of the project, Proposer shall provide an explanation why this variance is beneficial to the Owner.
- Discuss how the design and construction processes will interface, including how value analysis and

constructability reviews will be performed.

- Discuss how Proposer's project approach incorporates innovative concepts, technology and construction methods, which ensures the Owner receives best value for their capital investment.
- Describe the process for developing and maintaining a dynamic cost model to be used to ensure compliance with the Owner's budget.
- Describe the process for developing the preliminary costs for the two activated sludge options early in the process allowing Owner to choose the option that best fits the Owner's long term needs. Discuss how the design process can continue while the Owner considers the two options which may take up to three weeks of review time.
- Identify the work components critical to the Project's success and how these components would be achieved.
- Explain the Proposer's approach for achieving the MBE/WBE goals established for the project.
- Describe the process for developing the GMP proposal (including the amount of cost contingency).
- Identify key risks and discuss how they are managed and mitigated across all phases of the Project.
- Describe the approach to project safety and how this approach considers Proposer personnel, subconsultants, subcontractors, Owner staff and the public.
- Describe the approach to ensuring quality in the design and construction phases of the Project, how quality will be measured and how the approach integrates Proposer personnel, subconsultants, subcontractors and Owner staff.
- Prepare and present a Project schedule in detail sufficient for Proposer to identify the critical path through the Project and how conformance with the planned substantial and final completion dates will be achieved.

5.3.4 Part 3 – Progressive Design-Build Contract Markup

The Proposal must include in Appendix A, Progressive Design-Build Contract Markup a detailed redline markup of the Draft Progressive Design-Build Contract (including its attachments), setting forth any and all revisions requested by the Proposer. Although it is likely that the Owner will undertake negotiations of the Progressive Design-Build Contract, the Progressive Design-Build Contract Markup will be treated as a *de facto* offer that the Owner can accept as is, resulting in a binding contract between the Design-Builder and Owner without further negotiations or revision.

Part 3 of the Proposal (maximum 2 pages) must describe the significant revisions included in Appendix A (Progressive Design-Build Contract Markup) and explain the rationale for such revisions and the associated benefits to the Owner. Proposers are encouraged to suggest revisions that would more efficiently allocate risk, improve the parties' understanding of risk allocation, and improve clarity of any terms of the Draft Progressive Design-Build Contract where ambiguities or uncertainties may arise in their application or interpretation.

The Owner is not obligated to accept any of the requested exceptions, modifications, additions, etc. submitted by the Proposer in the Progressive Design-Build Contract Markup when negotiating and finalizing the Progressive Design-Build Contract. Furthermore, the Owner may request additional revisions during negotiations and before finalizing the Progressive Design-Build Contract.

The Owner expects that this review and comment process will substantially reduce the need for extensive post-selection negotiation.

5.3.5 Part 4 – Fee and Rate Proposal

The Proposer must complete the RFP Attachment F, Fee and Rate Proposal Form, with all required pricing information and include it as Proposal Appendix B, Fee and Rate Proposal. The scope of Design-Builder services for which pricing is required is defined in RFP Attachment B, Scope of Design-Builder Services. Part 4 of the Proposal should describe (maximum one page) the basis for the fee and rate proposal and discuss its suitability from the Design-Builder's perspective.

Please be advised that the Owner is not interested in proposed fees or rates that provide excessive discounts from the Design-Builder's anticipated actual costs for the Phase One, off-ramp or Phase Two services. If Owner determines (at its sole discretion) that the fees and rates for Phase One, off-ramp or Phase Two services included in a Proposal are unacceptably below industry norms or that a Proposer's fees and rates are substantially or unacceptably below other Proposals, the Owner may (at its sole discretion) declare that Proposal to be nonresponsive or seek additional detailed information from that Proposer concerning the cost basis for its fee and rate proposal prior to rendering a decision on the Proposal's responsiveness.

5.3.6 Part 5 – Updated SOQ

This part of the Proposal (maximum one page) confirms that the statement of qualifications (SOQ) submitted in response to the request for qualifications is incorporated as part of the Proposal; it should include narrative explaining any proposed changes to the SOQ. Proposal Appendix C (Resumes) should include resumes for any additional or new personnel that may be proposed. Any such changes to the SOQ, however, are subject to acceptance or rejection by the Owner, at its sole discretion.

Section 6. Proposal Evaluation and Selection

6.1 General

The Proposals will be reviewed and evaluated by the Owner's selection committee (with assistance provided by outside advisors if desired by Owner) according to the requirements and criteria outlined in this Section 6. During the Proposal evaluation process, written questions or requests for clarification may be submitted to one or more Proposers regarding its Proposal or related matters. Failure to respond in a timely manner to any such questions or requests may be grounds for elimination of the Proposer from further consideration. In addition, the Owner may require that all or a limited number of Proposers participate in interviews.

6.2 Responsiveness

Each Proposal will be reviewed to determine whether it is responsive to the RFP. Failure to comply with the requirements of this RFP may result in a Proposal being rejected as non-responsive. At its sole discretion, however, the selection committee may waive any such failure to meet a requirement of this RFP and may request clarification or additional information to remedy a failure.

6.3 Comparative Evaluation Criteria

The selection committee will evaluate and rank responsive Proposals by applying the weighted comparative evaluation criteria set forth below.

Evaluation Criteria	Scoring
• Proposer's project approach	30%
• Approach to project safety and quality	15%
• Progressive Design-Build Contract Markup	20%
• Ability to meet MBE/WBE Participation Goal	5%
• Fee and Rate Proposal	30%
• Proposer's responsiveness to the RFP	Pass/Fail
• Proposer's Signatory Certification Form	Pass/Fail
• Certification Regarding Lobbying Form	Pass/Fail
• Kansas Act Against Discrimination Form	Pass/Fail

In ranking the proposals, the selection committee will utilize a 100-point scale whereby the maximum points awarded for each of the evaluation criteria will be based on the percentage weight set forth above. The selection committee will apply the non-price evaluation and complete its awarding of the non-price criteria points before opening the sealed envelope containing the fee and rate proposal.

6.4 Selection

After the evaluation process is complete, the Owner will notify the top-ranked Proposer that they have either been selected for contract award on the basis of its Progressive Design-Build Contract Markup or offered the opportunity to negotiate the final terms of the Progressive Design-Build Contract. However, if the Owner determines (at its sole discretion) that the top-ranked Proposer's Progressive Design-Build Contract Markup may require protracted negotiations, the Owner may choose to either select or negotiate with the next-ranked Proposer. If negotiations with any selected Proposer are not successful, the Owner may either select the next-ranked Proposer for award on the basis of its Progressive Design-Build Contract Markup or offer it the opportunity to negotiate the final terms of the Progressive Design-Build Contract (and so on for lower-ranked Proposers).

Section 7. Conditions for Proposers

7.1 Owner Authority

Owner is a Municipality in the State of Kansas created under Kansas state law. The procurement process for this Project is authorized under The City of Hays' Purchasing Policy.

7.2 Ineligible Firms and Individuals

The following firms and individuals are serving in an advisory capacity to the Owner for this Project and are therefore not eligible to assist or participate with any Proposer that submits a Proposal for the Project.

HDR Engineering, Inc.

HDR Constructors, Inc.

7.3 Conflict of Interest

Kansas state statutes mandate the public disclosure of certain information concerning persons doing business or seeking to do business with the Owner, including affiliations and business and financial relationships such persons may have with Owner officers.

7.4 Proprietary Information

All materials submitted to the Owner become public property and are subject to the City of Hays' Policies. If the Proposal contains proprietary information that the Proposer does not want disclosed, each page containing such information must be identified and marked "PROPRIETARY" at the time of submittal. Owner will, to the extent provided by law, maintain the confidentiality of and endeavor to protect such information from disclosure. The final decision as to what information must be disclosed, however, lies with the Owner. Failure to identify proprietary information will result in all unmarked sections being deemed non-proprietary and available upon public request. Proposers shall not be permitted to mark the entire Proposal as proprietary.

7.5 Rights of the Owner

In connection with this procurement process, including the receipt and evaluation of Proposals and award of the Progressive Design-Build Contract, Owner reserves to itself (at its sole discretion) all rights available to it

under applicable law, including without limitation, with or without cause and with or without notice, the right to:

- Cancel, withdraw, postpone, or extend this RFP, in whole or in part, at any time prior to the execution of the Progressive Design-Build Contract, without incurring any obligations or liabilities.
- Modify the procurement schedule.
- Waive deficiencies, informalities and irregularities in a Proposal and accept and review a non-conforming Proposal.
- Suspend and terminate the procurement process or terminate evaluations of Proposals received.
- Permit corrections to data submitted with any Proposal.
- Hold meetings and interviews, and conduct discussions and correspondence, with one or more of the Proposers to seek an improved understanding of any information contained in a Proposal.
- Seek or obtain, from any source, data that has the potential to improve the understanding and evaluation of the Proposals.
- Seek clarification from any Proposer to fully understand information provided in the Proposal and to help evaluate and rank the Proposers.
- Reject a Proposal containing exceptions, additions, qualifications or conditions not called for in the RFP or otherwise not acceptable to the Owner.
- Conduct an independent investigation of any information, including prior experience, included in a Proposal by contacting project references, accessing public information, contacting independent parties, or any other means.
- Request additional information from a Proposer during the evaluation of its Proposal.

7.6 Obligation to Keep Project Team Intact

Proposers are advised that all firms and Key Personnel identified in the Proposal shall remain on the Project Team for the duration of the procurement process and execution of the Project. (The anticipated dates for award of the Progressive Design-Build Contract and for completion of the Project are set forth in Section 2.3 of this RFP.) If extraordinary circumstances require a change, it must be submitted in writing to the Owner Contact, who, at his or her sole discretion, will determine whether to authorize a change, recognizing that certain circumstances (such as termination of employment) may occur that are beyond the Design-Builder's control. Unauthorized changes to the Project Team at any time during the procurement process may result in elimination of the Proposer from further consideration.

7.7 Addenda

If any revisions to the RFP or procurement process become necessary or desirable (at the Owner's sole discretion), the Owner may issue written addenda. **The Owner will not necessarily transmit addenda to potential Proposers.** The Owner will post all addenda on the Owner Project website at the following

address: www.haysusa.com/html/public_announcements.html/#bids. It is Proposer's responsibility to obtain all addenda prior to submitting its Proposal.

7.8 Protests

Any protest to an Owner's action in connection with this procurement must be filed in writing no later than **10** business days following such action and must be in strict accordance with the Owner's applicable procedures and with applicable law.

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Attachment A

Definition of Terms

The definitions of some of the capitalized terms used in this RFP are presented below:

Builder – The Design-Builder or other firm (such as a subcontractor or joint-venture partner) that will provide construction services and have responsible charge of construction of the Project.

Designer – The Design-Builder or other firm (such as a subconsultant or joint-venture partner) that will provide professional design services and have responsible charge of the design, including preparation of the construction documents.

Design-Builder – The entity that is selected to enter into the Progressive Design-Build Contract with the Owner and that will be the single point of accountability to the Owner for delivery of the services and the Project.

Draft Progressive Design-Build Contract – The draft contract, including the agreement and all of its attachments, presented as RFP Attachment C, Draft Progressive Design-Build Contract.

Key Personnel – The individuals, employed by Design-Builder or other firms included on the Project Team, who would fill certain key roles in delivery of the Project and related services by the Design-Builder, including the following positions: design-build project manager, safety manager, design manager, construction manager, lead estimator, quality manager and commissioning manager.

Ninety (90) Percent Design – Design documents prepared to a level of completion whereby all required systems, equipment, controls and componentry to be incorporated into the Project are adequately represented in the documents and design development is near completion except for the final QA/QC review and approval.

Owner – City of Hays, Kansas

Project – Hays Wastewater Treatment Plant Upgrade and Expansion Project

Project Team – The Design-Builder, Key Personnel and any additional firms (such as subcontractors and subconsultants) included in the Proposal.

Proposer – The entity responding to this RFP by submitting the Proposal.

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Attachment B

General Scope of Design-Builder Services

Listed below are typical services the Design-Builder will be expected to be able to perform for the project.

This scope provides additional details on Work that shall be completed by the Design-Builder prior to the acceptance of the Guaranteed Maximum Price (GMP) proposal and the second Phase of the Work.

General Services Included in Phase One and Phase Two (Preconstruction and Construction) Services shall include:

1. The preparation, submission and maintenance of a Project Management Plan the Design-Builder shall provide components including: Personnel Plan, Communication Plan, Project Schedule, Cost Estimate Model, Permitting Plan, Quality Management Plan, Environmental Management Plan, Safety Plan, and an Emergency Response Plan;
2. The Design-Builder shall submit a printed copy and an electronic copy (PDF format) of the Project Management Plan to HDR.
3. A Project Schedule shall include schedule information for the first and second phases of the Project as identified in DBIA contract 535;
4. Monthly Status reports and schedules shall be provided with payment applications. Status reports shall describe activities performed during reporting period, anticipated activities during the next period and any problems or anticipated issues that would impact Project scope, schedule or budget. The Project Schedule shall be cost loaded and automatically generated by a software package such as Primavera. Provide tracking graphs showing planned vs. actual Project expenditures.
5. The Design-Builder shall conduct weekly teleconferences and monthly in-person meetings with key personnel with the Owner and HDR to update the Project participants on the design, Project Schedule, constructability review and scope conformance.
6. Coordinate with the Owner on all communications with the Kansas Department of Health and Environment.

Phase One (Preconstruction) Services will generally include:

1. Provide Key Personnel Plan and all other associated personnel necessary to fully meet the Design-Builder obligations for Preconstruction Phase Services including but not limited to pre-construction and construction project manager(s), lead estimator, lead scheduler, procurement lead, QA/QC lead and all other associated personnel necessary to fully meet the Design-Builder's obligations for Phase One services;
2. Project Communication Plan that defines methods of communication between all Project participants and review Project expectations;
3. Develop, implement and maintain a quality management plan that assures conformance with the project specifications and the surveillance of design and construction to ensure error-free work;
4. Provide an environmental management plan detailing programs to ensure compliance with permits and regulations applicable to the Project;

5. Participate in one Project kick off meeting for Preconstruction Phase Services including Design-Builders key personnel including the project manager, superintendent(s), quality manager, lead scheduler, safety officer lead estimator and/or procurement specialist.
6. Develop a permitting plan that identifies all construction related permits to be obtained by Design-Builder, any other permits the Owner may desire the Design-Builder to be responsible for managing on its behalf, and other necessary permits identified during in the Agreement.
7. Participate in a formal partnering session with key personnel including the project manager, superintendent(s), quality manager, lead scheduler, safety officer lead estimator and/or procurement specialist shall participate in a formal partnering session with the Owner and HDR;
8. Conduct additional investigations (survey, geotechnical, environmental, etc) necessary to satisfy design development needs;
9. Produce the Basis of Design report. As part of this report, include a cost evaluation of two activated sludge options identified in Section 2 and Attachment E of this RFP, for consideration by Owner. Owner will review and direct Design-Builder for which option to move forward into design;
10. Design-Builder shall provide a 90% Design Package with intermediate Design Packages including schematic, 30% and 60%, and 90% design milestones;
11. Attend review workshops at design review milestones with key personnel to provide constructability review and consult on design document clarity and consistency issues in the development of the schematic, 30%, 60%, and 90% design review plans and specifications;
12. Incorporate Owner's Operations and Maintenance staff input into the design and construction of the Project;
13. With Owner's Staff, perform on-going value engineering reviews to minimize project cost and maximize operational flexibility and maintainability;
14. Identify, evaluate and propose innovative solutions/alternatives to minimize project cost and schedule;
15. The Design-Builder shall perform parallel independent detailed construction cost estimates at the schematic, 30%, 60%, and 90% design review milestones and reconcile the cost estimates with the cost estimates prepared by the Owner or Owner's Representative.
16. Prepare independent parallel Critical Path Method project schedules at the schematic, 30%, 60%, and 90% design review milestones and reconcile the schedules with the schedules prepared by the Owner or Owner's Representative.
17. Develop and maintain a project cost estimate model that will be used during Phase One services to validate conformance with the Project budget;
18. Identify gaps and provide potential adjustments and/or recommendations to resolve gaps in writing if there is a budget or schedule disagreement between the estimate prepared by the Design-Builder and the estimate prepared by the Owner or Owner's Representative;
19. Prepare a detailed Guaranteed Maximum Price (GMP) proposal (including line item cost breakdowns with conditions, assumptions, and contingency) to be presented and negotiated in an open book manner with the Owner;
20. Attend a GMP negotiation and finalization meeting to present and review the completion of the GMP proposal to the Project participants, negotiation session to review the revised GMP from the original session;
21. Reconcile all survey datum from flood elevations (100 year and 500 year), previous plans, existing structures, and new improvements with NAVD 88 Datum.

Phase 2 (Construction) Services will generally include the following:

1. Under the relevant state laws, solicit and publicly conduct trade contractor or subcontractor bidding and proposals for all major elements of the construction work estimated at greater than \$15,000, and for material suppliers for the Project, unless incorporated above or otherwise exempted;
2. Identify long-lead equipment procurement needs;
3. Prepare the Bids/Proposals packages for the elements of the Work which must incorporate the requirements of the Contract;
4. Develop a Procurement and Buyout plan which maximizes competitive bidding by subcontractors, equipment vendors and suppliers;
5. Develop and submit recommendations for the award of the subcontracts to construct the Project;
6. Clearly identify Work packages that the Design-Builder intends to bid with the intent to self perform the Work in the Procurement Plan.
7. Establish a project office conference room from repurposed existing or mobile facilities with space sufficient for Design-Builder, Owner, Owner Advisor and major subcontractor personnel;
8. Develop a construction emergency response plan;
9. Prepare and submit a construction site safety plan;
10. Participate in one Project kick off meeting for Construction Phase Services;
11. Perform construction of the Work in strict accordance with all applicable Contract Documents;
12. Coordinate and manage the Work that includes all required appurtenances, necessary site improvements, and all other work required to make a complete and operable system within the Guaranteed Maximum Price and within the allowable contract time;
13. Coordinate with various local and state agencies, as necessary;
14. Provide Performance Bond and Payment Bond (s) as required by contract;
15. Implement the construction site safety plan to provide a safe working site for the Project, maintain, update and implement as needed the emergency response plan;
16. Conduct a pre-construction meeting with all the contractors and sub-contractors performing major elements of the work prior to the start of their work activities;
17. Obtain all necessary construction permits including but not limited to City of Hays and the Kansas Department of Health and Environment;
18. Establish and implement procedures to track, expedite and process all submittals, change orders, and requests for information;
19. Maintain, monitor and update the Critical Path Method schedule prepared during the preconstruction phase and prepare three week look ahead work schedules consistent with the overall schedule;
20. Conduct monthly progress meetings with the Owner staff and provide written monthly progress report and updated schedule;
21. Maintain current hard copies of Project Submittals and record drawings, including all subcontracted work, and submit monthly in hard copy, PDF and electronic format;
22. Develop, implement and manage a commissioning, start-up and testing plan suitable for Project acceptance and use;
23. Develop and submit electronic Operation and Maintenance Manuals;
24. Supervise and manage the warranties provided to the Owner for the equipment and construction work; and perform warranty work during the warranty period;
25. Implement close out procedures and provide lien waivers from all subcontractors and material suppliers.

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Attachment C

Draft Progressive Design-Build Contract

(To be added by addendum)

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Attachment D

Project Background Documents

Existing Site Conditions

The 100 year flood elevation, the existing plant, the plant expansion area, the contractor staging and equipment/ material storage area, and locations of active and inactive wells are shown in Figure 1-1.

Record Drawings

The following reference documents which depict previous construction at or near the site are on file at the office of the Owner's Representative. These reference documents are made available solely to allow Design-Builders to have ready access to the same information available to the Owner and Owner's Representative:

- Sewage Treatment Plant No. 2, Hays - Kansas, Contract Documents, 1953, Servis & Van Doren.
- Plans for Sewerage Improvements, Sewage Treatment Plant Additions, Hays, Kansas, Contract No. 2, Contract Drawings, 1967, Black & Veatch
- Drawings for Hays, Kansas, Big Creek Water Banking Plan, Wastewater Treatment Plant Improvements, Contract Drawings, 1992, Black & Veatch

Technical data contained in reference documents, including but not limited to dimensions, locations and conditions of existing surface and subsurface structures, roadways, underground utilities owned by the Owner, piping, raceways, equipment, etc., and other appurtenances shown or indicated may not accurately, correctly, or reliably reflect actual conditions. Design-Builders shall be responsible for confirming all technical data, nontechnical data, interpretations, or opinions contained in any reference drawings.

Each Design-Builder assumes full responsibility for any of their conclusions or interpretations related to the physical conditions which may be encountered based on the information or data made available, or those additional examinations, explorations, or studies made or obtained by the Design-Builder.

Reference documents are available from the Owner's Representative in pdf format on DVD.

Geotechnical Report

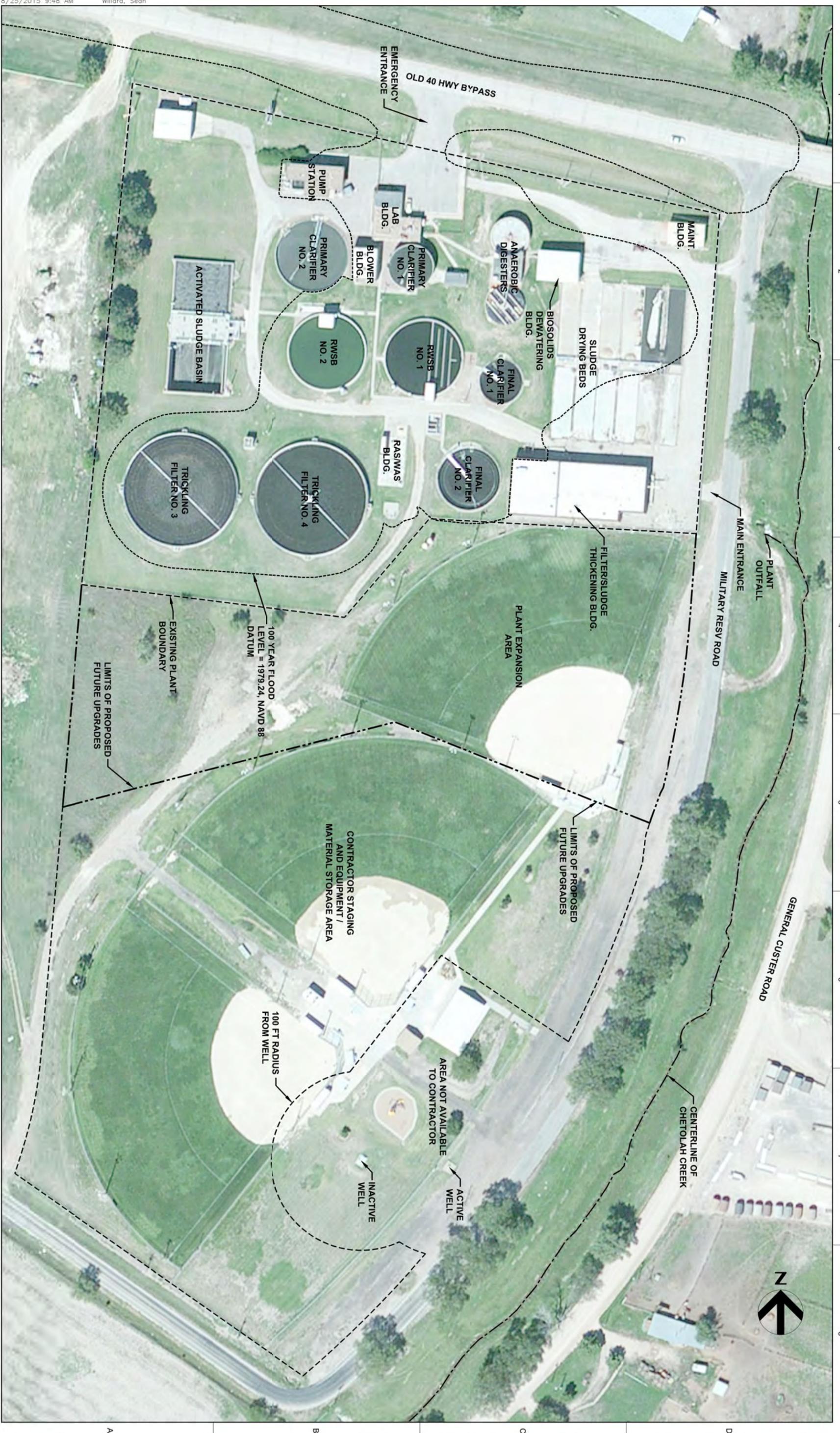
A preliminary geotechnical investigation has been initiated by the Owner. Results of the investigations will be provided in a summary report to be issued at by addendum.

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HDR
MISSOURI CERTIFICATE OF
AUTHORITY #: 000856
3741 NE TRICON DRIVE
LEES SUMMIT, MO 64084
816-947-1100

PROJECT MANAGER	
CIVIL	
STRUCTURAL	
ELECTRICAL	
PROJECT NUMBER	
ISSUE DATE	DESCRIPTION



**City of Hays, Kansas
Wastewater Treatment
Plant Improvements**

**SITE PLAN
PROPOSED SITE EXPANSION AREA**



FILENAME 3-1.dwg
SCALE 1" = 50'

FIGURE 1-1

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Attachment E

Project Technical Requirements

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Design/Build Design Criteria Package

City of Hays, Kansas

Upgrades and Expansion of the Hays Wastewater
Treatment Plant

September 14, 2015

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- Appendix D – American Iron and Steel

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Appendix F – Certification Regarding Debarment, Suspension, and Other Responsibility

Matters Form and Instructions – EPA Form 5700-49

Certification Regarding Lobbying – EPA Form 6600-06

Certification of Nonsegregated Facilities – EPA Form

Trafficking Victims Protection Act Form

State of Kansas Act Against Discrimination Contract Provision Certification Form

1 Introduction

The Hays Wastewater Treatment Plant (WWTP) was originally constructed in 1953. The original plant liquids process consisted of a primary clarifier, two trickling filters and a final clarifier. Solids processing consisted of an anaerobic digester and sludge beds.

The plant underwent major improvements in 1967. The improvements consisted of a new influent pumping station, a second primary clarifier, two additional trickling filters, a second final clarifier, a second anaerobic digester, and additional sludge drying beds.

The last major improvements to the WWTP occurred in 1992. The 1992 improvements consisted of the addition of two activated sludge basins and a blower building, a RAS/WAS pumping station, a tertiary filter and sludge thickening building, and the conversion of the original two trickling filters to reclaimed water storage basins.

The Hays WWTP currently has a permitted design flow of 2.8 million gallons per day (mgd), and is currently listed as a Class V plant by the State of Kansas. It receives domestic, commercial, and industrial flows. The following industries have pretreatment permits monitored by the Kansas Department of Health and Environment (KDHE): A-1 Scaffold Manufacturing; Cross Manufacturing Inc.; Enersys, Inc.; and Wheelchairs of Kansas.

The plant effluent is discharged to Chetolah Creek, a tributary to Big Creek. Currently, a portion of the plant effluent is used to irrigate the municipal golf course, multiple parks and the Sports Complex.

1.1 Purpose

The purpose of this Project is to design and construct improvements which will make the Hays WWTP capable of meeting the effluent discharge limits identified in the City's May 28, 2014 NPDES permit. In addition, the purpose of this Project is to meet the requirements of the following:

- The recommended plan shall meet state and federal design criteria. The project shall be accepted by all federal, state, and local agencies responsible for regulating environmental and cultural resources.
- The recommended plan shall be technologically compatible with the topography and geology of the area and the administrative and operational capabilities of the City.
- All equipment and processes must have a demonstrated proven record of performance under similar environmental and cultural conditions. The equipment selected must be accepted by the City as being capable of performing for a minimum 20 year service life with reasonable O&M requirements. The equipment and processes must be evaluated in terms of long-term operational and managerial cost implications.
- All required construction techniques should be common to the State of Kansas, thus encouraging competitive pricing in construction contracts. Property owners, road and highway commissions, and other utility owners shall accept the required construction techniques, including temporary disturbances as well as resulting permanent structures.

1.2 General Requirements

This project will consist of improvements to, or additions of, the following:

- Site Improvements
- Influent Pump Station
- Headworks Building
- Activated Sludge Treatment
- UV Disinfection
- Reclaimed Water Storage
- Septage Receiving
- Aerobic Digestion
- Biosolids Dewatering
- Office Building

Site improvements will include the repaving of Military Reservation Road from Old 40 Highway Bypass to the new main plant entrance. Site improvements will also include a new paved parking area around the Office Building, new gravel access roads, and fencing around the perimeter of the site.

New structures added with the improvements to the WWTP shall be protected from the 500 year flood elevation of 1981.04, based on the NGVD 88 datum.

A new submersible pump style influent pump station will be constructed to pump the plant influent flow to an elevation which will enable gravity flow through screening, grit removal, and the activated sludge process.

The existing grit removal system is at an elevation which does not enable gravity flow through the activated sludge process. The existing grit removal system will be abandoned and a new Headworks Building will be constructed to house new screening and grit removal. The screening provided will be dependent upon the chosen activated sludge process.

The new activated sludge process may consist of new 5-stage activated sludge basins followed by new secondary clarifiers and rehabilitation of the existing tertiary filters, or new 4-stage activated sludge basins followed by membrane bioreactors (MBR).

The activated sludge treatment will be followed by UV disinfection. The UV disinfection will consist of an in-pipe or open-channel UV disinfection system. Permit requirements will be based on whether plant effluent is being conveyed to the plant outfall or being reclaimed for irrigation.

The existing trickling filters are not in service and the west trickling filter will be converted to a reclaimed water storage basin. The existing reclaimed water storage basins will be abandoned. Conversion of the existing west trickling filter to a reclaimed water storage basin will consist of removal of the equipment and media, addition of a liner or coating to the interior of the basin, and a new pump station for distribution of the reclaimed water as well as for the plant's non-potable water distribution system.

A Septage Receiving Station will be constructed which will provide storage for testing of septage loads received at the plant. The receiving station will include valves to control discharge of the septage loads to the Influent Pump Station, as well as a wash-down system.

The existing Activated Sludge Basins will be converted to Aerobic Digesters. Modifications will include replacing the existing fine bubble diffusers with coarse bubble diffusers, and the addition of a pump station to pump the biosolids to the new biosolids dewatering screw press. Conditions for reuse of the existing blowers are listed in Section 6.11.1.

A new screw press will be installed in the existing Biosolids Dewatering Building. The existing belt press will remain for back-up.

The existing DAF room in the existing Filter/ Sludge Thickening Building will be converted to offices and storage.

2 Abbreviations

ACI	American Concrete Institute
AISC	American Institute of Steel Construction
ANSI	American National Standards Institute
ASCE	American Society of Civil Engineers
ASHRAE	American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc.
CFM	Cubic Feet per Minute
CFR	Code of Federal Regulations
CPVC	Chlorinated Polyvinyl chloride
DO	Dissolved Oxygen
EL	Elevation
EPA	Environmental Protection Agency
F	Fahrenheit
FRP	Fiberglass Reinforced Plastic
g	grams
gpd	Gallons per Day
gpm	Gallons per Minute
HMI	Human Machine Interface
HP	Horsepower
HVAC	Heating Ventilating and Air Conditioning
I/O	Input/Output
IBC	International Building Code
IEEE	Institute of Electrical and Electronics Engineers
KDHE	Kansas Department of Health and Environment
ksi	Kips per Square Inch
LED	Light Emitting Diode
MBR	Membrane Bioreactor
MCC	Motor Control Center
MG	Million Gallons
mg	Milligrams
MGD	Million Gallons per Day

NEC	National Electrical Code (NFPA 70)
NEMA	National Electrical Manufacturers Association
NESC	National Electrical Safety Code
NFPA	National Fire Protection Agency
NPDES	National Pollutant Discharge Elimination System
O&M	Operation and Maintenance
OIU	Operator Interface Units
OSHA	Occupational Safety and Health Act
PC	Personal Computer
pcf	Pounds per Cubic Foot
PLC	Programmable Logic Controller
PS	Pump Station
psf	Pounds Per Square Foot
psi	Pounds per Square Inch
PVC	Poly-Vinyl Chloride
RAS	Return Activated Sludge
RVSS	Reduced Voltage Solidstate Starter
SCADA	Supervisory Control and Data Acquisition
scfm	Standard Cubic Feet per Minute
SWD	Side Water Depth
TDH	Total Dynamic Head
TEFC	Totally Enclosed Fan Cooled
UL	Underwriters Laboratories Inc.
UPS	Uninterruptible Power Supply
UV	Ultra Violet
V	Volts
VFD	Variable Frequency Drive
w/c	Water/Cement Ratio
WAS	Waste Activated Sludge
WWTP	Wastewater Treatment Plant

3 Project Background

3.1 Existing Site Conditions

The Hays WWTP is located in the southern part of Hays at the intersection of Old 40 HWY Bypass and Military Reservation Rd. Three baseball fields are located south of the WWTP. One field is available to be used for construction of improvements to the WWTP. The other two fields are available for field trailers and staging of equipment and materials. The ball fields are below the 100 year flood elevation of 1979.24, based on the NGVD 88 datum. There is an active and an inactive drinking water well located on the property. Construction activities shall not come within 100 feet of the wells. The 100 year flood elevation, the plant expansion area, the contractor staging and equipment/ material storage area, and the locations of the active and inactive wells are shown in Figure 3-1.

3.2 Environmental Clearance

Environmental clearance requests were sent to the necessary governmental agencies to obtain environmental clearance documentation or permit requirements. Agencies contacted, and summaries of their responses, are shown in Table 3-1. The clearance letters and responses are located in the Facility Plan, Appendix A, in their entirety.

The following environmental permitting that will have to be obtained by the design-builder has been identified:

- A permit for fill in a mapped floodway fringe will be required from the Kansas Department of Agriculture Division of Water Resources
- Permit coverage from the Kansas Department of Health and Environment (KDHE) to discharge stormwater runoff associated with construction activity for most any project which disturbs one acre or more of soils. A Notice of Intent (NOI) must be submitted to KDHE 60 days before the start of construction and a permit determination from KDHE must be made before construction can begin. The Kansas construction general permit, a Notice of Intent (application form), a frequently asked questions file, and supplemental materials are available online on the KDHE Stormwater Web Page at www.kdhe.state.ks.us/stormwater.

Figure 3-1 Site Plan

Table 3-1 Environmental Clearance Documents

Agencies Contacted	Status
Federal Agencies	
U.S. Fish and Wildlife Services	Clearance granted
U.S. Army Corp of Engineers	Clearance granted
State Conservationist	Clearance granted
State Agencies	
Kansas Department of Wildlife, Parks and Tourism	Clearance granted
Kansas Water Office	Clearance granted
Kansas Department of Health and Environment	Clearance granted
Kansas Biological Survey	Clearance granted
Kansas Department of Agriculture Division of Water Resources	A permit for fill within the fringe of a defined floodway will be required
Kansas State Historical Society	Clearance granted
Kansas Geological Survey	Clearance granted
Kansas Department of Agriculture Conservation Division	Clearance granted
Kansas Corporation Commission	Clearance granted
Regional Planning Commission	
North Central Regional Planning Commission	Clearance is not required from this agency
Southeast Kansas Regional Planning Commission	Clearance is not required from this agency - notified by phone
NW Kansas Planning & Develop Commission	Clearance granted
Wichita-Sedg. Co. Metro Area Planning	Clearance is not required from this agency - notified by phone
Mo-Kan Regional Council	Clearance is not required from this agency
South Central KS Economic Dev. Dist	Clearance granted
Mid-America Regional Council	Clearance is not required from this agency - notified by phone
Topeka Planning Dept	Clearance is not required from this agency - notified by phone

3.3 Applicable Codes and Standards for which Compliance is Required

3.3.1 Architectural

1. International Building Code 2006 as adopted in City of Hays Ordinances Section 11.42.
2. International Fire Code – 2006 Edition.
3. Americans with Disabilities Act (ADA) – 2010 Edition
4. Occupational Safety and Health Administration (OSHA)
5. Applicable ASTM Standards
6. NFPA 820, Standard for Fire Protection in Wastewater Treatment and Collection Facilities.
7. Other applicable NFPA Standards

3.3.2 Structural

1. International Building Code 2006 as adopted in City of Hays Ordinances Section 11.42.
2. ACI 350-06 Code Requirements for Environmental Engineering Concrete Structures and Commentary
3. ACI 350.1-10, Specification for Tightness Testing of Environmental Engineering Concrete Structures.
4. ACI 350.4R-04 Design Considerations for Environmental Engineering Concrete Structures
5. ACI 318-05 Building Code Requirements for Structural Concrete and Commentary.
6. ACI 530-05/ASCE 5-05/TMS 402-05 Building Code Requirements for Masonry Structures.
7. AISC Manual of Steel Construction, 13th Edition.
8. AA ADM 1-05 Aluminum Design Manual.
9. ASCE 7-05 Minimum Design Loads for Buildings and Other Structures
10. Kansas Department of Transportation, - Standard Specifications for State Road and Bridge Construction, 2015.

3.3.3 Mechanical

1. 2006 International Building Code (IBC)
2. Uniform Plumbing Code – 2009 Edition
3. Uniform Mechanical Code- 2009 Edition
4. International Fire Code – 2009 Edition
5. International Fuel Gas Code – 2009 Edition
6. National Fire Protections Association NFPA 820 – 2012 Edition
7. Various Air Moving and Conditioning Association (AMCA) Standards
8. Various American Society of Heating, Refrigerating, and Air Conditioning Engineers (ASHRAE) Standards
9. American National Standards Institute (ANSI)
10. Sheet Metal and Air Conditioning Contractors of North America (SMACNA)
11. Air Conditioning and Refrigeration Institute (ARI)
12. Various American Society of Testing and Materials (ASTM) Standards
13. Various National Fire Protection Association (NFPA) Standards

3.3.4 Electrical

1. American National Standards Institute (ANSI):
 - a. C78.377, Specification for the Chromaticity of Solid State Lighting Products.
2. ETL Testing Laboratories (ETL).
3. Environmental Protection Agency (EPA):
 - a. 40 CFR Part 60, Subpart IIII, Protection of Environment, Standards of Performance for New Stationary Sources, Standards for Performance for Stationary Compression Ignition Internal Combustion Engines.
4. Federal Communications Commission (FCC):
 - a. Code of Federal Regulations (CFR), 47 CFR 18, Industrial, Scientific and Medical Equipment.
 - b. Code of Federal Regulations (CFR), 47 CFR 15, Radio Frequency Devices.
5. FM Global (FM).
6. Illuminating Engineering Society of North America (IESNA)
7. Institute of Electrical and Electronics Engineers, Inc. (IEEE):
 - a. 519, Recommended Practices and Requirements for Harmonic Control in Electrical Power Systems.
 - b. 802.3, Information Technology - Local and Metropolitan Area Networks - Part 3: Carrier Sense Multiple Access with Collision Detection (CSMA/CD) Access Method and Physical Layer Specifications.
 - i. 802.3u: IEEE Standards for Local and Metropolitan Area Networks: Supplement to Carrier Sense Multiple Access with Collision Detection (CSMA/CD) Access Method and Physical Layer Specifications Media Access Control (MAC) Parameters, Physical Layer, Medium Attachment Units, and Repeater for 100 Mb/s Operation, Type 100BASE-T.
 - ii. 802.3x: IEEE Standards for Local and Metropolitan Area Networks: Specification for 802.3 Full Duplex Operation.
 - c. C2, National Electrical Safety Code (NESC).
 - d. C62.41, Recommended Practice on Surge Voltages in Low-Voltage AC Power Circuits.
8. The International Society of Automation (ISA):
 - a. S5.1, Instrumentation Symbols and Identification.
 - b. S5.3, Graphic Symbols for Distributed Control/Shared Display Instrumentation, Logic and Computer Systems.
 - c. S18.1, Annunciator Sequences and Specifications.
 - d. S20, Standard Specification Forms for Process Measurement and Control Instruments, Primary Elements and Control Valves.
9. National Electrical Manufacturers Association (NEMA):
 - a. 250, Enclosures for Electrical Equipment (1000 Volts Maximum).
 - b. ICS 2, Industrial Control and Systems: Controllers, Contactors, and Overload Relays Rated 600 Volts.
 - c. ICS 6, Industrial Control and Systems: Enclosures.
 - d. MG 1, Motors and Generators.
10. National Fire Protection Association (NFPA):
 - a. 70, National Electrical Code (NEC).
 - b. 101, Life Safety Code.
 - c. 780, Standard for the Installation of Lightning Protection Systems.
 - d. 820, Fire Protection in Wastewater Treatment and Collection Facilities.
 - e. 508A, Standard for Safety Industrial Control Panels.

11. National Institute of Standards and Technology (NIST).
12. Society of Cable Telecommunications Engineers (SCTE):
 - a. 77, Specification for Underground Enclosure Integrity.
13. Underwriters Laboratories, Inc. (UL).
 - a. 467, Grounding and Bonding Equipment.
 - b. 497B, Standard for Safety Protectors for Data Communications and Fire-Alarm Circuits.
 - c. 508, Standard for Safety Industrial Control Equipment.
 - d. 913, Standard for Safety, Intrinsically Safe Apparatus and Associated Apparatus for Use in Class I, II, and III, Division 1, Hazardous (Classified) Locations.
 - e. 924, Standard for Emergency Lighting and Power Equipment.
 - f. 1778, Uninterruptible Power Systems.
 - g. Where UL test procedures have been established for the product type, use UL or ETL approved electrical equipment and provide with the UL or ETL label.
 - h. 96A, Standard for Installation Requirements for Lightning Protection Systems.
14. United States Department of Energy (USDOE):
 - a. EAct, the National Energy Policy Act.
15. United States Department of Interior Bureau of Reclamation (USDIBR):
 - a. Water Measurement Manual.
16. Lighting Protection Institute (LPI)

3.4 Record Drawings

The following reference documents which depict previous construction at or near the site are on file at the office of the Owner's Representative. These reference documents are made available solely to allow Design-Builders to have ready access to the same information available to the Owner and Owner's Representative:

- Sewage Treatment Plant No. 2, Hays - Kansas, Contract Documents, 1953, Servis & Van Doren.
- Plans for Sewerage Improvements, Sewage Treatment Plant Additions, Hays, Kansas, Contract No. 2, Contract Drawings, 1967, Black & Veatch
- Drawings for Hays, Kansas, Big Creek Water Banking Plan, Wastewater Treatment Plant Improvements, Contract Drawings, 1992, Black & Veatch

Technical data contained in reference documents, including but not limited to dimensions, locations and conditions of existing surface and subsurface structures, roadways, underground utilities owned by the Owner, piping, raceways, equipment, etc., and other appurtenances shown or indicated may not accurately, correctly, or reliably reflect actual conditions. Design-Builders shall be responsible for confirming all technical data, nontechnical data, interpretations, or opinions contained in any reference drawings.

Each Design-Builder assumes full responsibility for any conclusions or interpretations he makes related to the physical conditions which may be encountered based on the information or data made available, or those additional examinations, explorations, or studies made or obtained by the Design-Builder.

3.5 Site Survey Information

The only site survey information available is contained within the record drawings of the existing facilities. The adjustment for the plant datum to the NAVD 88 datum on the 1992 record drawings is plant datum plus 1.35 feet. The elevations for the top of concrete walls and finished floors are shown in Table 3-2. The adjustment from the NGVD 29 datum to the NAVD 88 datum is NGVD 29 datum plus 0.839 feet. The elevations for the 100 and 500 year flood elevations is shown in Table 3-3. Verification of elevations shown on reference drawings prior to the 1992 improvements will have to be made by the Design-Builder. Neither the Owner nor the Owner's Representative assumes any responsibility for the accuracy, correctness, reliability, or completeness of site survey information prepared by others.

Table 3-2 Facility/ Structure Elevations

Existing Facilities/ Structures	Top of Concrete Walls/ Finished Floors Elevations per 1967 Drawings (Feet)	Top of Concrete Walls/ Finished Floors Elevations per 1992 Drawings (Feet)	Adjustment of Plant Datum in 1992 Drawings to NAVD 88 Datum (Feet)	NAVD 88 Datum Elevation (Feet)
Influent Pump Station	1982.00	N/A	1.32	1983.32
Primary Clarifier No. 2	1980.00	N/A	1.32	1981.32
Activated Sludge Basins	N/A	1983.00	1.32	1984.32
Blower Building	N/A	1980.25	1.32	1981.57
RAS/ WAS Pump Station	N/A	1980.00	1.32	1981.32
Trickling Filters	1987.00	N/A	1.32	1988.32
Final Clarifier No. 2	1980.00	N/A	1.32	1981.32
Filter/ Sludge Thickening/ Hypochlorite Storage and Feed	N/A	1979.50	1.32	1980.82
Splitter Box/ Effluent Metering Pit	N/A	1982.50	1.32	1983.82
North Anaerobic Digester	1991.00	N/A	1.32	1992.32
Biosolids Dewatering Building	N/A	N/A	N/A	1979.83
Generator Building	N/A	N/A	N/A	1979.55

Table 3-3 100-Year and 500-Year Flood Elevations

Item Description	NGVD 29 Datum (Feet)	Adjustment from NGVD 29 Datum to NAVD 88 Datum (Feet)	NAVD 88 Datum Elevation (Feet)
100-Year Flood Elevation	1978.4	0.839	1979.24
500-Year Flood Elevation	1980.2	0.839	1981.04

3.5.1 Boundary

Construction of improvements to the Hays WWTP shall be limited to the existing WWTP site and the first baseball field located to the south of the existing plant. The limits of construction are shown in Figure 3-1.

3.5.2 Site Access Preferences

A construction entrance shall be provided off Military Service Road, south of the existing WWTP. A new primary entrance for WWTP staff shall be provided near the new Operations/ Maintenance Building. The existing main entrance is above the 100 year flood elevation and shall be maintained as a future emergency entrance.

3.6 Geotechnical Information

A geotechnical report is being completed and will be issued by addendum. A site boring map, providing 13 boring locations, is located in Figure 3-2. The following testing is being completed:

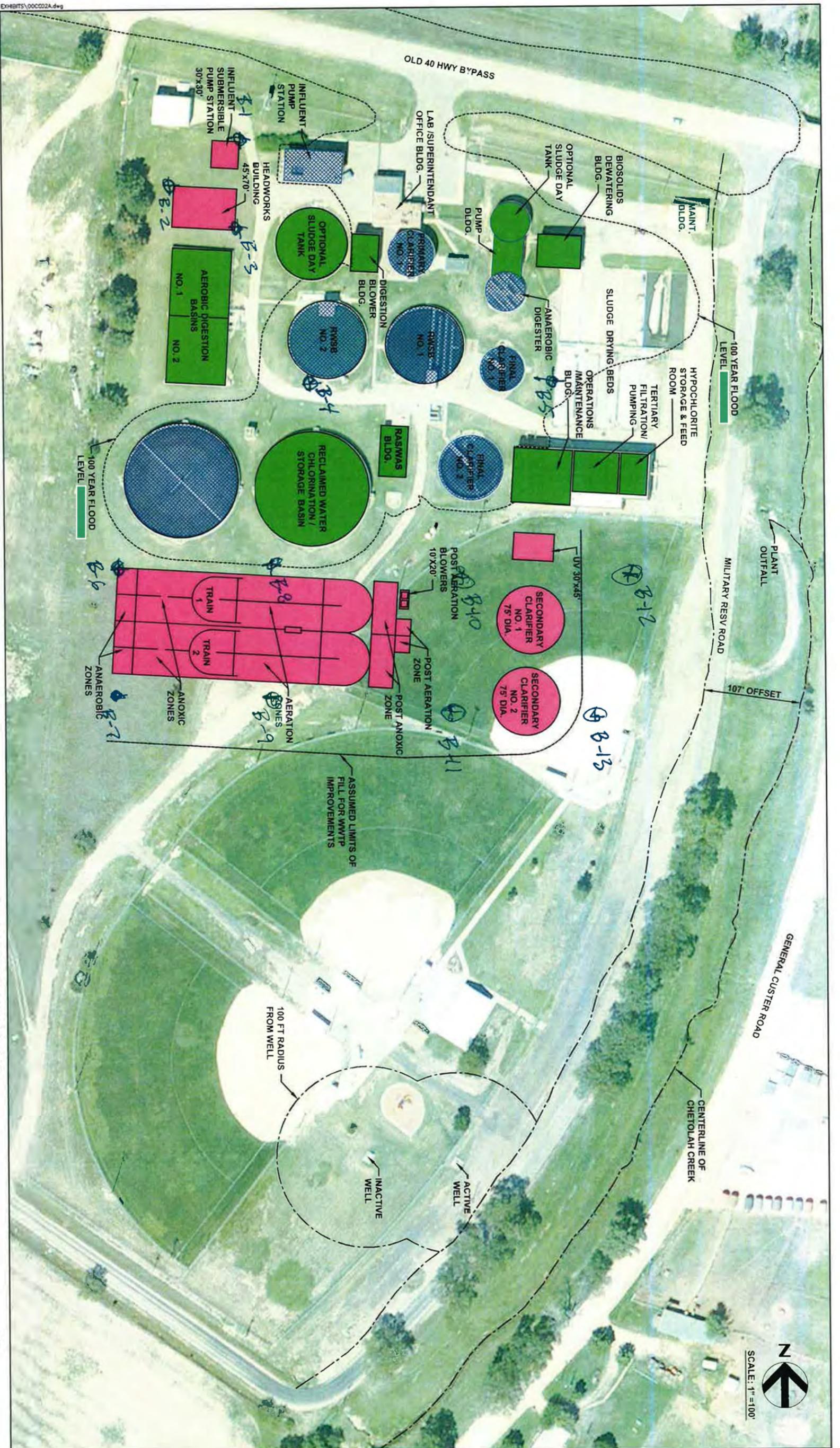
- Moisture content – 80
- Dry Unit Weight – 7
- Unconfined compression/ unconsolidated-undrained triaxial – 7
- Grain size analysis – 7
- Atterberg limits -7
- One-dimensional consolidation – 1

The geotechnical report will include the following:

- A boring location plan
- Identification of soil strata, including expansive soils, and a summary of general laboratory results
- General geological information including the depth of rock and rock types, if encountered
- Site grading considerations, including an evaluation of the suitability for reuse of the on-site soils, recommended compaction levels and placement techniques, and evaluation of new fill placement impacting existing structures
- Temporary excavation and permanent slope considerations including slope stability comments and recommendations
- Considerations for excavation near existing structures
- Rock removal recommendations, if required
- Discussion of dewatering techniques
- Recommended foundation types for the structures, including allowable bearing pressure and estimated settlement. Settlement will be based on correlated soil parameters derived from correlated values and possibly laboratory test results
- Considerations for ground improvement, if required
- Below-grade wall design parameters, including lateral earth pressures
- Frost penetrations and design frost depth
- Seismic considerations
- Remediation of subgrade soils with volume change potential, if required

Owner's responsibility for information in the geotechnical report is limited to Technical Data, including the data contained in boring logs, recorded measurements of subsurface water levels, laboratory test results, and other factual, objective information regarding conditions at the Site that are set forth in the report. Owner is not responsible for Design-Builder's use of opinions or recommendations in the report. Perform any additional geotechnical investigation or testing required for structural or civil design.

Figure 3-2 Site Boring Map



LEGEND

	DEMO OR ABANDON
	PROPOSED MODIFIED OR REHABILITATED FACILITY
	PROPOSED NEW FACILITY
	ANTICIPATED FUTURE FACILITY

H2R

**CITY OF HAYS, KS
UPGRADES TO EXISTING WWTP
CONCEPTUAL SITE LAYOUT
ACTIVATED SLUDGE - 5-STAGE WITH
SECONDARY CLARIFIERS AND FILTERS**

DATE

FIGURE

FIGURE 3-2

3.7 Power Supply/ Connection Points

The Plant electrical utility is Midwest Energy. The contact for electrical expansion and construction for the Hays WWTP is Craig Augustine (800) 222-3121.

The existing electrical utility service entrance is at the north side of the plant site to the west of the main entrance. The existing services is rated for 1200A at 480V 3 phase. The existing utility transformers (one per phase) are located on an elevated platform suspended between two power poles.

Midwest Energy will provide a new service drop pole, pad mounted transformer and primary conductors for any plant utility power upgrades at no additional cost to the Owner or Design-Builder. Required plant utility upgrades shall be determined and coordinated with Midwest Energy by the Design-Builder. The concrete transformer pad and conduits to the new service drop location will be at the expense of the Design-Builder.

3.8 Existing Control System

The plant has an existing PLC-based SCADA system integrated together with the City's remote wastewater pump stations and the City's Water Plant.

The plant has a custom InTouch version 9.5.100 HMI interface, programmed by Pedrotti Co., running on a Windows XP desktop computer.

The plant has a fiber optic telecom data line. All intra-plant communication between buildings as well as remote site telemetry is via CalAmp Ethernet radio.

4 Influent Flow and Loadings

4.1 Existing Flows and Loadings

The plant flows, measured by the existing effluent flow meter, and influent loadings were reviewed based on flow data received from the City for the period of 2012 - 2014. The influent flow to the plant is not metered.

The influent loading parameters that were analyzed include TSS, BOD, TP, NH₄, and TKN. A statistical analysis of the flow and loading data was conducted. The results of the statistical analysis are shown in Table 4-1.

Table 4-1 Historical Flows and Loadings (2012 – 2014)

Parameter	Average Daily	Maximum Month	Peak Day
Flow (MGD)	1.7	2.1	2.5
BOD (mg/L)	290	320	
BOD (lb/d)	4,000	5,490	7,540
TSS (mg/L)	290	400	
TSS (lb/d)	4,060	7,220	12,890
TP (mg/L)	7	8	
TP (lb/d)	100	130	170
NH ₄ (mg/L)	40*	45*	
NH ₄ (lb/d)			
TKN (mg/L)	60	65	
TKN (lb/d)	840	1,130	1,510

*Based upon limited data for the period of December 2014 through February 2015

Additional influent loading testing for soluble BOD, VFA, VSS and sTKN were completed for the period of July 15, 2015 to August 5, 2015. The averages of the results of this testing are shown in Table 4-2.

Table 4-2 Additional Influent Testing

Parameter	07-15-2015	07-22-2015	07-29-2015	08-05-2015
sBOD (mg/L)	113	-	82**	105*
VFA (mg/L)	61.2	51.5	43.3	43.3
VSS (mg/L)	250	250	338	244
sTKN (mg/L)	49	8.7	8.6	8.5

*The temperature used for this analysis was below the acceptable temperature range specified in the method.

**Regulatory analytical holding time for this analysis was exceeded. The temperature used for this analysis was below the acceptable temperature range specified in the method.

Transmittance testing began August 14, 2015, and is continuing to be completed. The results of the testing completed to date are included in Table 4-3.

Table 4-3 UV Transmittance Testing Results

Date	Average Transmittance (%)
8-14-2015	72.1
8-15-2015	73.3
8-16-2015	72.9
8-17-2015	72.1
8-18-2015	70.0
8-19-2015	71.8
8-20-2015	70.3
8-21-2015	71.75
8-24-2015	72.4
8-25-2015	74.2
8-26-2015	72.8
8-27-2015	72.6
8-28-2015	72.1
8-29-2015	69.6
8-30-2015	70.4
8-31-2015	71.8
9-1-2015	73.3
9-2-2015	73.3
9-3-2015	73.7
9-4-2015	74
9-5-2015	73.6
9-6-2015	73.6
9-7-2015	74
9-8-2015	74.4
9-9-2015	73.6

4.2 Design Flows and Loadings

The design flows and loadings for this WWTP upgrade project are discussed in detail in the Facility Plan. Table 4-4 summarizes the design flow and loadings.

Table 4-4 Design Flows and Loadings

Design Flows and Loadings	
Average Flow (MGD)	2.5
Peak Day (MGD)	3.8
Peak (MGD)*	7.5
Max. Month (MGD)	3.1
BOD (mg/L) – Average Day	290
BOD (mg/L) – Maximum Month	320
TSS (mg/L) – Average Day	290
TSS (mg/L) – Maximum Month	400
TP (mg/L) – Average Day	7
TP (mg/L) – Maximum Month	8
TKN (mg/L) – Average Day	60
TKN (mg/L) – Maximum Month	65

*The capacity of the existing influent pump station is 4.75 MGD. Influent wetwell level trending received from the City indicated the plant currently receives peak flows requiring full pump station capacity, resulting in approximately a 3 to 1 peak to average flow ratio. Based on that information, a 3 to 1 peak to average flow ratio was used for the design flows. The wetwell level trending utilized is shown in Appendix A. More wetwell trending information is available from the City, if needed.

5 Effluent Performance Criteria

5.1 Permit Limits

The WWTP outfall is located on Chetolah Creek, which is a tributary to Big Creek. Big Creek is listed in the Kansas Surface Water Quality Standards within K.A.R. 28-16-28d. The current discharge permit issued for this facility includes requirements that assure compliance with all applicable surface water quality requirements. A copy of the current permit is included in Appendix B. Table 5-1 summarizes the current discharge limits.

Table 5-1 Current Effluent Requirements

Wastewater Effluent Limitation			
Discharging to Chetolah Creek			
Parameter	Averaging Period	Maximum Concentration	Time of the Year
BOD, mg/L	Weekly	40	January through February
	Monthly	25	
	Weekly	30	March through October
	Monthly	20	
	Weekly	40	November through December
	Monthly	25	
Total Suspended solids, mg/L	Weekly	45	All times
	Monthly	30	
Ammonia as nitrogen, mg/L	Monthly	12.7	January through February
	Monthly	7.2	March through April
	Monthly	5.2	May
	Monthly	4.5	June through July
	Monthly	4.2	August
	Monthly	6.1	September
	Monthly	7.7	October
	Monthly	13.1	November through December
E. coli colonies/100 milliliter (ml)	Weekly	4348	April through October
	Monthly	262	
	Monthly	2358	November through March
Total Residual Chlorine μ /L	Daily	14	All times
Minimum dissolved oxygen, mg/L	Daily	5	All times
Nitrate mg/L	Monthly	10	All times
Total Phosphorus lbs/day	Annual	35.1	All times
Total Nitrate + Nitrite lbs/day	Annual	187	All times

5.2 Future Permit

A new NPDES permit will be issued related to the new facilities. It is anticipated that the new permit will have the same discharge limits as the current permit (Table 5-1). It is anticipated new ammonia limits will be included as follows:

Table 5-2 Effluent Ammonia Limits in New Permit

Ammonia (as N) – mg/L		
January - February	Daily Max	8.97
	Avg Month	2.18
March	Daily Max	8.56
	Avg Month	1.70
April	Daily Max	6.73
	Avg Month	1.40
May	Daily Max	4.06
	Avg Month	0.93
June	Daily Max	3.22
	Avg Month	0.77
July	Daily Max	2.86
	Avg Month	0.70
August	Daily Max	2.91
	Avg Month	0.71
September	Daily Max	4.63
	Avg Month	1.04
October	Daily Max	8.01
	Avg Month	1.61
November - December	Daily Max	8.97
	Avg Month	2.18

5.3 Anticipated Effluent Disinfection Virus Criteria

The Environmental Protection Agency (EPA) is considering new effluent limits for viruses. Studies performed by EPA show viruses may be the predominant drivers related to exposures causing illness. EPA anticipates issuing testing protocols for bacteriophage before issuing draft implementation plans for peer review and public comment, and ultimately including in NPDES permits. The addition of virus removal criteria to future NPDES permits will impact the sizing of disinfection systems.

6 Unit Process Design Criteria

6.1 General Description

The proposed improvements to the Hays WWTP include:

- Influent Pumping
- Influent Screening
- Influent Grit Removal
- Activated Sludge Treatment
 - 5-Stage with Secondary Clarifiers and Filters, or
 - 4-Stage with Membrane Bioreactor (MBR)
- UV Disinfection
- Water Reclamation
- Effluent Reaeration
- Septage Receiving
- Aerobic Digestion
- Solids Dewatering
- Office Addition

All unit process shall be designed to the below minimum standards. Where a requirement is not specifically listed below, refer to the KDHE Minimum Standards of Design for Water Pollution Control Facilities.

6.2 Influent Pumping (Influent Pump Station):

6.2.1 Minimum Design Criteria:

- Influent pumping will require automatic operation 24 hours per day, 7 days a week.
- Peak Pumping Capacity (all firm pumps in service): 7.5 MGD
- Minimum Single Pump Capacity (at reduced speed): 1.5 MGD
- Maximum Number of Pump Starts per Hour: 15
- Number of Firm Pumps: Minimum of 3
- Number of Installed Standby Pumps: 1
- Pump Type: Submersible non-clog with guide rail system
- Pump Speed: Variable
- Acceptable Manufacturers
 - Flygt
 - KSB
 - Gorman Rupp
 - Fairbanks Morse
 - Or Approved Equal

- Divided wet well with equal number of submersible pumps on each side of divider
- Wet well divider wall shall be designed such that the top of wall elevation is greater than the high wet well level
- Valve vault with pump isolation and flow reversal valves
- Provide valve vault access through hatch with ladder
- Provide hatches to facilitate valve removal
- Pump level control system with level transducer and fully redundant float control system
- Design in accordance with current Hydraulic Institute Standards
- Flow Measurement: Magnetic flow meter, minimum 98% accuracy, in accessible vault with isolation valves to facilitate removal

6.2.2 Equipment Testing:

- Demonstrate the functional integrity of the mechanical, electrical, and control interfaces of the equipment.
- After the pumps have been completely installed and wired, the Contractor shall have the manufacturer perform the following, at a minimum:
 - Verify alignment.
 - Megger stator and power cables.
 - Check seal lubrication.
 - Check for proper rotation.
 - Check power supply voltage.
 - Measure motor operating load and no load current.
 - Vibration measurement.
 - After installation and prior to energizing the motor, perform inspections and tests per NETA ATS 7.15.
 - Bump motor to check for correct rotation.
- Conduct initial startup of equipment and perform operation checks.
- Provide Owner with a written certificate that Manufacturer's equipment has been installed properly, has been started up, and is ready for operation by Owner's personnel.

6.2.3 Performance Testing:

- Prior to submergence, run pump dry to establish correct rotation and mechanical integrity.
- Run pump for 30 minutes submerged, a minimum of 6 FT under water.
 - Record head (ft) versus flow (gpm) for each pump. Engineer shall compare results against manufacturer's provided performance curve.

6.2.4 Training:

- Provide on-site training for Owner's personnel:
 - A minimum of one 4-HR training session
 - To cover non-routine maintenance and operation/routine maintenance, including:
 - Operation, start-up, shut-down, lock-out, emergency operating procedures, control, adjustment, maintenance, assembly, disassembly, and repair of the equipment including control sequences, identification systems, materials, spare parts, special tools, lubricants, and fuels.
 - Technical repair manual.
 - Cleaning.
 - Lubrication of equipment.
 - Optimizing equipment and system performance.

- Capabilities of equipment and systems.
- Operational safety of equipment and systems.
- Emergency situation response of equipment and systems.

6.2.5 Spare Parts:

- None.

6.2.6 Monitoring and Controls:

- All critical control functions shall be able to be performed locally via hand switches though hardwired controls in the event a PLC, network or I/O device fails. Critical interlocks shall not be bypassed via hand mode operation.
- All unit processes shall have local hand, local automatic (where applicable), and remote hand (through SCADA HMI interface) operation modes.
- Automatic controls shall be native to the unit process facility to the extent possible.
- Automatic control shall have defined automatic fail safe operational modes for all anticipated failure modes including communications loss (remote variable data unavailable), automatic fail over to redundant equipment on fault, emergency power transition automatic restart, etc.
- Pumps shall be controlled based on analog level monitoring signal.
 - Higher level calls more pumps, lower level de-energizes unneeded pumps.
- Complete hardwired back up float switch array.
 - Low level alarm
 - High level alarm
 - High High level alarm
- All VFD driven pumps shall operate at the same speed. Speed ramps up from minimum on startup and follows level.
- Pumps shall operate in an automatic first on first off rotation.
- One pump is standby at all times (hardwired interlocked).
- Low level protection automatic stop/start permissive hardwired.
- Control valve interlocks as applicable.

6.3 Influent Screening (Headworks Building):

6.3.1 Minimum Design Criteria:

5-Stage with Secondary Clarifiers and Filters

- Minimum Number of Firm Mechanical Screens: 1
- Mechanical Screen Type: Perforated plate, plate perpendicular to flow
- Mechanical Screen Opening Size: 5 to 6 mm
- Acceptable Manufacturer's
 - Andritz - Aqua-Screen
 - HydroDyne - Bull Shark HDR
 - Kusterswater - ProTechtor Perforated Filter Screen
 - Huber - EscaMax
 - Or Approved Equal
- Number of Standby Screens: 1
- Standby Screen Type: Manual bar rack type, maximum 1" spacing
- Screening system controls

- Washer/Compactor, one dedicated for each mechanical screen

4-stage with MBR

- Minimum Number of Firm Mechanical Screens: 1
- Mechanical Screen Type: Perforated or woven wire inclined drum (in channel type)
- Mechanical Screen Opening Size: 2 mm
- Number of Standby Screens: 1
- Standby Screen Type: Perforated or woven wire inclined drum (in channel type)
- Washer/Compactor, one integral to each mechanical screen
- Acceptable Manufacturer's
 - Huber - ROTAMAT RPPS
 - Lakeside - RAPTOR Perforated Drum Screen
 - Enviro-Care - FloDrum Rotating Drum Screen
 - Or Approved Equal

Additional Screening Requirements

- Peak Screening Capacity per Screen: 7.5 MGD
- All wetted materials shall be of 316 stainless steel. Non-wetted parts may be 304 stainless steel except for those items provided as 316 stainless steel as part of Manufacturer's standard equipment provision.

6.3.2 Equipment Testing:

- Demonstrate the functional integrity of the mechanical, electrical, and control interfaces of the equipment.
- Conduct initial startup of equipment and perform operation checks.
- Provide Owner with a written certificate that Manufacturer's equipment has been installed properly, has been started up, and is ready for operation by Owner's personnel.

6.3.3 Performance Testing:

- None.

6.3.4 Training:

- Provide on-site training for Owner's personnel:
 - A minimum of one 4-HR training session
 - To cover non-routine maintenance and operation/routine maintenance, including:
 - Operation, start-up, shut-down, lock-out, emergency operating procedures, control, adjustment, maintenance, assembly, disassembly, and repair of the equipment including control sequences, identification systems, materials, spare parts, special tools, lubricants, and fuels.
 - Technical repair manual.
 - Cleaning.
 - Lubrication of equipment.
 - Optimizing equipment and system performance.
 - Capabilities of equipment and systems.
 - Operational safety of equipment and systems.

- Emergency situation response of equipment and systems.

6.3.5 Spare Parts:

- Perforated Plate:
 - Two screen panels.
 - Two torque arm limit switch (drive, brush).
 - Two drive bearings.
 - Two brush bearings.
 - One set of spray nozzles.
 - Two solenoid valves.
 - One set of chains/tracks.
- Rotating Drum:
 - One drum brush.
 - Two sets of spray nozzles.
 - One solenoid valve rebuild kit.
 - One face seal.
 - One set of upper flange wheels.

6.3.6 Monitoring and Controls:

- All critical control functions shall be able to be performed locally via hand switches though hardwired controls in the event a PLC, network or I/O device fails. Critical interlocks shall not be bypassed via hand mode operation.
- All unit processes shall have local hand, local automatic (where applicable), and remote hand (through SCADA HMI interface) operation modes.
- Automatic controls shall be native to the unit process facility to the extent possible.
- Automatic control shall have defined automatic fail safe operational modes for all anticipated failure modes including communications loss (remote variable data unavailable), automatic fail over to redundant equipment on fault, emergency power transition automatic restart, etc.
- Screen operation based on level differential measured across screen.
- Upstream backup high level switch to initiate continuous run 'storm mode' operation.
- Backup timer to run system at least once per hour if differential level control does not reach its set-point.
- Equipment vendor standard controls.
 - PLC, if any, shall be plant standard PLC manufacturer.
 - Up and down stream differential level transducers.

6.4 Influent Grit Removal (Headworks Building):

6.4.1 Minimum Design Criteria:

- Locate grit chamber outdoors.
- Peak Grit Removal Capacity (all basins in service): 7.5 MGD
- Minimum Grit Removal Efficiency: 95% at 80 Mesh
- Optimize Channel Upstream of Fine Screen and Grit Chamber to Maintain Velocities which keep Solids Suspended During Low Flow Conditions
- Number of Firm Grit Chambers: 1
- Minimum Grit Chamber Diameter: 11'
- Number of Standby Grit Chambers: None
- Number of Firm Grit Pumps: 1

- Number of Standby Grit Pumps: 1, uninstalled shelf spare
- Pump Type: Self-Priming or Flooded Suction Dry-Pit Submersible. Provide adequate freeze protection for all applicable equipment and piping located outdoors.
- Pump Speed: Constant
- Number of Firm Grit Classifiers: 1, includes grit hydro-cyclone
- Number of Standby Grit Classifiers: None
- Acceptable Manufacturer's
 - Smith & Loveless - Pista
 - Kusterswater - ProTechtor XGT
 - John Meunier - MectanV
 - Or Approved Equal
- Valves for pump isolation and flow reversal, as required
- Provide grit removal bypass channel with isolation gates

6.4.2 Equipment Testing:

- Demonstrate the functional integrity of the mechanical, electrical, and control interfaces of the equipment or system.
- After the equipment has been completely installed and wired, the Contractor shall have the manufacturer perform the following, at a minimum:
 - Verify alignment.
 - Megger stator and power cables.
 - Check seal lubrication.
 - Check for proper rotation.
 - Check power supply voltage.
 - Measure motor operating load and no load current.
 - Vibration measurement.
- Conduct initial startup of equipment and perform operation checks.
- Provide Owner with a written certificate that Manufacturer's equipment has been installed properly, has been started up, and is ready for operation by Owner's personnel.

6.4.3 Performance Testing:

- None.

6.4.4 Training:

- Provide on-site training for Owner's personnel:
 - A minimum of one 8-HR training session
 - To cover non-routine maintenance and operation/routine maintenance, including:
 - Operation, start-up, shut-down, lock-out, emergency operating procedures, control, adjustment, maintenance, assembly, disassembly, and repair of the equipment including control sequences, identification systems, materials, spare parts, special tools, lubricants, and fuels.
 - Technical repair manual.
 - Cleaning.
 - Lubrication of equipment.
 - Optimizing equipment and system performance.
 - Capabilities of equipment and systems.
 - Operational safety of equipment and systems.
 - Emergency situation response of equipment and systems.

6.4.5 Spare Parts:

- Grit removal mechanism:
 - One lot of oil and grease.
 - One slewing ring.
- Grit dewatering screw:
 - One lot of oil and grease.
 - One shaft seal packing.
 - One shaft seal kit.
 - One flight hard facing.
- Grit pump skid:
 - One mechanical seal kit.
 - One set of seals and bearings.
- Hydro-cyclone:
 - One set of rubber liners.

6.4.6 Monitoring and Controls:

- All critical control functions shall be able to be performed locally via hand switches though hardwired controls in the event a PLC, network or I/O device fails. Critical interlocks shall not be bypassed via hand mode operation.
- All unit processes shall have local hand, local automatic (where applicable), and remote hand (through SCADA HMI interface) operation modes.
- Automatic controls shall be native to the unit process facility to the extent possible.
- Automatic control shall have defined automatic fail safe operational modes for all anticipated failure modes including communications loss (remote variable data unavailable), automatic fail over to redundant equipment on fault, emergency power transition automatic restart, etc.
- Adjustable timer based removal.
- Interlocked equipment controls.
- Monitoring only.
- Equipment vendor standard controls.
 - PLC, if any, shall be plant standard PLC manufacturer.

6.5 Activated Sludge Treatment: General Criteria

6.5.1 Minimum Design Criteria:

- Average Daily Flow Treatment Capacity: 2.5 MGD
- Peak Daily Flow Treatment Capacity (all basins in service): 3.8 MGD
- Peak Hydraulic Capacity (all basins in service): 7.5 MGD
- Minimum Number of Treatment Trains: 2
- Minimum Aerobic Hydraulic Retention Time at Average Daily Flow: 20 hours
- Minimum Aerated Solids Retention Time at Average Daily Flow:
 - 15 days - 5-stage with Secondary Clarifiers and Filters
 - 15 days - 4-stage with MBR (Includes DeOx and MBR zones)
- Maximum Month Loading:
 - BOD₅ = 8,273 lbs/day
 - TSS = 10,341 lbs/day
 - TKN = 1,681 lbs/day
- Minimum Oxygen Supply Requirements (with largest unit out of service):
 - 1.23 lbs O₂ per lb BOD

- 4.6 lbs O₂ per lb Ammonia
- Minimum Aeration Transfer Efficiencies:
 - Fine Bubble Diffusers: 1.5%/ft
 - Mechanical Aerator: 3.5 lbs O₂/hp/hr
- Treatment Requirements
 - See NPDES permit requirements in Project Description section
- All submerged piping shall be 304 stainless steel or CPVC per manufacturer's recommendations. All supports and hardware shall be, at a minimum, 304 stainless steel.
- Current phase shall not be based on use of chemicals for N removal. For future use only.

6.6 Activated Sludge - 5-stage with Secondary Clarifiers and Filters

6.6.1 5-stage with Secondary Clarifiers and Filters – Biological Treatment System

6.6.1.1 MINIMUM DESIGN CRITERIA:

- Design Minimum Hydraulic Retention Times at Average Daily Flow:
 - Anaerobic Zone: 2 hrs (if provided)
 - Pre-Anoxic Zone: 6.5 hrs
 - Aerated Zone: 20 hrs
 - Post-Anoxic Zone: 2.8 hrs
 - Post-Aerated Zone: .5 hrs
- Acceptable Manufacturers - System Supplier
 - Ovivo - Carrousel (Excell)
 - WesTech - OxyStream
 - Or Approved Equal
- Ancillary Equipment and Controls
 - Ancillary equipment and controls shall be designed and provided as a single source by the System Supplier and shall be as acceptable to the Engineer and Owner. Ancillary equipment shall include the following as a minimum
 - Submersible mixing equipment
 - Flow control gates
 - Pumps for mixer liquor recycle, as required
 - Package aeration blowers with weather/sound enclosure
 - Chemical feed and storage systems for carbon and metal salt addition
 - Provide space for future suitable storage tanks for minimum 14 days storage at average design flow usages as well as applicable chemical feed systems with redundant feed pumps. Items in the future to be located in a building enclosure. Consider use of Micro-C for carbon source in lieu of methanol, ethanol or other flammable liquids.
 - Controls for aeration and nutrient removal systems

6.6.2 Equipment Testing:

- Demonstrate the functional integrity of the mechanical, electrical, and control interfaces of the equipment or system.

- After the equipment have been completely installed and wired, the Contractor shall have the manufacturer perform the following, at a minimum:
 - Verify alignment.
 - Megger stator and power cables.
 - Check power supply voltage.
 - Measure motor operating load and no load current.
 - Vibration measurement.
 - After installation and prior to energizing the motor, perform inspections and tests per NETA ATS 7.15.
 - Bump motor to check for correct rotation.
- Conduct initial startup of equipment and perform operation checks.
- Provide Owner with a written certificate that Manufacturer's equipment has been installed properly, has been started up, and is ready for operation by Owner's personnel.

6.6.3 Performance Testing:

6.6.3.1 GENERAL:

- Perform dissolved oxygen concentration measurements by direct reading instruments which have been standardized against a laboratory determination of dissolved oxygen as described in latest edition of "Standard Methods for Examination of Water and Waste Water" with appropriate modification for interfering substances:
 - Multiple probes will be required as detailed under Paragraph A and appropriate references.
- Notify the Owner a minimum of one (1) week prior to intended testing period:
 - Schedule testing to be performed between 10:00 AM and 5:00 PM and to begin on a Monday or Tuesday.
 - If more than one (1) day of testing is required, schedule testing to be done on consecutive days.
- Provide support facilities which includes but is not necessarily limited to electrical power, water, air, equipment chemical storage tanks, mixing equipment, sampling equipment, testing chemicals and equipment and incidental items.

6.6.3.2 BASIC COMMON ELEMENTS OF PERFORMANCE TESTS:

- Water used for performance tests shall be tap water:
 - Ensure water temperature is between 15 - 25 DegC.
- Chemical additive #1:
 - In each test, a 10-percent (by weight) solution of sodium sulfite Na_2SO_3 shall be prepared in sufficient quantity to deplete the dissolved oxygen concentration in tank to zero and maintain zero reading condition for a minimum of one (1) minute.
 - Stoichiometrically, approximately 75 LBS of 96 percent pure sodium sulfite are required per million gallons of tank volume to deplete the dissolved oxygen concentration 1 milligram per liter.
 - Use only technical grade sodium sulfite, free of catalyst.
 - Approximately 150 percent of stoichiometric quantity will be required to achieve and maintain zero conditions for one (1) minute.
- Chemical additive #2:
 - A 10-percent (by weight) solution of cobalt chloride $\text{CoCl}_2 \cdot 6\text{H}_2\text{O}$ shall be prepared for the initial series of tests.
 - Approximately 34 LBS of cobalt chloride are required per million gallons of tank volume to produce 1 milligram per liter.
 - For test purposes, use cobalt ion concentration of 0.5 mg/l.
- Test setup:
 - For initial series, introduce cobalt chloride solution to desired residual.

- After cobalt ion residual is obtained, mix or agitate tank volume for a minimum of 15 minutes.
- Add sodium sulfite solution to tank within a period of five (5) minutes start to finish:
 - Add solution of multiple points to achieve uniform dispersion throughout tank.
- After first series of tests are complete, prepare another batch of sodium sulfite:
 - No additional cobalt chloride shall be added after first series of tests.
- Perform additional series of tests according to same procedure; however, no more than 10 series of tests shall be made in same test water.
- Ensure disposal of waste materials, water, chemicals, and incidentals after testing in acceptable manner to appropriate regulatory agencies.
- Oxygen transfer coefficient $[KL(a)]T$:
 - For each point of measurement specified, compute overall oxygen transfer coefficient by determining slope of line of best fit by following equation:

$$\frac{\ln((C(s)-C(1))/(C(s)-C(2)))}{(KL(a))T} = t(2)-t(1)$$

Where:

- \ln - natural logarithm to base(e)
- T = water temperature, DegC
- $C(s)-C(1)$ = Initial $t(1)$ dissolved oxygen deficit, mg/l
- $C(s)-C(2)$ = final $t(2)$ dissolved oxygen deficit, mg/l
- $t(2)-t(1)$ = time span from initial to final reading, hours
- $C(s)$ = oxygen saturation at test site barometric pressure and liquid temperature T ; the theoretical oxygen saturation value at a point 1/3 depth from water surface to pint of air application.
- Calculate and plot on semi-log graph paper the dissolved oxygen deficit from saturation $(C(s)-C(t))$ for each measurement:
 - Plot with log axis as ordinate with dissolved oxygen deficit and linear axis as abscissa with time (t).
 - $C(t)$ is the measure oxygen concentration at any time (t).
 - By regression analysis, draw a line of best fit on all points between 20 and 80 percent of saturation value $C(s)$.
- Correct oxygen transfer coefficient $((KL(a))T)$ for each measurement point to 20 DegC by the following equation:
- The values of X for each condition specified shall be average and at least two-thirds of individual X values shall be within 10-percent of average value:
 - $(20-T)$
 - $X = KL(a)20C = (KL(a))T \times 1.024$
 - The values of X for each condition specified shall be average and at least two-thirds of individual X values shall be within 10-percent of average value. If not, conduct additional series of test until two-thirds of X values are within 10-percent of the average of all X values.
- The average value of X , $((KL(a)20C))$ Oxygen transfer coefficient shall be equal to or greater than specified under appropriate "Performance Requirements."

6.6.3.3 TRAINING:

- Provide on-site training for Owner's personnel:
 - A minimum of one 8-HR training session
 - To cover non-routine maintenance and operation/routine maintenance, including:

- Operation, start-up, shut-down, lock-out, emergency operating procedures, control, adjustment, maintenance, assembly, disassembly, and repair of the equipment including control sequences, identification systems, materials, spare parts, special tools, lubricants, and fuels.
- Technical repair manual.
- Cleaning.
- Lubrication of equipment.
- Optimizing equipment and system performance.
- Capabilities of equipment and systems.
- Operational safety of equipment and systems.
- Emergency situation response of equipment and systems.

6.6.3.4 SPARE PARTS:

- Aerator:
 - One oil sensing cutout switch.
 - One flexible motor coupling.
- Mixer:
 - One set of bearings.
 - One set of mechanical seals.
 - One set of O-rings.
- Blower (for each blower type):
 - One air filter.
 - One belt set.
 - One oil (five gallon container).
- Air distribution system:
 - Complete diffuser assemblies – Minimum of 5% installed.

6.6.3.5 MONITORING AND CONTROLS:

- All critical control functions shall be able to be performed locally via hand switches though hardwired controls in the event a PLC, network or I/O device fails. Critical interlocks shall not be bypassed via hand mode operation.
- All unit processes shall have local hand, local automatic (where applicable), and remote hand (through SCADA HMI interface) operation modes.
- Automatic controls shall be native to the unit process facility to the extent possible.
- Automatic control shall have defined automatic fail safe operational modes for all anticipated failure modes including communications loss (remote variable data unavailable), automatic fail over to redundant equipment on fault, emergency power transition automatic restart, etc.
- Available aeration equipment control parameters by DO, pH, Ammonia and Nitrogen levels as required for each basin. Mixers are normally always on.
- Automatic chemical dosing shall be parameter and plant influent flow paced.
- Chemical storage monitoring (future).

6.6.4 5-stage with Secondary Clarifiers and Filters - Secondary Clarification:

6.6.4.1 MINIMUM DESIGN CRITERIA:

- Average Daily Flow: 2.5 MGD
- Peak Daily Flow: 3.8 MGD
- Peak flow: 7.5 MGD
- Design RAS Rate Range: 50% to 150% of average design flow

- Minimum Number of Basins: 2
- Minimum Diameter: 70'
- Minimum Side Water Depth: 14'
- Inlet Area: Center Feed, inner energy dissipating well and outer feed well
- Sludge Removal Type: Suction header
- Scum Removal Type: Full radius
- Maximum Solids Loading Rate: 25 lbs/day/ft² (all basins in service, at peak daily flow)
- Maximum Weir Loading Rate: 15,000 gal/day/ft (all basins in service, at peak daily flow)
- Maximum Overflow Rate: 800 gal/day/ft² (all basins in service, at peak daily flow)
- Acceptable Manufacturers
 - Evoqua - Envirex Tow-Bro Suction Unitube Header Clarifier
 - Ovivo - Emico Suction Header Clarifier
 - WesTech - COP Suction Head Clarifier
 - Walker Process Equipment - Tapered Suction Header Clarifier
 - Or Approved Equal
- Effluent Launder Covers: Weir wall mounted type, Fiberglass, with access hatches or accessible leafs that open toward tank center
 - Acceptable Manufacturers:
 - Nefco
 - Glass Steel
 - Jacobs Manufacturing
 - Warminster
 - Or Approved Equal

6.6.4.2 EQUIPMENT TESTING:

- Demonstrate the functional integrity of the mechanical, electrical, and control interfaces of the equipment.
- Conduct initial startup of equipment and perform operation checks.
- Provide Owner with a written certificate that Manufacturer's equipment has been installed properly, has been started up, and is ready for operation by Owner's personnel.

6.6.4.3 PERFORMANCE TESTING:

- Torque Test:
 - Load test the entire collector mechanism by anchoring collector arms individually, 1 at a time. In successive tests, demonstrate the sludge collection mechanism's (including drive unit, cage, gears and structures) capability to withstand not less than 130 percent of the specified rated running torque.
 - Field torque test the clarifier mechanism under the supervision of the equipment manufacturer's representative before the mechanisms are approved and placed into operation.
 - The torque test shall consist of securing the rake arms by cables to anchor bolts installed by the contractor in the tank floor at locations recommended by the manufacturer and the Engineer. Apply a torque load to the scraper arm by means of a ratchet lever and cylinder connected to the cable assembly.
 - Measure the magnitude of the applied load by calculating the torque from the distance of the line of action of each cable to the center line of the mechanism.
 - Readings shall be taken at 100 percent, 120 percent, and 130 percent of the AGMA rated torque.
 - The test load shall be applied and noted on the torque overload device.

- The manufacturer's service representative shall certify that the alarm and motor cut-out torque of the drives as calibrated in the manufacturer's shop are in proper operation to shut down the units as specified.
- Operation Test:
 - Fill clarifier with water to its operating level and operate mechanism continuously at its maximum speed for a period of not less than 48 HRS.
 - At no time during the operating tests shall the equipment exceed the rated torque or exhibit indications of binding or uneven operation.
 - Record torque values as registered on the drive mechanism torque indicator and motor amperage (all 3 phases) at 3 HRS intervals.
 - After successful completion of the fully submerged operating test, operate the mechanism at full speed with no more than 1.5 FT of water at the sidewall in the tank for a period of not less than 6 HRS. Record data as described above.
 - If the mechanism exceeds rated torque or, in the opinion of the Owner, the mechanism exhibits indications of binding or improper adjustment:
 - Contractor shall immediately halt the tests and remedy the problem.
 - Repeat the tests after completion of necessary repairs or adjustments.
 - Failure to successfully complete the test in 6 attempts is sufficient cause for rejection.

6.6.4.4 TRAINING:

- Provide on-site training for Owner's personnel:
 - A minimum of one 4-HR training session
 - To cover non-routine maintenance and operation/routine maintenance, including:
 - Operation, start-up, shut-down, lock-out, emergency operating procedures, control, adjustment, maintenance, assembly, disassembly, and repair of the equipment including control sequences, identification systems, materials, spare parts, special tools, lubricants, and fuels.
 - Technical repair manual.
 - Cleaning.
 - Lubrication of equipment.
 - Optimizing equipment and system performance.
 - Capabilities of equipment and systems.
 - Operational safety of equipment and systems.
 - Emergency situation response of equipment and systems.

6.6.4.5 SPARE PARTS:

- Two sets of all gaskets.
- Two sets of shaft seals for each drive unit.
- One skimmer wiper for each skimmer arm.
- Two site glasses.
- Six shear pins for each drive unit.
- Two sets of manifold seals for the suction headers in each clarifier

6.6.4.6 MONITORING AND CONTROLS:

- All critical control functions shall be able to be performed locally via hand switches though hardwired controls in the event a PLC, network or I/O device fails. Critical interlocks shall not be bypassed via hand mode operation.

- All unit processes shall have local hand, local automatic (where applicable), and remote hand (through SCADA HMI interface) operation modes.
- Automatic controls shall be native to the unit process facility to the extent possible.
- Automatic control shall have defined automatic fail safe operational modes for all anticipated failure modes including communications loss (remote variable data unavailable), automatic fail over to redundant equipment on fault, emergency power transition automatic restart, etc.
- Always on.
- Monitoring only.

6.6.5 5-stage with Secondary Clarifiers and Filters - RAS/WAS Pumping:

6.6.5.1 MINIMUM DESIGN CRITERIA:

- Peak RAS Pumping Capacity (all firm pumps in service): 3.75 MGD
- Minimum Number of Firm RAS Pumps: 2
- Number of Installed RAS Standby Pumps: 1
- Peak WAS Pumping Capacity (all firm pumps in service): 200 GPM
- Minimum Number of Firm WAS Pumps: 1
- Number of Installed WAS Standby Pumps: 1
- RAS and WAS Pump Type: Horizontal Suction, Screw Induced Centrifugal
- Pump Speed: Variable
- Acceptable Manufacturer's
 - Wemco
 - Hayward Gordon
 - Fairbank Morse
 - Or Approved Equal
- Pump control system
- Flow Measurement: Replacement of existing magnetic flow meters for RAS (Quantity 1) and WAS (Quantity 1) flow streams

6.6.5.2 EQUIPMENT TESTING:

- Demonstrate the functional integrity of the mechanical, electrical, and control interfaces of the equipment.
- After the pumps have been completely installed and wired, the Contractor shall have the manufacturer perform the following, at a minimum:
 - Verify alignment.
 - Megger stator and power cables.
 - Check seal lubrication.
 - Check for proper rotation.
 - Check power supply voltage.
 - Measure motor operating load and no load current.
 - Vibration measurement.
 - After installation and prior to energizing the motor, perform inspections and tests per NETA ATS 7.15.
 - Bump motor to check for correct rotation.
- Conduct initial startup of equipment and perform operation checks.
- Provide Owner with a written certificate that Manufacturer's equipment has been installed properly, has been started up, and is ready for operation by Owner's personnel.

6.6.5.3 PERFORMANCE TESTING:

- Prior to submergence, run pump dry to establish correct rotation and mechanical integrity.
- Run pump for 30 minutes submerged, a minimum of 6 FT under water.
 - Record head (ft) versus flow (gpm) for each pump. Engineer shall compare results against manufacturer's provided performance curve.

6.6.5.4 TRAINING:

- Provide on-site training for Owner's personnel:
 - A minimum of one 4-HR training session
 - To cover non-routine maintenance and operation/routine maintenance, including:
 - Operation, start-up, shut-down, lock-out, emergency operating procedures, control, adjustment, maintenance, assembly, disassembly, and repair of the equipment including control sequences, identification systems, materials, spare parts, special tools, lubricants, and fuels.
 - Technical repair manual.
 - Cleaning.
 - Lubrication of equipment.
 - Optimizing equipment and system performance.
 - Capabilities of equipment and systems.
 - Operational safety of equipment and systems.
 - Emergency situation response of equipment and systems.

6.6.5.5 SPARE PARTS:

- One for each pump type:
 - One set of gaskets and o-ring seals.
 - One set of mechanical seals.
 - One set of bearings.
 - One shaft sleeve.
 - One impeller.
 - One complete set of special tools required to dismantle pump.

6.6.5.6 MONITORING AND CONTROLS:

- All critical control functions shall be able to be performed locally via hand switches though hardwired controls in the event a PLC, network or I/O device fails. Critical interlocks shall not be bypassed via hand mode operation.
- All unit processes shall have local hand, local automatic (where applicable), and remote hand (through SCADA HMI interface) operation modes.
- Automatic controls shall be native to the unit process facility to the extent possible.
- Automatic control shall have defined automatic fail safe operational modes for all anticipated failure modes including communications loss (remote variable data unavailable), automatic fail over to redundant equipment on fault, emergency power transition automatic restart, etc.
- Waste rate is user adjustable programmed schedule (7 day timer type).
 - Waste valve control remote and local manual control.
- High discharge pressure pump automatic shut off and alarm.
- Pumps may be remotely manually controlled via the SCADA system HMI.
- All VFD driven pumps shall operate at speed selected. One pump is standby at all times (hardwired interlocked).

- Low level cavitation protection automatic stop/start permissive hardwired.

6.6.6 5-stage with Secondary Clarifiers and Filters - Tertiary Filtration (Existing Tertiary Filtration Building):

6.6.6.1 MINIMUM DESIGN CRITERIA:

- Replace all Existing Equipment and Media, including underdrains and Backwash Bridges
- Number of Filters: 2
- Filter Dimensions: 48L x 12.5W
- Media Type: Sand and anthracite
- Media Depth: 12" of sand and 12" of anthracite
- Traveling Bridge Assemblies: 2
- Acceptable Manufacturer
 - Aqua-Aerobic - AquaABF
 - Evoqua - Davco Gravisand Filter
 - IDI - ABW Quickplate
 - Or Approved Equal
- At least one filter shall remain in operation at all times

6.6.6.2 EQUIPMENT TESTING:

- Demonstrate the functional integrity of the mechanical, electrical, and control interfaces of the equipment.
- Conduct initial startup of equipment and perform operation checks.
- Provide Owner with a written certificate that Manufacturer's equipment has been installed properly, has been started up, and is ready for operation by Owner's personnel.

6.6.6.3 PERFORMANCE TESTING:

- None.

6.6.6.4 TRAINING:

- Provide on-site training for Owner's personnel:
 - A minimum of one 4-HR training session
 - To cover non-routine maintenance and operation/routine maintenance, including:
 - Operation, start-up, shut-down, lock-out, emergency operating procedures, control, adjustment, maintenance, assembly, disassembly, and repair of the equipment including control sequences, identification systems, materials, spare parts, special tools, lubricants, and fuels.
 - Technical repair manual.
 - Cleaning.
 - Lubrication of equipment.
 - Optimizing equipment and system performance.
 - Capabilities of equipment and systems.
 - Operational safety of equipment and systems.
 - Emergency situation response of equipment and systems.

6.6.6.5 SPARE PARTS:

- One spare backwash pump of each type.

6.6.6.6 MONITORING AND CONTROLS:

- All critical control functions shall be able to be performed locally via hand switches though hardwired controls in the event a PLC, network or I/O device fails. Critical interlocks shall not be bypassed via hand mode operation.
- All unit processes shall have local hand, local automatic (where applicable), and remote hand (through SCADA HMI interface) operation modes.
- Automatic controls shall be native to the unit process facility to the extent possible.
- Automatic control shall have defined automatic fail safe operational modes for all anticipated failure modes including communications loss (remote variable data unavailable), automatic fail over to redundant equipment on fault, emergency power transition automatic restart, etc.
- Equipment vendor standard controls.
 - PLC, if any, shall be plant standard PLC manufacturer.

6.6.7 5-stage with Secondary Clarifiers and Filters - Intermediate Pumping:

6.6.8 Minimum Design Criteria:

- Peak Pumping Capacity (all firm pumps in service): 7.5 MGD
- Number of Firm Pumps: Minimum of 3
- Number of Installed Standby Pumps: 1
- Pump Type: Vertical Turbine
- Pump Speed: Variable
- Acceptable Manufacturer's
 - Fairbank Morse
 - Flowserve
 - Or Approved Equal
- Pump level control system with level transducer and fully redundant float control system

6.6.8.1 EQUIPMENT TESTING:

- Demonstrate the functional integrity of the mechanical, electrical, and control interfaces of the equipment.
- After the pumps have been completely installed and wired, the Contractor shall have the manufacturer perform the following, at a minimum:
 - Verify alignment.
 - Megger stator and power cables.
 - Check seal lubrication.
 - Check for proper rotation.
 - Check power supply voltage.
 - Measure motor operating load and no load current.
 - Vibration measurement.
 - After installation and prior to energizing the motor, perform inspections and tests per NETA ATS 7.15.
 - Bump motor to check for correct rotation.
- Conduct initial startup of equipment and perform operation checks.

- Provide Owner with a written certificate that Manufacturer's equipment has been installed properly, has been started up, and is ready for operation by Owner's personnel.

6.6.8.2 PERFORMANCE TESTING:

- Prior to submergence, run pump dry to establish correct rotation and mechanical integrity.
- Run pump for 30 minutes submerged, a minimum of 6 FT under water.
 - Record head (ft) versus flow (gpm) for each pump. Engineer shall compare results against manufacturer's provided performance curve.

6.6.8.3 TRAINING:

- Provide on-site training for Owner's personnel:
 - A minimum of one 4-HR training session
 - To cover non-routine maintenance and operation/routine maintenance, including:
 - Operation, start-up, shut-down, lock-out, emergency operating procedures, control, adjustment, maintenance, assembly, disassembly, and repair of the equipment including control sequences, identification systems, materials, spare parts, special tools, lubricants, and fuels.
 - Technical repair manual.
 - Cleaning.
 - Lubrication of equipment.
 - Optimizing equipment and system performance.
 - Capabilities of equipment and systems.
 - Operational safety of equipment and systems.
 - Emergency situation response of equipment and systems.

6.6.8.4 SPARE PARTS:

- One set of mechanical seals.
- One set of bearings.
- One set of seals.
- One impeller.

6.6.8.5 MONITORING AND CONTROLS:

- All critical control functions shall be able to be performed locally via hand switches though hardwired controls in the event a PLC, network or I/O device fails. Critical interlocks shall not be bypassed via hand mode operation.
- All unit processes shall have local hand, local automatic (where applicable), and remote hand (through SCADA HMI interface) operation modes.
- Automatic controls shall be native to the unit process facility to the extent possible.
- Automatic control shall have defined automatic fail safe operational modes for all anticipated failure modes including communications loss (remote variable data unavailable), automatic fail over to redundant equipment on fault, emergency power transition automatic restart, etc.
- Pumps shall be controlled based on redundant analog level monitoring signal.
 - Higher level calls more pumps, lower level de-energizes unneeded pumps.
- Back up high, high high, low, and low low level float switches
- Pumps may be remotely manually controlled via the SCADA system HMI.
- All VFD driven pumps shall operate at the same speed. Speed ramps up from minimum on startup and follows level.

- Pumps shall operate in an automatic first on first off rotation.
- One pump is standby at all times (hardwired interlocked).
- Low level cavitation protection automatic stop/start permissive hardwired.

6.7 Activated Sludge - 4-stage with MBR

6.7.1 Minimum Design Criteria:

- Potential reuse of existing Filter Room for MBR components
- Provide sufficient membrane trains to treat Peak Daily Flow with 1 train out of service
- Provide adequate freeboard in activated sludge basins for attenuation of peak flows which are above rated capacity of MBR system
- Membrane flux rates shall not exceed manufacturer published recommended values
- Design Minimum Hydraulic Retention Times at Average Daily Flow:
 - Pre-Anoxic Zone: 1.5 hrs
 - Aerated Zone: 13.5 hrs
 - Post-Anoxic Zone: 8.5 hrs
 - Post-Aerated/MBR Zone: 0.9 hrs
- Acceptable Manufacturers - System Supplier
 - GE - ZeeWeed 500
 - Or Approved Equal
- Manufacturers to provide current generation equipment and controls
- Ancillary Equipment and Controls
 - Ancillary equipment and controls shall be designed and provided as a single source by the System Supplier and shall be as acceptable to the Engineer and Owner. Ancillary equipment shall include the following as a minimum
 - Submersible mixing equipment
 - Flow control gates
 - Package aeration blowers with weather/sound enclosure
 - Membranes
 - Pumps for RAS/WAS, mixer liquor recycle
 - Chemical feed and storage systems for carbon and metal salt addition
 - Provide space for future suitable storage tanks for minimum 14 days storage at average design flow usages as well as applicable chemical feed systems with redundant feed pumps. Items in the future to be located in a building enclosure. Consider use of Micro-C for carbon source in lieu of methanol, ethanol or other flammable liquids.
 - Controls for aeration and nutrient removal systems

6.7.2 Equipment Testing:

- Demonstrate the functional integrity of the mechanical, electrical, and control interfaces of the equipment.
- Conduct initial startup of equipment and perform operation checks.
- Provide Owner with a written certificate that Manufacturer's equipment has been installed properly, has been started up, and is ready for operation by Owner's personnel.

6.7.3 Performance Testing:

6.7.3.1 GENERAL:

- Perform dissolved oxygen concentration measurements by direct reading instruments which have been standardized against a laboratory determination of dissolved oxygen as described in latest edition of "Standard Methods for Examination of Water and Waste Water" with appropriate modification for interfering substances:
 - Multiple probes will be required as detailed under Paragraph A and appropriate references.
- Notify the Owner a minimum of one (1) week prior to intended testing period:
 - Schedule testing to be performed between 10:00 AM and 5:00 PM and to begin on a Monday or Tuesday.
 - If more than one (1) day of testing is required, schedule testing to be done on consecutive days.
- Provide support facilities which includes but is not necessarily limited to electrical power, water, air, equipment chemical storage tanks, mixing equipment, sampling equipment, testing chemicals and equipment and incidental items.

6.7.3.2 BASIC COMMON ELEMENTS OF PERFORMANCE TESTS

- Water used for performance tests shall be tap water:
 - Ensure water temperature is between 15 - 25 DegC.
- Chemical additive #1:
 - In each test, a 10-percent (by weight) solution of sodium sulfite Na_2SO_3 shall be prepared in sufficient quantity to deplete the dissolved oxygen concentration in tank to zero and maintain zero reading condition for a minimum of one (1) minute.
 - Stoichiometrically, approximately 75 LBS of 96 percent pure sodium sulfite are required per million gallons of tank volume to deplete the dissolved oxygen concentration 1 milligram per liter.
 - Use only technical grade sodium sulfite, free of catalyst.
 - Approximately 150 percent of stoichiometric quantity will be required to achieve and maintain zero conditions for one (1) minute.
- Chemical additive #2:
 - A 10-percent (by weight) solution of cobalt chloride $\text{CoCl}_2 \cdot 6\text{H}_2\text{O}$ shall be prepared for the initial series of tests.
 - Approximately 34 LBS of cobalt chloride are required per million gallons of tank volume to produce 1 milligram per liter.
 - For test purposes, use cobalt ion concentration of 0.5 mg/l.
- Test setup:
 - For initial series, introduce cobalt chloride solution to desired residual.
 - After cobalt ion residual is obtained, mix or agitate tank volume for a minimum of 15 minutes.
 - Add sodium sulfite solution to tank within a period of five (5) minutes start to finish:
 - Add solution of multiple points to achieve uniform dispersion throughout tank.
 - After first series of tests are complete, prepare another batch of sodium sulfite:
 - No additional cobalt chloride shall be added after first series of tests.
 - Perform additional series of tests according to same procedure; however, no more than 10 series of tests shall be made in same test water.
 - Ensure disposal of waste materials, water, chemicals, and incidentals after testing in acceptable manner to appropriate regulatory agencies.
- Oxygen transfer coefficient $[\text{KL}(\text{a})]\text{T}$:
 - For each point of measurement specified, compute overall oxygen transfer coefficient by determining slope of line of best fit by following equation:

$$\frac{\ln((C(s)-C(1))/(C(s)-C(2)))}{(KL(\text{a})\text{T}) = t(2-t(1))}$$

Where:

- \ln - natural logarithm to base(e)
- T = water temperature, DegC
- $C(s)-C(1)$ = Initial t(1) dissolved oxygen deficit, mg/l
- $C(s)-C(2)$ = final t(2) dissolved oxygen deficit, mg/l
- $t(2)-t(1)$ = time span from initial to final reading, hours
- C(s) = oxygen saturation at test site barometric pressure and liquid temperature T; the theoretical oxygen saturation value at a point 1/3 depth from water surface to point of air application.
- Calculate and plot on semi-log graph paper the dissolved oxygen deficit from saturation ($C(s)-C(t)$) for each measurement:
 - Plot with log axis as ordinate with dissolved oxygen deficit and linear axis as abscissa with time (t).
 - C(t) is the measure oxygen concentration at any time (t).
 - By regression analysis, draw a line of best fit on all points between 20 and 80 percent of saturation value C(s).
- Correct oxygen transfer coefficient ($(KL(a))T$ for each measurement point to 20 DegC by the following equation:
- The values of X for each condition specified shall be average and at least two-thirds of individual X values shall be within 10-percent of average value:
 - $(20-T)$
 - $X = KL(a)20C = (KL(a))T \times 1.024$
 - The values of X for each condition specified shall be average and at least two-thirds of individual X values shall be within 10-percent of average value. If not, conduct additional series of test until two-thirds of X values are within 10-percent of the average of all X values.
- The average value of X, ($(KL(a)20C)$) Oxygen transfer coefficient shall be equal to or greater than specified under appropriate "Performance Requirements."
- Demonstrate membrane flux rate

6.7.4 Training:

- Provide on-site training for Owner's personnel:
 - A minimum of two 8-HR training session
 - To cover non-routine maintenance and operation/routine maintenance, including:
 - Operation, start-up, shut-down, lock-out, emergency operating procedures, control, adjustment, maintenance, assembly, disassembly, and repair of the equipment including control sequences, identification systems, materials, spare parts, special tools, lubricants, and fuels.
 - Technical repair manual.
 - Cleaning.
 - Lubrication of equipment.
 - Optimizing equipment and system performance.
 - Capabilities of equipment and systems.
 - Operational safety of equipment and systems.
 - Emergency situation response of equipment and systems.

6.7.5 Spare Parts:

- Spare membranes equal to 5% of the installed capacity.
- Complete membrane type diffuser assemblies – Minimum of 5% installed.

6.7.6 Monitoring and Controls:

- All critical control functions shall be able to be performed locally via hand switches though hardwired controls in the event a PLC, network or I/O device fails. Critical interlocks shall not be bypassed via hand mode operation.
- All unit processes shall have local hand, local automatic (where applicable), and remote hand (through SCADA HMI interface) operation modes.
- Automatic controls shall be native to the unit process facility to the extent possible.
- Automatic control shall have defined automatic fail safe operational modes for all anticipated failure modes including communications loss (remote variable data unavailable), automatic fail over to redundant equipment on fault, emergency power transition automatic restart, etc.
- Available aeration equipment control parameters by DO, pH, Ammonia and Nitrogen levels as required for each basin.
- Mixers are normally always on.
- Automatic chemical dosing shall be parameter and plant influent flow paced.
- Chemical storage monitoring.
- Equipment vendor standard controls.
 - PLC shall be plant standard PLC manufacturer.

6.8 UV Disinfection (UV Disinfection Building):

6.8.1 Minimum Design Criteria:

- Peak Daily Flow Treatment Capacity when Discharging to Reuse: 2.0 MGD
- Peak Daily Flow Treatment Capacity when Discharging to Receiving Stream: 4.0 MGD
- Peak Hydraulic Capacity = 7.5 MGD
- Design UVT:
 - 65% for tertiary filtered effluent
 - 70% for MBR effluent
- Design UV Dose (MS2)
 - 80 MJ to water reclaim system for MBR effluent
 - 30 MJ to receiving stream for MBR effluent
 - 100 MJ to water reclaim system for tertiary filtered effluent
 - 40 MJ to receiving stream for tertiary filtered effluent
- Treatment Requirements
 - See NPDES permit requirements in Project Description section
 - For water reclaim system, see NWRI guidelines for effluent reuse systems
- System Type: Open Channel or Enclosed Vessel
- Lamp Type: Low Pressure High Output
- Number of Firm UV Channels or Reactors: Minimum of 1
- Number of Standby Channels or Reactors for Discharge to Receiving Stream: 1
- Space Allotment for Number Channels or Reactors for Future Equipment: 1
- Reactor type UV system shall be located in an enclosed structure. Open-channel type UV system shall be located under a canopy system.
- Lamp Sleeve Cleaning System: Hydraulic or pneumatic
- UVT Meter
- Acceptable Manufacturers - Enclosed Vessel
 - Trojan Technologies - TrojanUVFit
 - Wedeco - LBX
 - Engineered Treatment Systems - UVLW

- Or Approved Equal
- Acceptable Manufacturers - Open Channel Systems
 - Trojan Technologies - Trojan 3000 Plus
 - Wedeco - TAK 55
 - IDI - Aquaray 3X HO
 - Or Approved Equal

6.8.1.1 EQUIPMENT TESTING:

- Demonstrate the functional integrity of the mechanical, electrical, and control interfaces of the equipment.
- Conduct initial startup of equipment and perform operation checks.
- Provide Owner with a written certificate that Manufacturer's equipment has been installed properly, has been started up, and is ready for operation by Owner's personnel.

6.8.1.2 PERFORMANCE TESTING:

- UV system provided shall produce an effluent conforming to the effluent standards defined in the design criteria in this specification. The performance shall be guaranteed by the Manufacturer.
- Harmonic distortion data taken from other similar projects shall be submitted showing compliance with IEEE 519-1992 Tables 10.1, 10.2, and 10.3 as measured at the input terminals to the Power Distribution Center. Power factor shall be 96 percent or greater.

6.8.1.3 TRAINING:

- Provide on-site training for Owner's personnel:
 - A minimum of one 8-HR training session
 - To cover non-routine maintenance and operation/routine maintenance, including:
 - Operation, start-up, shut-down, lock-out, emergency operating procedures, control, adjustment, maintenance, assembly, disassembly, and repair of the equipment including control sequences, identification systems, materials, spare parts, special tools, lubricants, and fuels.
 - Technical repair manual.
 - Cleaning.
 - Lubrication of equipment.
 - Optimizing equipment and system performance.
 - Capabilities of equipment and systems.
 - Operational safety of equipment and systems.
 - Emergency situation response of equipment and systems.

6.8.1.4 SPARE PARTS:

- 10% of total installed UV electronic ballasts.
- 10% of total installed UV lamps.
- 10% of total installed UV lamp sleeves.
- 10% of total installed UV cleaning wiper seals.
- 2 UV intensity sensors.

6.8.1.5 MONITORING AND CONTROLS:

- All critical control functions shall be able to be performed locally via hand switches though hardwired controls in the event a PLC, network or I/O device fails. Critical interlocks shall not be bypassed via hand mode operation.
- All unit processes shall have local hand, local automatic (where applicable), and remote hand (through SCADA HMI interface) operation modes.
- Automatic controls shall be native to the unit process facility to the extent possible.
- Automatic control shall have defined automatic fail safe operational modes for all anticipated failure modes including communications loss (remote variable data unavailable), automatic fail over to redundant equipment on fault, emergency power transition automatic restart, etc.
- Dedicated process flow meter to pace UV dose.
- Automatic online ultraviolet transmittance (UVT) dose adjustment.
- Automatic backup 'overkill' dose failsafe on loss of flow/UVT signal(s).
- Passive channel level control
- Channel low level automatic shutoff and high level alarms.
- Equipment vendor standard controls.
 - PLC, if any, shall be plant standard PLC manufacturer.

6.9 Water Reclaim Basin (Modified Trickling Filter Basins #3):

6.9.1 Minimum Design Criteria:

Water Reclaim Basins (Modified Trickling Filter Basins #3)

- Remove trickling filter equipment and media
- Make necessary piping and structure modifications for conversion to water reclaim basin
- Apply a permanent interior liner or coating to the basin to make the basin watertight. Test the basin after installation in accordance with ACI 350.1. Performance of the completed basin shall be equal to the requirements in ACI 350.1 Section 2.1 for containment structures with monolithically placed floors designed to be shrinkage crack free.

Chemical Feed System

- Location: Chemical Storage Room of Filter Building
- Volume of Storage: 250 gallon tote (by others)
- Liquid Sodium Hypochlorite Maintenance Dose: 0.5 to 1 mg/l
- Chemical Feed Skid: Minimum of one with a firm and redundant chemical feed system including all pumps, valves, etc.
- Acceptable Manufacturers
 - Neptune
 - LMI/Milton Roy
 - Pulsatron
 - DXP
 - USGI Encore
 - Watson Marlow
 - Blue and White
 - Or Approved Equal

Non-Potable Water Pump

- Peak Pumping Capacity: To be determined based upon selected equipment
- Minimum NPW Demand:
 - Minimum of two yard hydrants
 - Screening equipment
 - Screening washing/compacting equipment
 - Grit removal equipment
 - Screw press equipment
 - Polymer equipment
- Number of Firm Pumps: Minimum of 1
- Number of Installed Standby Pumps: 1
- Pump Type: Vertical Turbine
- Pump Speed: Variable
- Acceptable Manufacturer's
 - Fairbank Morse
 - Flowserve
 - Or Approved Equal
- Pump control system to match pump speed to demand, include cycle stop valve with pressure tank

Water Reclaim Pumps

- Peak Pumping Capacity (all firm pumps in service): 2.0 MGD
- Number of Firm Pumps: Minimum of 1
- Number of Installed Standby Pumps: 1
- May consider multiple pumps in lieu of 1 firm pump in low and high flow service arrangement
- Pump Type: Vertical Turbine
- Pump Speed: Variable
- Acceptable Manufacturer's
 - Fairbank Morse
 - Flowserve
 - Or Approved Equal
- Control system for pump level protection and maintaining level within irrigation pond
- Cycle stop valve

6.9.2 Equipment Testing:

- Demonstrate the functional integrity of the mechanical, electrical, and control interfaces of the equipment.
- After the pumps have been completely installed and wired, the Contractor shall have the manufacturer perform the following, at a minimum:
 - Verify alignment.
 - Megger stator and power cables.
 - Check seal lubrication.
 - Check for proper rotation.
 - Check power supply voltage.
 - Measure motor operating load and no load current.
 - Vibration measurement.

- After installation and prior to energizing the motor, perform inspections and tests per NETA ATS 7.15.
- Bump motor to check for correct rotation.
- Conduct initial startup of equipment and perform operation checks.
- Provide Owner with a written certificate that Manufacturer's equipment has been installed properly, has been started up, and is ready for operation by Owner's personnel.

6.9.3 Performance Testing:

- Record head (ft) versus flow (gpm) for each pump. Engineer shall compare results against manufacturer's provided performance curve.

6.9.4 Training:

- Provide on-site training for Owner's personnel:
 - A minimum of one 8-HR training session
 - To cover non-routine maintenance and operation/routine maintenance, including:
 - Operation, start-up, shut-down, lock-out, emergency operating procedures, control, adjustment, maintenance, assembly, disassembly, and repair of the equipment including control sequences, identification systems, materials, spare parts, special tools, lubricants, and fuels.
 - Technical repair manual.
 - Cleaning.
 - Lubrication of equipment.
 - Optimizing equipment and system performance.
 - Capabilities of equipment and systems.
 - Operational safety of equipment and systems.
 - Emergency situation response of equipment and systems.

6.9.5 Spare Parts:

- One for each pump type:
 - One set of gaskets and o-ring seals.
 - One set of mechanical seals.
 - One set of bearings.
 - One shaft sleeve.
 - One impeller.
 - One complete set of special tools required to dismantle pump.

6.9.6 Monitoring and Controls:

- All critical control functions shall be able to be performed locally via hand switches though hardwired controls in the event a PLC, network or I/O device fails. Critical interlocks shall not be bypassed via hand mode operation.
- All unit processes shall have local hand, local automatic (where applicable), and remote hand (through SCADA HMI interface) operation modes.
- Automatic controls shall be native to the unit process facility to the extent possible.
- Automatic control shall have defined automatic fail safe operational modes for all anticipated failure modes including communications loss (remote variable data unavailable), automatic fail over to redundant equipment on fault, emergency power transition automatic restart, etc.
- System pressure controlled pump speed.

- Water reclaim pumps to be controlled off of level at irrigation pond
- System controls shall also be designed to maintain a minimum Owner defined system pressure

6.10 Septage Receiving Station:

- Minimum Design Criteria
 - Underground septage tank to receive off-site septage hauling.
 - Design Tank Capacity: 4,000 gallons
 - Access Points: Minimum of 3, located to facilitate cleanout of tank contents
 - Provide sloped and curbed concrete inlet area with drain to allow septage trucks to empty load. Inlet area shall be connected by corrosion resistant piping to underground septage tank. Inlet area shall be minimum of 100 square feet.
 - Provide buried manual plug valve with access riser on tank discharge line to control discharge rate from tank to influent pump station.
 - Provide adjacent wash down hydrant for inlet area.
 - See Structural Design Requirements section for additional information

6.11 Aerobic Digestion

6.11.1 Aerobic Digesters

6.11.1.1 MINIMUM DESIGN CRITERIA:

- Reuse existing aeration basins and convert to aerobic digesters
- Number of Basins: 2
- Basin Dimensions: 63' long x 56' wide x 18' side water depth
- Design Air Requirements: 25 cfm per 1,000 ft³ of volume
- Telescoping Sludge Valves:
 - Minimum Quantity: 1 per basin
 - Minimum Travel Distance: 4'
 - Handwheel operable with scum baffle
- Diffusers:
 - Coarse Bubble: Acceptable Types
 - Acceptable Manufacturers
 - Coarse Bubble Membrane: Maximum Design Flow Per Diffuser: 5 scfm
 - EDI - PermaCap
 - SSI - ReliaBill
 - Or Approved Equal
- Blowers: Reuse of existing aeration blowers, 2 firm and 1 standby. Existing blowers have individual capacity of 1,590 cfm at 8 psi. Modify as required to accommodate varying design side water depths.
 - Provide new soft starters for each blower
 - Provide new blower motors for units #2 and #3
 - Provide new impeller blades for each blower

6.11.1.2 EQUIPMENT TESTING:

- Demonstrate the functional integrity of the mechanical, electrical, and control interfaces of the equipment.
- Conduct initial startup of equipment and perform operation checks.

- Provide Owner with a written certificate that Manufacturer's equipment has been installed properly, has been started up, and is ready for operation by Owner's personnel.

6.11.1.3 PERFORMANCE TESTING:

- None.

6.11.1.4 TRAINING:

- Provide on-site training for Owner's personnel:
 - A minimum of one 4-HR training session
 - To cover non-routine maintenance and operation/routine maintenance, including:
 - Operation, start-up, shut-down, lock-out, emergency operating procedures, control, adjustment, maintenance, assembly, disassembly, and repair of the equipment including control sequences, identification systems, materials, spare parts, special tools, lubricants, and fuels.
 - Technical repair manual.
 - Cleaning.
 - Lubrication of equipment.
 - Optimizing equipment and system performance.
 - Capabilities of equipment and systems.
 - Operational safety of equipment and systems.
 - Emergency situation response of equipment and systems.

6.11.1.5 SPARE PARTS:

- Blowers:
 - One air filter.
 - One belt set.
 - One oil (five gallon container).

6.11.1.6 MONITORING AND CONTROLS:

- All critical control functions shall be able to be performed locally via hand switches though hardwired controls in the event a PLC, network or I/O device fails. Critical interlocks shall not be bypassed via hand mode operation.
- All unit processes shall have local hand, local automatic (where applicable), and remote hand (through SCADA HMI interface) operation modes.
- Automatic controls shall be native to the unit process facility to the extent possible.
- Automatic control shall have defined automatic fail safe operational modes for all anticipated failure modes including communications loss (remote variable data unavailable), automatic fail over to redundant equipment on fault, emergency power transition automatic restart, etc.
- Level monitoring and manual blower On/Off control and monitoring.

6.11.2 Digested Sludge Pump Station:

6.11.2.1 MINIMUM DESIGN CRITERIA:

- Minimum Pumping Capacity (all firm pumps in service): 90 GPM
- Pumping Medium: Thickened Waste Activated Sludge (TWAS), 0 .5 to 2% Solids
- Number of Firm Pumps: Minimum of 1

- Number of Installed Standby Pumps: 1
- Pump Type: Positive Displacement
- Pump Speed: Variable
- Acceptable Manufacturers
 - Netzsch
 - Moyno
 - Seepex
 - Borger
 - Or Approved Equal
- Piping configuration will allow pumps to pull from either basin
- Pump vault with applicable valves for pump isolation and flow reversal
- Vault shall be provided with access hatch for pump/valve maintenance
- Flow Measurement: Magnetic flow meter, minimum 98% accuracy, in accessible vault with isolation valves to facilitate removal

6.11.2.2 EQUIPMENT TESTING:

- Demonstrate the functional integrity of the mechanical, electrical, and control interfaces of the equipment.
- After the pumps have been completely installed and wired, the Contractor shall have the manufacturer perform the following, at a minimum:
 - Verify alignment.
 - Megger stator and power cables.
 - Check seal lubrication.
 - Check for proper rotation.
 - Check power supply voltage.
 - Measure motor operating load and no load current.
 - Vibration measurement.
 - After installation and prior to energizing the motor, perform inspections and tests per NETA ATS 7.15.
 - Bump motor to check for correct rotation.
- Conduct initial startup of equipment and perform operation checks.
- Provide Owner with a written certificate that Manufacturer's equipment has been installed properly, has been started up, and is ready for operation by Owner's personnel.

6.11.2.3 PERFORMANCE TESTING:

- Record head (ft) versus flow (gpm) for each pump. Engineer shall compare results against manufacturer's provided performance curve.

6.11.2.4 TRAINING:

- Provide on-site training for Owner's personnel:
 - A minimum of one 4-HR training session
 - To cover non-routine maintenance and operation/routine maintenance, including:
 - Operation, start-up, shut-down, lock-out, emergency operating procedures, control, adjustment, maintenance, assembly, disassembly, and repair of the equipment including control sequences, identification systems, materials, spare parts, special tools, lubricants, and fuels.
 - Technical repair manual.
 - Cleaning.
 - Lubrication of equipment.

- Optimizing equipment and system performance.
- Capabilities of equipment and systems.
- Operational safety of equipment and systems.
- Emergency situation response of equipment and systems.

6.11.2.5 SPARE PARTS:

- One complete set of special tools required for maintenance or dismantling of the units.
- One set of mechanical seals for each pump supplied.

6.11.2.6 MONITORING AND CONTROLS:

- All critical control functions shall be able to be performed locally via hand switches though hardwired controls in the event a PLC, network or I/O device fails. Critical interlocks shall not be bypassed via hand mode operation.
- All unit processes shall have local hand, local automatic (where applicable), and remote hand (through SCADA HMI interface) operation modes.
- Automatic controls shall be native to the unit process facility to the extent possible.
- Automatic control shall have defined automatic fail safe operational modes for all anticipated failure modes including communications loss (remote variable data unavailable), automatic fail over to redundant equipment on fault, emergency power transition automatic restart, etc.

6.12 Solids Dewatering Building (Existing)

- Minimum Dewatering Capacity: 90 GPM of Thickened Waste Activated Sludge
- Approximate Influent TWAS % Solids: 0.5 to 2
- Dewatering Equipment Type: Screw Press
- Number of Dewatering Units: 1, no standby unit required
- Minimum Required Cake Discharge % Solids: 18%
- Acceptable Manufacturer's
 - Huber - ROTAMAT Screw Press RoS 3Q
 - BDP - DSP
 - Schwing
 - Or Approved Equal
- Polymer Feed System with static mixer and injection equipment. Acceptable Manufacturer's:
 - USGI - PolyBlend
 - Fluid Dynamics - dynaBlend
 - VeloDyne - VeloBlend
 - Or Approved Equal
- Dewatered Cake Discharge Conveyor Type: Shaftless Screw. Acceptable Manufacturer's:
 - Spirac
 - JDV Equipment Corporation
 - Custom Conveyor Corporation
- Conveyor to discharge within building to disposal vehicle. Disposal vehicle by others.

6.12.1.1 EQUIPMENT TESTING:

- Demonstrate the functional integrity of the mechanical, electrical, and control interfaces of the equipment or system.
- After the system has been completely installed and wired, the Contractor shall have the manufacturer perform the following, at a minimum:

- Verify alignment.
- Check for proper rotation.
- Check power supply voltage.
- Measure motor operating load and no load current.
- Vibration measurement.
- After installation and prior to energizing the motor, perform inspections and tests per NETA ATS 7.15.
- Bump motor to check for correct rotation.
- Conduct initial startup of equipment and perform operation checks.
- Provide Owner with a written certificate that Manufacturer's equipment has been installed properly, has been started up, and is ready for operation by Owner's personnel.

6.12.1.2 PERFORMANCE TESTING:

- After operational testing and adjusting described above is completed.
- Submit screw press to a performance test to:
 - Performance tests shall commence within two weeks of having the equipment installation complete and ready for startup.
 - Demonstrate each piece of equipment can perform as specified.
 - Owner is responsible for delivering sludge.
 - Run a minimum of three (3) tests
 - Tests will be made in five (5)-hour runs.
 - Days between tests will vary from 1-2 days due to solids production.
 - Tests to be witnessed by Engineer.
 - Tests to be scheduled by Engineer in conjunction with Owner and Manufacturer.
- Collect samples at the following locations:
 - Solids discharge.
 - Filtrate discharge.
 - Feed pipe prior to polymer addition.
 - Samples collected at start and end of each test run and at 45 minute max intervals in between. Sample volume shall be at least 500 ml for each sample taken at the three sample points at each sample time.
 - Each day's samples will be combined for a composite sample for testing.
 - Each day's composite will be split with the OWNER.
 - Test results will be averaged over the test period.
- Suitably label and split samples and deliver promptly OWNER's split sample for his analysis.
- Manufacturer shall have the following tests performed by an independent EPA accredited laboratory to determine solids concentration and suspended solid recovery. Laboratory shall also collect samples:
 - Solids: Total solids.
 - Filtrate: Suspended solids.
 - Solids feed: Suspended solids and volatile solids.
- Computation to determine solids recovery efficiency to be determined from following formula:

$$\% \text{ recovery} = \frac{C(F-E)}{F(C-E)} \times 100$$

Where C = % solids (total solids)
 F = % feed solids (suspended solids)
 E = % centrate solids (suspended solids)
 All values expressed as a decimal

- Design-BUILDER will order and inventory performance polymer. Record polymer usage by weight during each performance run.

- Determine polymer concentrations from weight record.
 - Compute pounds of polymer per dry ton solids.
- Consumed horsepower:
 - Connect recording watt meters by Manufacturer.
 - Watt meters to record watts consumed by unit during each test.
 - Compute consumed horsepower per gpm (hp/gpm) of feed.
- If performance fails to meet the specifications:
 - Manufacturer will be allowed to make corrections and retest as needed for a period of one month.
 - All adjustments and retests to be made within 90 days of first test at Manufacturer's cost.
- After successful completion of acceptance tests, manufacturer shall prepare written report:
 - Summarize details of tests.
 - Provide test results.
 - Compare test results with acceptance criteria.
 - Present data in tabular and graphical form.

6.12.1.3 TRAINING:

- Provide on-site training for Owner's personnel:
 - A minimum of one 8-HR training session
 - To cover non-routine maintenance and operation/routine maintenance, including:
 - Operation, start-up, shut-down, lock-out, emergency operating procedures, control, adjustment, maintenance, assembly, disassembly, and repair of the equipment including control sequences, identification systems, materials, spare parts, special tools, lubricants, and fuels.
 - Technical repair manual.
 - Cleaning.
 - Lubrication of equipment.
 - Optimizing equipment and system performance.
 - Capabilities of equipment and systems.
 - Operational safety of equipment and systems.
 - Emergency situation response of equipment and systems.

6.12.1.4 SPARE PARTS:

- One (1) set of brushes with mounting hardware (clips) - (brushes are wear parts)
- One (1) bearing assembly for shaft
- One (1) solenoid valve 1-inch, 110V, CI.1/ Div.2 for spray bar washing system
- Ten (10) nozzles for spray bar washing system
- One (1) spare part kit for neat polymer pump

6.12.1.5 MONITORING AND CONTROLS:

- All critical control functions shall be able to be performed locally via hand switches though hardwired controls in the event a PLC, network or I/O device fails. Critical interlocks shall not be bypassed via hand mode operation.
- All unit processes shall have local hand, local automatic (where applicable), and remote hand (through SCADA HMI interface) operation modes.
- Automatic controls shall be native to the unit process facility to the extent possible.

- Automatic control shall have defined automatic fail safe operational modes for all anticipated failure modes including communications loss (remote variable data unavailable), automatic fail over to redundant equipment on fault, emergency power transition automatic restart, etc.
- Equipment Interlocks.
- Equipment vendor standard controls.
 - PLC, if any, shall be plant standard PLC manufacturer.

6.13 Office Addition

The proposed office addition shall be constructed within the DAF Building and shall include the following interior spaces (areas listed are intended to be approximate):

- Superintendent's Office – 215 square feet (sf)
- SCADA/Control Room – 275 sf
- Laboratory Room – 275 sf
- Locker Room with restroom facilities – 295 sf
- Janitor's Closet – 64 sf
- Mechanical Room – 165 sf
- Electrical Room – 82 sf
- Break Room – 310 sf
- Temporary Contractor Office/Future Storage Space – 810 sf

6.14 Optional Project Enhancements

6.14.1 Mechanical Screen Prior to 4-Stage MBR Fine Screens

- Minimum Design Criteria
 - Screen to be located in Headworks Building enclosure. Screen to be located upstream of 4-Stage MBR Fine Screens.
 - Screen Type: Bar or perforated
 - Screen Opening: Maximum spacing 1/2"
 - Number of Firm Screens: 1
 - Number of Standby Screens: None
 - Provide discharge chute or sluiceway to direct screenings to washer compactor.
 - Provide dedicated washer/compactor

Additional Screening Requirements

- Peak Screening Capacity per Screen: 7.5 MGD
- All wetted materials shall be of 316 stainless steel. Non-wetted parts may be 304 stainless steel except for those items provided as 316 stainless steel as part of Manufacturer's standard equipment provision.

6.14.1.1 EQUIPMENT TESTING:

- Demonstrate the functional integrity of the mechanical, electrical, and control interfaces of the equipment.
- Conduct initial startup of equipment and perform operation checks.

- Provide Owner with a written certificate that Manufacturer's equipment has been installed properly, has been started up, and is ready for operation by Owner's personnel.

6.14.1.2 PERFORMANCE TESTING:

- None.

6.14.1.3 TRAINING:

- Provide on-site training for Owner's personnel:
 - A minimum of one 4-HR training session
 - To cover non-routine maintenance and operation/routine maintenance, including:
 - Operation, start-up, shut-down, lock-out, emergency operating procedures, control, adjustment, maintenance, assembly, disassembly, and repair of the equipment including control sequences, identification systems, materials, spare parts, special tools, lubricants, and fuels.
 - Technical repair manual.
 - Cleaning.
 - Lubrication of equipment.
 - Optimizing equipment and system performance.
 - Capabilities of equipment and systems.
 - Operational safety of equipment and systems.
 - Emergency situation response of equipment and systems.

6.14.1.4 SPARE PARTS:

- None

6.14.1.5 MONITORING AND CONTROLS:

- All critical control functions shall be able to be performed locally via hand switches though hardwired controls in the event a PLC, network or I/O device fails. Critical interlocks shall not be bypassed via hand mode operation.
- All unit processes shall have local hand, local automatic (where applicable), and remote hand (through SCADA HMI interface) operation modes.
- Automatic controls shall be native to the unit process facility to the extent possible.
- Automatic control shall have defined automatic fail safe operational modes for all anticipated failure modes including communications loss (remote variable data unavailable), automatic fail over to redundant equipment on fault, emergency power transition automatic restart, etc.
- Screen operation based on level differential measured across screen.
- Upstream backup high level switch to initiate continuous run 'storm mode' operation.
- Backup timer to run system at least once per hour if differential level control does not reach its set-point.
- Equipment vendor standard controls.
 - PLC, if any, shall be plant standard PLC manufacturer.
 - Up and down stream differential level transducers.

6.14.2 Package Aeration Blowers with Outdoor Weather/Sounds Enclosure for Aerobic Digestion

- Minimum Design Criteria

- Blowers to be located near converted Aerobic Digesters
- Blower Type: Rotary Lobe or Screw, Positive Displacement
- Minimum Capacity: 2,000 cfm, each
- Minimum Number of Firm Blowers: 2
- Number of Standby Blowers: 1
- Instrumentation: 1 air flow meter per basin. 1 air header pressure sensor per basin.
- Acceptable Manufacturers:
 - Gardner Denver
 - Universal Blower
 - Kaeser
 - Aerzen
 - Robuschi
 - Or Approved Equal

6.14.2.1 EQUIPMENT TESTING:

- Demonstrate the functional integrity of the mechanical, electrical, and control interfaces of the equipment.
- After the blowers have been completely installed and wired, the Contractor shall have the manufacturer perform the following, at a minimum:
 - Verify alignment.
 - Megger stator and power cables.
 - Check lubrication.
 - Check for proper rotation.
 - Check power supply voltage.
 - Measure motor operating load and no load current.
 - Vibration measurement.
 - After installation and prior to energizing the motor, perform inspections and tests per NETA ATS 7.15.
 - Bump motor to check for correct rotation.
- Conduct initial startup of equipment and perform operation checks.
- Provide Owner with a written certificate that Manufacturer's equipment has been installed properly, has been started up, and is ready for operation by Owner's personnel.

6.14.2.2 PERFORMANCE TESTING:

- Run blower to establish mechanical integrity.
- Run blower for 30 minutes
 - Record pressure (psi) versus air flow (cfm) for each blower. Engineer shall compare results against manufacturer's provided performance curve.

6.14.2.3 TRAINING:

- Provide on-site training for Owner's personnel:
 - A minimum of one 4-HR training session
 - To cover non-routine maintenance and operation/routine maintenance, including:
 - Operation, start-up, shut-down, lock-out, emergency operating procedures, control, adjustment, maintenance, assembly, disassembly, and repair of the equipment including control sequences, identification systems, materials, spare parts, special tools, lubricants, and fuels.
 - Technical repair manual.
 - Cleaning.

- Lubrication of equipment.
- Optimizing equipment and system performance.
- Capabilities of equipment and systems.
- Operational safety of equipment and systems.
- Emergency situation response of equipment and systems.

6.14.2.4 SPARE PARTS:

- One (1) spare belt assembly

6.14.2.5 MONITORING AND CONTROLS:

- All critical control functions shall be able to be performed locally via hand switches though hardwired controls in the event a PLC, network or I/O device fails. Critical interlocks shall not be bypassed via hand mode operation.
- All unit processes shall have local hand, local automatic (where applicable), and remote hand (through SCADA HMI interface) operation modes.
- Automatic controls shall be native to the unit process facility to the extent possible.
- One blower is standby at all times (hardwired interlocked).
- Air Control valve interlocks as applicable.

6.14.3 Water Reclaim Basin (Modified Trickling Filter Basins #4):

6.14.3.1 MINIMUM DESIGN CRITERIA:

Water Reclaim Basins (Modified Trickling Filter Basins #4)

- Remove trickling filter equipment and media
- Make necessary piping and structure modifications for conversion to water reclaim basin
- Make necessary piping modifications for connection to Modified Trickling Filter Basin #3. Include basin isolation valves.
- Apply a permanent interior liner or coating to the basin to make the basin watertight. Test the basin after installation in accordance with ACI 350.1. Performance of the completed basin shall be equal to the requirements in ACI 350.1 Section 2.1 for containment structures with monolithically placed floors designed to be shrinkage crack free.

7 Discipline Design Criteria

7.1 Civil/Site

7.1.1 Civil/ Site Design

The site/civil elements shall be designed to adequately support the proposed improvements. Design shall be consistent with the standard of care for professional services and shall comply with national codes, building construction codes and life safety codes where applicable.

The site shall be graded to follow existing ground contours as much as practical to minimize earthwork and off-site borrow or wasting. Fill material may be required to elevate the site to provide positive drainage away from the structures. Fill material can be provided from excavation of the new facilities. Additional suitable fill material shall be furnished by design-builder from Owner approved locations on or off the project site. Final grading of the site shall have positive drainage of all surfaces, with no ponding or flat areas that retain water. Roof and paved surface drainage shall be conveyed away from structures, and away from or underneath roads, and walkways. Areas requiring mowing or maintenance shall have a slope no steeper than 4H:1V.

Site grading will not be required to detain stormwater for flood control purposes. Site construction shall meet stormwater quality requirements in accordance with City's Post Construction BMP Manual: <http://www.haysusa.com/html/stormwater.html>.

7.1.2 Asphaltic Pavement and Gravel Access Roads

Site improvements will include the repaving of Military Reservation Road from Old 40 Highway Bypass to the new main plant entrance. The approximate location of the new main plant entrance is shown in Figure 3-1. Site improvements will also include a new paved parking area around the Office Building and new gravel access roads within the plant.

Asphaltic pavement and gravel access roads shall be in conformance with The City of Hays Standard Details and Specifications.

7.1.3 Site Fencing

A new sliding cantilever gate with an electric gate operator shall be provided at the new main plant entrance and fence shall be provided around the perimeter of any expanded portions of the WWTP site. The following are the minimum requirements for the sliding cantilever gate, electric gate operator and site fencing:

- Chain link fencing to match existing, with three-strand, barbed wire extension
- Acceptable Manufacturers:
 - Fence Systems
 - Cyclone
 - Page-Wilson Corporation (Page Fence Division)
 - Anchor Fence, Inc.
 - Or approved Equal

- Electric Gate Operators
 - Richards – Wilcox
 - Robot Industries, Inc.
 - Electric Operators
 - Or approved Equal
- Sliding Cantilever Gate
 - ASTM F1184, Type II Cantilever Slide Gates, Class 2 (Internal Roller)
 - Complete with sensors and safety interlocks for a fully functional system

7.1.4 Geotechnical Design and Testing

Plan, develop, perform, and record results of a testing program to demonstrate performance of earthwork compaction and placement. Compacted soil density and related testing shall be required for all subgrades and bearing surfaces, trenching and structure backfill, structural fill, embankments, and site fill. Establish required soil density, moisture, and earthwork performance requirements to meet the structural design requirements and to achieve long-term settlement of no more than 1.50 IN total for structures, 0.75 IN differential for structures, 2.00 IN for pavement and curbs, and 0.50 for buried piping. All gravel and sand materials furnished for use on the project shall be tested for gradation and conformance to KDOT Standard Specification Section 1100 and the design requirements. Furnish testing services performed by a qualified geotechnical testing laboratory, overseen and sealed by a geotechnical engineer registered as a Professional Engineer in Kansas.

7.2 Architectural

7.2.1 Design

Fire protection, life safety, and accessibility shall conform to the Codes and Standards. Occupancy, construction type, use group, allowable area and height, fire resistive requirements, egress requirements, and accessibility shall be calculated and listed on the plans for all structures that are enclosed or occupied, including existing structures that are to be modified by this project.

7.2.2 Wall and Framing Systems

Precast concrete or masonry exterior wall systems shall be used for walls of new buildings and occupied structures. All new building walls shall use the same exterior wall finish with a consistent appearance. New or modified walls for existing buildings shall match the remaining structure in materials and appearance, but shall be designed according to the Codes and Standards.

7.2.2.1 EXTERIOR WALL SYSTEM, PRECAST CONCRETE

- Precast concrete walls shall be a composite wall system consisting of insulated precast concrete wall panels with an architectural finish on the exterior. The interior finish shall also be an architectural finish if exposed.

7.2.2.2 EXTERIOR WALL SYSTEM, MASONRY

- Masonry wall systems shall consist of standard brick or textured, colored concrete masonry unit veneer over rigid insulation and vapor barrier applied to load bearing masonry block

(CMU). The system of veneer, vapor barrier, insulation, flashing, and CMU backup shall perform as a waterproof, vented cavity wall.

- Wall systems for buildings that contain only IBC Group B occupancies shall have brick or CMU veneer but may have CMU or metal stud backup.

7.2.2.3 WALL AND FRAMING SYSTEMS – PROHIBITED

- Metal wall finishes and pre-engineered metal building systems shall not be used.
- Wood framing systems shall not be used.

7.2.2.4 ROOF FRAMING SYSTEMS

- Process areas with process piping, tanks, or water channels shall have cast-in-place or precast concrete roof framing systems.
- Dry process areas without process piping (such as blower or electrical rooms) may have painted metal roof framing systems meeting Building Code requirements.
- Buildings that contain only IBC Group B occupancies may have metal roof framing systems with architectural ceiling finishes.
- Wood roof framing systems shall not be used.

7.2.3 General Requirements

7.2.3.1 ROOFING AND INSULATION

- Roofing systems shall be provided for the performance characteristics of long term durability, low maintenance, constructability, sustainability and the greatest value. Roofing systems performance shall be no less that that provided by the following system:
 - EPDM, fully adhered 60 mil thickness.
 - Roof insulation shall be a combination of flat and tapered polyisocyanate rigid insulation creating a slope of ¼ inch per foot. Any necessity for bypassing equipment or counter-sloping with be developed with ½ inch per foot tapered insulation.

7.2.3.2 DOORS, WINDOWS, GLASS, AND HARDWARE

- Exterior and interior doors on all buildings shall be insulated anodized aluminum with fiberglass reinforced plastic face sheets colored to match the aluminum surfaces of the door.
- Where safety and/or visibility is required, the doors shall have vision lites of up to 100 square inches.
 - Exterior doors shall be insulated.
 - Overhead doors shall be insulated coiling aluminum with factory finish.
 - Glazed openings shall be provided with 1 inch thick insulated glazing units with Low-E soft coating.
- Door Hardware: Type 630 stainless steel hardware, including lever handle, heavy-duty mortise locks matching existing cylinder and keying, heavy-duty, stainless steel, mortise hinges, overhead closers and where required, heavy-duty overhead stops. Accessories shall include stainless steel kickplates, continuous replaceable weather-stripping, door sweep, and aluminum thresholds. Doors shall be keyed into a consistetn plant-wide system.
- Louvers: Rain proof and drainable 4 IN deep anodized aluminum
- Windows and frames: Insulated glass in anodized aluminum frames.

7.2.3.3 INTERIOR WALL SYSTEMS

- Interior walls for process areas shall be concrete masonry or cast in place concrete.
- Interior walls for finished, non-process occupancies shall be materials permitted by the IBC.

7.2.3.4 RAILINGS

- Interior and exterior locations shall be welded or mechanically joined aluminum systems with mill finish, except as noted below:
 - Exterior areas exposed to view shall receive an anodized finish.
 - Fiberglass reinforced plastic (FRP) shall be used in process areas with exposure to chemicals that could reduce the performance of aluminum if spilled.
- All railings shall be designed in accordance with 2006 IBC, Sections 1012 Handrails and 1013 Guards.

7.2.3.5 SIGNAGE

- Furnish building identification signage and room identification signs.
- Furnish identification devices including pipe and equipment identification and safety signs.

7.2.4 Process Building and Area Requirements

7.2.4.1 PROCESS AREAS

Process buildings and process areas in new or existing buildings shall be designed with special attention to durability and corrosion resistance of materials and optimum layout to accommodate the equipment, piping and process for which they are designed. Process areas shall include all areas defined as Non-Architecturally Finished Areas.

7.2.4.2 INTERIOR FINISHES FOR PROCESS AREAS:

- Concrete floors:
 - Clear sealer.
 - High performance industrial coatings where spilled chemicals may come in contact with concrete.
 - High performance industrial coatings with nonp-slip grit where spilled chemicals such as polymer may create slippery surfaces.
- Walls and Ceilings:
 - All paint shall be High Performance Industrial Coatings.
 - Pipes to be color coded per the plant's standard.
 - Plastic piping shall not be painted and shall have vinyl self adhesive tape identification.
 - Interior concrete masonry walls shall be left unpainted.
 - Miscellaneous ferrous metals in corrosive atmospheres: Epoxy primer with epoxy or urethane top coats.
 - Walls shall be concrete, or shall be painted with high performance industrial coatings.
 - Ceilings shall be precast concrete, or shall be painted with high performance industrial coatings.
 - Existing ceilings in process areas shall be prepared and repainted with high performance industrial coatings.

7.2.5 Landscape

All open areas disturbed during construction shall be seeded with an appropriate blend of grass species.

7.3 Structural

7.3.1 Loads

The following project-specific loads shall be used in addition to the loads generally defined in the Design Codes and Standards. Where conflicts exist between the Building Code and this document, the more stringent requirements shall apply. Structures for this project shall be classified in accordance with IBC table 1604.5 as Occupancy Category III (wastewater treatment plants). Design loads shall be presented on the drawings as required by the Building Code.

7.3.1.1 DEAD LOAD

Dead load shall be the weight of materials of construction incorporated into the structure, including but not limited to walls, floors, ceilings, stairways, built-in partitions, finishes, cladding and other similarly incorporated architectural and structural items.

7.3.1.2 LIVE LOAD

1. Floor uniform live loads shall be in accordance with the building code but not less than 100 PSF. Live loads shall be increased where necessary for the use of the structure.

Ground Level:	150 psf
Basement Level:	300 psf
Process Areas and Electrical Rooms:	200 psf
Water containing structures:	300 psf min or Water Load
Stairs and Landings:	100 psf
Equipment Platforms and Walkways:	100 psf

2. Piping: Smaller pipes less than 10 IN in diameter shall be accounted for in a uniform piping load that shall be no less than 10 psf. Pipe support reactions for pipes 10 IN and larger, pipe racks, valves, and fittings that produce heavier concentrated loads at pipe supports shall be calculated and structural members shall be designed for the appropriate loads.
3. Equipment: Localized areas of the structure shall be designed to provide support for larger pieces of equipment in addition to the other uniform loads when the average distributed equipment load is greater than the design live load. Actual size and weight of equipment supplied shall be used in structural design. The weights of small equipment units may be included as part of the design live load if the equipment plus equipment pad weight is less than the design live load. Include equipment pad weights with the equipment weight. Dynamic loads shall be included when appropriate.
4. Fluid Loads:
 - o Lateral and vertical loads from fluid applied loads shall be considered in design of tanks and basins. The specific gravity of the fluid shall be taken as 1.0 for wastewater, mixed liquor, and sludge. The design high water level elevation shall be in accordance with the hydraulic profile of the facility. In addition, a maximum possible water level elevation equal to the top of the containment walls shall be considered in design.
 - o Structural design for lateral groundwater pressure shall be based on a water level equal to the 100-YR flood level outside the levee

- Pressure relief valves with granular base material and filter fabric may be used to prevent uplift forces in basins below water level.
 - Smaller structures with bases below the design groundwater level shall be designed to resist uplift with a minimum factor of safety against uplift of 1.25. Loads used to resist uplift include the permanent weights of the structure and soil on the structure, but shall not include water in the structure. Soil resting directly above the footing projection may be included in the resisting weights, provided that the volume of displaced fluid includes the volume of soil on the footing lip below the water level.
5. Snow Load (ASCE 7-05):
- Ground Snow Load, $P_g = 20$ psf (IBC Figure 1608.2)
 - Exposure Factor, $C_e = 1.0$ (Based on Table 7-2, Exposure Category C, Partially Exposed)
 - Thermal Factor, $C_t = 1.0$ (Based on Table 7-3)
 - Importance Factor, $I_s = 1.1$ (Based on Table 7-4)
 - Other additional snow load conditions shall be applied as required by the Building Code. These may include ponding instability, partial loading, unbalanced snow loading, drifting snow, roof projections, sliding snow and ice dams along eaves. In no case shall the design roof load be less than the required roof live load.
6. Roof Live Load: A minimum roof live load of 20 psf shall be used. No reductions shall be used for tributary area or roof slope.
7. Wind Load (ASCE 7-05):
- Basic Wind Speed (3-Second Gust), $V_{3s} = 90$ mph.
 - Exposure Category C
 - Importance Factor, I_w is 1.15
 - The simplified provisions for low-rise buildings (per IBC) may be used when allowed by code. ASCE 7-05 shall be used to compute wind loads for structures not specifically addressed by the IBC.
8. Seismic Load (ASCE 7-05):
- Seismic Load (ASCE 7-05)
 - Spectral response accelerations shall be determined and shown on the Structural General Notes drawing.
 - Site Class as identified by geotechnical investigation.
 - Seismic design category and Importance Factor, $I_E = 1.25$ in accordance with ASCE 7-05 Chapter 11.
9. Soil Load: Soil design data shall be obtained from the Geotechnical Investigation commissioned for the WWTP site.
- Lateral Pressure: Lateral pressure based upon the at-rest condition shall be used for tank structures to minimize wall movement and the potential cracks.
 - A surcharge of 250 psf or a produced by an HS-20 wheel load shall be included in the design lateral pressure for buried walls of basements, tanks, and vaults.
10. Load Combinations:
- Load combinations from Codes and Standards shall be used in design.
 - Serviceability factors (per ACI 350) shall be included with all water bearing structures. Water bearing structures shall be checked for the following load combinations as described in ACI 350.4R.:
 - Full water level without serviceability factors.
 - Normal water level with serviceability factors.

- Empty inside with soil and design groundwater outside.
- Filled inside without soil or groundwater outside.
- Construction load cases shall be checked where appropriate. These may include the following:
 - Tank or basement walls that may be backfilled prior to constructing the roof slab.
 - Heavier soil loads or patterned soil loads on the roofs of below grade tanks and structures.

7.3.2 Foundations

Unless otherwise recommended by the final Geotechnical Report, the design at the new WWTP shall be based on the following criteria:

- Structures with very low net bearing pressures such as deep basins or wet wells, where the depth of the structure results offsets the weight, shall have a mat foundation bearing on soil. If unsuitable material is found under deep structures, it shall be removed and replaced with compacted structural fill.
- Process buildings and other significant structures shall be supported on spread footings or mat foundations.
- Geotechnical recommendations for control of volume change in soil materials below floors and slabs on grade shall be implemented in the design..

7.3.3 Building Structural Systems

7.3.3.1 BUILDINGS

See Architectural Design Requirements for building wall and roof framing systems.

7.3.3.2 BASINS, VAULTS, PUMP STATIONS, AND WATER CONTROL STRUCTURES

Basins and water control structures shall be constructed using reinforced cast in place concrete. Concrete finishes shall be determined by the end use of each structure. Exterior finishes shall be consistent for all structures.

7.3.3.3 PRECAST CONCRETE MANHOLES, VAULTS, AND WATER CONTAINING STRUCTURES

Precast buried structures shall be designed and constructed in accordance with applicable Codes and Standards. Interior horizontal dimensions of rectangular precast structures shall not exceed 6 FT.

7.3.4 Materials

7.3.4.1 STRUCTURAL MATERIALS

1. General Use Concrete:
 - Minimum 28-day compressive strength, $f'c = 4000$ psi
 - Maximum $w/c = 0.42$
 - Portland cement shall meet requirements for Type II. Fly ash or ground slag may be incorporated in concrete mix designs.
 - Suitable for concrete exposed to freeze / thaw in moist condition
 - Suitable for concrete subjected to moderate sulfate exposure.
2. Precast Concrete
 - Minimum 28-day compressive strength, $f'c = 5000$ psi
 - Maximum $w/c = 0.45$

3. Fill concrete (with Type II Cement)
 - Minimum 28-day compressive strength, $f'c = 3000$ psi
 - Maximum $w/c = 0.45$
4. Concrete Topping
 - Minimum 28-day compressive strength, $f'c = 4000$ psi
 - Maximum $w/c = 0.45$
 - Modify maximum aggregate size to accommodate topping thickness.
 - Include polypropylene fibers
5. Concrete Aggregate
 - Aggregates for concrete shall conform with requirements of KDOT Standard Specification Section 1101 and 1102 designated (AE)(SA), structural concrete with select coarse aggregate for wear and absorption.
 - Furnish aggregate qualified on the current KDOT List of Non-Reactive Siliceous Aggregate Sources for Concrete (Wetting & Drying List). Provide certification for all aggregate. Minimum 28-day compressive strength, $f'c = 4000$ psi
6. Reinforcing Steel
 - ASTM A516 Grade 60
 - Minimum yield strength, $f_y = 60,000$ psi
7. Masonry
 - $f'm = 1500$ psi, normal weight block with integral water repellent admixture for exterior masonry walls.
 - All exterior masonry wall mortar shall have integral water repellent admixture.
 - Control joints at 20 FT, or conforming to building layout.
8. Steel
 - The following materials shall be used as the default steel in the specifications. Other grades of steel may be used under certain conditions. However, these different grades of steel need to be specified and the specific locations must be indicated on the Drawings.
 - W and WT shapes: ASTM A992 (Grade 50)
 - Other shapes and plates: ASTM A36 ($F_y = 36$ ksi)
 - Pipes: ASTM A53 Grade B ($F_y = 35$ ksi)
 - Hollow struct. sections (Rect.): ASTM A500, Grade B ($F_y = 46$ psi)
 - High strength bolts: ASTM A325
 - Anchor bolts: Type 304 or 316 Stainless Steel.
 - Stainless steel: Type 304 or 316 Stainless Steel.
9. Aluminum
 - The following materials shall be used as the default aluminum material in the specifications. Other alloys may be used under certain conditions. However, these different alloys need to be specified and the specific locations must be indicated on the Drawings.
 - Alloy 6061-T6, $f_y = 32,000$ psi
10. Bolts: ASTM F467 and F468, Alloy 2024 T4
11. Welds: AWS D1.2 filler alloy 4043 or 5356

7.3.4.2 STRUCTURAL MATERIAL REQUIREMENTS:

1. Stairs, landings, and platforms (interior and exterior):
 - Concrete, or

- Aluminum structure with aluminum grating or aluminum checker plate treads and landings.
- 2. Ladders:
 - Aluminum.
 - Stairs are preferred over ladders at all locations where practical. Alternating tread stairs may be used for locations with limited space. When used, alternating tread stairs shall be aluminum.
- 3. Channel grating:
 - Aluminum bar grating.
 - Aluminum plank.
 - Fiberglass grating may be used for interior grating.
- 4. Welded aluminum guardrail and handrail systems in all areas:
 - Mill finish aluminum, 2-rail pipe with kickplate where required.
- 5. Submerged supports and components (excluding weirs and clarifier mechanisms):
 - Stainless steel.
 - Weirs shall be aluminum, stainless steel, or fiberglass.
- 6. Floor doors and access hatches:
 - Aluminum with stainless steel hardware.
- 7. Anchors (wet or damp areas, and all exterior anchors):
 - Stainless steel.

7.3.5 Construction Observation, Testing, and Special Inspection

7.3.5.1 GENERAL

Construction observation, testing and special inspection is required by the Building Code for portions of this project. Design –Builder’s design professional shall prepare a Statement of Special Inspections in accordance with IBC section 1705 if required by Owner.

7.3.5.2 TESTING

Furnish testing services as required for Special Inspections, whether or not Special Inspection reports are required by Owner’s Planning and Development Department. Furnish, for all structural work and all site and process concrete work, testing services of the type and frequency required for Special Inspections. Submit testing reports weekly. Testing services shall be performed by qualified testing laboratories and paid for by the Contractor.

7.3.5.3 SPECIAL INSPECTIONS

1. Soils:
 - Special Inspection per IBC 1704.7 shall be required to verify the allowable soil bearing pressure, compaction densities, materials and conformance to the project specifications. Testing shall be performed by an independent Geotechnical Engineering testing firm. Submit testing reports sealed by a Kansas Professional Engineer
2. Concrete:
 - Special Inspection per IBC Table 1704.4 shall be required. Inspection is required for material verification, reinforcing steel, embedded bolts, and concrete placement and curing. Testing is required for materials, including concrete as placed. Sampling and

testing shall be performed by an independent laboratory. Submit testing reports sealed by a Kansas Professional Engineer

3. Steel:

- Special Inspection per IBC Table 1704.3 shall be required for material verification and inspection of bolting.

7.4 Mechanical

Process piping shall conform to the following requirements:

- Exposed piping up to 3"
 - Pipe: Schedule 80 PVC
 - Joints/Fittings: Solvent welded
- Buried piping up to 3"
 - Pipe: PVC, CL 200 (SDR 21)
 - Joints/Fittings: Restrained
- Exposed piping 4" to 48"
 - Pipe: Ductile Iron, Class 53, restrained
 - Lining: Cement for submerged service, Protecto 401 or Sewpercoat for corrosion service
 - Fittings: Ductile Iron, AWWA/ANSI C110/A21.10, flanged or grooved
 - Joints: Ductile Iron, AWWA/ANSI C115/A21.15, flanged joints with flanges at valves and penetrations
- Buried piping 4" to 48"
 - Pipe: Ductile Iron, Minimum Pressure Class 150, restrained
 - Lining: Cement for submerged service, Protecto 401 or Sewpercoat for corrosion service
 - Fittings:
 - Ductile Iron, AWWA/ANSI C110/A21.10, Ductile Iron
 - Ductile Iron, AWWA/ANSI C153/A21.53, Ductile Iron compact fittings for sizes up to 24"
 - Joints: Ductile Iron restrained

7.5 HVAC & Plumbing

7.5.1 Introduction

This chapter addresses key design standards applicable to the heating, ventilating, and air conditioning (HVAC) design and construction for the Hays Waste Water Treatment Plant Improvement Project. In the following sections, the HVAC improvements are discussed. Each building (new and existing will be addressed to outline the design requirements for each.

7.5.2 Objective and Purpose

HVAC systems in wastewater treatment have multiple purposes. The systems provide fresh air to maintain an environment that is safe for plant operations. In addition, ventilation systems provide sufficient air flows that help reduce corrosion by minimizing the creation of humid conditions in plant interior spaces. Furthermore, the spaces must achieve ventilation rates that meet the National Fire Protection Association's 820 standard

7.5.3 General Requirements

- Elevation – 1,998 feet above sea level.

- Summer ambient maximum design condition – 100.4⁰F dry bulb, 75 ⁰F wet bulb. According to ASHRAE the outside ambient condition will be this value or less 99.6 percent of the time during the warm season.
- Winter ambient minimum design condition – 2.6⁰F. According to ASHRAE the outside ambient condition will be this value or greater 99.6 percent of the time during the cold season.
- Outside ventilation will meet the requirements of NFPA 820 and or ANSI/ASHRAE Standard 62.1.
- Ductwork in Process Areas and Chemical Areas will be aluminum.
- Foul Air Ductwork will be FRP.

7.5.4 Heating Ventilation and Air Conditioning

The following section discusses the HVAC systems for each of the spaces to be modified in this project as well as new spaces.

7.5.4.1 INFLUENT PUMPING STATION

The influent pumping station will be a new structure that houses a open pumping system and enclosed valve vault . The vault will be ventilated at 6 continuous air changes per hour or 30 hours intermitant. to maintain a class I division 2 group D rating for the entire enclosed area. This will be accomplished by an electric heated make up air unit and exhaust fan configured in a push pull configuration.

7.5.4.2 HEADWORKS

The Headworks building will be a new structure that houses the screening, grit removal and a dumpster. This building will be a two story masonry structure with a slab on grade floor. The room will be ventilated at 12 air changes per hour (with the exception of any separated dedicated electrical rooms) to maintain a Class 1, Division 2, Group D classification. The supply and exhaust systems will be balanced to maintain a negative pressurization in the Headworks area. This will be accomplished by an electric heated make up air unit and exhaust fan configured in a push pull configuration.

7.5.4.3 RAS/WAS PUMPING STATION

The RAS/WAS pumping station is a masonry building that was constructed in 1992. The building is served by an electric heated make up air unit and a centrifugal exhaust fan. Both pieces of equipment are located outside on grade. Both pieces of equipment are in average to poor condition and are at the end of their useful lives. The new equipment will ventilate the space at 6 air changes per hour to maintain an Unclassified classification of the area.

7.5.4.4 BLOWER BUILDING

The blower building is an existing single story masonry building constructed in 1992. No mechanical work is anticipated in this building.

7.5.4.5 MBR (MEMBRANE BIO REACTOR) STRUCTURE

A new 5,000 SF structure will be constructed over the MBR's. This structure will provide the dual purpose of protecting MBR's from environmental hazards and house the valves and piping associated with the process. The structure, if enclosed will be ventilated at 12 air changes per hour to maintain a Class 1, Division 2, Group D classification. This does not include dedicated separated electrical rooms. This will be accomplished by an electric heated make up air unit and exhaust fan configured in a push pull configuration.

7.5.4.6 TERTIARY FILTER BUILDING

The Tertiary filter building is part of a larger building that houses the filter, Hypochlorite Storage and Feed room and Operations and Maintenance buildings as well. The building is a single story masonry building. Currently there are gas fired unit heaters providing supplemental heat to the space and wall mounted louvers for ventilation. The building is unclassified per NFPA 820.

7.5.4.7 HYPOCHLORITE STORAGE AND FEED ROOM

The Hypochlorite Storage and Feed room is part of a larger building that houses the tertiary filter, and operations and maintenance building as well. The building is a single story masonry building. The building heating is accomplished by a small electric make up air unit and exhaust louvers. There is also an exhaust fan with registers at floor level and at ceiling that exhaust the area at no less than 1 CFM per square foot per NFPA 400. The area shall be unclassified per NFPA 820. No Mechanical work is anticipated in this space as part of the project.

7.5.4.8 OPERATIONS/MAINTENANCE BUILDING

The Operations and maintenance building is part of a larger building that houses the tertiary filter and Hypochlorite Storage and Feed Room as well. The building is a single story masonry building constructed in 1992 and houses a variety of equipment. The building is served by a large make up air unit. The use of this building will change into a variety of uses including multiple offices, meeting/conference room, break room, SCADA control room, Mechanical and Electrical rooms, a lab and restrooms and a locker room. New HVAC systems will be installed for all areas to provide adequate heating and cooling for each space. The systems will include:

- Offices: DX cooling gas heating unit with ventilation air
- Meeting/conference room: DX cooling gas heating unit with ventilation air.
- Break Room: DX cooling gas heating unit with ventilation air.
- SCADA Control room: dedicated DX cooling unit.
- Mechanical room: Gas unit heater and ventilation.
- Electrical room: DX cooling, heating, PPU and ventilation.
- Lab: DX cooling, dehumidification and gas heating.
- Restrooms and locker rooms: DX cooling, gas heating and exhaust ventilation.

7.5.4.9 UV DISINFECTION

The type of UV disinfection has yet to be determined. Currently, open channel and in pipe systems are both being considered. The open channel system will likely not be an enclosed structure and will require no HVAC work. If an in pipe system is chosen it will be housed in a vault or small structure. If that is the case gas unit heaters will provide heating and will be ventilated for cooling and occupancy. There are no ventilation requirements to meet to allow the room to be Unclassified per NFPA 820.

7.5.4.10 BIOSOLIDS DEWATERING BUILDING

The biosolids dewatering building is a prefabricated metal building that was constructed sometime after 1992. It houses the current dewatering equipment. That is being upgraded to new equipment. With the new equipment, a new make up air unit and exhaust fan configured in a push pull configuration would be installed. The new exhaust fan would be installed on the existing roof and the new make up air unit would be installed on grade. The units would be sized to provide a minimum of 6 air changes per hour to maintain an Unclassified rating per NFPA 820.

7.5.5 Plumbing Systems

7.5.5.1 PIPE MATERIALS

- Copper type L pipe will be used for both potable hot and cold water.
- Potable hot and cold water lines will be insulated.
- Sanitary drainage and Process drain piping will be cast iron soil pipe.
- Flat roof rain leaders and secondary rain leaders inside buildings will be cast iron soil pipe. Horizontal runs at the ceiling will be insulated.
- Roof gutters and down spouts for sloped roofs will be outside the structure. See Chapter 12 for a description.

7.6 Electrical

- Provide short circuit, overcurrent coordination and arc flash studies.
 - AIC ratings sized per study
 - Arc flash labels as needed per studies.
- Demolish and remove damaged and non-code compliant equipment.
- Provide training for all new equipment.
- Installation shall meet all applicable NFPA codes including area classification requirements, working clearance spacing, etc.

7.6.1 Exterior Power Distribution

- New plant utility service drop with pad mounted three-phase utility transformer.
- New service entrance rated plant electrical distribution equipment.
- Remove and replace as needed all damaged and code violating electrical distribution equipment.
- Distribution circuits shall be routed underground in ductbanks.
- Digital power monitoring to be provided at main distribution panel.
- Lightning arrestors and transient voltage surge suppressor shall be provided at all distribution panels connected to exterior circuits.
- Ductbanks:
 - Concrete encased under roadways, drive surfaces and locations with expected vehicular traffic.
 - Reinforced concrete encased ductbank within 10ft of structure foundations. Reinforcement shall be tied to building or structure reinforcement.
 - Direct buried schedule 80 PVC or HDPE conduit where single circuits are routed alone or via directional bore.
 - Electrical power circuits shall be routed through manholes or handholes as necessary for bending and pull length requirements. Handholes or manholes shall allow conduits to drain freely. Conduits shall not turn up into the bottom of the handhole or manhole unless the other end drains freely. Drain holes shall not be drilled into direct buried conduits.
 - 20% spare conduits shall be provided in each ductbank and from each building main distribution center to a handhole, manhole or pull box on the exterior of the building.
- All cables in ductbanks shall be XHHW-2 600V rated insulation.
- Provide local disconnect safety switch for each field device.

7.6.2 Interior Power Distribution

- Remove and replace as needed all damaged and code violating electrical distribution equipment.
- Design electrical systems in compliance with NFPA 820 standard.
- Circuits shall be routed in conduit where possible.
 - Cable tray is acceptable in clean, environmentally controlled rooms.
- Conduits shall be installed exposed where possible.
- Exposed conduits shall be threaded rigid galvanized steel, rigid aluminum, PVC coated rigid galvanized steel, or stainless steel (no EMT, IMC, PVC, Fiberglass, and HDPE conduit or set-screw coupled conduit).
- Intra-building wiring shall be THHN 600V rated insulated.
- Provide local disconnect safety switch for each field device.

7.6.3 Distribution Panels

- Switchgear, switchboard, panel board and MCC acceptable manufacturers:
 - Allen-Bradley.
 - Eaton.
 - General Electric Company.
 - Square D Company.
 - Siemens.
 - Or Approved Equal
- Provide harmonic analysis study and provide active or passive filters as necessary meet IEEE 519 standard at each building or facility main distribution panel.
- Transient voltage surge suppressors shall be provided at all distribution panels.
- To the extent practical, overcurrent protection shall be circuit breaker type.
- Provide at least 2 spare circuit breakers in each distribution panel.
- Distribution panels are to be sized with 20% spare capacity.
- All distribution panel main breakers shall be 100% rated.
- Motor loads 7 1/2hp and larger shall be provided with VFD or RVSS starters.

7.6.4 Backup Power Generation

- Upgrade existing back up power generating equipment to expand the generation capacity to provide back up power for the upgraded plant. The new system shall be sized to carry all peak flow electrical loads with worst case heating or cooling loads, plus 20%.
 - Solids dewatering unit process loads are not required to be included in the maximum power usage calculation. Dewatering building lighting, control and HVAC loads are still required to have backup power.
 - The backup power generation system shall have onsite fuel storage capacity for 24hr continuous operation at the peak load factor.
 - The existing Kohler 750kW diesel generator may be paralleled with a new generator to achieve the total backup generation capacity as required.
 - Existing generator alternator winding pitch must be matched.
- Alternative 1:
 - Minimum total back up power generation capacity 1500kW
- Alternative 2:
 - Minimum total back up power generation capacity 1750kW

- Acceptable manufacturers:
 - Caterpillar.
 - Cummins Onan.
 - Kohler.
 - Generac.
 - MTU.
- Provide new automatic transfer function as appropriate for the equipment provided.

7.6.5 Grounding and Lighting Protection

- Ground fields of three ¾" diameter by 10ft long copper clad ground rods connected by 4/0 copper wire shall be provided for each structure. Connect to exterior underground metallic piping and structural steel.
- Lightning protection shall be provided as required by NFPA 720.
 - Design shall be provided with UL Master Label Certificate.

7.6.6 VFDs (Variable Frequency Drives)

- Acceptable manufacturers:
 - ABB
 - Robicon
- Provide VFDs 50HP and over in separate cabinets and not part of an MCC linup.
- Provide harmonics analysis study and provide passive filters as necessary.

7.6.7 Site lighting

- Replace all damaged and non-code compliant exterior lighting
- Minimum 5FC and 15:1 max to min ratio for all drive and parking surfaces
- Minimum 5FC for all elevated security areas.
- Minimum 1FC for all monitored process areas (basins, open channels, etc.).
- Minimum 0.5FC for all egress paths.
- Metal pole on concrete pedestal mounting for area lighting.
- Building mounted egress lighting above all access doors.
- All lighting to be LED type.
- Match color temperature of all exterior luminaires.
- Flood lighting not acceptable, provide all exterior lighting with full cut-off optics.
- Acceptable manufacturers:
 - Cree
 - Holophane
 - RAB
 - Or Approved Equal
- Photocell controlled

7.6.8 Interior lighting

- Average 30FC with minimum 4 max to min ratio for all process, electrical, mechanical and office areas.
- Average 10FC for all stairwells and hallways.
- Average 1FC for all egress paths.
- All normal lighting to be LED type.
- Emergency lighting UPS (90min) for egress paths and critical use areas.

- Provide with either occupancy sensor, scheduled on/off timer, dimmer or manual dual level control for each lighting zone. Photocell “daylight harvesting” control for areas with skylighting.
- Match color temperature of all lamps in the same room.
- Acceptable manufacturers:
 - Holophane
 - Hubble
 - Lithonia
 - Or Approved Equal
- Fixture shall be manufactured and listed for use in the environment to be installed.

7.7 Instrumentation and Controls

7.7.1 SCADA (supervisory control and data acquisition) system

- Provide all SCADA system components under one supplier/installer (integrator).
- Integrator shall have minimum 5 year experience with similarly sized projects.
 - Acceptable integrators:
 - Durkin Inc.
 - Empire Electric
 - Integrated Controls
 - Microcomm
 - Pedrotti Co.
 - SCI Automation
 - Or Approved Equal
- All indication lights and HMI symbols shall use the following conventions:
 - Red for stopped or closed.
 - Green for running or open.
 - Amber for fault, fail, and not in automatic mode.
 - White for control power on.
 - Gray for not in service (HMI only)
- Utilize the minimum number of communications protocols necessary.
- Acceptable communications protocol:
 - Ethernet IP
 - Modbus
 - DeviceNet
- To the extent possible, the SCADA network shall be physically isolated from all other networks; including administration, Internet and surveillance networks.
- SCADA network shall be arranged in a ring configuration with managed network switches.
- HMIs shall be run on PC based hardware platforms running client versions of the HMI software from redundant central SCADA/HMI servers.
- Provide dedicated Historian Workstation running compatible historian software. Acceptable manufacturers:
 - GE Historian
- All critical control functions shall be able to be performed locally via hand switches though hardwired controls in the event a PLC, network or I/O device fails. Critical interlocks shall not be bypassed via hand mode operation.

- Category 5/6 cable shall be limited to intra-building applications. Fiber optic cable or radio connections shall be used for inter-building applications.
- Owner to grant system access permission for each local or remote modification or discrete access work period.
 - Owner to be notified of all planned modifications with 8hr prior notice.
 - Owner to be notified of all implemented modifications at the time of completion.
 - Modifications to existing or on-line processes are to be initiated and completed during plant operator normal working hours.
 - No modifications shall be made during peak flow events or within 30 minutes of the end of senior plant staff normal working hours.
- Integrator to provide capability for on-line remote troubleshooting capability for critical issues.
- Integrator shall provide a 2 year maintenance/warranty contract for all work provided.
 - Contract is in addition to all other warranties otherwise required.
 - Maintenance/warranty agreement shall include SCADA system, network, process controls and instrumentation troubleshooting and optimization.
 - All instrument related maintenance components shall be provided for the contract duration. (i.e. analytical reagents, probe replacement heads, gas detection catalytic beads, etc.)
- Appropriate training shall be provided to the owner for all hardware and software.
 - Minimum of 40hrs of training.
 - Schedule training at the Owners time and location preference.
 - Coordinate training to cover all operational shifts of Owners staff.

7.7.2 PLC (programmable logic controller)

- Acceptable manufacturers/models:
 - GE RX3i/Versamax (as needed)
 - Allen Bradley Controllogix/Micrologix (as needed)
- All PLCs on project to be of the same manufacturer, including PLCs in unit process vendor supplied panels and skids.
- Where no local automatic control is necessary provide networked remote I/O rack instead of PLC.
- All control panels shall be provided with 20% spare I/Os of each type provided.
- Provide 10% spare of each I/O card used (minimum 1).
- All I/O cards of the same type shall be the same model to reduce number of different spare cards needed.
- Programmed with non-proprietary program in ladder logic or structured text. Provide owner with reproducible backup copies of all programs.

7.7.3 Software HMI (human machine interface)

- Acceptable manufacturers:
 - GE iFix/Proficy
- Software shall be designed with multiple security levels for users with different permissions
 - Observer (default) level may view all plant statuses.
 - Operator level shall have all observer permissions and use of all remote control functions and the ability to acknowledge alarms.
 - Supervisor level shall have all Operator permissions and set-point modifying permissions.

- Provide licenses as necessary for design plus 20% future I/O or workstations. Provide owner with all copies of the runtime and development software.
- Provide reproducible back up copies of all custom programming to the owner.
- Remote access via VPN internet.
- Integrated software autodialer for critical alarms (minimum 15) with acknowledge function. User editable time dependent call list functionality.
 - Acceptable manufacturers:
 - Ivensys
 - Wonderware
 - Win911

7.7.4 Workstations and Servers

- Provide a minimum of 2 operator workstations.
- Provide at least one tag and historian server
- Historian harddrive shall be sized for a minimum 90 day data retention with first in first out configuration and minimum 1 minute polling.
- Acceptable manufacturers:
 - Dell
 - HP Hewlett Packard
 - Lenovo
 - Asus
- PCs shall be provided with Windows 8.1 software including Microsoft Office (to include Word, Excel, Outlook and Power Point.
- Minimum specifications:
 - Dual 24" widescreen LED monitors
 - Intel i7 Quadcore 3.6GHz
 - 1TB hybrid hard drive OR 1GB solid state boot drive and 750GB storage hard disk drive.
 - 9GB DDR3 SDRAM
 - Dedicated graphics card with 1.5GB onboard dedicated video RAM
 - CD/DVD R/W+/- drive
- Provide UPS power for each workstation and Server.

7.7.5 Control Panels

- Meet all applicable codes and standards, including area classifications.
- Three point latch with locking access handle.
- Acceptable manufacturers:
 - Hoffman
 - Hammond Manufacturing.
 - Millbank Mfg. Co.
 - Rittal
- Provide with active cooling as necessary for location and most temperature sensitive component.
- All exterior panels to include surge suppressors on all external circuits.
- All panels to include heater and corrosion inhibitors.
- PLC and I/O panels shall have UPS power source.

- Provide intrinsically safe barriers as necessary.

7.7.6 Telemetry

- On site inter-building telemetry shall be Ethernet over radio or fiber optic.
 - Category 5/6 cable Ethernet for intra-building networking only.
- Remote site telemetry shall be by existing Ethernet over radio (spread spectrum).
 - Modifications and additions shall be compatible with Owner's existing infrastructure.
- Radio equipment acceptable manufacturers:
 - CalAmp
 - MDS Microwave Data Systems, Inc.
- Ethernet over fiber managed network routers and switches acceptable manufacturers:
 - HP
 - Siemens.
 - N-TRON.
 - Allen-Bradley/Cisco.
- Provide direct fiber optic cable link from Wastewater Treatment Plant to Hays City Hall.
 - Procure easements as necessary along route.
 - Fiber optic cable to be 6 fiber cable single mode loose tube with water blocking system, direct burial, aerial and plenum rated where applicable.
 - 9/125 micrometer (core/cladding diameter)
 - Minimum bandwidth at 1300 nm: 500 MHz/km.
 - Maximum attenuation at 1300 nm: 0.4dB/km.
 - Type FC connectors.
 - Trench or directional bore in 2in schedule 80 HDPE conduit.
 - Pull tracer wire with fiber in conduit.
 - Cable and conduit shall be installed and maintained by local company.
 - Fiber optic cable shall be dedicated, owned by the City.
 - Aerial fiber where existing is acceptable; underground is required for non-existing sections of fiber optic cable run
 - Acceptable companies:
 - Eagle Communications
 - Nextech
 - Or approved equal
 - Provide all hardware, software and appurtenances on each end to facilitate the network link, including patch panels, fiber optic network switches, etc. Fiber signal to be converted to layer 2 Ethernet for use at each facility.

7.7.7 Telecom and Data

- Relocate all telecom and data utility services from existing control building to new office and laboratory.
 - Provide in dedicated panels in an electrical or server room.
- Provide local telecom and data networks.
- Provide a minimum of 6 new telecom and data outlets in new office and laboratory.

7.7.8 Instruments

7.7.8.1 GENERAL

- Provide 4-20mA analog and fail digital output to SCADA from all instruments where available.

7.7.8.2 FLOW

- Parshall Flume
 - For open channel flow
 - Acceptable manufacturers:
 - Plasti-Fab, Inc.
 - Warminster Fiberglass
 - Free Flow
 - For use with ultrasonic level transducer/transmitter pair, see below.
 - Minimum 1, Effluent flow.
- MAG Meter
 - For recording, custody transfer and other high accuracy liquid flow measurement.
 - For full pipe applications only.
 - Acceptable Manufacturers:
 - ABB
 - Endress + Hauser
 - Foxboro
 - Krohne
 - Rosemount
 - Siemens
 - Toshiba
 - Electrodes: Titanium
 - Liner: Neoprene, PTFE, or EDPM
 - Line voltage powered
 - Minimum 5: Influent flow, RAS flow, WAS flow, UV Disinfection process flow and Non-potable reuse flow.
- Thermal Mass Flow Meter
 - For process air flow
 - Acceptable Manufacturers:
 - Fluid Components, Inc.
 - Kurz
 - STI Magnetrol.
 - Reaction time of >10 seconds.
 - Minimum 2: Aeration flow Basins 1 and 2.

7.7.8.3 PRESSURE

- Acceptable Manufacturers:
 - Endress + Hauser
 - Foxboro
 - Honeywell
 - Rosemount
- Aluminum housing, Stainless steel isolating diaphragm
- Loop powered.

- Minimum 3: Non-potable water reuse system pressure, RAS discharge pressure and WAS discharge pressure.

7.7.8.4 LEVEL

- Level switch
 - Provided for high and low level alarm for all level measurement applications.
 - Float tilt type.
 - Weighted internally or externally.
 - Retrievable adjustable suspension/mounting.
 - Mercury type SPDT switch.
 - Wired for fail safe operation.
 - Minimum 2 per wetwell for high and low alarms. Minimum 2 per level controlled pump (backup on and off elevations).
- Ultrasonic
 - For low turbulence liquid level applications (33ft signal distance maximum).
 - Line voltage powered
 - All-in-one transmitter/transducer not acceptable for inaccessible mounting locations.
 - Acceptable Manufacturers:
 - Endress + Hauser
 - STI Magnetrol
 - MJK
 - Rosemount
 - Siemens Milltronics
 - Minimum 1 per wetwell (unless Radar level transducer used). Minimum one per storage basin (unless Radar level transducer used).
- Radar
 - For longer range or turbulent liquid level applications or for chemical level measurement through plastic containment vessel.
 - For narrow locations or high obstruction levels use guided wave type, otherwise use 'air burst' open air type.
 - Loop powered
 - All-in-one transmitter/transducer not acceptable for inaccessible mounting locations
 - Acceptable manufacturers:
 - Endress + Hauser
 - Ohmart
 - Rosemount
 - STI Magnetrol
 - Minimum one per chemical storage tote. Minimum 1 per wetwell (unless ultrasonic level transducer used). Minimum one per storage basin (unless ultrasonic level transducer used).

7.7.8.5 ANALYTICAL - DO

- Membrane-less LDO style (not amperometric type)
- Acceptable Manufacturers:
 - Hach
 - Insite
 - YSI (WTW)

- Minimum one per aerobic biological treatment zone.

7.7.8.6 ANALYTICAL – TOTAL SOLIDS

- Microwave transmission measurement principal.
- Flanged spool form factor.
- Acceptable manufacturers:
 - Metso
 - Toshiba
 - Or approved equal
- Minimum one at solids dewatering unit process.

7.7.8.7 ANALYTICAL – MULTICHEMICAL INSITU ONLINE ANALYZERS

- For Ammonium, pH, and Nitrogen
- Automatic temperature compensation
- Acceptable Manufacturers:
 - Hach
 - Rosemount Analytical
 - YSI (WTW)
 - Or approved equal.
- As required for biological treatment process.

7.7.8.8 ANALYTICAL - UVT

- For UV transmittance
- Acceptable Manufacturer:
 - Hach
- Minimum one at UV disinfection unit process influent.

7.7.8.9 SAMPLER

- Refrigerated.
- Segregated samples.
- Integral sample pump.
- Rated for environment to be located.
- Permanent hardwired power circuit (cable in conduit).
- Minimum one.

7.7.8.10 GAS DETECTION

- For combustible gas detection (CGD) and Hydrogen Sulfide (H₂S)
- Analytic bead type
- Acceptable Manufacturers:
 - Bacharach
 - Honeywell
 - Industrial Scientific
 - MSA Instruments
 - Sierra
- Couple with local audio visual alarm devices
- Indicator located outside monitored area.
- Provide with sensor modules for 5 years of operation.
- Minimum one combustible gas detection unit per area required by NFPA 820.

- Minimum one H₂S sensor per class 1 hazardous area.

7.8 Process Monitoring/ Control Requirements

The following list of process monitoring/ control requirements is preliminary, and shall be modified/expanded as required by the Design/Build team for the particular processes selected.

7.8.1 Generator and Auto-Transfer Device

- Monitoring only.
- Operator adjustable plant emergency power mode.
 - Automatic Stop/lockout designated non-critical equipment to conserve backup power fuel/runtime.
 - Automatic staged equipment restart on power transition from/to emergency power (open transition).
 - Nuisance alarm suppression during power failure and transitions.
 - Automatic residual decay delay timer on power transition; allow motors to spin down to reduce inrush spiking on restart.

7.9 Operation and Maintenance Manuals

Design-Builder shall develop an electronic Operations Manual (eOM) for the facilities constructed. The eOM will provide City staff convenient, quick and easy access to the information necessary to operate and maintain the plant facilities in an efficient and reliable manner. The eOM will contain a variety of information, including facility and equipment descriptions, design criteria, process control narratives, design drawings, and vendor supplied equipment O&M manuals. Using the eOM, City staff will be able to access this information in an electronic format with an easy-to-use graphical user interface. The eOM will provide a permanent archive of the information.

8 Sequencing

8.1 Facility Operations and Coordination of Construction

1. Owner will operate the wastewater treatment plant continuously during construction activities. Design/ Builder is required to schedule and obtain advance Owner approval of all work effecting operations, capabilities, facilities or redundancies. In the event of unforeseen equipment breakdowns, high flow events or other conditions which threaten wastewater treatment operations, the Owner, without notice or liability, has the right to rescind approval of the Design/ Builder's approved work activities with no additional compensation or contract time allocated.
2. Maintaining continuous operation of the Owner's facilities so that all permit requirements are met at all times is of critical importance. Schedule, secure approval, complete all down-times, equipment change-outs, tie-ins, transitions, diversions, demolition and construction to enable existing facilities to operate with full functionality, except where expressly approved otherwise. Where unavoidable interruptions of operations are necessary, Design/ Builder shall define and obtain advanced approval of the nature, duration and extent of such interruptions. Works shall be completed within the allotted time frames, with Design/ Builder bearing all costs associated with variance from the stipulated work arrangement.
3. When necessary, plan, design, provide, install, and properly remove various temporary services, utilities, connections, temporary piping and heating, access, pumping, and similar items to maintain continuous operations of Owner's facility in compliance with all permit requirements. All temporary provisions shall be properly labeled and all inactivated electrical systems shall have a proper lock-out/tag-out process.
4. Perform Work continuously during critical connections and changeovers, and as required to prevent, minimize or limit interruption of Owner's operations.
5. All interruptions to operations, bypass facilities, and temporary connections must be approved by and scheduled with Owner and Owner's Representative in advance.
 - a. Bypassing untreated sewage flow will not be allowed to accommodate the Work.
 - b. Only the Owner's personnel are authorized to operate the wastewater treatment plant, including all piping, valves, process control, equipment and facilities.
 - c. Do not, under any circumstances, close lines, open or close valves, or take other action which would affect the operation of existing systems, except as specifically required by the Contract Documents and after authorized and when directly overseen by Owner and Engineer. Such authorizations will be submitted in writing by Design/ Builder to Owner and Owner's Representative at least 48 hours before the activity is planned and shall not proceed until specifically approved.
6. Submit for review and approval a minimum of two (2) weeks prior to commencing any interruption, demolition, bypass, or connection work a Work Plan which defines the work to be done, the order of work, type and amounts of equipment and personnel to be used, anticipated duration and schedule of service interruptions, safety equipment and other miscellaneous work components necessary to assure work is planned and safely executed.
7. Bypass pumping shall be provided by Design/ Builder if the Work Plan includes modifications that would prevent the containment of wastewater if flow were to resume prior to completion of the work.

8.2 Special Requirements and Limitations

8.2.1 Liquids Process (Milestone 1)

With the exception of the replacement of the tertiary filtration equipment and media, the new liquids process train shall be constructed and operational in its entirety prior to removing the existing liquids process from service. The tertiary filters are not critical to meeting the current effluent limits. Therefore, the filters shall be taken down during construction and the traveling bridge filter units and media shall be replaced and ready to be placed in operation when the new liquids process train is ready to be placed into operation. The referenced new liquids process train includes the following:

- Influent Pump Station
- Headworks
- Activated Sludge 5-stage with Secondary Clarifiers and Filters or 4-stage with MBR. See Sections 6.5 and 6.6 for descriptions of activated sludge alternatives
- UV Disinfection

The biological treatment system shall be started up by transferring the MLSS from the existing activated sludge basins to the new system. The existing activated sludge basins shall then be converted to aerobic digesters while the MLSS grows in the new biological system.

8.2.2 Solids Process (Milestone 2)

The new sludge dewatering screw press shall be operational in its entirety prior to removing the existing activated sludge basins from service. Modifications to convert the existing activated sludge basins to aerobic digesters shall be completed within a period of 60 days from the date of the transferring of MLSS from the existing activated sludge basins to the new system.

Table 8-1 contains a list of each facility, the milestone by which construction shall be substantially complete, and probable construction constraints.

Table 8-1 Milestones and Constraints per Facility

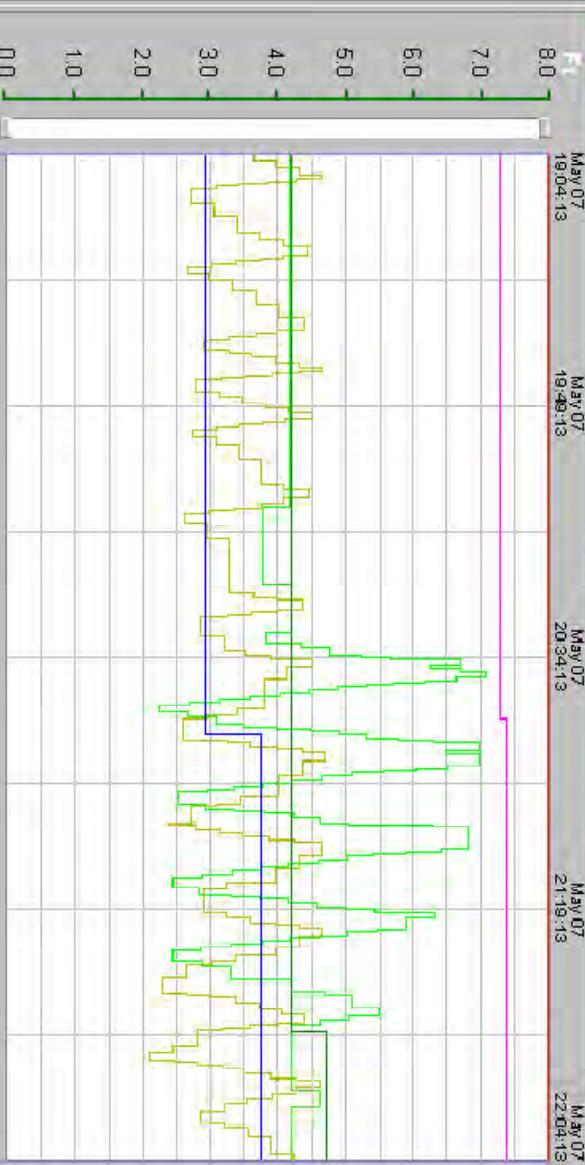
Facility	Milestone	Constraints
Influent Pump Station	1	None
Headworks	1	None
Activated Sludge 5-stage with Secondary Clarifiers and Filters or 4-stage with MBR	1	None
Tertiary Filters (5-stage with Secondary Clarifiers and Filters only)	1 or 2	One filter at a time or simultaneous if done during non-irrigation season
Intermediate Pump Station (5-stage with Secondary Clarifiers and Filters only)	1 or 2	Replace one pump at a time to maintain 2 firm pumps in service at all times
UV Disinfection	1	None
Effluent Reaeration	1	None
Operations Building	1 or 2	None
RAS/WAS Pump Station (5-stage with Secondary Clarifiers and Filters only)	1	Replace one pump at a time to maintain 2 firm pumps in service at all times
Sodium Hypochlorite	2	After successful start-up of Milestone 1
Relained Water Storage Basins	1	None
TWAS Pump Station	1	Tie-in to be performed in Milestone 2
Aerobic Digester Conversion	2	Convert one activated sludge basin to aerobic digestion at a time. Transfer contents of existing activated sludge basins to new activated sludge trains. Allow 2 weeks for completion of in basin piping/diffuser modifications to existing basin. Place converted basin into service as aerobic digester. After successful start-up, complete modifications to second existing basin in 2 week period.
Sludge Dewatering Improvements	1 or 2	Limit system outage to 45 days
Site Miscellaneous	2	TBD

9 Owner Special Considerations

Reference the following appendices for Owner special considerations:

- Appendix C – Davis-Bacon Wage Determination
- Appendix D – American Iron and Steel
- Appendix E – MBE/ WBE/ DBE
- Appendix F – Certification Regarding Debarment, Suspension, and Other Responsibility Matters Form and Instructions – EPA Form 5700-49
Certification Regarding Lobbying – EPA Form 6600-06
Certification of Nonsegregated Facilities – EPA Form
Trafficking Victims Protection Act Form
State of Kansas Act Against Discrimination Contract Provision Certification Form

Appendix A - Influent Wetwell Level Trending Graphs



Description	Left Value	Right Value	Current Value	Units
Raw Sewage Wetwell Level	5.243	5.282	5.101	ft
Primary Basin Supply Wetwell Level	10.000	10.000	10.000	ft
Trickling Filter Supply Wetwell Level	5.473	6.383	4.102	ft
Trickling Filter Effluent Wetwell Level	4.227	4.777	2.923	ft
Filter Effluent Wetwell Level	1.837	2.339	1.945	ft
Golf course pond and wetwell lvl	8.223	8.323	8.411	ft

Trend Options

Type: Historical Real Time

Displayed Timespan: 3h

1-Click Timespan Selection

- 5 Minutes
- 1 Hour
- 8 Hours
- 24 Hours
- 1 Week

Zoom Control

IN x2 19:04:13

OUT x2 22:04:13

Horizontal Scroll

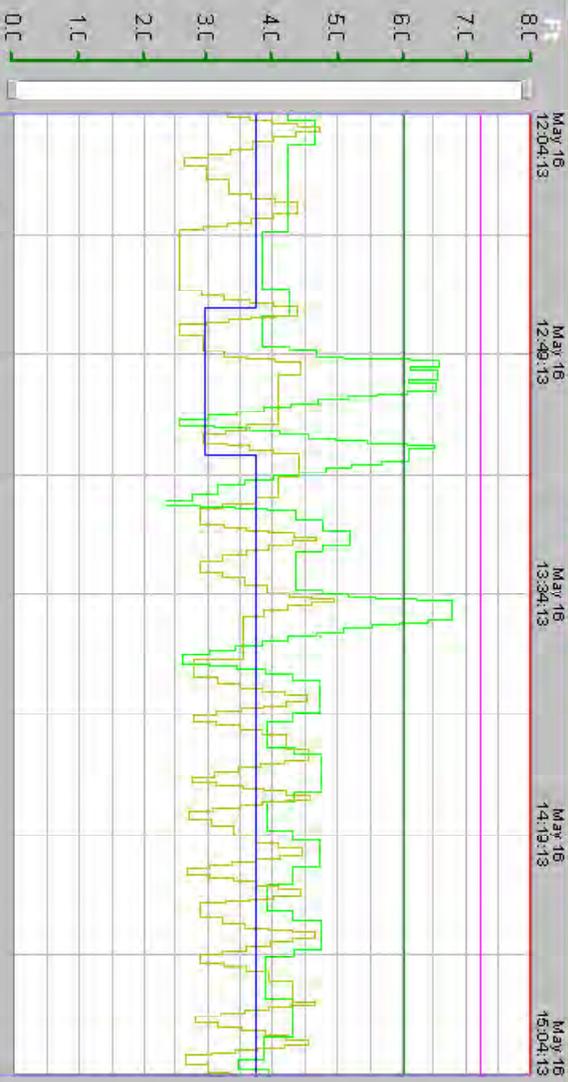
Scroll Status: 0 min

Custom 1 Hour 5 Minutes 8 Hours

TeamViewer

Session list 479 046 897

www.teamviewer.com



Description	Left Value	Right Value	Current Value	Unit
Raw Sewage Wetwell Level	5.320	4.939	5.012	ft
Primary Basin Supply Wetwell Level	10.000	10.000	10.000	ft
Trickling Filter Supply Wetwell Level	4.951	5.020	5.196	ft
Trickling Filter Effluent Wetwell Level	6.034	6.034	2.877	ft
Filter Effluent Wetwell Level	2.349	2.351	1.668	ft
Golf course pond and wetwell lvl	8.142	8.142	8.228	ft

Trend Options

Type: Historical Real Time

Displayed Timespan: 3h

1-Click Timespan Selection

5 Minutes

1 Hour 8 Hours

24 Hours 1 Week

Zoom Control

IN x2 12:04:13

OUT x2 15:04:13

Horizontal Scroll

Scroll Status: 0 min.

Custom 5 Minutes

1 Hour 0 Hours

TeamViewer

Session list

479 086 897

www.teamviewer.com



Description	Left Value	Right Value	Current Value	Units
Raw Sewage Wetwell Level	5.351	4.061	4.839	ft
Primary Basin Supply Wetwell Level	10.000	10.000	10.000	ft
Trickling Filter Supply Wetwell Level	5.519	6.688	5.034	ft
Trickling Filter Effluent Wetwell Level	6.537	6.537	2.893	ft
Fiter Effluent Wetwell Level	1.845	1.845	1.993	ft
Golf course pond and wetwell lvl	8.142	8.142	8.174	ft

Trend Options

Type: Historical Real Time

Displayed Timespan: 3h

1-Click Timespan Selection

5 Minutes
1 Hour
8 Hours
24 Hours
1 Week

Zoom Control

IN: x2
21:04:13

OUT: x2
00:04:13

Horizontal Scroll

Scroll Status: 0 min.

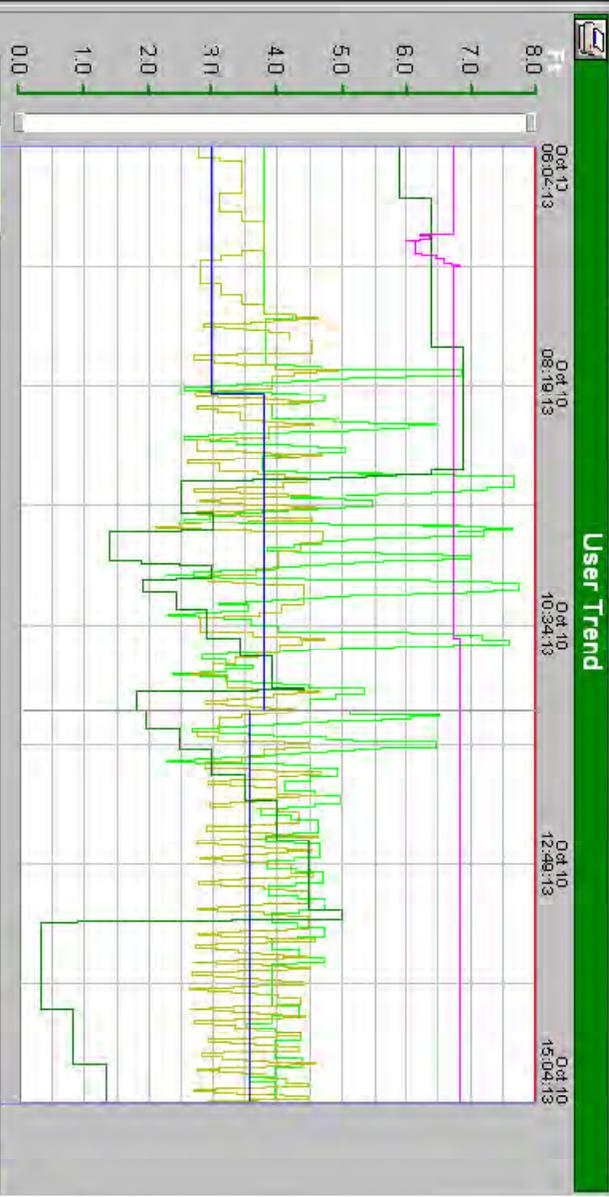
Custom
1 Hour
5 Minutes
8 Hours

TeamViewer

Session list
479 046 897

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CURRENT USER: Josh B TIME ON: 13106 sec Log 18 May 12:04:14 PM UNACK 18 May 11:47:42 AM UNACK GOLF course pond influent press lo slm On IN AL... DSC G+ DSC C.1



Description	Left Value	Right Value	Current Value	Units
Raw Sewage Wetwell Level	4.751	4.473	5.224	ft
Primary Basin supply Wetwell Level	10.000	10.000	10.000	ft
Trickling Filter Supply Wetwell Level	4.165	4.406	5.000	ft
Trickling Filter Effluent Wetwell Level	5.910	1.330	2.927	ft
Filter Effluent Wetwell Level	1.876	2.243	1.922	ft
Golf course pond and wetwell lvl	7.602	7.703	8.185	ft

Trend Options

Type: Historical Real Time

Displayed Timespan: 9h

1-Click Timespan Selection

5 Minutes

1 Hour 8 Hours

24 Hours 1 Week

Zoom Control

IN x2 06:04:13

OUT x2 15:04:13

Horizontal Scroll

Scroll Status: 0 min.

Custom 5 Minutes

1 Hour 8 Hours

TeamViewer

Session list

479 0-6 897

www.teamviewer.com

Appendix B – Current Discharge Permit

Kansas Permit No.: M-SH16-0002

Federal Permit No.: KS0036684

KANSAS WATER POLLUTION CONTROL PERMIT AND
AUTHORIZATION TO DISCHARGE UNDER
THE NATIONAL POLLUTANT DISCHARGE
ELIMINATION SYSTEM

Pursuant to the Provisions of Kansas Statutes Annotated 65-164 and 65-165, the Federal Water Pollution Control Act as amended, (33 U.S.C. 1251 et seq; the "Act"),

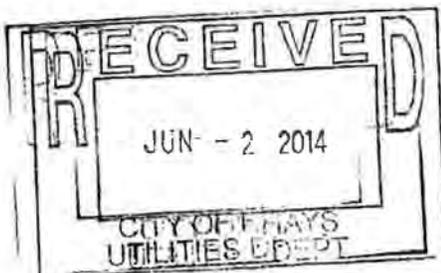
Owner: Hays, City of
Owner's Address: P.O. Box 490
Hays, Kansas 67601
Facility Name: Hays Wastewater Treatment Facility
Facility Location: 1498 E. Highway 40 Bypass
Hays, Kansas 67601
NE¼, SE¼, SW¼, Section 3, Township 14S, Range 18W
Ellis County, Kansas
PLANT Latitude: 38.85967, Longitude: -99.31059
OUTFALL Latitude: 38.85920, Longitude: -99.30892
Receiving Stream Basin: Big Creek via Chetolah Creek
Smoky Hill River Basin

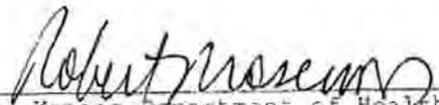
is authorized to discharge from the wastewater treatment facility described herein, in accordance with effluent limits and monitoring requirements as set forth herein.

This permit is effective June 1, 2014, supersedes the previously issued Kansas Water Pollution Control permit M-SH16-0002, and expires May 31, 2019.

FACILITY DESCRIPTION:

1. Raw Wastewater Screening
2. Aerated Grit Chamber
3. Primary Sedimentation
4. Trickling Filters - Not in Use
5. Activated Sludge Basin
6. Final Sedimentation
7. Tertiary Treatment (granular media effluent filters)
8. Dissolved Air Flotation Sludge Thickener - Not in use
9. Anaerobic Sludge Digestion
10. Sand Drying Beds
11. Disinfection of Effluent via Chlorination
12. Effluent Dechlorination Facilities (Sulfur Dioxide)
13. Effluent Storage Basin
14. Irrigation of Golf Course and Ball Fields
15. Golf Course Holding Pond with Reclaimed Effluent: Pump Station
(Old Highway 40 & Golf Course Road)
16. Reaeration of Effluent
17. Design Flow = 2.8 MGD




Secretary, Kansas Department of Health and Environment

May 28, 2014
Date

A. EFFLUENT LIMITS AND MONITORING REQUIREMENTS

The permittee is authorized to discharge from outfall(s) with serial number(s) as specified in this permit. The effluent limits shall become effective on the dates specified herein. Such discharges shall be controlled, limited, and monitored by the permittee as specified. There shall be no discharge of floating solids or visible foam in other than trace amounts.

Monitoring reports shall be submitted on or before the 28th day of the following month. In the event no discharge occurs, written notification is still required.

EFFECTIVE DATE	Upon Issuance	See SCHEDULE of COMPLIANCE	Measurement Frequency	Sample Type
	Interim Limits	Final Limits		
<u>Monitoring Location 001AG (EDMR code: INFO01AG) - Influent to Treatment Plant</u>				
Biochemical Oxygen Demand(5-Day)-mg/l	Monitor	Monitor	Twice Monthly	24 Hour Composite
Total Suspended Solids - mg/l	Monitor	Monitor	Twice Monthly	24 Hour Composite
Total Phosphorus (as P)-mg/l	Monitor	Monitor	Twice Monthly	24 Hour Composite
Total Kjeldahl Nitrogen (as N) - mg/l	Monitor	Monitor	Twice Monthly	24 Hour Composite
<u>Outfall 001A1 (EDMR code: EFF001A1) - Effluent to Chatolah Creek</u> (Monitoring location is the effluent sampling manhole unless noted otherwise)				
Biochemical Oxygen Demand (5-Day) - mg/l*			Twice Monthly	24 Hour Composite
Jan. - Feb. and Nov. - Dec.				
Weekly Average	40	40		
Monthly Average	25	25		
March through October				
Weekly Average	30	30		
Monthly Average	20	20		
Total Suspended Solids - mg/l*			Twice Monthly	24 Hour Composite
Weekly Average	45	45		
Monthly Average	30	30		
pH - Standard Units (May monitor at the Palmer-Bolus effluent flume)	6.0-9.0	6.0-9.0	Twice Monthly	Grab
Ammonia (as N) - mg/l			Twice Monthly	24 Hour Composite
January & February Monthly Average	12.7	12.7		
March & April Monthly Average	7.2	7.2		

A. EFFLUENT LIMITS AND MONITORING REQUIREMENTS (continued)

May Monthly Average	5.2	5.2		
June & July Monthly Average	4.5	4.5		
August Monthly Average	4.2	4.2		
September Monthly Average	6.1	6.1		
October Monthly Average	7.7	7.7		
November & December Monthly Average	13.1	13.1		
E.coli - colonies/100 ml			Twice Monthly	Grab
April through October				
Weekly Geometric Average	4348	4348		
Monthly Geometric Average	262	262		
November through March				
Monthly Geometric Average	2358	2358		
Total Phosphorus (as P)-mg/l***	Monitor	Monitor	Twice Monthly	24 Hour Composite
Total Phosphorus (as P)-lbs/day	Calculate	Calculate	Twice Monthly	Calculate
Nitrate(NO ₃) + Nitrite(NO ₂)-(as N)***			Twice Monthly	24 Hour Composite
Monthly Average - mg/l	Monitor	10		
Nitrate + Nitrite (as N)-lbs/day (NO ₃ + NO ₂)	Calculate	Calculate	Twice Monthly	Calculate
Total Kjeldahl Nitrogen (as N)-mg/l*** (TKN)	Monitor	Monitor	Twice Monthly	24 Hour Composite
Total Nitrogen (as N)-mg/l*** (TKN + NO ₃ + NO ₂)	Calculate	Calculate	Twice Monthly	Calculate
Total Nitrogen (as N)-lbs/day (TKN + NO ₃ + NO ₂)	Calculate	Calculate	Twice Monthly	Calculate
Sulfates-mg/l	Monitor	Monitor	Once Monthly	24 Hour Composite
Total Residual Chlorine - µg/l** (May monitor at the Palmer-Bolus effluent flume)	14	14	Daily	Grab
Dissolved Oxygen - mg/l (May monitor at the Palmer-Bolus effluent flume)	Monitor	Monitor	Twice Monthly	Grab

A. EFFLUENT LIMITS AND MONITORING REQUIREMENTS (continued)

Whole Effluent Toxicity - See Supplemental Conditions F.1.

Priority Pollutant Scan - See Supplemental Conditions F.2.

Flow to Receiving Stream - MGD Monitor Monitor Daily Meter

TMDL Calculation 001T1 (EDMR code: TMDL001T1) - TMDL Calculations at Effluent

Total Phosphorus (as P) - Annual Avg.****			Monthly	Calculate
TMDL Annual Daily Mass - lbs/day	Calculate	35.1		
Nitrate(NO3)+ Nitrite(NO2) as N - Annual Avg.****			Monthly	Calculate
TMDL Annual Daily Mass - lbs/day	Calculate	187		

* Minimum removal of 85% required for Biochemical Oxygen Demand (5-Day) and Total Suspended Solids.

** Permittee shall conduct testing for total chlorine residual according to the methods prescribed in 40 CFR Part 136. The current acceptable quantification level for total residual chlorine in wastewater is 100 micrograms/l. Test results in excess of the quantification level are violations of the permit limits.

*** Permittee shall sample for these tests on the same day and calculate the total nitrogen only when both test values are available. The Minimum Reportable Limit (MRL) for TKN is 1 mg/l and for nitrate + nitrite is 0.1 mg/l. Values less than the MRL shall be reported using the less than sign (<) with the MRL value but for purposes of calculating and reporting the total nitrogen result, individual less than values shall be defaulted to zero and the less than sign dropped from the reported values.

**** Rolling 12-month annual average calculated monthly.

B. SUPPLEMENTAL CONDITIONS FOR GOLF COURSE, PARK, BALLFIELD AND SPORT COMPLEX IRRIGATION†

Permittee shall provide written notice to KDHE prior to the extension of the irrigation system to irrigate another park or ball field in addition to the ones listed in the following paragraph. Written authorization from KDHE will be required to irrigate additional sites. The supplemental conditions for irrigation within this permit may need to be revised depending on the proposed new irrigation area.

The following management and monitoring requirements apply for treated wastewater from the Hays Wastewater Treatment Facility utilized for irrigation purposes at the Stramel Ball Fields, Dusty Glassman Baseball Complex, Pratt-Optimist Soccer Field, Larks Park, Fort Hays Municipal Golf Course and the Bickle-Schmidt Sports Complex:

1. Monitoring and testing of the treated wastewater must be conducted for any calendar month during which irrigation is utilized. If the wastewater irrigation system for the public use areas is not used, no testing of the wastewater reclaimed water basin at the wastewater treatment plant is required.

Parameter	Final Limits	Measurement Frequency	Sample Type
<u>Monitoring location 003A1 (EDMR code: WRB003A1) - Treated Wastewater into the West Reclaimed Water Basin</u>			
Total Residual Chlorine - mg/l†		Daily	Grab
Daily Average (minimum)		2.5	

†Total Residual Chlorine shall be determined using the DPD-colorimetric method.

B. SUPPLEMENTAL CONDITIONS FOR GOLF COURSE, PARK AND BALLEFIELD IRRIGATION (continued)

2. If the Sports Complex irrigation site is not irrigated with reclaimed wastewater effluent in a calendar month there is no requirement to sample and test in that month for E. coli at the Sports Complex. The discharge monitoring report must indicate ND (for No Discharge) on the last day of the month for any month which the site is not irrigated with reclaimed wastewater effluent.

SPORTS COMPLEX SITE

Parameter	Final Limits	Measurement Frequency	Sample Type
<u>Monitoring Location 001C1 (EDMR code: SCS001C1) - Sprinkler Head or sampling tap at end of irrigation distribution system</u>			
E. coli-Colonies/100 ml	Monitor	Twice Monthly	Grab
Effluent Irrigation Flow (YES or ND)!!	Monitor	Monthly	Observe
!! Leave blank for yes or enter ND for no discharge.			

† In the event that all treated effluent is routed to irrigation or other reclamation uses and there is no discharge at the 001A1 to the receiving stream, the permittee shall continue to operate the plant pursuant to the requirements of paragraph 6 of the Standard Conditions and shall monitor the discharge from the facility at the frequency and include all the parameters as listed under the outfall 001A1. However, the test results shall not be reported under outfall 001A1 but the permittee shall retain the test results and make them available to the permitting authorities upon request.

3. Management practices required for reuse of treated wastewater for irrigation at the golf course, parks, ball fields, and sport complex:
- A. Irrigation of crops produced for direct human consumption is prohibited.
 - B. Irrigation shall be limited in such a manner as to avoid runoff of effluent, from sprinklers or hoses, to adjacent landowners.
 - C. Irrigation of effluent shall be conducted in such a manner as to prevent ponding of wastewater on the ground surface.
 - D. Irrigation spray shall not be allowed to fall or drift on areas used for picnicking, public drinking fountains, potable water hose bibbs, private residences or any other areas where food or drink is routinely prepared or served.
 - E. Signs bearing the following notice must be posted around any treated wastewater holding pond: RECLAIMED WASTEWATER DO NOT DRINK OR SWIM.
 - F. Signs bearing the following notice must be posted at any hose bibb which can discharge treated wastewater: RECLAIMED WASTEWATER DO NOT DRINK.
 - G. Cross-connections between treated wastewater lines and potable water supply lines are prohibited.
 - H. A notice shall be placed on the golf course score cards indicating the irrigation system contains treated wastewater.
 - I. All monitoring of the treated wastewater shall be conducted using EPA approved methods and KDHE certified laboratories.
 - J. The results of the analyses shall be reported quarterly to the address shown on the standard Discharge Monitoring Report.

K. Maintenance/repairs to the system may be tested at any time provided the system operator (or maintenance personnel) is present at the irrigated site during the entire test.

L. Effluent shall not be discharged to the holding pond at the golf course when the pond is overflowing to Big Creek.

C. STANDARD CONDITIONS

In addition to the specified conditions stated herein, the permittee shall comply with the attached Standard Conditions dated August 1, 2010.

D. SLUDGE DISPOSAL

Sludge disposal shall be in accordance with the 40 CFR Part 503 Sludge Regulations.

E. SUPPLEMENTAL CONDITIONS

Although improvements to this wastewater treatment facility will be designed and constructed to increase nutrient removal and final limits for nitrate and phosphorus are provided herein, additional reductions may be necessary in the future to accommodate growth in the area. The permittee is pursuing a construction project to upgrade the biological process to improve nitrification and provide denitrification, to provide phosphorus removal, and to upgrade the biosolids system. The upgraded facility may be able to change operations to maximize the level of nutrient removal with the intent of achieving either of the following goals as annual average target effluent levels:

	Goal 1	Goal 2
1. Total Nitrogen	10.0	8.0
2. Total Phosphorus	1.0	1.5

These target values are not to be considered as effluent limits for this permit. KDHE reserves the right to reopen this permit to impose limits for nutrients pursuant to Kansas law when such criteria are adopted in the Kansas surface Water quality Standards.

F. SCHEDULE OF COMPLIANCE

1. Complete construction of upgrades to the facility by December 31, 2017 and achieve compliance with the final limits by July 31, 2018.

2. By March 1, 2015, and annually thereafter until the project is complete, the permittee shall provide to KDHE an annual report discussing the status of the project and delays which could cause the permittee to miss the complete construction date and any prudent activities necessary to bring the project back on schedule.

G. BIOMONITORING AND PRIORITY POLLUTANTS

1. Whole Effluent Toxicity:

- a. Chronic Whole Effluent Toxicity (WET) testing on a 24-hr composite sample of the effluent shall be conducted once in calendar year 2014 and annually thereafter. The 25% Inhibition Concentration, IC25, shall be equal to or greater than 81% effluent. Test results less than 81% are violations of this permit. The test procedures shall use the seven day static renewal test method in accordance with the EPA document, Short-Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms, fourth edition, October 2002 (EPA-821-R-02-013) using test organisms *Pimephales promelas* (fathead minnow) and *Ceriodaphnia dubia* (water flea) within a dilution series containing 0%, 50%, 70%, 81%, 90%, and 100% effluent. KDHE reserves the right to increase or decrease testing frequency based upon compliance history and toxicity testing results.
- b. If the WET test results indicate the IC25 is equal to or greater than 81% effluent, the effluent has passed the toxicity test. The test results shall be recorded on the Discharge Monitoring Report and an electronic copy of the test report shall be provided to KDHE within 10 days of receipt of the information.
- c. If the WET test results indicate the IC50 is less than 81% effluent, the effluent has failed the toxicity test and the permittee shall immediately notify KDHE by telephone at (785) 296-5517 and submit to KDHE an electronic copy of the test report within five days of receipt of the information. KDHE reserves the right to require the permittee to take such actions as are reasonable to identify and remedy any identified or predicted toxic conditions in the receiving stream outside of the mixing zone which is caused by the permittee's effluent.
- d. Permittee shall also test a portion of the same effluent sample used for the WET test for the following substances (required minimum reportable levels are in parenthesis):

Antimony (10 µg/L)*	Nickel (10 µg/L)*
Arsenic (10 µg/L)*	Selenium (5 µg/L)*
Beryllium (5 µg/L)*	Silver (2 µg/L)*
Cadmium (2 µg/L)*	Thallium (10 µg/L)*
Chromium (10 µg/L)*	Zinc (20 µg/L)*
Copper (10 µg/L)*	Ammonia as "N" (0.2 mg/l)
Lead (5 µg/L)*	Total Hardness as CaCO3 mg/l
Mercury (0.2 µg/L-Cold Vapor Method)	pH

* Parameter shall be tested and reported as "total recoverable" metals.
- e. Permittee shall coordinate sampling for this test with other monitoring requirements of this permit and may use the test results to satisfy this and other corresponding testing requirements. The permittee shall use a laboratory approved by KDHE for Whole Effluent Toxicity testing.

2. Priority Pollutant Scan

Permittee shall conduct a Priority Pollutant Scan on the effluent for the parameters listed in Table I, Priority Pollutant Scan, on the following pages. The Priority Pollutant Scan shall be conducted within 18 months of the expiration date of this permit and the results reported to KDHE prior to 6 months of the expiration date of this permit. Samples results shall be reported with the next Discharge Monitoring Report following receipt of the results.

Sample type shall be 24-hour composite except for Volatiles which shall be a grab sample. See Supplemental Condition G.1.d. for minimum reportable limits for certain metals in the Priority Pollutant Scan.

Table 1 - Priority Pollutant Scan*

<u>Metals (µg/l)</u>	<u>Base/Neutral (µg/l)</u>	<u>Acid Compounds (µg/l)</u>
Total Antimony	Acenaphthene	2-chlorophenol
Total Beryllium	Acenaphthylene	2,4-dichlorophenol
Total Cadmium	Anthracene	2,4-dimethylphenol
Total Chromium	Benzidine	2,4-dinitrophenol
Total Copper	Benzo(a) anthracene	2-nitrophenol
Total Lead	Benzo(a)pyrene	4-nitrophenol
Total Mercury	Benzo(k)fluoranthene	Parachlorometa cresol
Total Nickel	Benzo (ghi) perylene	Pentachlorophenol
Total Selenium	Benzo (b) fluoranthene	Phenol
Total Silver	Bis(2-chloroethoxy)methane	4,6-dinitro-o-cresol
Total Thallium	Bis(2-chloroethyl)ether	2,4,6-trichlorophenol
Total Zinc	Bis(2-ethylhexyl)phthalate	
	Bis(2-chloroisopropyl) ether	<u>Volatiles (µg/l)</u>
<u>Pesticides (µg/l)</u>	1,2-diphenylhydrazine	Acrolein
Aldrin	Fluoranthene	Acrylonitrile
Alpha-BHC**	Fluorene	Benzene
Beta-BHC**	Nitrobenzene	Bromoform
Gamma-BHC**	N-nitrosodimethylamine	Carbon Tetrachloride
Delta-BHC**	N-nitrosodi-n-propylamine	Chlorobenzene
Chlordane	N-nitrosodiphenylamine	Chlorodibromomethane
4,4-DDT	Phenanthrene	Chloroethane
4,4-DDD	Pyrene	2-chloroethylvinyl ether
4,4-DDE	1,2,4-trichlorobenzene	Chloroform
Dieldrin	4-bromophenyl phenyl ether	Dichlorobromomethane
Alpha-endosulfan	Butyl benzyl phthalate	1,1-dichloroethane
Beta-endosulfan	2-chloronaphthalene	1,2-dichloroethane
Endosulfan sulfate	4-chlorophenyl phenyl ether	1,1-dichloroethylene
Endrin	Chrysene	1,2-dichloropropane
Endrin aldehyde	Dibenzo(a,h) anthracene	1,3-dichloropropylene
Heptachlor	1,2-dichlorobenzene	Ethylbenzene
Heptachlor epoxide	1,3-dichlorobenzene	Methyl bromide
Toxaphene	1,4-dichlorobenzene	Methyl chloride
	3,3-dichlorobenzidine	Methylene chloride
<u>Polychlorinated Biphenyls (µg/l)</u>	Dimethyl phthalate	1,1,2,2-tetrachloroethane
PCB-1242	Diethyl phthalate	Tetrachloroethylene
PCB-1254	Di-n-butyl phthalate	Toluene
PCB-1221	2,4-dinitrotoluene	1,2 trans-dichloroethylene
PCB-1232	2,6-dinitrotoluene	1,1,1-trichloroethane
PCB-1248	Di-n-octyl phthalate	1,1,2-trichloroethane
PCB-1260	Hexachlorobenzene	Trichloroethylene
PCB-1016	Hexachlorobutadiene	Vinyl chloride
	Hexachlorocyclopentadiene	
	Hexachloroethane	<u>Miscellaneous</u>
	Indeno (1,2,3-cd) pyrene	Total Cyanide (mg/l)***
	Naphthalene	Asbestos (cnt/l)
	Isophorone	2,3,7,8-TCDD (Dioxin) (µg/l)

* Testing not required for pollutants with a strike-through.

** Scientific name is hexachlorocyclohexane

*** The total cyanide analysis must include preliminary treatment of the sample to avoid NO₂⁻ interference. See Standard Methods for the Examination of Water and Wastewater, 22nd Edition, 4500-CN B. Preliminary Treatment of Samples.

STANDARD CONDITIONS FOR
KANSAS WATER POLLUTION CONTROL AND
NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM PERMITS

1. Representative Sampling and Discharge Monitoring Report Submittals:

- A. Samples and measurements taken as required herein shall be representative of the quality and quantity of the monitored discharge. Test results shall be recorded for the day the samples were taken. If sampling for a parameter was conducted across more than one calendar day, the test results may be recorded for the day sampling was started or ended. All samples shall be taken at the locations designated in this permit, and unless specified, at the outfall/monitoring location(s) before the wastewater joins or is diluted by any other water or substance.
- B. Monitoring results shall be recorded and reported on forms acceptable to the Division and postmarked no later than the 28th day of the month following the completed reporting period. Signed and certified copies of these, prepared in accordance with KAR 28-16-59, and all other reports required herein, may be FAXed to 785.296.0086, e-mailed as scanned attachments to dmr4kdhe@kdheks.gov, or sent by U.S. mail to:

Kansas Department of Health & Environment
Bureau of Water-Technical Services Section
1000 SW Jackson Street, Suite 420
Topeka, KS 66612-1367

2. Definitions:

- A. Unless otherwise specifically defined in this permit, the following definitions apply:
1. The "Daily Maximum" is the total discharge by weight or average concentration, measurement taken, or value calculated during a 24-hour period. The parameter, pH, is limited as a range between and including the values shown.
 2. The "Weekly Average" is the arithmetic mean of the value of test results from samples collected, measurements taken or values calculated during four monitoring periods in each month consisting of calendar days 1-7, 8-14, 15-21 and 22 through the end of the month.
 3. The "Monthly Average", other than for E. coli bacteria, is the arithmetic mean of the value of test results from samples collected, measurements taken or values calculated during a calendar month. The monthly average is determined by the summation of all calculated values or measured test results divided by the number of calculated values or test results reported for that parameter during the calendar month. The monthly average for E. coli bacteria is the geometric average of the value of the test results from samples collected in a calendar month. The geometric average can be calculated by using a scientific calculator to multiply all the E. coli test results together and then taking the nth root of the product where n is the number of test results. Non-detect values shall be reported using the less than symbol (<) and the minimum detection or reportable value. To calculate average values, non-detects shall be defaulted to zero (or one for geometric averages). Greater than values shall be reported using the greater than symbol (>) and the reported value. To calculate average values, the greater than reported value shall be used in the averaging calculation.
- B. A "grab sample" is an individual sample collected in less than 15 minutes. A "composite sample" is a combination of individual samples in which the volume of each individual sample is proportional to the flow, or the sample frequency is proportioned to the flow rate over the sample period, or the sample frequency is proportional to time.
- C. The terms "Director", "Division", and "Department" refer to the Director, Division of Environment, Kansas Department of Health and Environment, respectively.
- D. "Severe property damage" means substantial physical damage to property, damage to the treatment facilities which causes them to become inoperable, or substantial and permanent loss of natural resources which can reasonably be expected to occur in the absence of an in-plant diversion. Severe property damage does not mean economic loss caused by delays in production.
- E. "Bypass" means the intentional diversion of waste streams from any portion of the treatment facility.

3. **Schedule of Compliance:** No later than 14 calendar days following each date identified in the "Schedule of Compliance," the permittee shall submit via mail, e-mail or fax per paragraph 1.B above, either a report of progress or, in the case of specific action being required by identified dates, a written notice of compliance or noncompliance. In the latter case, the notice shall include the cause of noncompliance, any remedial actions taken, and the probability of meeting the next scheduled requirements, or, if there are no more scheduled requirements, when such noncompliance will be corrected.
4. **Test Procedures:** All analyses required by this permit shall conform to the requirements of 40 CFR Part 136, unless otherwise specified, and shall be conducted in a laboratory accredited by the Department. For each measurement or sample, the permittee shall record the exact place, date, and time of measuring/sampling; the date and time of the analyses, the analytical techniques or methods used, minimum detection or reportable level, and the individual(s) who performed the measuring/sampling and analysis and, the results. If the permittee monitors any pollutant at the location(s) designated herein more frequently than required by this permit, using approved procedures, the results shall be included in the Discharge Monitoring Report form required in 1.B. above. Such increased frequencies shall also be indicated.
5. **Change in Discharge:** All discharges authorized herein shall be consistent with the permit requirements. The discharge of any pollutant not authorized by this permit or of any pollutant identified in this permit more frequently than or at a level in excess of that authorized shall constitute a violation of this permit. Any anticipated facility expansions, production or flow increases, or production or wastewater treatment system modifications which result in a new, different, or increased discharge of pollutants shall be reported to the Division at least one hundred eighty (180) days before such change.
6. **Facilities Operation:** The permittee shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the permittee to achieve compliance with the requirements of this permit and Kansas and Federal law. Proper operation and maintenance also include adequate laboratory controls and appropriate quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems which are installed by a permittee only when the operation is necessary to achieve compliance with the requirements of this permit. The permittee shall take all necessary steps to minimize or prevent any adverse impact to human health or the environment resulting from noncompliance with any effluent limits specified in this permit, including such accelerated or additional monitoring as necessary to determine the nature and impact of the noncomplying discharge. When necessary to maintain compliance with the permit requirements, the permittee shall halt or reduce those activities under its control which generate wastewater routed to this facility.
7. **Incidents:**

"Collection System Diversion" means the diversion of wastewater from any portion of the collection system.

"In-Plant Diversion" means routing the wastewater around any treatment unit in the treatment facility through which it would normally flow.

"In-Plant Flow Through" means an incident in which the wastewater continues to be routed through the equipment even though full treatment is not being accomplished because of equipment failure for any reason.

"Spill" means any discharge of wastewater, sludge or other materials from the treatment facility other than effluent or as more specifically described by other "Incidents" terms.

"Upset" means an exceptional incident in which there is unintentional and temporary noncompliance or anticipated noncompliance with permit effluent limits because of factors beyond the reasonable control of the permittee, as described by 40 C.F.R. 122.41(n).
8. **Diversions not Exceeding Limits:** The permittee may allow any diversion to occur which does not cause effluent limits to be exceeded, but only if it also is for essential maintenance to assure efficient operation. Such diversions are not subject to the Incident Reporting requirements shown below.
9. **Prohibition of an In-Plant Diversion:** Any in-plant diversion from facilities necessary to maintain compliance with this permit is prohibited, except: (a) where the in-plant diversion was unavoidable to prevent loss of life, personal injury, or severe property damage; (b) where there were no feasible alternatives to the in-plant diversion, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime and (c) the permittee submitted a notice as required in the Incident Reporting paragraph below. The Director may approve an anticipated in-plant diversion, after considering its adverse effects, if the Director determines that it will meet the three conditions listed above.

10. **Incident Reporting:** The permittee shall report any unanticipated collection system diversion, in-plant diversion, in-plant flow through occurrences, spill, upset or any violation of a permitted daily maximum limit within 24 hours from the time the permittee became aware of the incident. A written submission shall be provided within 5 days of the time the permittee became aware of the incident. The written submission shall contain a description of the noncompliance and its cause, the period of noncompliance, including exact dates and times; and if the noncompliance has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent recurrence of the noncompliance. An Incident Report form is available at www.kdheks.gov/water/tech.html.

For an anticipated incident or any planned changes or activities in the permitted facility that may result in noncompliance with the permit requirements, the permittee shall submit written notice, if possible, at least ten days before the date of the event.

For other noncompliance, the above information shall be provided with the next Discharge Monitoring Report.

11. **Removed Substances:** Solids, sludges, filter backwash, or other pollutants removed in the course of treatment of water shall be utilized or disposed of in a manner acceptable to the Division.
12. **Power Failures:** The permittee shall provide an alternative power source sufficient to operate the wastewater control facilities or otherwise control pollution and all discharges upon the loss of the primary source of power to the wastewater control facilities.
13. **Right of Entry:** The permittee shall allow authorized representatives of the Division of Environment or the Environmental Protection Agency upon the presentation of credentials, to enter upon the permittee's premises where an effluent source is located, or in which are located any records required by this permit, and at reasonable times, to have access to and copy any records required by this permit, to inspect any facilities, monitoring equipment or monitoring method required in this permit, and to sample any influents to, discharges from or materials in the wastewater facilities.
14. **Transfer of Ownership:** The permittee shall notify the succeeding owner or controlling person of the existence of this permit by certified letter, a copy of which shall be forwarded to the Division. The succeeding owner shall secure a new permit. This permit is not transferable to any person except after notice and approval by the Director. The Director may require modification or revocation and reissuance of the permit to change the name of the permittee and incorporate such other requirements as may be necessary.
15. **Records Retention:** Unless otherwise specified, all records and information resulting from the monitoring activities required by this permit, including all records of analyses and calibration and maintenance of instruments and recordings from continuous monitoring instruments, shall be retained for a minimum of 3 years, or longer if requested by the Division. Biosolids/sludge records and information are required to be kept for a minimum of 5 years, or longer if requested by the Division. Groundwater monitoring data, including background samples results, shall be kept for the life of the facility regardless of ownership.
16. **Availability of Records:** Except for data determined to be confidential under 33 USC Section 1318, all reports prepared in accordance with the terms of this permit shall be available for public inspection at the offices of the Department. Effluent data shall not be considered confidential. Knowingly making any false statement on any such report or tampering with equipment to falsify data may result in the imposition of criminal penalties as provided for in 33 USC Section 1319 and KSA 65-170c.
17. **Permit Modifications and Terminations:** As provided by KAR 28-16-62, after notice and opportunity for a hearing, this permit may be modified, suspended or revoked or terminated in whole or in part during its term for cause as provided, but not limited to those set forth in KAR 28-16-62 and KAR 28-16-28b through g. The permittee shall furnish to the Director, within a reasonable amount of time, any information which the Director may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit or to determine compliance with this permit. The permittee shall also furnish upon request, copies of all records required to be kept by this permit. The filing of a request by the permittee for a permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance does not stay any permit condition.

18. **Toxic Pollutants:** Notwithstanding paragraph 17 above, if a toxic effluent standard or prohibition (including any schedule of compliance specified at such effluent standards) is established under 33 USC Section 1317(a) for a toxic pollutant which is present in the discharge and such standard or prohibition is more stringent than any limitation for such pollutant in this permit, this permit shall be revised or modified in accordance with the toxic effluent standard or prohibition. Nothing in this permit relieves the permittee from complying with federal toxic effluent standards as promulgated pursuant to 33 USC Section 1317.
19. **Administrative, Civil and Criminal Liability:** The permittee shall comply with all requirements of this permit. Except as authorized in paragraph 9 above, nothing in this permit shall be construed to relieve the permittee from administrative, civil or criminal penalties for noncompliance as provided for in KSA 65-161 et seq., and 33 USC Section 1319.
20. **Oil and Hazardous Substance Liability:** Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from any responsibilities, liabilities or penalties to which the permittee is or may be subject to under 33 USC Section 1321 or KSA 65-164 et seq. A municipal permittee shall promptly notify the Division by telephone upon discovering crude oil or any petroleum derivative in its sewer system or wastewater treatment facilities.
21. **Industrial Users:** A municipal permittee shall require any industrial user of the treatment works to comply with 33 USC Section 1317, 1318 and any industrial user of storm sewers to comply with 33 USC Section 1308.
22. **Property Rights:** The issuance of this permit does not convey any property rights in either real or personal property, or any exclusive privileges, nor does it authorize any injury to private property or any invasion of personal rights nor any infringements of or violation of federal, state or local laws or regulations.
23. **Operator Certification:** The permittee shall, if required, ensure the wastewater facilities are under the supervision of an operator certified by the Department. If the permittee does not have a certified operator or loses its certified operator, appropriate steps shall be taken to obtain a certified operator as required by KAR 28-16-30 et seq.
24. **Severability:** The provisions of this permit are severable. If any provision of this permit or any circumstance is held invalid, the application of such provision to other circumstances and the remainder of the permit shall not be affected thereby.
25. **Removal from Service:** The permittee shall inform the Division at least three months before a pumping station, treatment unit, or any other part of the treatment facility permitted by this permit is to be removed from service and shall make arrangements acceptable to the Division to decommission the facility or part of the facility being removed from service such that the public health and waters of the state are protected.
26. **Duty to Reapply:** A permit holder wishing to continue any activity regulated by this permit after the expiration date, must apply for a new permit at least 180 days prior to expiration of the permit.

Appendix C – Davis-Bacon Wage Determination

General Decision Number: KS150021 01/02/2015 KS21

Superseded General Decision Number: KS20140021

State: Kansas

Construction Type: Heavy

County: Ellis County in Kansas.

HEAVY CONSTRUCTION PROJECTS (including sewer/water construction).

Note: Executive Order (EO) 13658 establishes an hourly minimum wage of \$10.10 for 2015 that applies to all contracts subject to the Davis-Bacon Act for which the solicitation is issued on or after January 1, 2015. If this contract is covered by the EO, the contractor must pay all workers in any classification listed on this wage determination at least \$10.10 (or the applicable wage rate listed on this wage determination, if it is higher) for all hours spent performing on the contract. The EO minimum wage rate will be adjusted annually. Additional information on contractor requirements and worker protections under the EO is available at www.dol.gov/whd/govcontracts.

Modification Number	Publication Date
0	01/02/2015

* ELEC0226-001 09/01/2014

	Rates	Fringes
ELECTRICIAN.....	\$ 28.85	13.21

IRON0024-007 06/01/2014

	Rates	Fringes
IRONWORKER (REINFORCING AND STRUCTURAL).....	\$ 21.85	10.24

* SUKS2014-001 07/09/2014

	Rates	Fringes
CARPENTER.....	\$ 17.67	1.62
CEMENT MASON/CONCRETE FINISHER...	\$ 13.67	0.00
LABORER: Common or General.....	\$ 12.00	0.00
LABORER: Pipelayer.....	\$ 14.13	1.30
OPERATOR: Backhoe/Excavator/Trackhoe.....	\$ 18.84	3.97
OPERATOR: Bulldozer.....	\$ 16.75	0.00

OPERATOR: Crane.....	\$ 28.00	0.00
OPERATOR: Loader.....	\$ 16.17	0.00
OPERATOR: Scraper.....	\$ 15.68	0.00
OPERATOR: Tractor.....	\$ 15.90	0.00
PAINTER (Brush, Roller, and Spray).....	\$ 18.03	0.78
TRUCK DRIVER: Dump (Tandem) Truck.....	\$ 15.70	3.58

WELDERS - Receive rate prescribed for craft performing operation to which welding is incidental.

Unlisted classifications needed for work not included within the scope of the classifications listed may be added after award only as provided in the labor standards contract clauses (29CFR 5.5 (a) (1) (ii)).

The body of each wage determination lists the classification and wage rates that have been found to be prevailing for the cited type(s) of construction in the area covered by the wage determination. The classifications are listed in alphabetical order of "identifiers" that indicate whether the particular rate is a union rate (current union negotiated rate for local), a survey rate (weighted average rate) or a union average rate (weighted union average rate).

Union Rate Identifiers

A four letter classification abbreviation identifier enclosed in dotted lines beginning with characters other than "SU" or "UAVG" denotes that the union classification and rate were prevailing for that classification in the survey. Example: PLUM0198-005 07/01/2014. PLUM is an abbreviation identifier of the union which prevailed in the survey for this classification, which in this example would be Plumbers. 0198 indicates the local union number or district council number where applicable, i.e., Plumbers Local 0198. The next number, 005 in the example, is an internal number used in processing the wage determination. 07/01/2014 is the effective date of the most current negotiated rate, which in this example is July 1, 2014.

Union prevailing wage rates are updated to reflect all rate changes in the collective bargaining agreement (CBA) governing this classification and rate.

Survey Rate Identifiers

Classifications listed under the "SU" identifier indicate that no one rate prevailed for this classification in the survey and the published rate is derived by computing a weighted average rate based on all the rates reported in the survey for that classification. As this weighted average rate includes all rates reported in the survey, it may include both union and non-union rates. Example: SULA2012-007 5/13/2014. SU indicates the rates are survey rates based on a weighted average calculation of rates and are not majority rates. LA indicates the State of Louisiana. 2012 is the year of survey on which these classifications and rates are based. The next number, 007 in the example, is an internal number used in producing the wage determination. 5/13/2014 indicates the survey completion date for the classifications and rates under that identifier.

Survey wage rates are not updated and remain in effect until a new survey is conducted.

Union Average Rate Identifiers

Classification(s) listed under the UAVG identifier indicate that no single majority rate prevailed for those classifications; however, 100% of the data reported for the classifications was union data. EXAMPLE: UAVG-OH-0010 08/29/2014. UAVG indicates that the rate is a weighted union average rate. OH indicates the state. The next number, 0010 in the example, is an internal number used in producing the wage determination. 08/29/2014 indicates the survey completion date for the classifications and rates under that identifier.

A UAVG rate will be updated once a year, usually in January of each year, to reflect a weighted average of the current negotiated/CBA rate of the union locals from which the rate is based.

WAGE DETERMINATION APPEALS PROCESS

1.) Has there been an initial decision in the matter? This can be:

- * an existing published wage determination
- * a survey underlying a wage determination
- * a Wage and Hour Division letter setting forth a position on a wage determination matter
- * a conformance (additional classification and rate) ruling

On survey related matters, initial contact, including requests for summaries of surveys, should be with the Wage and Hour Regional Office for the area in which the survey was conducted because those Regional Offices have responsibility for the Davis-Bacon survey program. If the response from this initial contact is not satisfactory, then the process described in 2.) and 3.) should be followed.

With regard to any other matter not yet ripe for the formal

process described here, initial contact should be with the Branch of Construction Wage Determinations. Write to:

Branch of Construction Wage Determinations
Wage and Hour Division
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

2.) If the answer to the question in 1.) is yes, then an interested party (those affected by the action) can request review and reconsideration from the Wage and Hour Administrator (See 29 CFR Part 1.8 and 29 CFR Part 7). Write to:

Wage and Hour Administrator
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

The request should be accompanied by a full statement of the interested party's position and by any information (wage payment data, project description, area practice material, etc.) that the requestor considers relevant to the issue.

3.) If the decision of the Administrator is not favorable, an interested party may appeal directly to the Administrative Review Board (formerly the Wage Appeals Board). Write to:

Administrative Review Board
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

4.) All decisions by the Administrative Review Board are final.

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END OF GENERAL DECISION

Appendix D – American Iron and Steel



LOAN RECIPIENT ASSURANCE OF COMPLIANCE WITH AMERICAN IRON AND STEEL
REQUIREMENTS

This form must be submitted with any disbursement request that includes construction contract invoices or loan disbursements will be delayed.

KPWSLF OR KWPCRLF PROJECT # _____

DISBURSEMENT REQUEST # _____

To assure compliance with American Iron and Steel requirements required by Exhibit C of the loan agreement for the project referenced above, the Loan Recipient indicated below, hereby certifies that for all iron and steel products incorporated into the project, certifications have been obtained and reviewed. Furthermore, as of the date of the construction contract pay request submitted as part of the above referenced KDHE SRF disbursement request, all such iron and steel products have been produced in the United States except for any items specifically waived by US EPA. Reporting documentation required by any US EPA waiver that is used on this project is attached to this certification.

Indicate below if the Loan Recipient is using the De Minimis waiver approved by US EPA.

_____ Yes _____ No

Representative of Loan Recipient

Title of Representative

Signature of Representative

Legal Name of Loan Recipient

Date

Appendix L

2014 Buy American Iron and Steel (AIS) Policies and Procedures from EPA

EPA Memo "Implementation of American Iron and Steel provisions of P.L. 113-76, Consolidated Appropriations Act, 2014" dated March 20, 2014

Additional information available at

http://water.epa.gov/grants_funding/aisrequirement.cfm



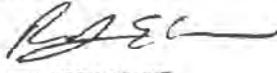
UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

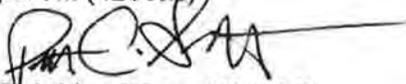
MAR 20 2014

OFFICE OF WATER

MEMORANDUM

SUBJECT: Implementation of American Iron and Steel provisions of P.L. 113-76, Consolidated Appropriations Act, 2014

FROM: For Andrew D. Sawyers, Director 
Office of Wastewater Management (4201M)

Peter C. Grevatt, Director 
Office of Ground Water and Drinking Water (4601M)

TO: Water Management Division Directors
Regions I - X

P.L. 113-76, Consolidated Appropriations Act, 2014 (Act), includes an "American Iron and Steel (AIS)" requirement in section 436 that requires Clean Water State Revolving Loan Fund (CWSRF) and Drinking Water State Revolving Loan Fund (DWSRF) assistance recipients to use iron and steel products that are produced in the United States for projects for the construction, alteration, maintenance, or repair of a public water system or treatment works if the project is funded through an assistance agreement executed beginning January 17, 2014 (enactment of the Act), through the end of Federal Fiscal Year 2014.

Section 436 also sets forth certain circumstances under which EPA may waive the AIS requirement. Furthermore, the Act specifically exempts projects where engineering plans and specifications were approved by a State agency prior to January 17, 2014.

The approach described below explains how EPA will implement the AIS requirement. The first section is in the form of questions and answers that address the types of projects that must comply with the AIS requirement, the types of products covered by the AIS requirement, and compliance. The second section is a step-by-step process for requesting waivers and the circumstances under which waivers may be granted.

Implementation

The Act states:

Sec. 436. (a)(1) None of the funds made available by a State water pollution control revolving fund as authorized by title VI of the Federal Water Pollution Control Act (33 U.S.C. 1381 et seq.) or made available by a drinking water treatment revolving loan fund as authorized by section 1452 of the Safe Drinking Water Act (42 U.S.C. 300j-12) shall be used for a project for the construction, alteration, maintenance, or repair of a public water system or treatment works unless all of the iron and steel products used in the project are produced in the United States.

(2) In this section, the term “iron and steel products” means the following products made primarily of iron or steel: lined or unlined pipes and fittings, manhole covers and other municipal castings, hydrants, tanks, flanges, pipe clamps and restraints, valves, structural steel, reinforced precast concrete, and construction materials.

(b) Subsection (a) shall not apply in any case or category of cases in which the Administrator of the Environmental Protection Agency (in this section referred to as the “Administrator”) finds that—

(1) applying subsection (a) would be inconsistent with the public interest;

(2) iron and steel products are not produced in the United States in sufficient and reasonably available quantities and of a satisfactory quality; or

(3) inclusion of iron and steel products produced in the United States will increase the cost of the overall project by more than 25 percent.

(c) If the Administrator receives a request for a waiver under this section, the Administrator shall make available to the public on an informal basis a copy of the request and information available to the Administrator concerning the request, and shall allow for informal public input on the request for at least 15 days prior to making a finding based on the request. The Administrator shall make the request and accompanying information available by electronic means, including on the official public Internet Web site of the Environmental Protection Agency.

(d) This section shall be applied in a manner consistent with United States obligations under international agreements.

(e) The Administrator may retain up to 0.25 percent of the funds appropriated in this Act for the Clean and Drinking Water State Revolving Funds for carrying out

the provisions described in subsection (a)(1) for management and oversight of the requirements of this section.

(f) This section does not apply with respect to a project if a State agency approves the engineering plans and specifications for the project, in that agency's capacity to approve such plans and specifications prior to a project requesting bids, prior to the date of the enactment of this Act.

The following questions and answers provide guidance for implementing and complying with the AIS requirements:

Project Coverage

1) What classes of projects are covered by the AIS requirement?

All treatment works projects funded by a CWSRF assistance agreement, and all public water system projects funded by a DWSRF assistance agreement, from the date of enactment through the end of Federal Fiscal Year 2014, are covered. The AIS requirements apply to the entirety of the project, no matter when construction begins or ends. Additionally, the AIS requirements apply to all parts of the project, no matter the source of funding.

2) Does the AIS requirement apply to nonpoint source projects or national estuary projects?

No. Congress did not include an AIS requirement for nonpoint source and national estuary projects unless the project can also be classified as a 'treatment works' as defined by section 212 of the Clean Water Act.

3) Are any projects for the construction, alteration, maintenance, or repair of a public water system or treatment works excluded from the AIS requirement?

Any project, whether a treatment works project or a public water system project, for which engineering plans and specifications were approved by the responsible state agency prior to January 17, 2014, is excluded from the AIS requirements.

4) What if the project does not have approved engineering plans and specifications but has signed an assistance agreement with a CWSRF or DWSRF program prior to January 17, 2014?

The AIS requirements do not apply to any project for which an assistance agreement was signed prior to January 17, 2014.

5) What if the project does not have approved engineering plans and specifications, but bids were advertised prior to January 17, 2014 and an assistance agreement was signed after January 17, 2014?

If the project does not require approved engineering plans and specifications, the bid advertisement date will count in lieu of the approval date for purposes of the exemption in section 436(f).

6) What if the assistance agreement that was signed prior to January 17, 2014, only funded a part of the overall project, where the remainder of the project will be funded later with another SRF loan?

If the original assistance agreement funded any construction of the project, the date of the original assistance agreement counts for purposes of the exemption. If the original assistance agreement was only for planning and design, the date of that assistance agreement will count for purposes of the exemption only if there is a written commitment or expectation on the part of the assistance recipient to fund the remainder of the project with SRF funds.

7) What if the assistance agreement that was signed prior to January 17, 2014, funded the first phase of a multi-phase project, where the remaining phases will be funded by SRF assistance in the future?

In such a case, the phases of the project will be considered a single project if all construction necessary to complete the building or work, regardless of the number of contracts or assistance agreements involved, are closely related in purpose, time and place. However, there are many situations in which major construction activities are clearly undertaken in phases that are distinct in purpose, time, or place. In the case of distinct phases, projects with engineering plans and specifications approval or assistance agreements signed prior to January 17, 2014 would be excluded from AIS requirements while those approved/signed on January 17, 2014, or later would be covered by the AIS requirements.

8) What if a project has split funding from a non-SRF source?

Many States intend to fund projects with "split" funding, from the SRF program and from State or other programs. Based on the Act language in section 436, which requires that American iron and steel products be used in any project for the construction, alteration, maintenance, or repair of a public water system or treatment works receiving SRF funding between and including January 17, 2014 and September 30, 2014, any project that is funded in whole or in part with such funds must comply with the AIS requirement. A "project" consists of all construction necessary to complete the building or work regardless of the number of contracts or assistance agreements involved so long as all contracts and assistance agreements awarded are closely related in purpose, time and place. This precludes the intentional splitting of SRF projects into separate and smaller contracts or assistance agreements to avoid AIS coverage on some portion of a larger

project, particularly where the activities are integrally and proximately related to the whole. However, there are many situations in which major construction activities are clearly undertaken in separate phases that are distinct in purpose, time, or place, in which case, separate contracts or assistance agreement for SRF and State or other funding would carry separate requirements.

9) What about refinancing?

If a project began construction, financed from a non-SRF source, prior to January 17, 2014, but is refinanced through an SRF assistance agreement executed on or after January 17, 2014 and prior to October 1, 2014, AIS requirements will apply to all construction that occurs on or after January 17, 2014, through completion of construction, unless, as is likely, engineering plans and specifications were approved by a responsible state agency prior to January 17, 2014. There is no retroactive application of the AIS requirements where a refinancing occurs for a project that has completed construction prior to January 17, 2014.

10) Do the AIS requirements apply to any other EPA programs, besides the SRF program, such as the Tribal Set-aside grants or grants to the Territories and DC?

No, the AIS requirement only applies to funds made available by a State water pollution control revolving fund as authorized by title VI of the Federal Water Pollution Control Act (33 U.S.C. 1381 et seq.) or made available by a drinking water treatment revolving loan fund as authorized by section 1452 of the Safe Drinking Water Act (42 U.S.C. 300j-12)

Covered Iron and Steel Products

11) What is an iron or steel product?

For purposes of the CWSRF and DWSRF projects that must comply with the AIS requirement, an iron or steel product is one of the following made primarily of iron or steel that is permanently incorporated into the public water system or treatment works:

- Lined or unlined pipes or fittings;
- Manhole Covers;
- Municipal Castings (defined in more detail below);
- Hydrants;
- Tanks;
- Flanges;
- Pipe clamps and restraints;
- Valves;
- Structural steel (defined in more detail below);
- Reinforced precast concrete; and
- Construction materials (defined in more detail below).

12) What does the term ‘primarily iron or steel’ mean?

‘Primarily iron or steel’ places constraints on the list of products above. For one of the listed products to be considered subject to the AIS requirements, it must be made of greater than 50% iron or steel, measured by cost. The cost should be based on the material costs.

13) Can you provide an example of how to perform a cost determination?

For example, the iron portion of a fire hydrant would likely be the bonnet, body and shoe, and the cost then would include the pouring and casting to create those components. The other material costs would include non-iron and steel internal workings of the fire hydrant (i.e., stem, coupling, valve, seals, etc). However, the assembly of the internal workings into the hydrant body would not be included in this cost calculation. If one of the listed products is not made primarily of iron or steel, United States (US) provenance is not required. An exception to this definition is reinforced precast concrete, which is addressed in a later question.

14) If a product is composed of more than 50% iron or steel, but is not listed in the above list of items, must the item be produced in the US? Alternatively, must the iron or steel in such a product be produced in the US?

The answer to both question is no. Only items on the above list must be produced in the US. Additionally, the iron or steel in a non-listed item can be sourced from outside the US.

15) What is the definition of steel?

Steel means an alloy that includes at least 50 percent iron, between .02 and 2 percent carbon, and may include other elements. Metallic elements such as chromium, nickel, molybdenum, manganese, and silicon may be added during the melting of steel for the purpose of enhancing properties such as corrosion resistance, hardness, or strength. The definition of steel covers carbon steel, alloy steel, stainless steel, tool steel and other specialty steels.

16) What does ‘produced in the United States’ mean?

Production in the United States of the iron or steel products used in the project requires that all manufacturing processes, including application of coatings, must take place in the United States, with the exception of metallurgical processes involving refinement of steel additives. All manufacturing processes includes processes such as melting, refining, forming, rolling, drawing, finishing, fabricating and coating. Further, if a domestic iron and steel product is taken out of the US for any part of the manufacturing process, it becomes foreign source material. However, raw materials such as iron ore, limestone and iron and steel scrap are not covered by the AIS requirement, and the

material(s), if any, being applied as a coating are similarly not covered. Non-iron or steel components of an iron and steel product may come from non-US sources. For example, for products such as valves and hydrants, the individual non-iron and steel components do not have to be of domestic origin.

17) Are the raw materials used in the production of iron or steel required to come from US sources?

No. Raw materials, such as iron ore, limestone, scrap iron, and scrap steel, can come from non-US sources.

18) If an above listed item is primarily made of iron or steel, but is only at the construction site temporarily, must such an item be produced in the US?

No. Only the above listed products made primarily of iron or steel, permanently incorporated into the project must be produced in the US. For example trench boxes, scaffolding or equipment, which are removed from the project site upon completion of the project, are not required to be made of U.S. Iron or Steel.

19) What is the definition of 'municipal castings'?

Municipal castings are cast iron or steel infrastructure products that are melted and cast. They typically provide access, protection, or housing for components incorporated into utility owned drinking water, storm water, wastewater, and surface infrastructure. They are typically made of grey or ductile iron, or steel. Examples of municipal castings are:

- Access Hatches;
- Ballast Screen;
- Benches (Iron or Steel);
- Bollards;
- Cast Bases;
- Cast Iron Hinged Hatches, Square and Rectangular;
- Cast Iron Riser Rings;
- Catch Basin Inlet;
- Cleanout/Monument Boxes;
- Construction Covers and Frames;
- Curb and Corner Guards;
- Curb Openings;
- Detectable Warning Plates;
- Downspout Shoes (Boot, Inlet);
- Drainage Grates, Frames and Curb Inlets;
- Inlets;
- Junction Boxes;
- Lampposts;
- Manhole Covers, Rings and Frames, Risers;

- Meter Boxes;
- Service Boxes;
- Steel Hinged Hatches, Square and Rectangular;
- Steel Riser Rings;
- Trash receptacles;
- Tree Grates;
- Tree Guards;
- Trench Grates; and
- Valve Boxes, Covers and Risers.

20) What is 'structural steel'?

Structural steel is rolled flanged shapes, having at least one dimension of their cross-section three inches or greater, which are used in the construction of bridges, buildings, ships, railroad rolling stock, and for numerous other constructional purposes. Such shapes are designated as wide-flange shapes, standard I-beams, channels, angles, tees and zeeks. Other shapes include H-piles, sheet piling, tie plates, cross ties, and those for other special purposes.

21) What is a 'construction material' for purposes of the AIS requirement?

Construction materials are those articles, materials, or supplies made primarily of iron and steel, that are permanently incorporated into the project, not including mechanical and/or electrical components, equipment and systems. Some of these products may overlap with what is also considered "structural steel". This includes, but is not limited to, the following products: wire rod, bar, angles, concrete reinforcing bar, wire, wire cloth, wire rope and cables, tubing, framing, joists, trusses, fasteners (i.e., nuts and bolts), welding rods, decking, grating, railings, stairs, access ramps, fire escapes, ladders, wall panels, dome structures, roofing, ductwork, surface drains, cable hanging systems, manhole steps, fencing and fence tubing, guardrails, doors, and stationary screens.

22) What is not considered a 'construction material' for purposes of the AIS requirement?

Mechanical and electrical components, equipment and systems are not considered construction materials. Mechanical equipment is typically that which has motorized parts and/or is powered by a motor. Electrical equipment is typically any machine powered by electricity and includes components that are part of the electrical distribution system.

The following examples (including their appurtenances necessary for their intended use and operation) are NOT considered construction materials: pumps, motors, gear reducers, drives (including variable frequency drives (VFDs)), electric/pneumatic/manual accessories used to operate valves (such as electric valve actuators), mixers, gates, motorized screens (such as traveling screens), blowers/aeration equipment, compressors, meters, sensors, controls and switches, supervisory control and

data acquisition (SCADA), membrane bioreactor systems, membrane filtration systems, filters, clarifiers and clarifier mechanisms, rakes, grinders, disinfection systems, presses (including belt presses), conveyors, cranes, HVAC (excluding ductwork), water heaters, heat exchangers, generators, cabinetry and housings (such as electrical boxes/enclosures), lighting fixtures, electrical conduit, emergency life systems, metal office furniture, shelving, laboratory equipment, analytical instrumentation, and dewatering equipment.

23) If the iron or steel is produced in the US, may other steps in the manufacturing process take place outside of the US, such as assembly?

No. Production in the US of the iron or steel used in a listed product requires that all manufacturing processes must take place in the United States, except metallurgical processes involving refinement of steel additives.

24) What processes must occur in the US to be compliant with the AIS requirement for reinforced precast concrete?

While reinforced precast concrete may not be at least 50% iron or steel, in this particular case, the reinforcing bar and wire must be produced in the US and meet the same standards as for any other iron or steel product. Additionally, the casting of the concrete product must take place in the US. The cement and other raw materials used in concrete production are not required to be of domestic origin.

If the reinforced concrete is cast at the construction site, the reinforcing bar and wire are considered to be a construction material and must be produced in the US.

Compliance

25) How should an assistance recipient document compliance with the AIS requirement?

In order to ensure compliance with the AIS requirement, specific AIS contract language must be included in each contract, starting with the assistance agreement, all the way down to the purchase agreements. Sample language for assistance agreements and contracts can be found in Appendix 3 and 4.

EPA recommends the use of a step certification process, similar to one used by the Federal Highway Administration. The step certification process is a method to ensure that producers adhere to the AIS requirement and assistance recipients can verify that products comply with the AIS requirement. The process also establishes accountability and better enables States to take enforcement actions against violators.

Step certification creates a paper trail which documents the location of the manufacturing process involved with the production of steel and iron materials. A step certification is a process under which each handler (supplier, fabricator, manufacturer,

processor, etc) of the iron and steel products certifies that their step in the process was domestically performed. Each time a step in the manufacturing process takes place, the manufacturer delivers its work along with a certification of its origin. A certification can be quite simple. Typically, it includes the name of the manufacturer, the location of the manufacturing facility where the product or process took place (not its headquarters), a description of the product or item being delivered, and a signature by a manufacturer's responsible party. Attached, as Appendix 5, are sample certifications. These certifications should be collected and maintained by assistance recipients.

Alternatively, the final manufacturer that delivers the iron or steel product to the worksite, vendor, or contractor, may provide a certification asserting that all manufacturing processes occurred in the US. While this type of certification may be acceptable, it may not provide the same degree of assurance. Additional documentation may be needed if the certification is lacking important information. Step certification is the best practice.

26) How should a State ensure assistance recipients are complying with the AIS requirement?

In order to ensure compliance with the AIS requirement, States SRF programs must include specific AIS contract language in the assistance agreement. Sample language for assistance agreements can be found in Appendix 3.

States should also, as a best practice, conduct site visits of projects during construction and review documentation demonstrating proof of compliance which the assistance recipient has gathered.

27) What happens if a State or EPA finds a non-compliant iron and/or steel product permanently incorporated in the project?

If a potentially non-compliant product is identified, the State should notify the assistance recipient of the apparent unauthorized use of the non-domestic component, including a proposed corrective action, and should be given the opportunity to reply. If unauthorized use is confirmed, the State can take one or more of the following actions: request a waiver where appropriate; require the removal of the non-domestic item; or withhold payment for all or part of the project. Only EPA can issue waivers to authorize the use of a non-domestic item. EPA may use remedies available to it under the Clean Water Act, the Safe Drinking Water Act, and 40 CFR part 31 grant regulations, in the event of a violation of a grant term and condition.

It is recommended that the State work collaboratively with EPA to determine the appropriate corrective action, especially in cases where the State is the one who identifies the item in noncompliance or there is a disagreement with the assistance recipient.

If fraud, waste, abuse, or any violation of the law is suspected, the Office of Inspector General (OIG) should be contacted immediately. The OIG can be reached at 1-

888-546-8740 or OIG_Hotline@epa.gov. More information can be found at this website: <http://www.epa.gov/oig/hotline.htm>.

28) How do international trade agreements affect the implementation of the AIS requirements?

The AIS provision applies in a manner consistent with United States obligations under international agreements. Typically, these obligations only apply to direct procurement by the entities that are signatories to such agreements. In general, SRF assistance recipients are not signatories to such agreements, so these agreements have no impact on this AIS provision. In the few instances where such an agreement applies to a municipality, that municipality is under the obligation to determine its applicability and requirements and document the actions taken to comply for the State.

Waiver Process

The statute permits EPA to issue waivers for a case or category of cases where EPA finds (1) that applying these requirements would be inconsistent with the public interest; (2) iron and steel products are not produced in the US in sufficient and reasonably available quantities and of a satisfactory quality; or (3) inclusion of iron and steel products produced in the US will increase the cost of the overall project by more than 25 percent.

In order to implement the AIS requirements, EPA has developed an approach to allow for effective and efficient implementation of the waiver process to allow projects to proceed in a timely manner. The framework described below will allow States, on behalf of the assistance recipients, to apply for waivers of the AIS requirement directly to EPA Headquarters. Only waiver requests received from states will be considered. Pursuant to the Act, EPA has the responsibility to make findings as to the issuance of waivers to the AIS requirements.

Definitions

The following terms are critical to the interpretation and implementation of the AIS requirements and apply to the process described in this memorandum:

Reasonably Available Quantity: The quantity of iron or steel products is available or will be available at the time needed and place needed, and in the proper form or specification as specified in the project plans and design.

Satisfactory Quality: The quality of iron or steel products, as specified in the project plans and designs.

Assistance Recipient: A borrower or grantee that receives funding from a State CWSRF or DWSRF program.

Step-By-Step Waiver Process

Application by Assistance Recipient

Each local entity that receives SRF water infrastructure financial assistance is required by section 436 of the Act to use American made iron and steel products in the construction of its project. However, the recipient may request a waiver. Until a waiver is granted by EPA, the AIS requirement stands, except as noted above with respect to municipalities covered by international agreements.

The waiver process begins with the SRF assistance recipient. In order to fulfill the AIS requirement, the assistance recipient must in good faith design the project (where applicable) and solicit bids for construction with American made iron and steel products. It is essential that the assistance recipient include the AIS terms in any request for proposals or solicitations for bids, and in all contracts (see Appendix 3 for sample construction contract language). The assistance recipient may receive a waiver at any point before, during, or after the bid process, if one or more of three conditions is met:

1. Applying the American Iron and Steel requirements of the Act would be inconsistent with the public interest;
2. Iron and steel products are not produced in the United States in sufficient and reasonably available quantities and of a satisfactory quality; or
3. Inclusion of iron and steel products produced in the United States will increase the cost of the overall project by more than 25 percent.

Proper and sufficient documentation must be provided by the assistance recipient. A checklist detailing the types of information required for a waiver to be processed is attached as Appendix 1.

Additionally, it is strongly encouraged that assistance recipients hold pre-bid conferences with potential bidders. A pre-bid conference can help to identify iron and steel products needed to complete the project as described in the plans and specifications that may not be available from domestic sources. It may also identify the need to seek a waiver prior to bid, and can help inform the recipient on compliance options.

In order to apply for a project waiver, the assistance recipient should email the request in the form of a Word document (.doc) to the State SRF program. It is strongly recommended that the State designate a single person for all AIS communications. The State SRF designee will review the application for the waiver and determine whether the necessary information has been included. Once the waiver application is complete, the State designee will forward the application to either of two email addresses. For CWSRF waiver requests, please send the application to: cwsrfwaiver@epa.gov. For DWSRF waiver requests, please send the application to: dwsrfwaiver@epa.gov.

Evaluation by EPA

After receiving an application for waiver of the AIS requirements, EPA Headquarters will publish the request on its website for 15 days and receive informal comment. EPA Headquarters will then use the checklist in Appendix 2 to determine whether the application properly and adequately documents and justifies the statutory basis cited for the waiver – that it is quantitatively and qualitatively sufficient – and to determine whether or not to grant the waiver.

In the event that EPA finds that adequate documentation and justification has been submitted, the Administrator may grant a waiver to the assistance recipient. EPA will notify the State designee that a waiver request has been approved or denied as soon as such a decision has been made. Granting such a waiver is a three-step process:

1. Posting – After receiving an application for a waiver, EPA is required to publish the application and all material submitted with the application on EPA's website for 15 days. During that period, the public will have the opportunity to review the request and provide informal comment to EPA. The website can be found at: http://water.epa.gov/grants_funding/aisrequirement.cfm
2. Evaluation – After receiving an application for waiver of the AIS requirements, EPA Headquarters will use the checklist in Appendix 2 to determine whether the application properly and adequately documents and justifies the statutory basis cited for the waiver – that it is quantitatively and qualitatively sufficient – and to determine whether or not to grant the waiver.
3. Signature of waiver approval by the Administrator or another agency official with delegated authority – As soon as the waiver is signed and dated, EPA will notify the State SRF program, and post the signed waiver on our website. The assistance recipient should keep a copy of the signed waiver in its project files.

Public Interest Waivers

EPA has the authority to issue public interest waivers. Evaluation of a public interest waiver request may be more complicated than that of other waiver requests so they may take more time than other waiver requests for a decision to be made. An example of a public interest waiver that might be issued could be for a community that has standardized on a particular type or manufacturer of a valve because of its performance to meet their specifications. Switching to an alternative valve may require staff to be trained on the new equipment and additional spare parts would need to be purchased and stocked, existing valves may need to be unnecessarily replaced, and portions of the system may need to be redesigned. Therefore, requiring the community to install an alternative valve would be inconsistent with public interest.

EPA also has the authority to issue a public interest waiver that covers categories of products that might apply to all projects.

EPA reserves the right to issue national waivers that may apply to particular classes of assistance recipients, particular classes of projects, or particular categories of iron or steel products. EPA may develop national or (US geographic) regional categorical waivers through the identification of similar circumstances in the detailed justifications presented to EPA in a waiver request or requests. EPA may issue a national waiver based on policy decisions regarding the public's interest or a determination that a particular item is not produced domestically in reasonably available quantities or of a sufficient quality. In such cases, EPA may determine it is necessary to issue a national waiver.

If you have any questions concerning the contents of this memorandum, you may contact us, or have your staff contact Jordan Dorfman, Attorney-Advisor, State Revolving Fund Branch, Municipal Support Division, at dorfman.jordan@epa.gov or (202) 564-0614 or Kiri Anderer, Environmental Engineer, Infrastructure Branch, Drinking Water Protection Division, at anderer.kirsten@epa.gov or (202) 564-3134.

Attachments

Appendix 1: Information Checklist for Waiver Request

The purpose of this checklist is to help ensure that all appropriate and necessary information is submitted to EPA. EPA recommends that States review this checklist carefully and provide all appropriate information to EPA. This checklist is for informational purposes only and does not need to be included as part of a waiver application.

Items	✓	Notes
<p>General</p> <ul style="list-style-type: none"> • Waiver request includes the following information: <ul style="list-style-type: none"> — Description of the foreign and domestic construction materials — Unit of measure — Quantity — Price — Time of delivery or availability — Location of the construction project — Name and address of the proposed supplier — A detailed justification for the use of foreign construction materials • Waiver request was submitted according to the instructions in the memorandum • Assistance recipient made a good faith effort to solicit bids for domestic iron and steel products, as demonstrated by language in requests for proposals, contracts, and communications with the prime contractor 	✓	
<p>Cost Waiver Requests</p> <ul style="list-style-type: none"> • Waiver request includes the following information: <ul style="list-style-type: none"> — Comparison of overall cost of project with domestic iron and steel products to overall cost of project with foreign iron and steel products — Relevant excerpts from the bid documents used by the contractors to complete the comparison — Supporting documentation indicating that the contractor made a reasonable survey of the market, such as a description of the process for identifying suppliers and a list of contacted suppliers 		
<p>Availability Waiver Requests</p> <ul style="list-style-type: none"> • Waiver request includes the following supporting documentation necessary to demonstrate the availability, quantity, and/or quality of the materials for which the waiver is requested: <ul style="list-style-type: none"> — Supplier information or pricing information from a reasonable number of domestic suppliers indicating availability/delivery date for construction materials — Documentation of the assistance recipient's efforts to find available domestic sources, such as a description of the process for identifying suppliers and a list of contacted suppliers. — Project schedule — Relevant excerpts from project plans, specifications, and permits indicating the required quantity and quality of construction materials • Waiver request includes a statement from the prime contractor and/or supplier confirming the non-availability of the domestic construction materials for which the waiver is sought • Has the State received other waiver requests for the materials described in this waiver request, for comparable projects? 		

Appendix 2: HQ Review Checklist for Waiver Request

Instructions: To be completed by EPA. Review all waiver requests using the questions in the checklist, and mark the appropriate box as Yes, No or N/A. Marks that fall inside the shaded boxes may be grounds for denying the waiver. If none of your review markings fall into a shaded box, the waiver is eligible for approval if it indicates that one or more of the following conditions applies to the domestic product for which the waiver is sought:

1. The iron and/or steel products are not produced in the United States in sufficient and reasonably available quantities and of a satisfactory quality.
2. The inclusion of iron and/or steel products produced in the United States will increase the cost of the overall project by more than 25 percent.

Review Items	Yes	No	N/A	Comments
<p>Cost Waiver Requests</p> <ul style="list-style-type: none"> • Does the waiver request include the following information? <ul style="list-style-type: none"> — Comparison of overall cost of project with domestic iron and steel products to overall cost of project with foreign iron and steel products — Relevant excerpts from the bid documents used by the contractors to complete the comparison — A sufficient number of bid documents or pricing information from domestic sources to constitute a reasonable survey of the market • Does the Total Domestic Project exceed the Total Foreign Project Cost by more than 25%? 				
<p>Availability Waiver Requests</p> <ul style="list-style-type: none"> • Does the waiver request include supporting documentation sufficient to show the availability, quantity, and/or quality of the iron and/or steel product for which the waiver is requested? <ul style="list-style-type: none"> — Supplier information or other documentation indicating availability/delivery date for materials — Project schedule — Relevant excerpts from project plans, specifications, and permits indicating the required quantity and quality of materials • Does supporting documentation provide sufficient evidence that the contractors made a reasonable effort to locate domestic suppliers of materials, such as a description of the process for identifying suppliers and a list of contacted suppliers? <p>Based on the materials delivery/availability date indicated in the supporting documentation, will the materials be unavailable when they are needed according to the project schedule? (By item, list schedule date and domestic delivery quote date or other relevant information)</p> • Is EPA aware of any other evidence indicating the non-availability of the materials for which the waiver is requested? <p>Examples include:</p> <ul style="list-style-type: none"> — Multiple waiver requests for the materials described in this waiver request, for comparable projects in the same State — Multiple waiver requests for the materials described in this waiver request, for comparable projects in other States — Correspondence with construction trade associations indicating the non-availability of the materials • Are the available domestic materials indicated in the bid documents of inadequate quality compared those required by the project plans, specifications, and/or permits? 				

Appendix 3: Example Loan Agreement Language

ALL ASSISTANCE AGREEMENT MUST HAVE A CLAUSE REQUIRING COMPLIANCE WITH THE AIS REQUIREMENT. THIS IS AN EXAMPLE OF WHAT COULD BE INCLUDED IN SRF ASSISTANCE AGREEMENTS. EPA MAKES NO CLAIMS REGARDING THE LEGALITY OF THIS CLAUSE WITH RESPECT TO STATE LAW:

Comply with all federal requirements applicable to the Loan (including those imposed by the 2014 Appropriations Act and related SRF Policy Guidelines) which the Participant understands includes, among other, requirements that all of the iron and steel products used in the Project are to be produced in the United States (“American Iron and Steel Requirement”) unless (i) the Participant has requested and obtained a waiver from the Agency pertaining to the Project or (ii) the Finance Authority has otherwise advised the Participant in writing that the American Iron and Steel Requirement is not applicable to the Project.

Comply with all record keeping and reporting requirements under the Clean Water Act/Safe Drinking Water Act, including any reports required by a Federal agency or the Finance Authority such as performance indicators of program deliverables, information on costs and project progress. The Participant understands that (i) each contract and subcontract related to the Project is subject to audit by appropriate federal and state entities and (ii) failure to comply with the Clean Water Act/Safe Drinking Water Act and this Agreement may be a default hereunder that results in a repayment of the Loan in advance of the maturity of the Bonds and/or other remedial actions.

Appendix 4: Sample Construction Contract Language

ALL CONTRACTS MUST HAVE A CLAUSE REQUIRING COMPLIANCE WITH THE AIS REQUIREMENT. THIS IS AN EXAMPLE OF WHAT COULD BE INCLUDED IN ALL CONTRACTS IN PROJECTS THAT USE SRF FUNDS. EPA MAKES NO CLAIMS REGARDING THE LEGALITY OF THIS CLAUSE WITH RESPECT TO STATE OR LOCAL LAW:

The Contractor acknowledges to and for the benefit of the City of _____ (“Purchaser”) and the _____ (the “State”) that it understands the goods and services under this Agreement are being funded with monies made available by the Clean Water State Revolving Fund and/or Drinking Water State Revolving Fund that have statutory requirements commonly known as “American Iron and Steel;” that requires all of the iron and steel products used in the project to be produced in the United States (“American Iron and Steel Requirement”) including iron and steel products provided by the Contractor pursuant to this Agreement. The Contractor hereby represents and warrants to and for the benefit of the Purchaser and the State that (a) the Contractor has reviewed and understands the American Iron and Steel Requirement, (b) all of the iron and steel products used in the project will be and/or have been produced in the United States in a manner that complies with the American Iron and Steel Requirement, unless a waiver of the requirement is approved, and (c) the Contractor will provide any further verified information, certification or assurance of compliance with this paragraph, or information necessary to support a waiver of the American Iron and Steel Requirement, as may be requested by the Purchaser or the State. Notwithstanding any other provision of this Agreement, any failure to comply with this paragraph by the Contractor shall permit the Purchaser or State to recover as damages against the Contractor any loss, expense, or cost (including without limitation attorney’s fees) incurred by the Purchaser or State resulting from any such failure (including without limitation any impairment or loss of funding, whether in whole or in part, from the State or any damages owed to the State by the Purchaser). While the Contractor has no direct contractual privity with the State, as a lender to the Purchaser for the funding of its project, the Purchaser and the Contractor agree that the State is a third-party beneficiary and neither this paragraph (nor any other provision of this Agreement necessary to give this paragraph force or effect) shall be amended or waived without the prior written consent of the State.

Appendix 5: Sample Certifications

The following information is provided as a sample letter of step certification for AIS compliance. Documentation must be provided on company letterhead.

Date

Company Name

Company Address

City, State Zip

Subject: American Iron and Steel Step Certification for Project (XXXXXXXXXXXX)

I, (company representative), certify that the (melting, bending, coating, galvanizing, cutting, etc.) process for (manufacturing or fabricating) the following products and/or materials shipped or provided for the subject project is in full compliance with the American Iron and Steel requirement as mandated in EPA's State Revolving Fund Programs.

Item, Products and/or Materials:

1. XXXX
2. XXXX
3. XXXX

Such process took place at the following location:

If any of the above compliance statements change while providing material to this project we will immediately notify the prime contractor and the engineer.

Signed by company representative

The following information is provided as a sample letter of certification for AIS compliance. Documentation must be provided on company letterhead.

Date

Company Name

Company Address

City, State Zip

Subject: American Iron and Steel Certification for Project (XXXXXXXXXX)

I, (company representative), certify that the following products and/or materials shipped/provided to the subject project are in full compliance with the American Iron and Steel requirement as mandated in EPA's State Revolving Fund Programs.

Item, Products and/or Materials:

1. Xxx
2. Xxx
3. Xxx

Such process took place at the following location:

If any of the above compliance statements change while providing material to this project we will immediately notify the prime contractor and the engineer.

Signed by company representative

Appendix M

Clean Water SRF WRRDA Guidance Final 1-06-15 (Final Interpretive Guidance)

Appendix E – MBE/ WBE/ DBE

KDHE DISADVANTAGED BUSINESS ENTERPRISES (DBE) INFORMATION

**KANSAS DEPARTMENT OF HEALTH & ENVIRONMENT
DIVISION OF ENVIRONMENT
BUREAU OF WATER**

KANSAS
DEPARTMENT OF HEALTH & ENVIRONMENT
DIVISION OF ENVIRONMENT
BUREAU OF WATER

KANSAS PUBLIC WATER SUPPLY LOAN FUND
KANSAS WATER POLLUTION CONTROL REVOLVING LOAN FUND

Participation By Disadvantaged Business Enterprises Information Sheet

As a recipient of EPA SRF Capitalization Grants, the Kansas Department of Health and Environment (KDHE) is required by 40 CFR Part 33 to seek and is encouraged to utilize small, minority, and women-owned businesses in procurement under loan agreements associated with those grants. Because this project will receive funding, at least in part, from KDHE through a Kansas Public Water supply Loan Fund (KPWSLF) or a Kansas Water Pollution Control Revolving Loan Fund (KWPCRLF) loan agreement, those requirements are applicable to the loan recipient (municipality), engineering firm responsible for construction phase services, and prime contractor.

This information sheet explains requirements of the KPWSLF and KWPCRLF for Disadvantaged Business Enterprises (DBE) utilization. A copy of this Information Sheet must be included within engineering contracts for construction phase services and must be included within the contract documents of construction specifications.

Definitions

Disadvantaged Business Enterprise - entities owned and/or controlled by socially and economically disadvantaged individuals (as described in 42 USC 7601 and 42 USC 4370d - which includes Women's Business Enterprises (WBE) and Minority Business Enterprises (MBE) as defined in this information sheet); a Small Business Enterprise (SBE); a Small Business in Rural Area (SBRA); a Labor Surplus Area Firm (LSAF); or a Historically Underutilized Business (HUB) Zone Small Business Concern or a concern under a successor program.

Socially disadvantaged individual – individuals who have been subjected to racial or ethnic prejudice or cultural bias because of their identity as a member of a group without regard to their individual qualities, and are further defined as:

Black Americans	Asian Pacific Americans	Indian Tribes
Hispanic Americans	Native Hawaiian Organizations	Women
Native Americans	Historically Black Colleges and Universities	

Economically disadvantaged individual - those socially disadvantaged individuals whose ability to compete in the free enterprise system has been impaired due to diminished capital or credit opportunities, as compared to others in the same business area who are not socially disadvantaged.

Women's Business Enterprise (WBE) – a business concern which is at least 51% owned or controlled by women for purposes of 42 USC 7601 of 42 USC 4370d.

Minority Business Enterprises (MBE) - a Disadvantaged Business Enterprise other than a SBE, SBRA, LSAF, or WBE.

KDHE Implementation Requirements for DBE Procurement Opportunities

KDHE has an objective of using an amount equal to 4.1% of the capitalization grant as awarded by EPA to KDHE, for construction procurement performed by MBE entities and 6.9% of the capitalization grant for WBE entities. This is referred to as a fair share objective. The loan recipient (municipality), engineering firm responsible for construction phase services, and prime contractor are required to adopt this same fair share objective. The fair share objective is not a quota and EPA cannot penalize KDHE, the loan recipient, engineering firm, or the prime contractor for not meeting MBE or WBE participation objectives.

The prime contractor and consulting engineer responsible for construction phase services are required to make the good faith efforts and apply the administrative requirements listed below for any subcontracts.

Good Faith Efforts

1. Ensure DBEs are made aware of contracting opportunities to the fullest extent practicable through outreach and recruitment activities.

This step may include sending letters or making other personal contacts with DBEs. DBEs should be contacted when other potential subcontractors/suppliers are contacted, within reasonable time (i.e. minimum of fifteen days) prior to bid submission or closing date for receipt of initial offers. Those letters or other contacts should communicate the following:

- i. Specific description of the work to be subcontracted or supplies to be purchased;
 - ii. How and where to obtain a copy of plans and specifications or other detailed information needed to prepare a detailed price quotation;
 - iii. Date the quotation is due to the prime contractor;
 - iv. Name, address, and phone number of the person in the prime contractor's firm whom the prospective DBE subcontractor/supplier should contact for additional information.
2. Make information on forthcoming opportunities available to DBEs and arrange time frames for contracts and establish delivery schedules, where the requirements permit, in a way that encourages and facilitates participation by DBEs in the competitive process. This includes, whenever possible, posting solicitations for bids or proposals for a minimum of 30 calendar days before the bid or proposal closing date.
 3. Consider in the contracting process whether firms competing for large contracts could subcontract with DBEs.
 4. Encourage contracting with a consortium of DBEs when a contract is too large for one of these firms to handle individually.
 5. Use the services and assistance of the SBA and the Minority Business Development Agency of the Department of Commerce.

Administrative Requirements

The prime contractor/engineering firm responsible for construction phase services:

1. Must pay its subcontractor for satisfactory performance not more than 30 days from the prime contractor's receipt of payment.
2. Must notify KDHE in writing prior to termination of a DBE subcontractor for convenience.
3. Must employ the good faith efforts when soliciting a replacement subcontractor, if the original subcontractor fails to complete work for any reason.
4. Shall provide EPA Form 6100-2—DBE Program Subcontractor Participation Form to all of its DBE subcontractors. Subcontractors can submit this form to KDHE if there are any concerns regarding the project.
5. Must have its DBE subcontractors complete EPA Form 6100-3—DBE Program Subcontractor Performance Form, and submit it with the bid or proposal package. If DBE subcontractors are not anticipated to be used, a blank form with such notation must still be submitted with the prime bid package. You must still demonstrate DBE firms were provided an opportunity to obtain subcontracts.
6. Must complete and submit EPA Form 6100-4—DBE Program Subcontractor Utilization Form with the bid or proposal package (use additional copies of form if needed). If DBE subcontractors are not anticipated to be used, a blank form with such notation must still be submitted with the prime bid package. You must still demonstrate DBE firms were provided an opportunity to obtain subcontracts.
7. Shall not discriminate on the basis of race, color, national origin or sex in the performance of this contract. The contractor shall carry out applicable requirements of 40 CRF part 33 in the award and administration of contracts awarded under EPA financial assistance agreements. Failure by the contractor to carry out these requirements is a material breach of this contract which may result in the termination of this contract or other legally available remedies.

Finding DBE Firms

The Kansas Department of Transportation Directory of Disadvantaged Business Enterprise (DBE) can be found on the web at www.ksdot.org/divadinin/civilrights/.

The Kansas Department of Commerce maintains a Kansas Minority & Women Business Directory on the web at <http://mwbds.kansascommerce.com/>.

The Minority Business Development Agency of the Department of Commerce maintains a business locator database on the web at www.mbda.gov.

KDHE and the municipality are required to maintain a list of bidders that have competed for loan fund projects. This list can be used in conjunction with the directories listed above to find DBE firms. This list can be found on the web at www.kdheks.gov/pws/loan/SRFbidlist.xls.

DBE firms are not limited by the directories listed above. Prime contractors should use any means necessary to locate and contact DBE firms.

In order for a DBE to participate as an MBE or WBE, that entity must be certified by one of the following; the (1) Environmental Protection Agency (EPA), (2) Small Business Administration (SBA), (3) US Department of Transportation, or (4) any other state or local government or private organization certification that has standards that meet or exceed the EPA certification program. MBE's and WBE's must be certified in order for procurement to count towards meeting Fair Share Goals.

Determination of Compliance

Prime contractors must demonstrate compliance with DBE requirements in order to be deemed responsive prior to contract award. Demonstration of compliance shall include submittal of EPA Form 6100-3, EPA Form 6100-4, and a list of DBE subcontractors contacted and the method used to contact them (the attached Demonstration of Compliance with DBE Good Faith Efforts Worksheet can be used for this purpose).

Engineering firms responsible for construction phase services must demonstrate compliance with DBE requirements prior to the construction contract award. Demonstration of compliance shall include submittal of EPA Form 6100-3, EPA Form 6100-4, and a list of DBE subcontractors contacted and the method used to contact them (the attached Demonstration of Compliance with DBE Good Faith Efforts Worksheet can be used for this purpose).

The municipality is required to submit a copy of this information to KDHE as well as submit the Applicant Assurance with Respect to Good Faith Efforts for DBE Utilization form prior to the award of the construction contract. The municipality is also required to submit to KDHE by April 15 and October 15 (during project construction), EPA Form 5700-52A - MBE/WBE Utilization under Federal Grants, Cooperative Agreements, and Interagency Agreements. If MBE/WBE firms are utilized, proof of certification must be submitted with EPA Form 5700-52A.

DBE SUBCONTRACTOR PARTICIPATION FORM (EPA FORM 6100-2)

ENVIRONMENTAL PROTECTION AGENCY
DISADVANTAGED BUSINESS ENTERPRISE PROGRAM
DBE SUBCONTRACTOR PARTICIPATION FORM
EPA FORM 6100-2



OMB Control No: 2090-0030
 Approved: 8/13/2013
 Approval Expires: 8/31/2015

**Disadvantaged Business Enterprise (DBE) Program
 DBE Subcontractor Participation Form**

An EPA Financial Assistance Agreement Recipient must require its prime contractors to provide this form to its DBE subcontractors. This form gives a DBE¹ subcontractor² the opportunity to describe work received and/or report any concerns regarding the EPA-funded project (e.g., in areas such as termination by prime contractor, late payments, etc.). The DBE subcontractor can, as an option, complete and submit this form to the EPA DBE Coordinator at any time during the project period of performance.

Subcontractor Name		Project Name Lateral Sewer District No. 1 of Kill Creek No. 2 Contract 1 - Low Pressure Sewer Improvements Contract 2 - Residential Electrical Improvements	
Bid/ Proposal No.	Assistance Agreement ID No. (if known)	Point of Contact	
Address			
Telephone No.		Email Address	
Prime Contractor Name		Issuing/Funding Entity:	

Contract Item Number	Description of Work Received from the Prime Contractor Involving Construction, Services, Equipment or Supplies	Amount Received by Prime Contractor

¹ A DBE is a Disadvantaged, Minority, or Woman Business Enterprise that has been certified by an entity from which EPA accepts certifications as described in 40 CFR 33.204-33.205 or certified by EPA. EPA accepts certifications from entities that meet or exceed EPA certification standards as described in 40 CFR 33.202.

² Subcontractor is defined as a company, firm, joint venture, or individual who enters into an agreement with a contractor to provide services pursuant to an EPA award of financial assistance.

DBE SUBCONTRACTOR PERFORMANCE FORM (EPA FORM 6100-3)

ENVIRONMENTAL PROTECTION AGENCY
DISADVANTAGED BUSINESS ENTERPRISE PROGRAM
FORM 6100-3 (DBE SUBCONTRACTOR PERFORMANCE FORM)



OMB Control No: 2090-0030
 Approved: 8/13/2013
 Approval Expires: 8/31/2015

**Disadvantaged Business Enterprise (DBE) Program
 DBE Subcontractor Performance Form**

This form is intended to capture the DBE¹ subcontractor's² description of work to be performed and the price of the work submitted to the prime contractor. An EPA Financial Assistance Agreement Recipient must require its prime contractor to have its DBE subcontractors complete this form and include all completed forms in the prime contractors bid or proposal package.

Subcontractor Name		Project Name Lateral Sewer District No. 1 of Kill Creek No. 2 Contract 1 - Low Pressure Sewer Improvements Contract 2 - Residential Electrical Improvements	
Bid/ Proposal No.	Assistance Agreement ID No. (if known)	Point of Contact	
Address			
Telephone No.		Email Address	
Prime Contractor Name		Issuing/Funding Entity:	

Contract Item Number	Description of Work Submitted to the Prime Contractor Involving Construction, Services, Equipment or Supplies	Price of Work Submitted to the Prime Contractor
DBE Certified By: <input type="checkbox"/> DOT <input type="checkbox"/> SBA <input type="checkbox"/> Other: _____		Meets/ exceeds EPA certification standards? <input type="checkbox"/> YES <input type="checkbox"/> NO <input type="checkbox"/> Unknown

¹ A DBE is a Disadvantaged, Minority, or Woman Business Enterprise that has been certified by an entity from which EPA accepts certifications as described in 40 CFR 33.204-33.205 or certified by EPA. EPA accepts certifications from entities that meet or exceed EPA certification standards as described in 40 CFR 33.202.

² Subcontractor is defined as a company, firm, joint venture, or individual who enters into an agreement with a contractor to provide services pursuant to an EPA award of financial assistance.

**Disadvantaged Business Enterprise (DBE) Program
DBE Subcontractor Performance Form**

I certify under penalty of perjury that the forgoing statements are true and correct. Signing this form does not signify a commitment to utilize the subcontractors above. I am aware of that in the event of a replacement of a subcontractor, I will adhere to the replacement requirements set forth in 40 CFR Part 33 Section 33.302 (c).

Prime Contractor Signature	Print Name
Title	Date

Subcontractor Signature	Print Name
Title	Date

The public reporting and recordkeeping burden for this collection of information is estimated to average three (3) hours per response. Send comments on the Agency's need for this information, the accuracy of the provided burden estimates, and any suggested methods for minimizing respondent burden, including through the use of automated collection techniques to the Director, Collection Strategies Division, U.S. Environmental Protection Agency (2822T), 1200 Pennsylvania Ave., NW, Washington, D.C. 20460. Include the OMB control number in any correspondence. Do not send the completed form to this address.

DBE SUBCONTRACTOR UTILIZATION FORM (EPA FORM 6100-4)

ENVIRONMENTAL PROTECTION AGENCY
DISADVANTAGED BUSINESS ENTERPRISE PROGRAM
FORM 6100-4 (DBE SUBCONTRACTOR UTILIZATION FORM)

**Disadvantaged Business Enterprise (DBE) Program
DBE Subcontractor Utilization Form**

This form is intended to capture the prime contractor's actual and/or anticipated use of identified certified DBE¹ subcontractors² and the estimated dollar amount of each subcontract. An EPA Financial Assistance Agreement Recipient must require its prime contractors to complete this form and include it in the bid or proposal package. Prime contractors should also maintain a copy of this form on file.

Prime Contractor Name		Project Name Lateral Sewer District No. 1 of Kill Creek No. 2 Contract 1 - Low Pressure Sewer Improvements Contract 2 - Residential Electrical Improvements	
Bid/ Proposal No.	Assistance Agreement ID No. (if known)	Point of Contact	
Address			
Telephone No.		Email Address	
Issuing/Funding Entity:			

I have identified potential DBE certified subcontractors	__ YES	__ NO	
If yes, please complete the table below. If no, please explain:			
Subcontractor Name/ Company Name	Company Address/ Phone/ Email	Est. Dollar Amt	Currently DBE Certified?

Continue on back if needed

¹ A DBE is a Disadvantaged, Minority, or Woman Business Enterprise that has been certified by an entity from which EPA accepts certifications as described in 40 CFR 33.204-33.205 or certified by EPA. EPA accepts certifications from entities that meet or exceed EPA certification standards as described in 40 CFR 33.202.

² Subcontractor is defined as a company, firm, joint venture, or individual who enters into an agreement with a contractor to provide services pursuant to an EPA award of financial assistance.



OMB Control No: 2090-0030
Approved: 8/13/2013
Approval Expires: 8/31/2015

**Disadvantaged Business Enterprise (DBE) Program
DBE Subcontractor Utilization Form**

I certify under penalty of perjury that the forgoing statements are true and correct. Signing this form does not signify a commitment to utilize the subcontractors above. I am aware of that in the event of a replacement of a subcontractor, I will adhere to the replacement requirements set forth in 40 CFR Part 33 Section 33.302 (c).

Prime Contractor Signature	Print Name
Title	Date

The public reporting and recordkeeping burden for this collection of information is estimated to average three (3) hours per response. Send comments on the Agency's need for this information, the accuracy of the provided burden estimates, and any suggested methods for minimizing respondent burden, including through the use of automated collection techniques to the Director, Collection Strategies Division, U.S. Environmental Protection Agency (2822T), 1200 Pennsylvania Ave., NW, Washington, D.C. 20460. Include the OMB control number in any correspondence. Do not send the completed form to this address.

KDHE DEMONSTRATION OF COMPLIANCE WITH DBE GOOD FAITH EFFORTS
WORKSHEET

KDHE SRF CONTRACT PROVISIONS
(March 21, 2011)

Demonstration of Compliance with DBE Good Faith Efforts Worksheet

Project Name _____

KPWSLF or KWPCRLF Project No. _____

Prime Contract Bidder/Engineering Firm _____

Address _____

Contact Person: _____ Telephone No. _____

The following firms were made aware of subcontracting/supplier opportunities related to the project listed above.

DBE Subcontractor/Supplier contacted _____

Address _____

Contact Person: _____ Telephone No. _____

Email _____ Method used to contact (circle one): Phone Mail Fax

Is entity also a certified as a MBE _____ or WBE _____ ? (if no leave blank)

MBE/WBE status certified by (circle one) EPA SBA Other _____

DBE Subcontractor/Supplier contacted _____

Address _____

Contact Person: _____ Telephone No. _____

Email _____ Method used to contact (circle one): Phone Mail Fax

Is entity also a certified as a MBE _____ or WBE _____ ? (if no leave blank)

MBE/WBE status certified by (circle one) EPA SBA Other _____

DBE Subcontractor/Supplier contacted _____

Address _____

Contact Person: _____ Telephone No. _____

Email _____ Method used to contact (circle one): Phone Mail Fax

Is entity also a certified as a MBE _____ or WBE _____ ? (if no leave blank)

MBE/WBE status certified by (circle one) EPA SBA Other _____

DBE Subcontractor/Supplier contacted _____

Address _____

Contact Person: _____ Telephone No. _____

Email _____ Method used to contact (circle one): Phone Mail Fax

Is entity also a certified as a MBE _____ or WBE _____ ? (if no leave blank)

MBE/WBE status certified by (circle one) EPA SBA Other _____

Comments _____

Prepared By: _____

Date: _____

(Use additional copies of this sheet if needed)

KDHE KANSAS ACT AGAINST DISCRIMINATION CERTIFICATION FORM

All contracts must certify they comply with the Kansas Act Against Discrimination Requirements and attach a copy of the certification to the contract.

Kansas Act Against Discrimination

Contract Provisions of Kansas Statutes Annotated (K.S.A.) 44-1030 State and Local Government contracts; Mandatory Provisions

- (a) Except as provided by subsection (c) of this section, every contractor for or on behalf of the State and any county or municipality or other political subdivision of the State, or any agency of or authority created by any of the foregoing, for the construction, alteration, or repair of any public building or public work or for the acquisition of materials, equipment, supplies, or services shall contain provisions by which the contractor agrees that:
- (1) The contractor shall observe the provisions of the Kansas Act Against Discrimination and shall not discriminate against any person in the performance of work under the present contract because of race, religion, color, sex, disability, national origin, or ancestry;
 - (2) In all solicitations or advertisements for employees, the contractor shall include the phrase "equal opportunity employer" or a similar phrase to be approved by the Commission;
 - (3) If the contractor fails to comply with the manner in which the contractor reports to the Commission in accordance with the provisions of K.S.A. 44-1031 and amendments thereto, the contractor shall be deemed to have breached the present contract and it may be cancelled, terminated, or suspended, in whole or in part, by the contracting agency;
 - (4) If the contractor is found guilty of a violation of the Kansas Act Against Discrimination under a decision or order of the Commission which has become final, the contractor shall be deemed to have breached the present contract and it may be cancelled, terminated, or suspended, in whole, or in part, by the contracting agency;
 - (5) The contractor shall include the provisions of subsections (a)(1) through (4) in every subcontract or purchase order so that such provisions will be binding upon such subcontract or vendor.
- (b) The Kansas Human Rights Commission shall not be prevented hereby from requiring reports of contractors found to be not in compliance with the Kansas Act Against Discrimination.
- (c) The provisions of this section shall not apply to a contract entered into by a contractor:
- 1) Who employees fewer than four (4) employees during the term of such contract; or
 - 2) Whose contracts with the governmental entity letting such contract cumulatively total \$5,000 or less during the fiscal year of such governmental entity.

STATE OF KANSAS
ACT AGAINST DISCRIMINATION
CONTRACT PROVISION CERTIFICATION FORM

During the performance of this contract, the contractor agrees as follows:

- (1) The contractor shall observe the provisions of the Kansas Act Against Discrimination and shall not discriminate against any person in the performance of work under the present contract because of race, religion, color, sex, disability, national origin, or ancestry;
- (2) In all solicitations or advertisements for employees, the contractor shall include the phrase "equal opportunity employer" or a similar phrase to be approved by the Commission;
- (3) If the contractor fails to comply with the manner in which the contractor reports to the Commission in accordance with the provisions of K.S.A.44-1031 and amendments thereto, the contractor shall be deemed to have breached the present contract and it may be cancelled, terminated, or suspended, in whole or in part, by the contracting agency;
- (4) If the contractor is found guilty of a violation of the Kansas Act Against Discrimination under a decision or order of the Commission which has become final, the contractor shall be deemed to have breached the present contract and it may be cancelled, terminated or suspended, in whole, or in part, by the contracting agency;
- (5) The contractor shall include the provisions of (1) through (4) in every applicable subcontract or purchase order so that such provisions will be binding upon such subcontractor or vendor.

PROJECT/CONTRACT NAME AND NO. _____

MUNICIPALITY _____

CONTRACTOR'S
SIGNATURE _____

TITLE _____

KDHE PROJECT NO. _____

DATE _____

Appendix F – Certification Regarding Debarment, Suspension, and Other Responsibility Matters
Form and Instructions – EPA Form 5700-49
Certification Regarding Lobbying – EPA Form 6600-06
Certification of Nonsegregated Facilities – EPA Form
Trafficking Victims Protection Act Form
State of Kansas Act Against Discrimination Contract Provision Certification Form



Waste Water Project Number

C20

United States Environmental Protection Agency
Washington, DC 20460

Certification Regarding Debarment, Suspension, and Other Responsibility Matters

The prospective participant certifies to the best of its knowledge and belief that it and its principals:

- (a) Are not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from covered transactions by any Federal department or agency.
- (b) Have not within a three year period preceding this proposal been convicted of or had a civil judgement rendered against them for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, State, or local) transaction or contract under a public transaction; violation of Federal or State antitrust statutes or commission of embezzlement, theft, forgery, falsification or destruction of records, making false statements, or receiving stolen property;
- (c) Are not presently indicted for or otherwise criminally or civilly charged by a government entity (Federal, State, or local) with commission of any of the offenses enumerated in paragraph (1)(b) of this certification; and
- (d) Have not within a three-year period preceding this application/proposal had one or more public transactions (Federal, State, or local) terminated for cause or default.

I understand that a false statement on this certification may be grounds for rejection of this proposal or termination of the award. In addition, under 18 USC Sec. 1001, a false statement may result in a fine of up to \$10,000 or imprisonment for up to 5 years, or both.

Typed Name & Title of Authorized Representative

Signature of Authorized Representative

Date

I am unable to certify to the above statements. My explanation is attached.

EPA Form 5700-49 (11-88)

This form has been adopted for use as a Kansas Water Pollution Control Revolving Fund document

Instructions

Under Executive Order 12549, an individual or organization debarred or excluded from participation in Federal assistance or benefit programs may not receive any assistance award under a Federal program, or a subagreement thereunder for \$25,000 or more.

Accordingly, each prospective recipient of an EPA grant, loan, or cooperative agreement and any contract or subagreement participant thereunder must complete the attached certification or provide an explanation why they cannot. For further details, see 40 CFR 32.510, Participants' responsibilities, in the attached regulation.

Where To Submit

A prospective prime contractor for construction or modification of Waste Water Treatment facilities or support system must submit a completed certification or explanation to the individual or organization awarding the contract.

Each prospective subcontractor must submit a completed certification or explanation to the prime contractor for the project.

How To Obtain Forms:

KDHE will provide the certification form, instructions and a copy of its implementing regulation (40 CFR Part 32) in each application kit. Applicants may reproduce these materials as needed and provide them to their prospective prime contractor, who, in turn, may reproduce and provide them to prospective subcontractors. The form and instructions are also available in an electronic media by contacting KDHE at the address below:

Additional copies/assistance may be requested from:

Kansas Department of Health and Environment
Bureau of Water / Municipal Programs
1000 SW Jackson Street, Suite 420
Topeka, Kansas 66612-1367
(Telephone: 785/296-4262)
(Email: bdiegel@kdheks.gov)

The EPA instructions have been modified for use in the Kansas Revolving Loan Programs

EPA Form 5700-49 (11-88)

EPA Project Control Number

CERTIFICATION REGARDING LOBBYING

CERTIFICATION FOR CONTRACTS, GRANTS, LOANS AND COOPERATIVE AGREEMENTS

The undersigned certifies, to the best of his or her knowledge and belief, that:

(1) No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.

(2) If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions.

(3) The undersigned shall require that the language of this certification be included in the award documents for all sub-awards at all tiers (including sub-contracts, sub-grants, and contracts under grants, loans, and cooperative agreements) and that all sub-recipients shall certify and disclose accordingly.

This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by section 1352, title 31 U.S. Code. Any person who fails to file the required certification shall be subject to a civil penalty of not less than \$10,000 and not more than \$100,000 for each such failure.

Typed Name & Title of Authorized Representative

Signature and Date of Authorized Representative

U.S. ENVIRONMENTAL PROTECTION AGENCY
OFFICE OF POLICY AND MANAGEMENT

CERTIFICATION OF NONSEGREGATED FACILITIES

(Applicable to federally assisted construction contracts and related subcontracts exceeding \$10,000 which are not exempt from the Equal Opportunity clause.)

The federally assisted construction contractor certifies that he does not maintain or provide for his employees any segregated facilities at any of his establishments, and that he does not permit his employees to perform their services at any location, under his control, where segregated facilities are maintained. The federally assisted construction contractor certifies further that he will not maintain or provide for his employees any segregated facilities at any of his establishments, and that he will not permit his employees to perform their services at any location, under his control, where segregated facilities are maintained. The federally assisted construction contractor agrees that a breach of this certification is a violation of the Equal Opportunity clause in this contract. As used in this certification, the term "segregated facilities" means any waiting rooms, work areas, rest rooms and wash rooms, restaurants and other eating areas, time clocks, locker rooms and other storage or dressing areas, parking lots, drinking fountains, recreation or entertainment areas, transportation, and housing facilities provided for employees which are segregated by explicit directive or are in fact segregated on the basis of race, creed, color, or national origin, because of habit, local custom, or otherwise. The federally assisted construction contractor agrees that (except where he has obtained identical certifications from proposed subcontractors for specific time periods) he will obtain identical certifications from proposed subcontractors prior to the award of subcontracts exceeding \$10,000 which are not exempt from the provisions of the Equal Opportunity clause, and that he will retain such certifications in his files.

Signature

Date

Name and Title of Signer (Please Type)

Firm Name

NOTE: The penalty for making false statements in offers is prescribed in 18 U.S.C. 1001.

TRAFFICKING VICTIMS PROTECTION ACT

During the performance of this contract, the contractor agrees as follows:

The contractor, its employees, sub-contractors, and sub-contractor's employees under any KWPCRF Loan Agreement, may not engage in severe forms of trafficking in persons during the period of time that the award is in effect; procure a commercial sex act during the period of time that the award is in effect; or use forced labor in the performance of the contract or subcontracts under the award.

Project Name: _____

SRF Project Number: C20-_____

Company Name: _____

Contractor's
Signature: _____

Title: _____

Date: _____

STATE OF KANSAS
ACT AGAINST DISCRIMINATION
CONTRACT PROVISION CERTIFICATION FORM

During the performance of this contract, the contractor agrees as follows:

- (1) The contractor shall observe the provisions of the Kansas Act Against Discrimination and shall not discriminate against any person in the performance of work under the present contract because of race, religion, color, sex, disability, national origin, or ancestry;
- (2) In all solicitations or advertisements for employees, the contractor shall include the phrase "equal opportunity employer" or a similar phrase to be approved by the Commission;
- (3) If the contractor fails to comply with the manner in which the contractor reports to the Commission in accordance with the provisions of K.S.A.44-1031 and amendments thereto, the contractor shall be deemed to have breached the present contract and it may be cancelled, terminated, or suspended, in whole or in part, by the contracting agency;
- (4) If the contractor is found guilty of a violation of the Kansas Act Against Discrimination under a decision or order of the Commission which has become final, the contractor shall be deemed to have breached the present contract and it may be cancelled, terminated or suspended, in whole, or in part, by the contracting agency;
- (5) The contractor shall include the provisions of (1) through (4) in every applicable subcontract or purchase order so that such provisions will be binding upon such subcontractor or vendor.

PROJECT/CONTRACT NAME AND NO. _____

MUNICIPALITY _____

CONTRACTOR'S
SIGNATURE _____

TITLE _____

KDHE PROJECT NO. _____

DATE _____

Attachment F

Fee and Rate Proposal

Proposers are to identify the lump sum fee for cost elements 1 through 7 listed in the following table. The lump sum fee shall be supported by providing the fully burdened hourly rates and expected man-hours for each labor classification in the form of an excel spreadsheet which is included with the RFP. Proposers are free to modify the spreadsheet to accommodate additional labor classifications beyond those provided in the table.

Cost elements 8, 9 and 10 are to be percentages that the Proposer will be applying to the sum of their direct and indirect costs to be carried in their GMP cost proposal.

Cost Element	Project Phase	Description	Lump Sum Amount or Percentage
1	1	Engineering lump sum fee for Basis of Design report, (less cost element 2)	\$
2	1	Engineering to compare the two process options	\$
3	1	Engineering lump sum fee for 30% design milestone	\$
4	1	Engineering lump sum fee for 60% design milestone	\$
5	1	Engineering lump sum fee for 90% design milestone	\$
6	1	Preconstruction services lump sum fee including GMP development	\$
7	2	Engineering lump sum fee for final design milestone	\$
8	2	Home office overhead (as a percentage of direct and indirect costs)	%
9	2	Field office overhead (as a percentage of direct and indirect costs)	%
10	2	Construction Fee (as a percentage of direct and indirect costs)	%

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HAYS WWTP UPGRADE AND EXPANSION PROJECT - REQUEST FOR PROPOSALS

Labor Classification	Burdened Rate (\$/hr)	Phase 1 Hours					Phase 2 Hours
		Basis of Design Report	30% Design	60% Design	90% Design	Preconstruction Services	Final Design
Design-Build Project Manager							
Lead Discipline Engineer							
Lead Architect							
Staff Engineer							
Staff Architect							
Design QA/QC Reviewer							
Construction Manager							
Project Administrator							
Field Engineer							
Project Cost and Schedule Lead							
Superintendent							
QA/QC Inspectors							
Project Accountant							
Buyer/Procurement Lead							
Lead Estimator							
BIM Technician							
Commissioning and Startup Manager							
Start-up Engineer							
Other (identify)							
			\$	\$	\$	\$	\$

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Attachment G

Forms of Affirmation of Compliance

The affirmation of compliance forms required to be completed and included in Appendix D, Forms of Affirmation of Compliance. The blank forms and instructions for completion are included in the Appendices of the Design/Build Design Criteria Package included in the RFP.

Required forms are listed below:

Kansas Act Against Discrimination

State of Kansas Act Against Discrimination Contract Provisions Certification Form

Certification of Non-Segregated Facilities –

Certification of Nonsegregated Facilities

Trafficking Victims Protection Act of 2000

Trafficking Victims Protection Act form

American Iron and Steel Requirements

Assurance of Compliance with the American Iron and Steel Requirements Form

EPA Requirements for Funding under the Kansas Water Pollution Control Revolving Fund Program (SRF)

EPA form 5700-49: Certification Regarding Debarment Suspension and Other Responsibility Matters

EPA form 660-06: Certification Regarding Lobbying

STATE OF KANSAS
ACT AGAINST DISCRIMINATION
CONTRACT PROVISION CERTIFICATION FORM

During the performance of this contract, the contractor agrees as follows:

- (1) The contractor shall observe the provisions of the Kansas Act Against Discrimination and shall not discriminate against any person in the performance of work under the present contract because of race, religion, color, sex, disability, national origin, or ancestry;
- (2) In all solicitations or advertisements for employees, the contractor shall include the phrase "equal opportunity employer" or a similar phrase to be approved by the Commission;
- (3) If the contractor fails to comply with the manner in which the contractor reports to the Commission in accordance with the provisions of K.S.A.44-1031 and amendments thereto, the contractor shall be deemed to have breached the present contract and it may be cancelled, terminated, or suspended, in whole or in part, by the contracting agency;
- (4) If the contractor is found guilty of a violation of the Kansas Act Against Discrimination under a decision or order of the Commission which has become final, the contractor shall be deemed to have breached the present contract and it may be cancelled, terminated or suspended, in whole, or in part, by the contracting agency;
- (5) The contractor shall include the provisions of (1) through (4) in every applicable subcontract or purchase order so that such provisions will be binding upon such subcontractor or vendor.

PROJECT/CONTRACT NAME AND NO.

MUNICIPALITY _____

CONTRACTOR'S
SIGNATURE _____

TITLE _____

KPWSLF NO. _____

DATE _____

U.S. ENVIRONMENTAL PROTECTION AGENCY
OFFICE OF POLICY AND MANAGEMENT

CERTIFICATION OF NONSEGREGATED FACILITIES

(Applicable to federally assisted construction contracts and related subcontracts exceeding \$10,000 which are not exempt from the Equal Opportunity clause.)

The federally assisted construction contractor certifies that he does not maintain or provide for his employees any segregated facilities at any of his establishments, and that he does not permit his employees to perform their services at any location, under his control, where segregated facilities are maintained. The federally assisted construction contractor certifies further that he will not maintain or provide for his employees any segregated facilities at any of his establishments, and that he will not permit his employees to perform their services at any location, under his control, where segregated facilities are maintained. The federally assisted construction contractor agrees that a breach of this certification is a violation of the Equal Opportunity clause in this contract. As used in this certification, the term "segregated facilities" means any waiting rooms, work areas, rest rooms and wash rooms, restaurants and other eating areas, time clocks, locker rooms and other storage or dressing areas, parking lots, drinking fountains, recreation or entertainment areas, transportation, and housing facilities provided for employees which are segregated by explicit directive or are in fact segregated on the basis of race, creed, color, or national origin, because of habit, local custom, or otherwise. The federally assisted construction contractor agrees that (except where he has obtained identical certifications from proposed subcontractors for specific time periods) he will obtain identical certifications from proposed subcontractors prior to the award of subcontracts exceeding \$10,000 which are not exempt from the provisions of the Equal Opportunity clause, and that he will retain such certifications in his files.

Signature

Date

Name and Title of Signer (Please Type)

Firm Name

NOTE: The penalty for making false statements in offers is prescribed in 18 U.S.C. 1001.

TRAFFICKING VICTIMS PROTECTION ACT

During the performance of this contract, the contractor agrees as follows:

The contractor, its employees, sub-contractors, and sub-contractor's employees under any KWPCRF Loan Agreement, may not engage in severe forms of trafficking in persons during the period of time that the award is in effect; procure a commercial sex act during the period of time that the award is in effect; or use forced labor in the performance of the contract or subcontracts under the award.

Project Name: _____

SRF Project Number: C20-_____

Company Name: _____

Contractor's
Signature: _____

Title: _____

Date: _____

American Iron and Steel Certification

1. Identification of American-made Iron and Steel Products: The Bidder certifies that this bid reflects the Bidder's best, good faith effort to identify domestic sources of iron and steel products for every component contained in the bid solicitation where such American-made components are required. The term "iron and steel products" means the following products made primarily of iron or steel - lined or unlined pipes and fittings, manhole covers and other municipal castings, hydrants, tanks, flanges, pipe clamps and restraints, valves, structural steel, reinforced precast concrete, and construction materials.

2. Verification of U.S. Production: If this bid is accepted, the Bidder agrees that it will provide, to the Owner, reasonable, sufficient, and timely verification of the U.S. production of each Iron and Steel Product incorporated into the project.

3. Documentation Regarding Non-American-made Iron and Steel: The Bidder certifies that for any Iron or Steel Product that is not American-made but was incorporated in the development of this bid, is allowed by waiver of the U.S. Environmental Protection Agency and such waiver is attached to this certification.

Signature

Date

Name and Title of Signer (Please Print)

Q & A's, Waiver request instructions, and a list of approved waivers can be found at
http://water.epa.gov/grants_funding/aisrequirement.cfm



Waste Water Project Number

C20

United States Environmental Protection Agency
Washington, DC 20460

Certification Regarding Debarment, Suspension, and Other Responsibility Matters

The prospective participant certifies to the best of its knowledge and belief that it and its principals:

- (a) Are not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from covered transactions by any Federal department or agency.
- (b) Have not within a three year period preceding this proposal been convicted of or had a civil judgement rendered against them for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, State, or local) transaction or contract under a public transaction; violation of Federal or State antitrust statutes or commission of embezzlement, theft, forgery, falsification or destruction of records, making false statements, or receiving stolen property;
- (c) Are not presently indicted for or otherwise criminally or civilly charged by a government entity (Federal, State, or local) with commission of any of the offenses enumerated in paragraph (1)(b) of this certification; and
- (d) Have not within a three-year period preceding this application/proposal had one or more public transactions (Federal, State, or local) terminated for cause or default.

I understand that a false statement on this certification may be grounds for rejection of this proposal or termination of the award. In addition, under 18 USC Sec. 1001, a false statement may result in a fine of up to \$10,000 or imprisonment for up to 5 years, or both.

Typed Name & Title of Authorized Representative

Signature of Authorized Representative

Date

I am unable to certify to the above statements. My explanation is attached.

EPA Form 5700-49 (11-88)

This form has been adopted for use as a Kansas Water Pollution Control Revolving Fund document

KDHE PROJECT #

CERTIFICATION REGARDING LOBBYING

CERTIFICATION FOR CONTRACTS, GRANTS, LOANS AND COOPERATIVE AGREEMENTS

The undersigned certifies, to the best of his or her knowledge and belief, that:

(1) No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.

(2) If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions.

(3) The undersigned shall require that the language of this certification be included in the award documents for all sub-awards at all tiers (including sub-contracts, sub-grants, and contracts under grants, loans, and cooperative agreements) and that all sub-recipients shall certify and disclose accordingly.

This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by section 1352, title 31 U.S. Code. Any person who fails to file the required certification shall be subject to a civil penalty of not less than \$10,000 and not more than \$100,000 for each such failure.

Typed Name & Title of Authorized Representative

Signature and Date of Authorized Representative