

Individual Project Order Number
City of Wolfforth Water and Wastewater Master Plan Update (2025 – 2040)

Describing a specific agreement between Kimley-Horn and Associates, Inc. (the Consultant), and the City of Wolfforth, Texas (City) in accordance with the terms of the Master Agreement for Continuing Professional Services dated November 8, 2020 which is incorporated herein by reference.

Identification of Project: City of Wolfforth Water and Wastewater Master Plan Update (2025 – 2040)

Project Understanding: This project consists of updating of the City’s current water master plan and the creation of a wastewater master plan. The water master plan update will include updating the existing water model and determining groundwater availability. The wastewater master plan will include mapping of the City’s existing wastewater system and lift station condition assessments. Both plans will provide recommendations for water and wastewater capital improvements to address anticipated growth needs for the next 15 years.

TASK 1 WATER MASTER PLAN

A. Water System Data Collection – this task will include the coordination with the City to obtain or update the following water system data:

1. Water Facilities
 - a. Ground storage facilities: capacity, diameter, head range, ground elevation
 - b. Elevated storage facilities: capacity, diameter, head range, ground elevation, overflow elevation
 - c. Pump stations: total capacity, number of pumps, flow and head range, pump curves, pump impeller elevation
2. Water Supply
 - a. Well capacities
 - i. Historical data to be provided by City
 - b. Water treatment facilities: Buildout capacity
 - c. Wholesale water supply capacity and applicable contracts
3. Water consumption records – Previous two (2) years
 - a. Current and historical population (annually)
 - b. Current and historical number and type of water connections (monthly)
 - c. Total daily water usage (daily)
 - d. Water loss records (monthly)
4. Operating and SCADA records – Previous two (2) years

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- a. Customer billing information (monthly)
- b. Pump station flows, pressures, and pump run times (daily)
- c. Storage level variations (daily)
5. System Operational Parameters and Controls
 - a. Ground tank level settings
 - b. Elevated tank level settings
 - c. Pump control settings
 - d. Control valve settings
 - e. Water Treatment Facilities
6. Parcel Data
 - a. Current land use of all parcels within City limits
 - b. Future land use of all parcels within the City's ETJ
7. Water Distribution
 - a. City will provide shapefiles or historical records for all active water lines
 - b. City will provide shapefiles or historical records for all locations of active customer meters
 - c. City will provide shapefiles or historical records for all water valves, insert-a-valves, air release valves, fire hydrants, and any other appurtenances.
8. Fire flow testing for model calibration
 - a. Consultant will perform fire flow testing at a maximum of ten (10) locations throughout the City with City staff.
 - b. City will provide input regarding locations for calibration testing, including identifying key areas of the system with operational problems.
 - c. City will provide SCADA and operating information during the period of fire flow testing.
9. Historical maintenance data
 - a. Main break history
 - b. Loss of disinfection residual

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- c. Inadequate fire flow areas
- d. Maintenance problem areas
- e. Dead-end line identification
- f. Low pressure complaint areas

10. Deliverable:

- a. Data collection letter and log

B. Water System Analysis - this task shall consist of compiling existing infrastructure information and demographics to update the City's existing hydraulic water model. Consultant will use this model with the developed design criteria to identify infrastructure improvements required to alleviate existing deficiencies and to serve future growth for the next 15 years. The scope is anticipated to be as follows:

1. Existing System Analysis and Update

- a. Existing Land Use – Consultant will utilize the existing land use map provided by the City
- b. Design Criteria – Consultant will develop design criteria to base the analysis upon including but not limited to:
 - i. Minimum and maximum pressures
 - ii. Minimum and maximum pipe velocities
 - iii. Elevated storage
 - iv. Ground storage
 - v. Pumping
 - vi. Fire Flow
 - vii. Texas Commission on Environmental Quality (TCEQ) criteria
- c. Existing Water Demands – Consultant will utilize the City's existing water usage data to calculate the City's existing and historical water demands. Tasks will include:
 - i. Calculate historical and current average day, maximum day, and peak hour water demand.
 - ii. Calculate historical and current average day water demand per land use by each unique land use type.
 - iii. Calculate representative maximum day water diurnal demand curve.

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- d. Water System Model – Consultant will update the City’s water system model to represent the existing water system and its demands. The model will utilize existing infrastructure information, system operational parameters, and available customer demand information. Tasks will include:
 - i. Evaluate system connectivity.
 - ii. Confirm pipe and node parameters, such as pipe size, roughness factor, and node elevation.
 - iii. Confirm system components, such as elevated tanks, pump stations, and control valves are shown in the model with the correct location, connectivity, and geometry.
 - iv. Confirm system operational parameters and controls.
 - v. Evaluate the distribution of existing demands.
 - e. Model and Infrastructure Verification – Consultant will use data collected from fire hydrant flow testing to calibrate the model.
 - i. Consultant will coordinate with City staff to verify that the existing infrastructure matches the water system model.
 - ii. Evaluate system operation data from SCADA (or other City operational information) during the period of fire hydrant flow testing, including elevated tank levels, pump operation, and valve operation.
 - iii. Perform a calibration analysis to compare model results with the recorded data. Adjust the model to achieve model results within 5 psi of field recorded pressures.
 - 1) Parameters to be adjusted include valve position, pipe sizes, pump curves, distribution of demands, and pipe roughness coefficients.
2. Future System Analysis
- a. Future Land Use
 - i. Consultant will use future land use map previously performed by the Consultant.
 - b. Design Criteria
 - i. Consultant will analyze existing water system with future growth and determine the future capacity needs of existing water system. Capacity analysis will be determined by but not limited to:
 - 1) Minimum and maximum pressures
 - 2) Minimum and maximum pipe velocities
 - 3) Elevated storage

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- 4) Ground storage
 - 5) Pumping
 - 6) Fire Flow
 - 7) Texas Commission on Environmental Quality (TCEQ) criteria
 - ii. Future Water Demands – Consultant will develop water demands by developing average loading factors by existing land use and reference typical water demands per capita experienced by the City of Lubbock.
 - 1) System demands will be calculated and analyzed for 5, 10, and 15 year time periods.
3. Water System Capital Improvement Plan
- a. Consultant will evaluate the City’s current and future water infrastructure needs to address growth for the next 15 years. Consultant will propose a water infrastructure capital improvement list based on priority for the next 5, 10, and 15 year time periods.
4. Deliverables:
- a. Updated water system model in WaterCAD format
 - b. Updated existing water infrastructure map in .pdf format
 - c. Existing and future land use maps in .pdf format
 - d. Existing fire flow deficiencies map
 - e. Proposed water capital improvement plan and project list in .pdf format
- C. Loop 88 Water Quality Evaluation – this task will include reviewing the water quality of all the proposed water supply sources for the City and determining a TCEQ-approved water source blend ratio.
1. Water Source Sampling
 - a. Consultant will coordinate with City staff for City staff to collect a single (1) sample from each water supply source identified, for up to five (5) samples total.
 - i. Wells will be evaluated using collective samples for all wells within a 0.25-mile radius of each other.
 - ii. City will provide any previously completed sample test data, as relevant to the evaluation.
 - b. Consultant will coordinate with an approved lab to test the samples collected in accordance with the Texas Commission of Environmental Quality’s standards for fluoride and arsenic sampling.

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- i. Direct expenses associated with water quality lab testing will be billed directly to the City.
 2. Water Blend Ratio Determination
 - a. Consultant will utilize the water source sampling results to preliminarily calculate the impact on water quality from blending the proposed different water supply sources.
 - b. Consultant will utilize the information determined to coordinate with TCEQ to determine a final, TCEQ-approved blend ratio to be implemented.
 - i. Consultant will participate in up to two (2) virtual coordination meetings with TCEQ and the City.
 - ii. Consultant will provide the final blend calculations, in .pdf format, supplementary to the TCEQ-approved blend ratio for City reference and records.
- D. Water Master Plan Report - this task shall consist of compiling all the information determined in Task 1 into a finalized City of Wolfforth Water Master Plan for the years 2025-2040. The final report will include the following information:
 1. Population and Land Use
 - a. Historical Population
 - b. Existing Land Use
 - c. Future Land Use
 2. Water Supply
 - a. Existing water supply
 - b. Groundwater Hydrogeologic Analysis
 - c. Groundwater Hydrogeologic Recommendation
 - d. Future water supply
 3. Water Demand
 - a. Historical demands
 - b. Demands by land use
 4. Existing Infrastructure Analysis
 - a. Existing infrastructure asset descriptions
 - b. Water Model Analysis Methodology

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- c. Existing system results
 - i. Water Supply
 - ii. Water storage capacity
 - iii. Pumping Capacity
 - iv. Water Distribution
- 5. Future Infrastructure Analysis
 - a. Proposed future infrastructure asset descriptions
 - b. Water Model Analysis Methodology
 - c. Water Model results
 - i. Water Supply
 - ii. Water storage capacity
 - iii. Pumping Capacity
 - iv. Water Distribution
- 6. Capital Improvement Plan
 - a. Year Capital Improvement Plan Projects
 - b. 5 Year Capital Improvement Plan Projects
 - c. 10 Year Capital Improvement Plan Projects
 - d. 15 Year Capital Improvement Plan Projects
- 7. Deliverable:
 - a. City of Wolfforth Water Master Plan Report in .pdf format

TASK 2 WASTEWATER MASTER PLAN

A. Wastewater System Data Collection - the Consultant will coordinate with the City to obtain the following data:

- 1. Wastewater Specific Data Collection
 - a. Physical Data

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- i. Lift Stations: total capacity, number of pumps, flow and head range, pump curves, pump impeller elevation
 - ii. Wastewater treatment plant average day and maximum day capacity
 2. Wastewater discharge records – Previous ten (10) years
 - a. Current and historical population (annually)
 - b. Current and historical number and type of water connections (monthly)
 - c. Wastewater treatment plant discharge (daily)
 - d. Lift station discharge (daily)
 - e. Specific commercial/industrial meters (daily)
 3. System Operational Parameters and Controls
 - a. Lift station pump control settings
 4. Historical maintenance data
 - a. Sanitary Sewer Overflow (SSO) History
 - b. Maintenance problem areas
- B. Wastewater System Mapping (OJD)
 1. Manhole Inspections at fifty (50) locations. This information will be used to verify depth and diameter of specific manhole structures that are placed within the wastewater model. The inspections will provide data such as:
 - i. Size
 - ii. Depth from rim to invert
 - iii. Pipeline size in and out
 - iv. GPS location
 - v. Condition
 - 1) A photo and general condition assessment will be provided
 - vi. The fifty (50) manhole locations will be at sites agreed upon by the Consultant and the City.
 2. Survey

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- i. Perform field survey to identify wastewater infrastructure and provide existing wastewater infrastructure base map.

C. Wastewater System Analysis - this task shall consist of compiling existing infrastructure information and demographics to create the hydraulic sewer model for the City. The model will be created using industry standard sewer modeling software such as “SewerCAD” by Bentley. The model will consist of 12-inch and larger wastewater lines. Consultant will use this model with the developed design criteria to identify infrastructure improvements required to alleviate existing deficiencies and to serve future growth. The scope is anticipated to be as follows:

1. Existing System Analysis

- a. Existing Land Use – Consultant will utilize the existing land use map provided by the City
- b. Design Criteria – Consultant will develop design criteria that meets Texas Commission on Environmental Quality (TCEQ) regulations and industry design standards for:
 - i. Sewer line capacity
 - ii. Lift station and force main capacity
- c. Existing Wastewater Demands – Consultant will utilize the City’s existing wastewater discharge data and field data to calculate the City’s existing and historical wastewater discharges. Tasks will include:
 - i. Calculate historical and current average day, dry weather wastewater discharges for the City and for each wastewater basin.
 - ii. Calculate historical and current average day, dry weather wastewater discharges by each unique land use type.
 - iii. Calculate wet weather wastewater discharges for the City and for each wastewater basin for each unique rainfall event.
- d. Wastewater System Model – Consultant will create a wastewater system model to represent the existing wastewater system and existing wastewater system demands. The model will utilize existing infrastructure information, system operational parameters, and available customer demand information. Tasks will include:
 - i. Evaluate system connectivity.
 - ii. Confirm pipe and node parameters, such as pipe size, roughness factor, and node elevation.
 - iii. Confirm system components, such as lift stations, are shown in the model with the correct location, connectivity, and geometry.
 - iv. Confirm system operational parameters and controls.

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- v. Evaluate the distribution of existing demands.
2. Future System Analysis
- a. Future Land Use
 - i. Consultant will use future land use map previously performed by the Consultant.
 - b. Design Criteria
 - i. Consultant will analyze existing wastewater system with future growth and determine the future capacity needs of existing wastewater system. Capacity analysis will be determined by but not limited to:
 - 1) Transmission Lines
 - 2) Lift Stations
 - 3) Treatment Facilities
 - 4) Texas Commission on Environmental Quality (TCEQ) criteria
 - ii. Future Wastewater Demands – Consultant will develop wastewater demands by developing average loading factors by existing land use and reference typical wastewater demands per capita experienced by the City of Lubbock.
 - 1) System demands will be calculated and analyzed for the 5,10, and 15 year time periods
3. Wastewater System Capital Improvement Plan
- a. Consultant will evaluate the City’s current and future wastewater infrastructure needs to address growth for the next 15 years. Consultant will propose a wastewater infrastructure capital improvement list based on priority for the next 5, 10, and 15 year time periods.
4. Deliverables:
- a. Wastewater system model in SewerCAD format
 - b. Existing wastewater infrastructure map in .pdf format
 - c. Existing and future land use maps in .pdf format
 - d. Proposed wastewater capital improvement plan and project list in .pdf format
- D. Wastewater Lift Station Condition Assessments and Testing
- 1. Pre-Evaluation Summary – Consultant will visit each site to determine modifications to the site or preparations to be made prior to testing being performed.

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- a. Consultant will provide a summary of work that the needs to be completed by the City before testing is conducted at each location. Consultant will provide a summary of tasks and manpower to be provided by City and a test outline.
 - i. Modifications or preparations are expected to include, but not limited to, installation of tap assemblies, functional testing of isolation valves, cleaning of wet well, providing SCADA data, providing applicable pump curves and record drawings, and coordination to complete pump testing.
- b. Consultant will contact pump manufacturers to request pump curve information for sites where pump model information is available, but City cannot provide the necessary information. Consultant will make a reasonable number of attempts and effort to obtain pump information from vendors.
- c. Services/Deliverables provided by the City:
 - i. Installation or modification of equipment as detailed in Pre-Evaluation Summary. Install and confirm operation of flow meters and pressure taps as requested by Consultant. Confirm National Pipe Thread (NPT) pressure taps are available for pressure transducer connections.
 - ii. Provide the pump curves for each pump to be tested.
 - iii. Provide record drawings and previous studies of lift station.
 - iv. Coordinate and obtain data from SCADA system.
 - v. Review and provide site specific safety concerns.
 - vi. Functional testing of all valves, pumps, and taps prior to pump evaluations as detailed in Pre-Evaluation Summary.
 - vii. Confirm station is fully operational and ready for testing.
 - viii. Vacuum all grease and debris from the wet well or clarifier, if identified in Pre-Evaluation Summary.
2. Pump Performance Testing – Consultant will conduct pump performance tests of each pump in operation at the time of testing. Pump performance tests will be performed at the five (5) lift stations operated by the City listed below:
 - 1) Crestridge LS
 - 2) Bennett Elementary LS
 - 3) Preston Manor LS
 - 4) Main LS

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- 5) American Park LS.

- b. Pump performance tests will include flow, discharge head, suction head, NPSH, surge data, and input power measurements where possible. Power measurements will only be possible for 480 volt and below. Perform the following tests for each operational pump:
 - i. Perform one (1) single-point hydraulic test with a single pump in operation at a time.
 - ii. Perform one (1) single-point hydraulic test with two pumps in operation at a time.

- 3. Condition Assessment – Consultant will conduct a condition assessment of the following:
 - a. Structural – Exterior/interior areas of lift station buildings. Assess dry wells for visual evidence of deterioration and corrosion. Visually inspect the condition of the accessible portions of wet wells using a pole camera. An evaluation by a structural engineer or a detailed structural analysis is not included in the Condition Assessment.

 - b. Mechanical
 - i. Motors – Assessed for abnormal noise, abnormal heat, abnormal vibration, and any visual deficiencies. Motors inaccessible or within a confined space will not be assessed. Motors and pumps will not be removed or pulled from inaccessible area for inspection.

 - ii. Pumps – Assessed for issues including leaking, cavitation, abnormal noise, abnormal heat, abnormal vibration, and any visual deficiencies. Check pump mountings and bases for loose mounts or cracking. Motors and pumps will not be removed or pulled from inaccessible area for inspection.

 - iii. Piping Valves – Assess the suction isolation valve, discharge isolation valve, and check valve for each pump, noting malfunctioning or leaking. City will assist by operating the valves.

 - iv. Odor control and Noise evaluation – Evaluate the exterior condition of existing odor control equipment. Discuss with City staff to identify stations where odor or noise problems have been reported. Odor and noise observations will be qualitative and not include any measurements. Hydrogen-sulfide gas monitoring is not included in the Condition Assessment.

 - c. Electrical
 - i. Visual inspection of condition of electrical components including lighting, power distribution cables, starters, etc.

 - d. Instrumentation & Control

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- i. Flow transmitters and level transmitters will be checked for operability and performance issues.
 - ii. Evaluate existing wet well levels and provide recommendations for revised operating levels. Any recommended levels should not create a surcharge condition in the gravity lines.
 - e. HVAC and Piping
 - i. HVAC – Assess units visually for operability, vibrations, and corrosion.
 - f. Safety
 - i. Eyewash, emergency stop, fall protection, lighting, fencing, site access, and lifting equipment.
- 4. Condition assessments will include a numerical condition ranking from 1 to 5 including notes regarding significant defects. Photos and details will be provided for components with conditions equal to 4 or 5. Portions of the evaluation requiring confined space entry will not be performed.
- 5. Services/Deliverables provided by the City:
 - a. Provide one operator familiar with the site, electrical system, pumps, controls, operation, equipment, and trained in confined space.
 - b. Operate breakers, valves, pumps and other equipment and assist with field investigation.
 - c. Installation and removal of pressure transducer connections within areas requiring confined space entry.
- E. Wastewater Master Plan Report - Consultant will prepare a Wastewater Master Plan report summarizing the findings of the analysis and the recommendations.
 - 1. Prepare draft report for review and comment by City.
 - 2. Prepare final report based on City comments.
 - 3. The report is anticipated to include the following:
 - a. Executive summary
 - b. Introduction
 - c. Description of existing infrastructure
 - d. Design criteria and modeling methodology
 - e. Existing wastewater system deficiencies

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- f. Future land use and wastewater demand projections
- g. Analysis and recommendations
- h. Capital improvements plan
 - i. Opinion of probable construction cost
 - ii. Project description
- i. Lift Station Assessments
 - i. Pump Performance Testing and Condition Assessment Methodology
 - ii. Individual Lift Station Assessments
 - 1) General Information – Site information, pump curves/data sheets, location, photos, test information, etc.
 - 2) Pump Performance Information - Pump output (GPM), total dynamic head, current, voltage, input horsepower, output horsepower, wire-to-water efficiency, and comparisons to key performance indicators.
 - 3) Compliance with the Texas Commission on Environmental Quality lift station requirements.
 - 4) Condition Assessment – A tabulation of the components, their condition ranking, and descriptions of any defects observed.
 - Consequence of failure and likelihood of failure matrix.
 - 5) Recommendations – A list of recommendations for improvements at each site.
 - Opinion of probable construction cost to make recommended improvements.
 - 6) Replacement parts – Assessment of recommended replacement parts for City to keep on hand for critical equipment.
 - iii. Condition assessment consequence of failure and likelihood of failure matrix for all lift stations.
 - iv. Summary of findings and recommendations.
 - v. Prioritized opinion of probable construction cost for recommended improvements.
- j. Maps

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- i. Existing land use map
 - ii. Ultimate land use map
 - iii. Existing system infrastructure map
 - iv. Capital Improvement Plan map
4. Deliverable:
- a. City of Wolfforth Wastewater Master Plan Report in .pdf format

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Additional Services if required: See Below

Any services not specifically provided for in the above scope, as well as any changes in the scope requested by the City, will be considered additional services. Additional Services will be compensated on a reimbursable basis at the then current hourly rates. Consultant will not perform any Additional Services without City’s prior approval. Additional services include, but are not limited to, the following:

- Groundwater Hydrogeologic Study.
- Providing additional presentations to City Council.
- Attending additional public meetings during the project.
- Financial implementation planning.
- Design of infrastructure.
- Any additional sampling beyond that specifically referenced herein above.
- Any services not listed in the Scope of Services.

Services provided by City: _____

Schedule: Consultant will begin services upon receipt of Notice to Proceed.

Deliverables: See items listed above under Scope of Services.

Method of compensation: The services identified in the scope of services for the total fee below. Additional services with the scope and services will be performed for the total lump sum fee below:

Task 1 - Water Master Plan		
	A - Water System Data Collection	\$ 5,000
	B - Water System Analysis	\$ 30,000
	D - Water Quality Evaluation	\$ 12,000
	E - Water Pump Station Performance Testing	\$ 15,000
	F - Water Master Plan Report	\$ 25,000
	Subtotal:	\$ 87,000
Task 2 - Wastewater Master Plan		
	A - Wastewater System Data Collection	\$ 5,000
	B - Wastewater System Mapping (OJD)	\$ 45,000
	C - Wastewater System Analysis	\$ 30,000
	D - Wastewater Lift Station Condition Assessments and Testing	\$ 40,000
	E - Wastewater Master Plan Report	\$ 25,000
	Subtotal:	\$ 145,000
Total Lump Sum Fee:		\$ 232,000

All permitting, application, and similar project fees will be paid directly by the City. Fees and expenses will be invoiced monthly based, as applicable, upon the percentage of services performed or actual services performed and expenses incurred as of the invoice date. Payment will be due within 25 days of

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your receipt of the invoice.

Other special terms of Individual Project Order: None.

ACCEPTED:
City OF WOLFFORTH, TEXAS

KIMLEY-HORN AND ASSOCIATES, INC.

BY: _____
Randy Criswell

BY: _____
Bradley Hill

TITLE: City Manager

TITLE: Contract Specialist

DATE: _____

DATE: _____