



**Agreement Between City of Rapid City and HDR Engineering, Inc. for Professional Services for Water Reclamation Facility (WRF) Facility Plan, Project No. 14-2214/CIP No. 50943**

AGREEMENT made April 6, 2015, between the City of Rapid City, SD (City) and HDR Engineering, Inc., (Engineer), located at 703 Main Street, Suite 200, Rapid City, SD 57701. City intends to obtain professional services for Water Reclamation Facility (WRF) Facility Plan, Project No. 14-2214 CIP No. 50943. The scope of services is as described within this document and as further described in Exhibits A, B and C (attached).

The City and the Engineer agree as follows:

The Engineer shall provide professional engineering services for the City in all phases of the Project and as further defined in Exhibits A, B and C (attached), serve as the City's professional engineering representative for the Project, and give professional engineering consultation and advice to the City while performing its services.

**Section 1—Basic Services of Engineer**

**1.1 General**

- 1.1.1 The Engineer shall perform professional services described in this agreement, which include customary engineering services. Engineer intends to serve as the City's professional representative for those services as defined in this agreement and to provide advice and consultation to the City as a professional. Any opinions of probable project cost, approvals, and other decisions provided by Engineer for the City are rendered on the basis of experience and qualifications and represent Engineer's professional judgment.
- 1.1.2 All work shall be performed by or under the direct supervision of a professional Engineer licensed to practice in South Dakota.
- 1.1.3 All documents including Drawings and Specifications provided or furnished by Engineer pursuant to this Agreement are instruments of service in respect of the Project and Engineer shall retain an ownership therein. Reuse of any documents pertaining to this project by the City on extensions of this project or on any other project shall be at the City's risk. The City agrees to defend, indemnify, and hold harmless Engineer from all claims, damages, and expenses including attorney's fees arising out of such reuse of the documents by the City or by others acting through the City.
- 1.1.4 The contract will be based on an hourly rate and reimbursable fee schedule with a maximum not-to-exceed amount.



## 1.2 Scope of Work

The Engineer shall:

- 1.2.1 Consult with the City, other agencies, groups, consultants, and/or individuals to clarify and define requirements for the Project and review available data.
- 1.2.2 Perform the tasks described in the Scope of Services. (See Exhibit A.)

## Section 2—Information Provided by City

The City will provide any information in its possession for the project at no cost to the Engineer.

## Section 3—Notice to Proceed

The City will issue a written notification to the Engineer to proceed with the work. The Engineer shall not start work prior to receipt of the written notice. The Engineer shall not be paid for any work performed prior to receiving the Notice to Proceed.

## Section 4—Mutual Covenants

### 4.1 General

- 4.1.1 The Engineer shall not sublet or assign any part of the work under this Agreement without written authority from the City.
- 4.1.2 The City and the Engineer each binds itself and partners, successors, executors, administrators, assigns, and legal representatives to the other party to this agreement and to the partners, successors, executors, administrators, assigns, and legal representatives of such other party, regarding all covenants, agreements, and obligations of this agreement.
- 4.1.3 Nothing in this agreement shall give any rights or benefits to anyone other than the City and the Engineer.
- 4.1.4 This agreement constitutes the entire agreement between the City and the Engineer and supersedes all prior written or oral understandings. This agreement may only be amended, supplemented, modified, or canceled by a duly executed written instrument.



- 4.1.5 The Engineer shall make such revisions in plans which may already have been completed, approved, and accepted by the City, as are necessary to correct Engineer's errors or omissions in the plans, when requested to do so by the City, without extra compensation therefore.
- 4.1.6 If the City requests that previously satisfactorily completed and accepted plans or parts thereof be revised, the Engineer shall make the revisions requested by the City. This work shall be paid for as extra work.
- 4.1.7 If the City changes the location from the one furnished to the Engineer, or changes the basic design requiring a new survey for the portions so changed, the redesign will be paid for as extra work.
- 4.1.8 The City may at any time by written order make changes within the general scope of this Agreement in the work and services to be performed by the Engineer. Any changes which materially increase or reduce the cost of or the time required for the performance of the Agreement shall be deemed a change in the scope of work for which an adjustment shall be made in the Agreement price or of the time for performance, or both, and the Agreement shall be modified in writing accordingly. Additional work necessary due to the extension of project limits shall be paid for as extra work.
- 4.1.9 Extra work, as authorized by the City, will be paid for separately and be in addition to the consideration of this Section.
- 4.1.10 For those projects involving conceptual or process development services, activities often cannot be fully defined during the initial planning. As the project does progress, facts and conditions uncovered may reveal a change in direction that may alter the scope of services. Engineer will promptly inform the City in writing of such situations so that changes in this agreement can be renegotiated.
- 4.1.11 This Agreement may be terminated (a) by the City with or without cause upon seven days' written notice to the Engineer and (b) by the Engineer for cause upon seven days' written notice to the City. If the City terminates the agreement without cause, the Engineer will be paid for all services rendered and all reimbursable expenses incurred prior to the date of termination.

If termination is due to the failure of the Engineer to fulfill its agreement obligations, the City may take over the work and complete it. In such case, the Engineer shall be liable to the City for any additional cost to the extent directly resulting from Engineer's action.



- 4.1.12 The City or its duly authorized representatives may examine any books, documents, papers, and records of the Engineer involving transactions related to this agreement for three years after final payment. All examinations will be performed at reasonable times, with proper notice. Engineer's documentation will be in a format consistent with general accounting procedures.
- 4.1.13 The City shall designate a representative authorized to act on the City's behalf with respect to the Project. The City or such authorized representative shall render decisions in a timely manner pertaining to documents submitted by the Engineer in order to avoid unreasonable delay in the orderly and sequential progress of the Engineer's services.
- 4.1.14 Costs and schedule commitments shall be subject to renegotiation for delays caused by the City's failure to provide specified facilities or information or for delays caused by other parties, excluding sub-contractors and sub-consultants, unpredictable occurrences including without limitation, fires, floods, riots, strikes, unavailability of labor or materials, delays or defaults by suppliers of materials or services, process shutdowns, acts of God, or the public enemy, or acts of regulations of any governmental agency or any other conditions or circumstances beyond the control of the City or Engineer. Temporary delays of services caused by any of the above which results in additional costs beyond those outlined may require renegotiation of this agreement.
- 4.1.15 The City will give prompt written notice to the Engineer if the City becomes aware of any fault or defect in the Project or nonconformance with the Project Documents.
- 4.1.16 Unless otherwise provided in this Agreement, the Engineer and the Engineer's consultants shall have no responsibility for the discovery, presence, handling, removal or disposal of, or exposure of persons to hazardous materials in any form at the project site, including but not limited to asbestos products, polychlorinated biphenyl (PCB), or other toxic substances.
- 4.1.17 In the event asbestos or toxic materials are encountered at the jobsite, or should it become known in any way that such materials may be present at the jobsite or any adjacent areas that may affect the performance of Engineer's services, Engineer may, at their option and without liability for consequential or any other damages, suspend performance of services on the project until the City retains



appropriate specialist CONSULTANT(S) or contractor(s) to identify, abate, and/or remove the asbestos or hazardous or toxic materials.

- 4.1.18 This agreement, unless explicitly indicated in writing, shall not be construed as giving Engineer the responsibility or authority to direct or supervise construction means, methods, techniques, sequences, or procedures of construction selected by any contractors or subcontractors or the safety precautions and programs incident to the work of any contractors or subcontractors.
- 4.1.19 Neither the City nor the Engineer, nor its Consultants, shall hold the other liable for any claim based upon, arising out of, or in any way involving the discharge, dispersal, release or escape of smoke, vapors, soot, fumes, acids, alkalis, toxic chemicals, liquids, or gases, waste materials, or other irritants, contaminants, or pollutants.
- 4.1.20 Neither the City nor the Engineer, nor its Consultants, shall hold the other liable for any claim based upon, arising out of, or any way involving the specification or recommendation of asbestos, in any form, or any claims based upon use of a product containing asbestos.
- 4.1.21 Engineer hereby represents and warrants that it does not fail or refuse to collect or remit South Dakota or City sales or use tax for transactions which are taxable under the laws of the State of South Dakota.

#### **4.2 City of Rapid City NonDiscrimination Policy Statement**

In compliance with Title VI of the Civil Rights Act of 1964, Section 504 of the Rehabilitation Act of 1973, the Age Discrimination act of 1975, the Americans with Disabilities Act of 1990, and other nondiscrimination authorities it is the policy of the City of Rapid City, 300 Sixth Street, Rapid City, SD 57701-5035, to provide benefits, services, and employment to all persons without regard to race, color, national origin, sex, disabilities/handicaps, age, or income status. No distinction is made among any persons in eligibility for the reception of benefits and services provided by or through the auspices of the City of Rapid City.

Engineer will permit access to any and all records pertaining to hiring and employment and to other pertinent data and records for the purpose of enabling the Commission, its agencies or representatives, to ascertain compliance with the above provisions.

This section shall be binding on all subcontractors or suppliers.



## **Section 5—Payments to the Engineer**

### **5.1 Schedule of Pay Rates**

The City will pay the Engineer for services rendered or authorized extra work according to the Engineer's hourly and reimbursable rate schedule described in Exhibit C.

### **5.2 Fee**

The maximum amount of the fee for the services as detailed in Section 1.2 shall not exceed \$392,716.00 unless the scope of the project is changed as outlined in Section 4. If expenses exceed the maximum amount, the Engineer shall complete the design as agreed upon here without any additional compensation. Sub task dollar amounts may be reallocated to other tasks as long as the total fee is not exceeded. Prime consultant may not mark up sub-consultant or sub-contractor services.

### **5.3 Progress Payments**

Monthly progress payments shall be processed by the City upon receipt of the claim as computed by the Engineer based on work completed during the month per the hourly rates and allowable reimbursable as established in Section 5.1 and approved by the City.

Net payment to the Engineer shall be due within forty-five (45) days of receipt by the City.

## **Section 6—Completion of Services**

The Engineer shall complete services on or before October 30, 2015 based on an award date of April 6, 2015.

## **Section 7—Insurance Requirements**

### **7.1 Insurance Required**

The Engineer shall secure the insurance specified below. The insurance shall be issued by insurance company(s) acceptable to the City and may be in a policy or policies of insurance, primary or excess. Certificates of all required insurance including any policy endorsements shall be provided to the City prior to or upon the execution of this Agreement.



## 7.2 Cancellation

The Engineer will provide the City with at least 30 days' written notice of an insurer's intent to cancel or not renew any of the insurance coverage. The Contractor agrees to hold the City harmless from any liability, including additional premium due because of the Contractor's failure to maintain the coverage limits required.

## 7.3 City Acceptance of Proof

The City's approval or acceptance of certificates of insurance does not constitute City assumption of responsibility for the validity of any insurance policies nor does the City represent that the coverages and limits described in this agreement are adequate to protect the Engineer, its consultants or subcontractors interests, and assumes no liability therefore. The Engineer will hold the City harmless from any liability, including additional premium due, because of the Engineer's failure to maintain the coverage limits required.

## 7.4 Specific Requirements

- 7.4.1 Workers' compensation insurance with statutory limits required by South Dakota law. Coverage B-Employer's Liability coverage of not less than \$500,000 each accident, \$500,000 disease-policy limit, and \$500,000 disease-each employee.
- 7.4.2 Commercial general liability insurance providing occurrence form contractual, personal injury, bodily injury and property damage liability coverage with limits of not less than \$1,000,000 per occurrence, \$2,000,000 general aggregate, and \$2,000,000 aggregate products and completed operations. If the occurrence form is not available, claims-made coverage shall be maintained for three years after completion of the terms of this agreement. The policy shall name the City and its representatives as an additional insured.
- 7.4.3 Automobile liability insurance covering all owned, nonowned, and hired automobiles, trucks, and trailers. The coverage shall be at least as broad as that found in the standard comprehensive automobile liability policy with limits of not less than \$1,000,000 combined single limit each occurrence. The required limit may include excess liability (umbrella) coverage.
- 7.4.4 Professional liability insurance providing claims-made coverage for claims arising from the negligent acts, errors or omissions of the Engineer or its consultants, of not less than \$1,000,000 each occurrence and not less than \$1,000,000 annual aggregate.





Coverage shall be maintained for at least three years after final completion of the services.

### **Section 8—Hold Harmless**

The Engineer hereby agrees to hold the City harmless from any and all claims or liability including attorneys' fees arising out of the professional services furnished under this Agreement, and for bodily injury or property damage arising out of services furnished under this Agreement, providing that such claims or liability are the result of a negligent act, error or omission of the Engineer and/or its employees/agents arising out of the professional services described in the Agreement.

### **Section 9—Independent Business**

The parties agree that the Engineer operates an independent business and is contracting to do work according to his own methods, without being subject to the control of the City, except as to the product or the result of the work. The relationship between the City and the Engineer shall be that as between an independent contractor and the City and not as an employer-employee relationship. The payment to the Engineer is inclusive of any use, excise, income or any other tax arising out of this agreement.

### **Section 10-Indemnification**

If this project involves construction and Engineer does not provide consulting services during construction including, but not limited to, onsite monitoring, site visits, site observation, shop drawing review and/or design clarifications, City agrees to indemnify and hold harmless Engineer from any liability arising from the construction activities undertaken for this project, except to the extent such liability is caused by Engineer's negligence.

### **Section 11-Controlling Law and Venue**

This Agreement shall be subject to, interpreted and enforced according to the laws of the State of South Dakota, without regard to any conflicts of law provisions. Parties agree to submit to the exclusive venue and jurisdiction of the State of South Dakota, 7<sup>th</sup> Judicial Circuit, Pennington County.

### **Section 12-Severability**

Any unenforceable provision herein shall be amended to the extent necessary to make it enforceable; if not possible, it shall be deleted and all other provisions shall remain in full force and effect.



**Section 13—Funds Appropriation**

If funds are not budgeted or appropriated for any fiscal year for services provided by the terms of this agreement, this agreement shall impose no obligation on the City for payment. This agreement is null and void except as to annual payments herein agreed upon for which funds have been budgeted or appropriated, and no right of action or damage shall accrue to the benefit of the Engineer, its successors or assignees, for any further payments. For future phases of this or any project, project components not identified within this contract shall not constitute an obligation by the City until funding for that component has been appropriated.

IN WITNESS WHEREOF, the parties hereto have made and executed this Agreement as of the day and year first above written.

**City of Rapid City:**

**Engineer:**

\_\_\_\_\_  
MAYOR

  
\_\_\_\_\_  
HDR ENGINEERING, INC.

DATE: \_\_\_\_\_

DATE: 3/12/15

ATTEST:

\_\_\_\_\_  
FINANCE OFFICER

**Reviewed By:**

  
\_\_\_\_\_  
DAN COON, OPERATIONS MANAGEMENT ENGINEER

DATE: 3/13/15

CITY'S DESIGNATED PROJECT REPRESENTATIVE

ENGINEERING FIRM'S DESIGNATED PROJECT REPRESENTATIVE

NAME: Dan Coon, P.E.  
PHONE: (605) 394-4154  
EMAIL: dan.coon@rcgov.org

NAME: Dan Graber, P.E.  
PHONE: (605) 977-7767  
EMAIL: Dan.Graber@hdrinc.com



## General

---

The current Water Reclamation Facility (WRF) plan was adopted in 2000. There are new regulatory requirements proposed that will impact the operation and effluent permit limits for the WRF. As a result, this project will evaluate the capabilities and needs to address these future requirements. In addition, the project will evaluate the Rapid City Water Reclamation Facility (WRF) to determine the existing equipment conditions and operational procedures and to make recommendations for improvements required to meet the Service Area's needs for wastewater treatment for the next 20 years and beyond. A Facility Plan Report will be developed to present the results of the evaluation and planning. This report will serve as a roadmap to guide the City of Rapid City for planning for capital expenditures and potential operational changes. This facility planning will take into consideration the proposed and potential regulatory requirements. The planned capital improvements will incorporate project trigger points based on a projected regulatory implementation schedule and flow and loading capacity along with condition assessment results.

As capital improvements become necessary, this planning document will be used as a basis for individual facility plans to be submitted to the DENR for funding via the State Revolving Loan Fund (SRF). Supplementary information required for the SRF approval will be developed and submitted at that time.

Refer to Exhibit B Man-hours and Cost and Project Schedule for related information.

## Scope of Services

---

The scope of services for the Facility Plan was generally described in the Request for Proposals (RFP) to include the following:

- Review of existing facility documentation and reports
- Evaluation of the existing WRF operational capabilities
- Analysis of wastewater flow and loading projections
- Review of anticipated regulatory changes and how the facility can be adapted to meet these new requirements as they relate to
  - facility discharge standards
  - current and future facility capacity
  - potential facility expansion scenarios needed to meet both discharge quality and quantity requirements
- Asset evaluation for each component and process at the facility
- Capital improvement needs and costs
- Recommendations for potential funding sources and scenarios to meet the needs identified
- Potential facility operational changes that will allow the facility to operate more efficiently
- Analysis of the WRF service area and customer base
- WRF site utilities
- WRF administration and maintenance space review
- Interaction with facility staff members, City engineering and planning staff members, regulatory personnel and identified stakeholders
- Development of implementation schedule
- Recommendations and development of a plan that will allow the City of Rapid City to meet the requirements and needs identified in the evaluation and analysis tasks listed above.
- Interim draft reports and a final document that will meet the City's requirements

The following paragraphs will present a work plan which addresses these items identified in the RFP, as well as additional items proposed to be included in the facility plan.

## **Work Plan Tasks**

---

HDR will work with the city staff throughout the project to get input regarding operational considerations, consensus, issues and objectives for the project. Specific tasks include:

### ***TASK SERIES 100 - PROJECT INITIATION/BACKGROUND DATA***

#### **Task 110 – Management Plan/Initiation Meeting**

- 111 Project Manual - A project manual will be developed to present procedures, contacts and responsibilities for the project.
- 112 Initiation Meeting - A meeting will be held with key HDR personnel and city staff to discuss the scope, goals and proposed schedule, and brainstorm the issues to clarify and establish direction for the individual tasks.

#### **Task 120 – Background Data**

HDR will compile and review background data required, including such items as:

- 121 Permit Information
- 122 Unit Process Loading Information
- 123 Operating Data; Unit Performance
- 124 Maintenance Information
  - i. Equipment replacement and
  - ii. Maintenance records
- 125 Review Previous Planning Documents
  - i. 2001 WRF Facility Plan
  - ii. Utility System Master Plan
  - iii. 2007 Burns & McDonnell's Digester Study
  - iv. 2011 Draft I/I Study
  - v. Rapid City Comprehensive Plan (adopted April 2014)
  - vi. Other Studies and Planning Documents

#### **Task 130 – Progress Meetings**

HDR will conduct bi-weekly (every two weeks) progress meetings. The meeting will be conducted either face to face or by teleconference.

#### **Deliverables**

- Meeting agendas and minutes
- Action item summary
- Monthly status reports, Monthly status reports address additional scope items and schedule impacts.

### ***TASK SERIES 200 – PERMIT REVIEW & FUTURE REGULATORY BASIS OF PLANNING***

This task series will include reviewing the impending permit and developing planning level design parameters for ammonia, total nitrogen, and total phosphorus. This task includes coordination with DENR and the City to define the regulatory goals for the facility planning upgrades. Task 213 includes review of the DENR model input and results.

#### **Task 210 – DENR Coordination**

- 211 NPDES Permit- The 2015 WRF NPDES permit will be reviewed and HDR will comment on any key issues or exceptions.
- 212 DENR Meeting - A meeting will be held with HDR, key DENR personnel, and city staff to:
  - New Permit Discussion based on detailed review of proposed project
  - Discuss Future Regulatory Impacts Including but not Limited to Ammonia & Nutrient Limits
- 213 Permit Modeling Review - Review model input and results for May 2015 draft permit. It is anticipated the City will receive a draft permit for comment in April-June 2015. This Task includes the review of model inputs, replication of model results, as necessary. This task will be considered on an “as needed” basis.

#### **Task 220 – Regulatory Basis of Planning**

- 221 HDR will complete a Technical Memorandum (TM) document describing the anticipated future regulatory limits that will be utilized for facility planning.

#### **Deliverables**

- DENR Meeting Minutes
- Proposed Regulatory Effluent Parameter Planning Basis
- DENR Permit Review Technical Memorandum (TM)

### ***TASK SERIES 300 – FLOW AND LOADING PROJECTIONS***

This task series will outline the plan with the City to define the flow and loading planning basis to be utilized for alternative evaluation and ultimately determining the capacity related upgrades. The focus of this task will be on the projected loads at the WRF and less focus on specific growth areas.

#### **Task 310 – Service Area Delineations**

- 311 HDR will obtain population data from the City and develop growth projections for the planning period and utilize other planning documents available, comprehensive plan, current land use policy plans etc. Coordination of service area projection includes a meeting with City engineering staff and a meeting with the City Planning Department. This task will include coordination with water and sewer planning projects that will be initiated in 2015.
- 312 Projected growth will include both Tier 1 – short term and Tier 2-50 year growth. Intermediate years will be interpolated for defining project improvement trigger points. An overall growth projection will be applied to the collective service area contributors including but not limited to:
  - City of Rapid City

- Northdale
- Black Hawk
- Southwest – Red Rocks, Countryside
- Terracotta
- Rapid Valley
- Rapid Canyon Sanitary District
- Hospital
- East Side (Water Service Areas)
- IPP program contributors

### **Task 320 – Flow Projections**

- 321 Existing Flows: HDR will review data on existing flows including:
- Average annual,
  - Seasonal,
  - Maximum Month
  - Maximum 7-Day and
  - Maximum Day
  - Peak Hour
  - Note: Data developed in previous studies will be used in this evaluation to avoid duplication of efforts, but will be verified independently as well.
- 322 Projected Flows
- HDR will utilize the historical data to evaluate trends and project the average 7-day, maximum month and peak flow projections for the selected trigger points.
- 323 Desktop I/I Flow Summary
- HDR will review historical data and compare current peak hour to average day flow ratios at the WRF with typically accepted ratios to estimate the contribution of flows from I/I.

### **Task 330 – Loading Projections**

- 331 Existing Loading: HDR will review the existing wastewater data of the influent and effluent, as well as at various locations throughout the treatment process as needed for the individual evaluations. Analytical data for the following parameters will be used from City testing records and will include (if available):
- TSS
  - BOD
  - COD
  - Ammonia
  - TKN
  - Phosphorus
  - Outside Sludge Contributions i.e. Summerset, Hot Springs, Box Elder, Jewel Cave
  - Septage Hauling Records
- 332 HDR will utilize the historical data to evaluate trends to project future planning loadings.

### **Task 340 – WRF Flow and Loading Planning Basis**

- 341 Provide a Technical Memorandum of the Flow and Loading Projections. The objective of this task is to provide trigger points for significant action. It is anticipated this task will identify 3 major trigger points, (ammonia criteria, nutrient criteria and hydraulic capacity as related to population growth)

#### **Deliverables**

- WRF 20-Year Flow and Loading Planning Basis

#### **Assumptions**

- The flow and loading utilized for the projected growth will be consistent with the existing service area contributions.
- One growth service area number will be produced. Growth will not be projected for individual communities or sub-basins.

### ***TASK SERIES 400 – ASSET & CAPACITY EVALUATION***

An asset study will be conducted to determine the condition and remaining useful life of the facility equipment and components. Based on the findings of this assessment the estimated expenditure and prioritized scheduling for repair, replacement or upgrade of the equipment and components will be determined. The corresponding hydraulic and treatment capacity of each component will be evaluated and the efficiency and capabilities of each unit will be determined and summarized. The result of the asset evaluation and capacity evaluation will be a prioritized capital improvements plan sorted by type of need i.e. condition, organic capacity or hydraulic capacity.

#### **HDR Facility Evaluators**

- Al Erickson, Chris Robinson, Kevin Newman – Process
- Vince Fallon – Architectural
- Damon Chmela – Electrical & I&C
- Ryan Dalrymle – Mechanical
- Brian Hoagland- Structural

#### **Task 410 – Existing WRF Evaluators**

The WRF evaluation will be conducted by each discipline as listed below. It is anticipated each discipline will be on site for 10 hours. The evaluation is anticipated to be conducted over a three day window with two separate teams to optimize City staff interaction. Team One would be process, mechanic and electrical/I&C. Team Two would be Process, Structural and Architectural.

- 411 Process
- 412 Architectural
- 413 Mechanical
- 414 Electrical
- 415 I&C
- 416 Structural

### **Task 420 – Existing Assets: Maintenance Record & Condition Review**

Evaluator Team will kick off asset and capacity evaluation with objective/issues opening meeting with City staff. This meeting will address City Staff concerns, introduce the team and set the direction for the site visit. A summary meeting will be conducted at the end of the evaluation visit to summarize findings, address specific items notes and develop action item/additional information list. Using our team of specialists and Asset Management Templates, the team will assess each unit process (equipment, structures buildings) in the facility and summarize:

- Reliability Issues
- Maintenance Issues
- Condition Evaluation
- Remaining useful life
- Failure mode

#### 421 Combined Flow -Headworks Processes

- Influent Flow Measurement (New)
- Pretreatment Headworks Facilities: Fine screening (New) & Vortex grit removal

#### 422 North Plant

- Primary Clarifier/Mechanisms and Sludge Pumping
- Trickling Filter Pumping (Utilize recent HDR evaluation as basis)
- Trickling Filters (Utilize recent HDR evaluation as basis)
- Secondary Clarification and Sludge Pumping
- Rotating Biological Contactors (RBCs)
- Tertiary Clarification and Sludge Pumping

#### 423 South Plant

- Activated Sludge Process Equipment
- Blowers
- RAS Pumping
- WAS Pumping
- Clariflocculator

#### 424 North/South Plant Effluent

- Post Aeration
- UV disinfection (seasonal) (New)

#### 425 Solids Handling

- Anaerobic Digestion
- Sludge Storage Lagoon
- Sludge Thickening (to co-compost)
- Sludge Dewatering (to landfill)

#### 426 Architectural/Structural

- Assess Building and Structures Architectural and Structural Condition
- Code Compliance



- 427 HVAC and Plumbing
- 428 Electrical & Controls
  - Electrical Service
  - Code Compliance
  - Assess Overall Control System Architecture.
  - Existing SCADA evaluation to be used to the extent possible
- 429 Other key ancillary components/systems identified will also be evaluated including:
  - Stream gaging station –Potential installation of a monitoring gauge upstream of the WRF.
  - Site Planning
  - Nonpotable and potable water systems
  - Space evaluation including: maintenance, office and laboratory.

### **Task 430 – Process and Hydraulic Modeling**

The objective of this task is to define the current facility treatment and hydraulic capacity.

- 431 Evaluate Unit Performance and Capacity - Update the existing GPS-X Model.
- 432 Hydraulic Evaluations – Confirm existing hydraulic profile.
  - Make a preliminary assessment of WRF hydraulic capacity using available information (original plant hydraulic profile, UV disinfection hydraulic profile, and trickling filter pumping capacity), historic plant influent flow data, and the experience/anecdotal information of city staff.
- 433 Outline Hydraulic Bottlenecks
  - Develop a plant hydraulic model to aid in the identification of hydraulic bottlenecks and limitations.
  - Identify hydraulic bottlenecks,
  - Identify key stream elevations that limit plant capacity.

### **Task 440 – Hydraulic Capacity Analysis**

The objective of this task is to determine facility constraints for current hydraulic capacity.

- 441 Process Limitations
  - Consider process performance implications, if any, associated with the preliminarily identified hydraulic capacity.
  - Evaluate each of the unit processes at the facility that are hydraulic capacity driven including:
    - Headworks (Screening, Grit)
    - In plant pumping
    - Intermediate and Final Clarifiers
    - RAS Pumping
    - Disinfection
    - Cascade Aerator
    - Plant Outfall

- 442 Hydraulic Constraints & Trigger Points for Improvements
  - Conduct additional hydraulic analysis, and identify modifications that could potentially increase hydraulic capacity consistent with process performance implications.
- 443 Summary of Unit Process Capacities

#### **Task 450 – Asset Recommended Improvements**

- 451 Building Upgrades
  - Architectural
  - Structural
  - HVAC
  - Electrical
- 452 Process Equipment Upgrades
- 453 Electrical Service Upgrades
- 454 SCADA Upgrades
- 455 Estimate of Probable Construction Cost
- 456 Summary of Asset Assessment
- 457 Summary of Recommended Improvements with Trigger Points

#### **Task 460 – Reviews**

- 461 Quality/Technical Review
- 462 Review with City

#### **Deliverables**

- Develop Technical Memorandum summarizing results of Physical Condition Assessment including results of Staff Interviews and Walkthrough along with a summary of Recommended Improvements with Trigger Points.
- Plant Hydraulic Capacity Technical Memorandum
- Plant Organic Capacity Technical Memorandum
- The Technical Memorandums are intended to be used as review documents. These TMs will be formatted to be utilized as chapters in the final Facility Plan.

### ***TASK SERIES 500 – OPERATIONS AND ENERGY EVALUATION***

#### **HDR Facilities Operations and Energy Evaluations Personnel**

- Chris Sheridan & Kevin Newman – Operations Evaluation
- Kevin Newman, DelRon Peters & Eric Evans – Energy Evaluation

#### **Task 510 – Plant Operations Review & Optimization**

The objective of this task is to review the operations procedures at the WRF for the purpose of optimizing plant process and O&M practices. It is anticipated the operations specialist will be on site three days to perform this evaluation. The operation specialist will begin the evaluation with a kickoff meeting to set objectives, schedule City staff time and establish priorities. A summary will be held at the conclusion of the visit to present initial findings of the evaluation. The Specialist will assess each unit process in the facility and summarize:

- 511 Discuss and Define Performance Objectives.
  - Includes meeting with staff prior to site visit to discuss operational concerns/issues.
- 512 Assess Work Practices
- 513 Review Current operation, operational issues, and recommended solutions for:
  - Staffing
  - Safety Issues
  - Operational Adjustments
  - Equipment Operation and Maintenance
  - Instrumentation
  - Sampling/Metering
  - Handling Side-streams
  - Controlling Chemical Feed Processes
  - Process Flexibility Improvements
  - Unused Facilities
- 514 Define and Prioritize Operations Improvement Projects for Capital Improvement Plan
- 515 Operations Assessment Technical Memorandum

### **Task 520 – Energy Evaluation & Process Optimization**

The objective of this task is to update the previous SDDENR energy audit to current electrical rates and include recommendations from that study into this WRF Facility Plan. A trigger point (i.e. cost per KWH) when energy related solutions become economically feasible will be identified. It is anticipated the operations specialist will be on site one day to perform this evaluation. This task will also include systems that were addressed in the previous study.

- 521 Review energy rates and develop an updated BHP energy rate for all analyses.
- 522 Update Rapid City WRF SD DENR Energy Audit Recommendations
- 523 Add Solids Handling to Energy Audit
- 524 Define and Prioritize Energy Improvement Projects for Capital Improvement Plan
- 525 Energy Assessment Technical Memorandum

### **Deliverables**

- Develop Technical Memorandum summarizing results of Operational Assessment including results of Staff Interviews and Walkthrough
- Technical Memorandum of Energy Assessment including trigger points for improvements.
- The Technical Memorandums will be utilized as chapters in the final Facility Plan.

### ***TASK SERIES 600 – WRF Improvements Evaluation and Implementation Plan Development***

#### **Task 610 – Alternatives Evaluation**

Alternatives reviewed in this section will identify applicable treatment alternatives available for three effluent nutrient limit levels. The results will be summarized including general discussion of operation, relative merits of each, advantages and disadvantages, process flow diagrams, etc. of various

alternatives in a preliminary Alternative Identification and Screening Technical Memorandum. HDR will perform necessary process modeling, sizing, costs and site plan for each of the plans. HDR will evaluate alternatives using order of magnitude Capital and O&M costs, timing of improvements, and relative merits of various alternatives in an Alternative Evaluation Technical Memorandum.

611 Pretreatment Evaluation

- Septage and Sewer Cleaning Handling Facilities
- Schematic layout, access and identification of needs for septage hauling facility

612 Liquid Process Treatment Evaluation

- Evaluate Alternative Configurations with GPS-X Model.
- Future Regulatory Impacts i.e. Ammonia and Nutrient Limits
  - Facility discharge standards
  - Potential facility expansion scenarios needed to meet both discharge quality and quantity requirements
    - Evaluation of alternatives and associated capital (construction) costs and operation and maintenance costs
    - Review Impact of Regulations on Rated Hydraulic Capacity
    - Determine Future for North Plant
    - Review Biological Nutrient Reduction (BNR)
    - Potential Elimination of RBCs
- Activated Sludge
  - Assess Controls
  - New Blower Technology and/or Jockey Blower

613 Solids Handling and Disposal Evaluation

The objective of this task is to determine the WRF solids processing plan recommendations for processing equipment criteria and final disposal.

- Digestion Capacity Evaluation
- Sludge Storage
- Thickening & Dewatering: The objective of this task will include selection of equipment types to meet solids handling planning criteria. Pilot studies for specific equipment types are not included in this scope of services.
- Sludge Disposal:
  - Landfill disposal/daily cover material
    - Requires dewatering
  - Co-composting
    - Requires dewatering and thickening
  - Class A vs Class B

614 Fats, Oils and Grease (FOG) Analysis

The goal of the FOG analysis is to determine if the return from the additional energy source is sufficient to support the change in process, additional maintenance and required infrastructure improvements.

- Desktop FOG Quantity Analysis will be conducted based on similar size communities.
- Digester Capacity Analysis

- Estimate increase in cogeneration production and value.
  - Digester Feedstock Receiving -Include cost for system feeding FOG and or food waste including: Facilities to remove unwanted waste, truck unloading, hauler rinse-out, and drainage systems, digester feed stock mixing, heating, odor control, and HVAC.
  - Digester Feedstock Processing – Provide for upgrades to accommodate the proposed improvements including: processing and receiving station, gas conditioning to minimize maintenance O&M issues, maximize generator output, and extend service life of existing equipment.
  - Biosolids production impacts: -Identify Energy Production & Biogas Use Strategies i.e. cogeneration, heating, gas powered pump etc.
  - Evaluate Staffing Needs
  - Net metering potential, necessary infrastructure improvements for net metering, and payback evaluation. Summarize overall return on investment of proposed FOG processing improvements.
  - Summarize potential green energy credits and available grants.
- 615 Review Options with City
- 616 Project Costs.

### **Task 620 – Draft Alternatives Report for Wastewater Treatment Facilities**

- 621 Prepare Technical Memorandum with Alternatives Capital Improvements Plan
- 622 Review capacity/loading trigger points for each process.

### **Task 630 – Reviews**

- 631 Quality/Technical Review
- 632 Review with City

### **Deliverables**

- Supplemental Sampling Plan to define additional variables that are not currently analyzed but may be needed to address planning for future regulatory changes.
- Alternative Identification and Screening TM
- Alternative Evaluation TM summarizing estimate of engineering, construction, and O&M costs for each alternative including life-cycle cost analysis.
- Non Monetary Evaluation TM including risks, and benefits.
- Recommended Nutrient Removal Plan
- Prepare Technical Memorandum with Alternatives Capital Improvements Plan (CIP) including capacity/loading trigger points for each process.
- Proposed FOG Planning Basis

### ***TASK SERIES 700 – FINAL WRF FACILITY PLAN***

The Facility Plan Report will be prepared by compiling the prior developed technical memorandums as the basis for the report, including an executive summary and an implementation plan for the improvements will be prepared and reviewed with city staff. The Implementation Plan will be based on trigger points such as regulatory requirements, energy costs, etc. and the priority of equipment replacement based on assessment (i.e. equipment in worst shape or most negatively impacting operations would be placed in category for highest priority, equipment that has a longer life but may need replaced in intermediate time frame would be placed in a medium priority category, and new equipment such as the screens would be placed in a low priority category). The City could then utilize this information to best develop the CIP by choosing which projects to implement based on available funding and resources.

#### **Task 710 – Prepare Draft Facility Plan Report**

- 711 Compile finalized TMs into draft facility plan report
- Develop an implementation plan of improvements.
  - Identify specific loading, hydraulic, regulatory, or useful life trigger for each step of the plan including the final alternative selected.
  - Prepare a 20-year capital needs plan that projects anticipated repair and/or replacement of major components and equipment. The developed CIP will reflect the timing of anticipated needs based on the condition assessment and additional facilities recommended.

#### **Task 720 – Facility Plan Reviews**

- 721 Technical/Quality Review  
722 City Review

#### **Task 730 – Funding**

- 731 Recommendations for potential funding sources and scenarios to meet the needs identified.
- 732 HDR will discuss available funding with the SD DENR funding administrators to determine availability of funds and options i.e. energy related grant/matching funding.

#### **Task 740 – Prepare Final Facility Plan Report**

- 741 Final Alternatives Selection  
742 Executive Summary  
743 Final Facility Plan Report

The final facility plan report will consist of an accumulation of the TMs developed for each task complete with sections or information that results in a coordinated report.

- Implementation Plan/Capital Improvements Plan (CIP)
- Short and long term capital improvement needs and costs
- Meeting Minutes
- Attendance at Public Works Committee Meeting/City Council

## **Deliverables**

- Draft Facility Plan
- Document Review Comment Compilation and Responses
- Final Facility Plan.

## ***TASK SERIES 800 – WORKSHOPS***

Workshops shall be conducted to effectively capitalize on and integrate the knowledge and expertise of the Owner and HDR Project team members, and to tailor Project recommendations to Owner operations and maintenance preferences.

### **Task 810 – Workshop 1 – Flow/Loads Basis of Planning**

Workshop 1 will be a teleconference for out of town HDR personnel and is anticipated to address the following:

- Results of Service Area, Current and Future Flows and Loads
- Results of Condition and Operational Assessment
- Results of Plant Hydraulic Modeling
- Result of Unit Process Evaluations
- Preliminary Identification of Treatment Alternatives. In Workshop 1, HDR will review the broad range of treatment alternatives along with the goal of narrowing the alternatives to the most practical options based on City and regulatory treatment goals. HDR will lead discussion on the advantages and disadvantages for each alternative. For example, a membrane bioreactor option will be discussed on the merits for this high quality effluent.

It is anticipated the City staff would attend at the HDR Rapid City office.

### **Task 820 – Workshop 2 – Liquid/Solids Process Selection**

Workshop 2 will be one day on-site at the WRF and is anticipated to consolidate the following:

- Results of Hydraulic Capacity Assessment
- Results of the Organic Capacity Assessment
- Screening of Treatment Alternatives. HDR will present further information on the selected alternatives and the workshop team will work through and further screen and develop the alternatives prior to final analysis.
- Outline Methodology of Alternative Analysis

### **Task 830 – Workshop 3 – Alternative Selection**

Workshop 3 will be one day on-site at the WRF and is anticipated to consolidate the following:

- Results of Initial Alternatives Analysis. The analysis results will include monetary and non-monetary criteria for Liquids/Solids treatment.
- Identification of Non-Monetary Criteria and Weighting
- Discussion of Asset Management Plan/Priority designations
- Results of FOG Analysis
- Results of Nutrient Removal Plan Development
- Presentation of Implementation Plan format presentation
- Discussion/Consensus of Selected Alternatives
- Initial Implementation Plan discussion

## **Deliverables**

- HDR to provide preliminary Technical Memorandum sections to be reviewed by Owner no less than 7 days prior to the respective workshop.
- Workshop agenda with designated time allocation.
- Detailed minutes from workshops.

## **Assumptions**

---

The Scope of Work defined above and outlined in this Exhibit does not include the following:

1. Wetlands Survey
2. Archaeological survey
3. Land/Easement Acquisition
4. Update of GIS flow data
5. Sampling and testing of wastewater parameters



**City of Rapid City  
Exhibit B: Task Order Manhour Estimate - WRF Facility Plan  
HDR Engineering, Inc.**

Labor	Total Hours	Task Expenses \$	HDR Task Total \$	Sub-consultant AE2S \$	Task Total with Sub. \$
<b>Task Series 100 - Project Initiation/Background Data</b>					
Task 110 - Management Plan/Initiation Meeting	46	\$660	\$8,450	\$756	\$9,206
Task 120 - Background Data	25	\$143	\$4,008	\$0	\$4,008
Task 130 - Progress Meetings	137	\$1,044	\$23,009	\$2,961	\$25,970
<b>Series 100 Hours</b>	<b>208</b>				
<b>Series 100 Fee</b>	<b>\$33,620</b>	<b>\$1,847</b>	<b>\$35,467</b>	<b>\$3,717</b>	<b>\$39,184</b>
<b>Task Series 200 - Permit Review &amp; Future Regulatory Basis of Planning</b>					
Task 210 - DENR Coordination/Meeting	4	\$15	\$335	\$0	\$335
211 - Permit Review	26	\$96	\$4,696	\$0	\$4,696
212 - DENR Meeting	39	\$313	\$7,448	\$0	\$7,448
213 - Permit Modeling Review	53	\$730	\$10,105	\$0	\$10,105
Task 220 - Regulatory Basis of Planning	23	\$85	\$3,520	\$735	\$4,255
<b>Series 200 Hours</b>	<b>145</b>				
<b>Series 200 Fee</b>	<b>\$24,965</b>	<b>\$1,239</b>	<b>\$26,104</b>	<b>\$735</b>	<b>\$26,839</b>
<b>Task Series 300 - Flow &amp; Loading Projections</b>					
Task 310 - Service Area Delineations	24	\$624	\$3,624	\$10,017	\$13,641
Task 320 - Flow Projections	24	\$89	\$3,849	\$7,295	\$11,144
Task 330 - Loading Projections	34	\$126	\$5,176	\$3,352	\$8,527
Task 340 - WRF Flow and Loading Planning Basis	35	\$130	\$5,545	\$6,118	\$11,663
<b>Series 300 Hours</b>	<b>117</b>				
<b>Series 300 Fee</b>	<b>\$17,225</b>	<b>\$968</b>	<b>\$18,193</b>	<b>\$26,782</b>	<b>\$44,975</b>
<b>Task Series 400 - Asset &amp; Capacity Evaluation</b>					
Task 410 - Existing WRF Evaluators	105	\$5,071	\$22,086	\$5,670	\$27,756
Task 420 - Existing Assets: Maintenance Record & Condition Review	49	\$181	\$7,696	\$1,764	\$9,460
Task 430 - Process & Hydraulic Modeling	38	\$141	\$7,481	\$0	\$7,481
Task 440 - Capacity Analysis	30	\$111	\$5,041	\$0	\$5,041
Task 450 - Asset Recommended Improvements	90	\$333	\$14,463	\$4,410	\$18,873
Task 460 - Reviews	7	\$26	\$1,401	\$735	\$2,138
Task 470 - Asset Memorandum	68	\$252	\$10,572	\$882	\$11,454
<b>Task 400 Hours</b>	<b>387</b>				
<b>Series 400 Fee</b>	<b>\$62,625</b>	<b>\$6,115</b>	<b>\$68,740</b>	<b>\$13,461</b>	<b>\$82,201</b>
<b>Task Series 500 - Operations &amp; Energy Evaluation</b>					
Task 510 - Plant Operations Review & Optimization	110	\$1,355	\$19,075	\$0	\$19,075
Task 520 - Energy Evaluation & Process Optimization	100	\$1,025	\$16,795	\$0	\$16,795
<b>Task 500 Hours</b>	<b>210</b>				
<b>Series 500 Fee</b>	<b>\$33,490</b>	<b>\$2,380</b>	<b>\$35,870</b>	<b>\$0</b>	<b>\$35,870</b>
<b>Task Series 600 - WRF Improvements Evaluation</b>					
Task 610 - Alternatives Evaluation		\$0	\$0	\$0	\$0
611 Pretreatment Evaluation	14	\$52	\$2,382	\$8,282	\$10,664
612 Liquid Process Treatment Evaluation	102	\$377	\$18,167	\$0	\$18,167
613 Solids Handling and Disposal Evaluation	97	\$359	\$17,374	\$0	\$17,374
614 Fats, Oils, and Grease (FOG) Analysis	34	\$126	\$5,156	\$0	\$5,156
615 Review Options with City	44	\$163	\$7,223	\$0	\$7,223
616 Project Costs and Implementation Schedule	62	\$229	\$10,709	\$2,646	\$13,355
Task 620 - Draft Alternatives Report	80	\$446	\$12,776	\$0	\$12,776
Task 630- Reviews	6	\$22	\$1,192	\$1,676	\$2,868
<b>Task 600 Hours</b>	<b>439</b>				
<b>Series 600 Fee</b>	<b>\$73,205</b>	<b>\$1,774</b>	<b>\$74,979</b>	<b>\$12,604</b>	<b>\$87,564</b>
<b>Task Series 700 - Final WRF Facility Plan</b>					
Task 710 - Prepare Draft Facilities Plan Report	85	\$315	\$12,420	\$1,985	\$14,404
Task 720 - Facility Plan Review	8	\$30	\$1,590	\$3,631	\$5,221
Task 730 - Funding	44	\$313	\$6,908	\$0	\$6,908
Task 740 - Prepare Final Facilities Plan Report	7	\$26	\$1,366	\$1,985	\$3,350
<b>Task 700 Hours</b>	<b>144</b>				
<b>Series 700 Fee</b>	<b>\$21,600</b>	<b>\$683</b>	<b>\$22,283</b>	<b>\$7,600</b>	<b>\$29,883</b>
<b>Task Series 800 - Workshops</b>					
Task 810 - Workshop 1 Flows/Loads Basis of Planning	32	\$232	\$5,222	\$4,862	\$10,084
Task 820 - Workshop 2 Liquid/Solids Process Selection	99	\$1,846	\$18,956	\$1,985	\$20,941
Task 830 - Workshop 3 Alternatives Selection	83	\$1,167	\$15,157	\$0	\$15,157
<b>Task 800 Hours</b>	<b>214</b>				
<b>Series 800 Fee</b>	<b>\$36,090</b>	<b>\$3,246</b>	<b>\$39,336</b>	<b>\$6,846</b>	<b>\$46,182</b>
<b>Rapid City WRF Facility Plan Total Hours</b>	<b>1864</b>				
<b>Total Fee</b>	<b>\$302,720</b>	<b>\$18,250</b>	<b>\$320,970</b>	<b>\$71,745</b>	<b>\$392,716</b>

BASE PROJECT TOTAL	
TOTAL LABOR	\$302,720
TOTAL EXPENSES	\$18,250
SUBCONSULTANT	\$71,745
<b>TOTAL NOT TO EXCEED FEE FOR PROJECT</b>	<b>\$392,716</b>

**City of Rapid City – WRF Facility Plan  
Exhibit C**

**HDR Engineering  
2015 Hourly Billing Rates**

Enclosed are the 2015 Hourly Billable Rates for HDR Engineering. These billing rates shall be adjusted annually to reflect any salary adjustments incurred by employees. The rates listed below do not include Reimbursable Expenses or hourly billing rates for equipment as defined below.

<b>Description</b>	<b>Billing Rate/Hour</b>
Managing Principal	\$205
Senior Project Manager	\$195
Project Manager	\$165
ASME Disciplines	\$170
Engineer V	\$160
Engineer IV	\$145
Engineer III	\$130
Engineer II	\$110
Engineer I	\$95
Engineering Technician III	\$110
Engineering Technician II	\$90
Engineering Technician I	\$80
Cadd/GIS Technician IV	\$120
Cadd/GIS Technician III	\$95
Cadd/GIS Technician II	\$90
Cadd/GIS Technician I	\$80
Right of Way III	\$165
Right of Way II	\$150
Right of Way I	\$125
Environmental Scientist V	\$160
Environmental Scientist IV	\$145
Environmental Scientist III	\$125
Environmental Scientist II	\$95
Environmental Scientist I	\$80
Senior Land Surveyor	\$140
Land Surveyor	\$120
Survey Technician III	\$100
Survey Technician II	\$90
Survey Technician I	\$80
Senior Construction Manager	\$165
Construction Manager	\$130
Construction Engineer	\$110
Construction Field Rep	\$80
Public Involvement III	\$135
Public Involvement II	\$105
Public Involvement I	\$85
Accountant	\$95
Graphic Designer	\$80
Admin Assistant	\$65

HDR has technical experts in various geographic locations that may be utilized based on specific project need. This specialized expertise is not subject to the above rates and associated billing rates are to be determined at the time of contract negotiation.

**Direct Expenses**

Traffic Counting Equipment	\$120.00 per hour
Survey/GPS Equipment	\$50.00 per hour
Robotic Total Station	\$50.00 per hour
Side-by-Side Utility Vehicle	\$20.00 per hour
Mileage	\$0.75 per mile
Technology Charge	\$3.70 per hour

Copies:

24" x 36" Mylar	\$15.00 each
Plots Bond	\$8.00 each
Plain Paper Copies	\$0.15 each
Plain Paper Copies 11" x 17"	\$0.25 each
Color 11" x 17" Copies	\$1.25 each

**OTHER REIMBURSABLE EXPENSES**

Reimbursable Expense shall mean the actual expenses incurred directly or indirectly in connection with the Project for transportation travel, subconsultants, subcontractors, computer usage, telephone, telex, shipping and express, and other incurred expense. Unless negotiated otherwise in the contract, ENGINEER will add 10% to invoices received by ENGINEER from subconsultants and subcontractors to cover administrative expenses and vicarious liability. Hourly equipment charges apply to specific equipment used on the project. Technology Charges apply to each hour an employee works on the project.

Specialized Expertise not listed on Standard Rate Sheet

<b>Description</b>	<b>Billing Rate/Hour</b>
Senior Process Engineer	\$195