ENVIRONMENTAL SERVICES
SPB05-894P-O

1. PARTIES

THIS CONTRACT, is entered into by and between the State of Montana, Department of Administration, State Procurement Bureau, (hereinafter referred to as "the State"), whose address and phone number are Room 165 Mitchell Building, 125 North Roberts, PO Box 200135, Helena MT 59620-0135, (406) 444-2575 and **HDR Engineering, Inc.**, (hereinafter referred to as the "Contractor"), whose nine digit Federal ID Number, address and phone number are 47-0680568, 412 E. Parkcenter Blvd Suite 100, Boise ID 83706-6659, and (208) 387-7000.

THE PARTIES AGREE AS FOLLOWS:

2. PURPOSE

The purpose of this term contract is to establish a list of Environmental Service Providers in several service areas. All qualified offerors will be assembled into a multiple contractor term contract for use by state agencies and other public procurement units. The State makes no guarantee of use by any agency-authorized access to this term contract. However, through data conveyed by the Montana Department of Environmental Quality, Montana Department of Natural Resources and Conservation, and Montana Fish, Wildlife and Parks, it is anticipated that this term contract should access approximately 2.5 million dollars or more annually.

3. EFFECTIVE DATE, DURATION, AND RENEWAL

3.1 Contract Term. This contract shall take effect upon execution of all signatures, and terminate on June 30, 2007, unless terminated earlier in accordance with the terms of this contract. (Mont. Code Ann. § 18-4-313.)

3.2 Contract Renewal. This contract may, upon mutual agreement between the parties and according to the terms of the existing contract, be renewed in one-year intervals, or any interval that is advantageous to the State, for a period not to exceed a total of four additional years. This renewal is dependent upon legislative appropriations.

3.3 Addition of Analytical Laboratory Contractor. Proposals will be accepted between April 1 and May 1 of each calendar year from current firms requesting review of their qualifications to perform Analytical Laboratory Services as originally requested under RFP SPB05-894P. The state will evaluate each proposal received in the exact manner in which the original proposals for other categories were evaluated. If proposal passes the requirements as evaluated to perform Analytical Lab Services, the state will update that firms term contract to include the Analytical Lab Services category contingent on said firm being in good standing otherwise.

4. NON-EXCLUSIVE CONTRACT

The intent of this contract is to provide state agencies with an expedited means of procuring supplies and/or services. This contract is for the convenience of state agencies and is considered by the State Procurement Bureau to be a "Non-exclusive" use contract. Therefore, agencies may obtain this product/service from sources other than the contract holder(s) as long as they comply with Title 18, MCA, and their delegation agreement. The State Procurement Bureau does not guarantee any usage.

5. COOPERATIVE PURCHASING

Under Montana law, public procurement units, as defined in section 18-4-401, MCA, have the option of cooperatively purchasing with the State of Montana. Public procurement units are defined as local or state public procurement units of this or any other state, including an agency of the United States, or a tribal procurement unit. Unless the bidder/offeror objects, in writing, to the State Procurement Bureau prior to the

award of this contract, the prices, terms, and conditions of this contract will be offered to these public procurement units.

6. TERM CONTRACT REPORTING

Term contract holder(s) shall furnish annual reports of term contract usage. Each report shall contain complete information on all public procurement units utilizing this term contract. Minimum information required to be included in usage reports: name of the agency or governmental entity who contacted you regarding a potential project; project title; agency contact person; if the project was not successfully negotiated, state the reason; number and title of contracts received; total dollar amounts for contracts received; the names of your company personnel involved in the project; and project status as of usage report date. The report for this term contract will be due on July 20th of each year.

Reported volumes and dollar totals may be checked by the State Procurement Bureau against State records for verification. Failure to provide timely or accurate reports is justification for cancellation of the contract and/or justification for removal from consideration for award of contracts by the State.

7. COST/PRICE ADJUSTMENTS

7.1 Cost Increase by Mutual Agreement. After the initial term of the contract, each renewal term may be subject to a cost increase by mutual agreement. Contractor must provide written, verifiable justification for any cost adjustments they request during each renewal period. Contractor shall provide its cost adjustments in both written and electronic format.

7.2 Differing Site Conditions. If, during the term of this contract, circumstances or conditions are materially different than set out in the specifications, the Contractor may be entitled to an equitable adjustment in the contract price. The Contractor shall immediately cease work and notify, in writing, the State of any such conditions necessitating an adjustment as soon as they are suspected and prior to the changed conditions affecting the performance of this contract. Any adjustment shall be agreed upon in writing by both parties to the contract.

7.3 Cost/Price Adjustment. All requests for cost/price adjustment must be submitted between April 1st and April 30th along with written justification. Requests received after April 30th will not be considered unless written approval from the SPB Contracts Officer is given to submit at a later date. In no event will cost/price adjustments be allowed beyond May 15th. All requests that are approved will be incorporated by contract amendment and made effective July 1st of the next approved renewal period.

8. SERVICES AND/OR SUPPLIES

8.1 Service Categories. Contractor agrees to provide to the State the following services:

TMDL Targets. The TMDL program (within DEQ) will often need additional data in order to develop TMDL targets. Targets are quantitative water quality goals or “endpoints” that represent all the applicable narrative or numeric water quality standards. These targets, when achieved will represent full beneficial use support. This may require additional monitoring to determine reference condition when TMDL targets are based on narrative criteria or designated uses (water quality standards). Targets may be based on numeric water quality criteria, pollutant concentrations or loads, habitat or geomorphic measures, and/or biological criteria or populations. Targets are also used to determine the existing Water Quality Impairment Status (WQIS) of the streams on the 303(d) list. In most cases, the contractor will be required to write a report, which includes a recommendation and justification for one or more TMDL targets and also compare those targets to the existing conditions to determine WQIS. Communication with the State is crucial while deriving preliminary targets to ensure TMDL consistency across Montana.

TMDL Source Assessment/Delineation. The TMDL program (within DEQ) will often need additional data in order to link water quality impairments to their sources, or to allocate sources of pollutants. This may require data compilation, investigative monitoring and statistical analysis within a specified watershed, which

can be used for source allocation, or the linkage of water quality impairments to causes and sources of impairment (e.g., sediment or land use practices). Quantitative source assessments may be conducted using field-based monitoring and/or interpretation and analysis of aerial photos, digital images, or GIS coverages depending upon impairment sources and available information. In most cases, contractors will be required to write a report that identifies what the major causes of impairment are and where the major sources of pollutants are located. DEQ will also need to have all pollution/pollutant sources quantified. The quantification of these loads will assist in both source load allocations and the total maximum daily loads. In addition, data collected during source assessments must be entered into an approved database structure or format and linkage to the National Hydrography Dataset (NHD) streams layer may be requested. The department may also request a cost/benefit analysis for implementing BMPs, which can be used for developing TMDL source allocations. Communication with the State is crucial while deriving assessing sources of pollutants to ensure TMDL consistency across Montana.

TMDL Load Allocations. The TMDL program (within DEQ) will often need additional data in order to develop load allocations in conjunction with the source assessment/delineation. Load allocations are the portion of a receiving water's loading capacity that is attributed to existing or future point or non-point sources of pollution or to natural background sources. Load allocations are best estimates of the loading, which can range from reasonably accurate estimates to gross allotments. Allocation can be expressed as a percent reduction that results in a maximum allowable load or as performance-based, which demonstrates how BMPs will be applied and how they will reduce the current loads. Communication with the State is crucial while deriving preliminary load allocations to ensure TMDL consistency across Montana.

Total Maximum Daily Loads. The TMDL program (within DEQ) will often need additional data in order to develop Total Maximum Daily Loads (TMDLs). A TMDL is defined as the sum of the wasteload allocations to point sources, load allocations to non-point sources and natural background sources with a margin of safety considering seasonal variation. TMDLS can be expresses in terms of mass per time, toxicity, or other appropriate measures that relate to the State's Water Quality Standards. Communication with the State is crucial while deriving preliminary TMDLs to ensure consistency across Montana.

Geographic Information Systems (GIS) Services. The State, and in particular DEQ, will need assessments that characterize a watershed and identify and quantify all probable sources of pollutants. GIS maps will be required for every waterbody that is assessed. Thematic maps may include, but are not limited to: land ownership, land use, topography, hydrology, soils, precipitation, and/or endangered species distribution. In addition, DEQ may request that GIS applications be used to facilitate the interpretation and analysis of digital images and/or other georeferenced data.

Water Quality Modeling. The State, and in particular DEQ, uses contracted services in the development and/or application of watershed and water quality modeling tools and techniques in the development of TMDLs. Models may be used to assist in defining TMDL loading allocations, performing existing/potential conditions analysis, watershed scenario analysis, and/or standards attainment analysis. The types of models that may be employed include dynamic watershed loading models (i.e. SWAT, HSPF), water quality fate and transport models (i.e. QUAL2E, QUAL2K), stream temperature and/or shade models (i.e. SSTemp, HeatSource, Shadow), and multi-dimensional lake/reservoir models (i.e. CE QUAL W2). In addition, simpler modeling tools and techniques such as GIS-based Risk Assessment Modeling may be employed or developed based on project needs and resources. The DEQ may also seek assistance in the identification and/or development of simple modeling tools that may be implemented at the desktop that facilitate quick scenario applications. These tools should be able to focus on specific water quality issues such as sediment, nutrients, salinity, etc. and be tailored to the various (eco) regions across the state.

Statistical Analysis. The State may request that large data sets be statistically analyzed for determining trends or for making comparisons. This service area may include data compilation, organization, manipulation and analysis. These analyses may be used to validate environmental targets by comparing reference data to existing data. They may also be used to establish a relationship or linkage between indicators and targets, the estimated loads and how targets link to beneficial use support. Analyses should be appropriate for the type of data being analyzed. In many cases, the contractor will be responsible for determining and providing rationale for appropriate statistical analyses to address pre-formulated

environmental hypotheses. Analyses must consider spatial and temporal variations. Analyses may range from providing simple descriptive statistics to reporting multifactor predictive analyses.

8.2 Reuse of Documents. When the projects dictate a design or engineered approach, the State agrees that it will not apply the Contractor's designs to any other projects.

9. ENGINEERING ACCESS

All of the firms selected may need to have access to engineering services depending on the nature of the project. The contractor(s) will be expected to use their own best judgment as to whether engineering services are needed for a given project. However, traditional engineering methodologies are not the emphasis of this RFP. It is a violation of State Statute to practice engineering or land surveying without a license.

10. PROJECT SELECTION

10.1 Project Identification. The State will be responsible for identifying projects, contacting landowners and securing necessary permission/cooperation agreements, selecting a contractor, writing grant applications and approving project payments.

10.2 Hazardous Materials. The State will not initiate projects where it is known that hazardous materials are present. If there is an indication of a potential of hazardous materials, then the State will do testing prior to contacting the contractor. However, there is always the possibility of unforeseen problems resulting in the stoppage of a project.

10.3 Meetings. The selected contractor may be required to meet with State personnel at the project site to conduct a site evaluation, discuss project issues and begin the negotiation process on project feasibility, conceptual design and costs for each project.

10.4 Approach Expectations. In the case of restoration activities, the agency will identify the preferred techniques. The determination made by the State may define which contractor(s) are contacted for project initiation. The State is always open to new and innovative approaches that accomplish project goals.

11. SELECTING A CONTRACTOR

The State may select a term contract holder from the Environmental Services contract home page as provided under the state's website address http://www.discoveringmontana.com/doa/gsd/procurement/TermContracts/environservices/Default.asp, taking into consideration such things as the contractor's area of expertise, requirements and location of the project, the contractor's availability and access to resources necessary to efficiently and effectively complete the project, demonstrated excellent past performance on State and public projects, identified subcontractors and total project cost.

General. Ordering agencies shall use the procedures in this section when ordering services priced at hourly rates as established by each Term Contract (TC). The applicable service categories are identified in each TC along with the contractor's price lists.

Request for Quotation (RFQ) procedures. The ordering agency must provide an RFQ, which includes the statement of work and limited, but specific evaluation criteria (*e.g.*, experience and past performance), to TC contractors that offer services that will meet the agency's needs. The RFQ may be posted to the agency's state website to expedite responses.

Statement of Work (SOWs). All SOW's shall include at a minimum a detailed description of the work to be performed, location of work, period of performance, deliverable schedule, applicable performance standards and any special requirements (e.g., security clearances, travel, special knowledge).

(1) Ordering agency may select a contractor from the appropriate service category and directly negotiate a mutually acceptable project based on a sudden and unexpected happening or unforeseen occurrence or condition, which requires immediate action. (Exigency).

(2) Ordering agency may place orders at or below the $5,000 threshold with any TC contractor that can meet the agency's needs. The ordering agency should attempt to distribute orders among all service category contractors.

(3) For orders estimated to exceed $5,000 but less than $25,000.

(i) The ordering agency shall develop a statement of work.

(ii) The ordering agency shall provide the RFQ (including the statement of work and evaluation criteria) to at least three TC contractors that offer services that will meet the agency's needs.

(iii) The ordering agency shall request that contractors submit firm-fixed prices to perform the services identified in the statement of work.

(4) For orders estimated to exceed $25,000. In addition to meeting the requirements of (3) above, the ordering agency shall:

(i) Provide the RFQ (including the statement of work and the evaluation criteria) to a minimum of six service category TC contractors (if category has less than 6, all contractors will be offered an RFQ) with a 50% replacement factor for each subsequent request for quote in the same service category.

Evaluation. The ordering agency shall evaluate all responses received using the evaluation criteria provided in the RFQ to each TC contractor. The ordering agency is responsible for considering the level of effort and the mix of labor proposed to perform a specific task being ordered, and for determining that the total price is reasonable. The agency will place the order with the contractor that represents the best value. After award, ordering agencies will provide timely notification to unsuccessful TC contractors. If an unsuccessful TC contractor requests information on a task order award that was based on factors other than price alone, a brief explanation of the basis for the award decision shall be provided.

Minimum documentation. The ordering agency shall document:

(1) The TC contractors considered, noting the contractor from which the service was purchased.
(2) A description of the service purchased.
(3) The amount paid.
(4) The evaluation methodology used in selecting the contractor to receive the order.
(5) The rationale for making the selection.
(6) Determination of price fair and reasonableness.

Agency project task orders will be utilized to finalize the project. Only written addenda will be used for adjustments of the task orders and must be signed by both parties. All task orders must contain signatures from both parties and appropriate agency legal review as directed in their procurement policy.

The State will monitor contractor selection by using the information provided in the annual TC usage reports.

Contractor's who fail to respond to three RFQ opportunities within a one-year period between July 1st and June 30th may be removed from the qualified list of contractors.

12. CONTRACTOR RESPONSIBILITIES

12.1 Supervision and Implementation. The selected contractor for an individual project will be responsible for the supervision and implementation of the approach and will be responsible for oversight of work performed by all subcontractors. In most cases the contractor will provide and be responsible for all the necessary equipment, materials, supplies and personnel necessary for proper execution of the work. However, the State reserves the right to hire subcontractors (equipment and/or labor) if it will provide a cost savings to the State. The selected contractor will also be responsible for clean up of the sites if necessary and must have the sites inspected by the State immediately prior to completion.

12.2 On-Site Requirements. When a contractor is contacted by the State to discuss a project, the State and the contractor may visit the job site if deemed necessary by the Project Manager, to become familiar with conditions relating to the project and the labor requirements. The State will provide a detailed scope of work for the project and request the contractor supply the State with a response to project approach, cost, timeframe and any other information deemed necessary by the State to make a selection or complete a contract negotiation.

In the cases of Restoration or On-The-Ground Activities, the contractor shall adequately protect the work, adjacent property, and the public in all phases of the work. They shall be responsible for all damages or injury due to their action or neglect.

The contractor shall maintain access to all phases of the contract pending inspection by the State, the landowner, or their representative. All interim or final products funded by the contract will become the property of the State or Cooperative Purchaser upon payment for said products.

All work rejected as unsatisfactory shall be corrected prior to final inspection and acceptance. The contractor shall respond within seven calendar days after notice of observed defects has been given and shall proceed to immediately remedy these defects. Should the contractor fail to respond to the notice or not remedy the defects, the State may have the work corrected at the expense of the contractor.

12.3 Clean Up (when project tasks require). The contractor shall:

- Keep the premises free from debris and accumulation of waste;
- Clean up any oil or fuel spills;
- Keep machinery clean and free of weeds;
- Remove all construction equipment, tools and excess materials; and
- Perform finishing site preparation to limit the spread of noxious weeds before final payment by the State.

12.4 Applicable Laws. The contractor shall keep informed of, and shall comply with all applicable laws, ordinances, rules, regulations and orders of the City, County, State, Federal or public bodies having jurisdiction affecting any work to be done to provide the services required. The contractor shall provide all necessary safeguards for safety and protection, as set forth by the United States Department of Labor, Occupational Safety and Health Administration.

12.5 Cooperation. The contractor shall work closely with the States analytical consultants, (i.e. environmental laboratories and taxonomists) to develop the desired products.

12.6 Work Acceptance. The contractor is responsible for project oversight as needed. The State may also periodically provide personnel for administrative oversight from the initiation of the contract through project completion. All work will be inspected by the State or designated liaison prior to approval of any contract payments. All work rejected as unsatisfactory shall be corrected prior to final inspection and acceptance. Contractor shall respond within seven calendar days after notice of defects has been given by the State and proceed to immediately remedy all defects.

12.7 Records. The contractor will supply the State with documentation, when requested, of methods used throughout project implementation. Contractor will maintain records for themselves and all subcontractors of supplies, materials, equipment and labor hours expended.

12.8 Communication. Remoteness of project sites may necessitate that the contractor have some form of field communication such as a cellular phone. This communication is necessary to enable the State to respond to public concerns related to the project, accidents, inspections, or other project issues that require immediate feedback. In addition, the State or Cooperative Purchaser may require scheduled communication at agreed upon intervals. The communication schedule will be dependent upon the project circumstances and requirements of the contracting agency. In the case when a communication schedule is included in the Scope of Work, the schedule will commence when the contractor initiates the project.

12.9 Change Of Staffing. Since qualifications of personnel were key in determining which offerors were selected to be on this TC, a written notification of any changes in key personnel must be made to the state agency, prior to entering into negotiations to perform any specific work scope. Contractor shall replace such employee(s) at its own expense with an employee of substantially equal abilities and qualifications without additional cost to the agency. If these staffing changes cause the contractor to no longer meet the qualifications stated herein, that firm will be removed from the service area of this TC. Failure to notify the state agency of staffing changes could result in the contractor being removed from the TC listing and possible suspension from bidding on other state projects.

12.10 Collaboration. The State encourages collaboration between contractors to increase the scope of services offered. In cases where the chosen contractor is not able to provide all services needed for the project, the State will expect the chosen contractor to contact other contractors on this list to negotiate subcontracts for these services before going elsewhere. Exceptions to this strategy will be evaluated on a case-by-case basis.

12.11 Subcontractors, Project Budget and Invoicing. All subcontractors to be used in any project must be approved by the authorized entity initiating the project. Project budgets will be negotiated for each individual project contract. However, all rates, terms and conditions set forth in this term contract will be applied to individual contracts. Subcontractor is defined as anyone other than the prime contractor having substantial direct involvement in a specific project.

The State reserves the right to choose the invoicing method from the following:

- Prime contractor's billing will include the subcontractors charges and payment will be made to the prime, or
- Prime and subcontractors will bill the State separately and the State will pay each directly.

13. CONSIDERATION/PAYMENT

13.1 Payment Schedule. In consideration for the services to be provided, the State shall pay according to the negotiated agreement for each project. Hourly rates and miscellaneous charges as provided in Attachment B shall apply.

13.2 Withholding of Payment. The State may withhold payments to the Contractor if the Contractor has not performed in accordance with this contract. Such withholding cannot be greater than the additional costs to the State caused by the lack of performance.

14. CONTRACTOR REGISTRATION

The Contractor will be registered with the Department of Labor and Industry under sections 39-9-201 and 39-9-204, MCA, *prior* to contract execution. The State cannot execute a contract for construction to a Contractor who is not registered. (Mont. Code Ann. § 39-9-401.)

Contractor Registration Number: 149680

15. CONTRACTOR WITHHOLDING

Section 15-50-206, MCA, requires the state agency or department for whom a public works construction contract over $5,000 is being performed, to withhold 1 percent of all payments and to transmit such monies to the Department of Revenue.

16. MONTANA PREVAILING WAGE REQUIREMENTS

Unless superseded by federal law, Montana law requires that contractors and subcontractors give preference to the employment of Montana residents for any public works contract in excess of $25,000 for construction or nonconstruction services in accordance with sections 18-2-401 through 18-2-432, MCA, and all administrative rules adopted pursuant thereto. Unless superseded by federal law, at least 50% of the workers of each contractor engaged in construction services must be performed by bona fide Montana residents. The

Commissioner of the Montana Department of Labor and Industry has established the resident requirements in accordance with sections 18-2-403 and 18-2-409, MCA. Any and all questions concerning prevailing wage and Montana resident issues should be directed to the Montana Department of Labor and Industry.

In addition, unless superseded by federal law, all employees working on a public works contract shall be paid prevailing wage rates in accordance with sections 18-2-401 through 18-2-432, MCA, and all administrative rules adopted pursuant thereto. Montana law requires that all public works contracts, as defined in section 18-2-401, MCA, in which the total cost of the contract is in excess of $25,000, contain a provision stating for each job classification the standard prevailing wage rate, including fringe benefits, travel, per diem, and zone pay that the contractors, subcontractors, and employers shall pay during the public works contract.

Furthermore, section 18-2-406, MCA, requires that all contractors, subcontractors, and employers who are performing work or providing services under a public works contract post in a prominent and accessible site on the project staging area or work area, no later than the first day of work and continuing for the entire duration of the contract, a legible statement of all wages and fringe benefits to be paid to the employees in compliance with section 18-2-423, MCA. Section 18-2-423, MCA, requires that employees receiving an hourly wage must be paid on a weekly basis.

Each contractor, subcontractor, and employer must maintain payroll records in a manner readily capable of being certified for submission under section 18-2-423, MCA, for not less than three years after the contractor's, subcontractor's, or employer's completion of work on the public works contract.

The nature of the work performed or services provided under this contract meets the statutory definition of a "public works contract" under section 18-2-401(11)(a), MCA, and falls under the category of Heavy Construction and Nonconstruction services. The booklets containing Montana's 2003 Rates for Heavy Construction and Nonconstruction Services are attached.

The most current Montana Prevailing Wage Booklet will automatically be incorporated at time of renewal. It is the contractor's responsibility to ensure they are using the most current prevailing wages during performance of its covered work.

17. ACCESS AND RETENTION OF RECORDS

17.1 Access to Records. The Contractor agrees to provide the State, Legislative Auditor or their authorized agents access to any records necessary to determine contract compliance. (Mont. Code Ann. § 18-1-118.)

17.2 Retention Period. The Contractor agrees to create and retain records supporting the environmental services for a period of three years after either the completion date of this contract or the conclusion of any claim, litigation or exception relating to this contract taken by the State of Montana or a third party.

18. ASSIGNMENT, TRANSFER AND SUBCONTRACTING

The Contractor shall not assign, transfer or subcontract any portion of this contract without the express written consent of the State. (Mont. Code Ann. § 18-4-141.) The Contractor shall be responsible to the State for the acts and omissions of all subcontractors or agents and of persons directly or indirectly employed by such subcontractors, and for the acts and omissions of persons employed directly by the Contractor. No contractual relationships exist between any subcontractor and the State.

19. HOLD HARMLESS/INDEMNIFICATION

The Contractor agrees to protect, defend, and save the State, its elected and appointed officials, agents, and employees, while acting within the scope of their duties as such, harmless from and against all claims, demands, causes of action of any kind or character, including the cost of defense thereof, arising in favor of the Contractor's employees or third parties on account of bodily or personal injuries, death, or damage to property

arising out of services performed or omissions of services or in any way resulting from the acts or omissions of the Contractor and/or its agents, employees, representatives, assigns, subcontractors, except the sole negligence of the State, under this agreement.

20. REQUIRED INSURANCE

20.1 General Requirements. The Contractor shall maintain for the duration of the contract, at its cost and expense, insurance against claims for injuries to persons or damages to property, including contractual liability, which may arise from or in connection with the performance of the work by the Contractor, agents, employees, representatives, assigns, or subcontractors. This insurance shall cover such claims as may be caused by any negligent act or omission.

20.2 Primary Insurance. The Contractor's insurance coverage shall be primary insurance as respect to the State, its officers, officials, employees, and volunteers and shall apply separately to each project or location. Any insurance or self-insurance maintained by the State, its officers, officials, employees or volunteers shall be excess of the Contractor's insurance and shall not contribute with it.

20.3 Specific Requirements for Commercial General Liability. The Contractor shall purchase and maintain occurrence coverage with combined single limits for bodily injury, personal injury, and property damage of $1,000,000 per occurrence and $2,000,000 aggregate per year to cover such claims as may be caused by any act, omission, or negligence of the Contractor or its officers, agents, representatives, assigns or subcontractors.

20.4 Additional Insured Status. The State, its officers, officials, employees, and volunteers are to be covered and listed as additional insureds; for liability arising out of activities performed by or on behalf of the Contractor, including the insured's general supervision of the Contractor; products and completed operations; premises owned, leased, occupied, or used.

20.5 Specific Requirements for Automobile Liability. The Contractor shall purchase and maintain coverage with split limits of $500,000 per person (personal injury), $1,000,000 per accident occurrence (personal injury), and $100,000 per accident occurrence (property damage), OR combined single limits of $1,000,000 per occurrence to cover such claims as may be caused by any act, omission, or negligence of the contractor or its officers, agents, representatives, assigns or subcontractors.

20.6 Additional Insured Status. The State, its officers, officials, employees, and volunteers are to be covered and listed as additional insureds for automobiles leased, hired, or borrowed by the Contractor.

20.7 Specific Requirements for Professional Liability. The Contractor shall purchase and maintain occurrence coverage with combined single limits for each wrongful act of $1,000,000 per occurrence and $2,000,000 aggregate per year to cover such claims as may be caused by any act, omission, negligence of the Contractor or its officers, agents, representatives, assigns or subcontractors. Note: if "occurrence" coverage is unavailable or cost prohibitive, the Contractor may provide "claims made" coverage provided the following conditions are met: (1) the commencement date of the contract must not fall outside the effective date of insurance coverage and it will be the retroactive date for insurance coverage in future years; and (2) the claims made policy must have a three year tail for claims that are made (filed) after the cancellation or expiration date of the policy.

20.8 Deductibles and Self-Insured Retentions. Any deductible or self-insured retention must be declared to and approved by the state agency. At the request of the agency either: (1) the insurer shall reduce or eliminate such deductibles or self-insured retentions as respects the State, its officers, officials, employees, or volunteers; or (2) at the expense of the Contractor, the Contractor shall procure a bond guaranteeing payment of losses and related investigations, claims administration, and defense expenses.

20.9 Certificate of Insurance/Endorsements. A certificate of insurance from an insurer with a Best's rating of no less than A- indicating compliance with the required coverages, has been received by the State Procurement Bureau, PO Box 200135, Helena MT 59620-0135. The Contractor must notify the State

immediately, of any material change in insurance coverage, such as changes in limits, coverages, change in status of policy, etc. The State reserves the right to require complete copies of insurance policies at all times.

21. COMPLIANCE WITH THE WORKERS' COMPENSATION ACT

Contractors are required to comply with the provisions of the Montana Workers' Compensation Act while performing work for the State of Montana in accordance with sections 39-71-120, 39-71-401, and 39-71-405, MCA. Proof of compliance must be in the form of workers' compensation insurance, an independent contractor's exemption, or documentation of corporate officer status. Neither the contractor nor its employees are employees of the State. This insurance/exemption must be valid for the entire term of the contract. A renewal document must be sent to the State Procurement Bureau, PO Box 200135, Helena MT 59620-0135, upon expiration.

22. COMPLIANCE WITH LAWS

The Contractor must, in performance of work under this contract, fully comply with all applicable federal, state, or local laws, rules and regulations, including the Montana Human Rights Act, the Civil Rights Act of 1964, the Age Discrimination Act of 1975, the Americans with Disabilities Act of 1990, and Section 504 of the Rehabilitation Act of 1973. Any subletting or subcontracting by the Contractor subjects subcontractors to the same provision. In accordance with section 49-3-207, MCA, the Contractor agrees that the hiring of persons to perform the contract will be made on the basis of merit and qualifications and there will be no discrimination based upon race, color, religion, creed, political ideas, sex, age, marital status, physical or mental disability, or national origin by the persons performing the contract.

23. INTELLECTUAL PROPERTY

All patent and other legal rights in or to inventions created in whole or in part under this contract must be available to the State for royalty-free and nonexclusive licensing. Both parties shall have a royalty-free, nonexclusive, and irrevocable right to reproduce, publish or otherwise use and authorize others to use, copyrightable property created under this contract.

24. PATENT AND COPYRIGHT PROTECTION

24.1 Third Party Claim. In the event of any claim by any third party against the State that the products furnished under this contract infringe upon or violate any patent or copyright, the State shall promptly notify Contractor. Contractor shall defend such claim, in the State's name or its own name, as appropriate, but at Contractor's expense. Contractor will indemnify the State against all costs, damages and attorney's fees that accrue as a result of such claim. If the State reasonably concludes that its interests are not being properly protected, or if principles of governmental or public law are involved, it may enter any action.

24.2 Product Subject of Claim. If any product furnished is likely to or does become the subject of a claim of infringement of a patent or copyright, then Contractor may, at its option, procure for the State the right to continue using the alleged infringing product, or modify the product so that it becomes non-infringing. If none of the above options can be accomplished, or if the use of such product by the State shall be prevented by injunction, the State will determine if the Contract has been breached.

25. CONTRACT TERMINATION

25.1 Termination for Cause. The State may, by written notice to the Contractor, terminate this contract in whole or in part at any time the Contractor fails to perform this contract.

25.2 Reduction of Funding. The State, at its sole discretion, may terminate or reduce the scope of this contract if available funding is reduced for any reason. (See Mont. Code Ann. § 18-4-313(3).)

26. STATE PERSONNEL

26.1 State Contract Manager. The State Contract Manager identified below is the State's single point of contact and will perform all contract management pursuant to section 2-17-512, MCA, on behalf of the State. Written notices, requests, complaints or any other issues regarding the contract should be directed to the State Contract Manager.

The State Contract Manager for this contract is:

Robert Oliver, Contracts Officer
Room 165 Mitchell Building
125 North Roberts
PO Box 200135
Helena MT 59620-0135
Telephone #: (406) 444-0110
Fax #: (406) 444-2529
E-mail: roliver@mt.gov

26.2 State Project Manager. Each using State agency or Cooperative Purchaser will identify a Project Manager in the project task order. The Project Manager will manage the day-to-day project activities on behalf of the State/Cooperative Purchaser.

27. CONTRACTOR PERSONNEL

27.1 Change Of Staffing. Since qualifications of personnel was key in determining which offerors were selected to be on this term contract list, a written notification to the State Procurement Bureau of any changes of key personnel must be made within two weeks of the change. These change notifications will be completed upon the departure or hiring of key personnel who are professional employees critical to awarded service areas. If these staffing changes cause the firm to no longer meet the qualifications stated herein, that firm will be removed from the service area of this term contract. Failure to notify the State Procurement Bureau of staffing changes could result in the contractor being removed from the term contract listing and possible suspension from bidding on other State projects.

27.2 Contractor Contract Manager. The Contractor Contract Manager identified below will be the single point of contact to the State Contract Manager and will assume responsibility for the coordination of all contract issues under this contract. The Contractor Contract Manager will meet with the State Contract Manager and/or others necessary to resolve any conflicts, disagreements, or other contract issues.

The Contractor Contract Manager for this contract is:

Larry Hoffman, Department Manager
412 E Parkcenter Blvd Suite 100
Boise ID 83706-6659
Telephone #: (208) 387-7000
Fax #: (208) 387-7811
E-mail: larry.hoffman@hdrinc.com

27.3 Contractor Project Manager. The Contractor Project Manager identified below will manage the day-to-day project activities on behalf of the Contractor:

The Contractor Project Manager for this contract is:

David Clark
412 E Parkcenter Blvd Suite 100
Boise, ID 83706-6659
Telephone #: (208) 387-7000

Fax #: (208) 387-7100
E-mail: dave.clark@hdrinc.com

28. MEETINGS

The Contractor is required to meet with the State's personnel, or designated representatives, to resolve technical or contractual problems that may occur during the term of the contract or to discuss the progress made by Contractor and the State in the performance of their respective obligations, at no additional cost to the State. Meetings will occur as problems arise and will be coordinated by the State. The Contractor will be given a minimum of three full working days notice of meeting date, time, and location. Face-to-face meetings are desired. However, at the Contractor's option and expense, a conference call meeting may be substituted. Consistent failure to participate in problem resolution meetings two consecutive missed or rescheduled meetings, or to make a good faith effort to resolve problems, may result in termination of the contract.

29. CONTRACTOR PERFORMANCE ASSESSMENTS

The State may do assessments of the Contractor's performance. This contract may be terminated for one or more poor performance assessments. Contractors will have the opportunity to respond to poor performance assessments. The State will make any final decision to terminate this contract based on the assessment and any related information, the Contractor's response and the severity of any negative performance assessment. The Contractor will be notified with a justification of contract termination. Performance assessments may be considered in future solicitations.

30. TRANSITION ASSISTANCE

If this contract is not renewed at the end of this term, or is terminated prior to the completion of a project, or if the work on a project is terminated, for any reason, the Contractor must provide for a reasonable period of time after the expiration or termination of this project or contract, all reasonable transition assistance requested by the State, to allow for the expired or terminated portion of the services to continue without interruption or adverse effect, and to facilitate the orderly transfer of such services to the State or its designees. Such transition assistance will be deemed by the parties to be governed by the terms and conditions of this contract, except for those terms or conditions that do not reasonably apply to such transition assistance. The State shall pay the Contractor for any resources utilized in performing such transition assistance at the most current rates provided by the contract. If there are no established contract rates, then the rate shall be mutually agreed upon. If the State terminates a project or this contract for cause, then the State will be entitled to offset the cost of paying the Contractor for the additional resources the Contractor utilized in providing transition assistance with any damages the State may have otherwise accrued as a result of said termination.

31. CHOICE OF LAW AND VENUE

This contract is governed by the laws of Montana. The parties agree that any litigation concerning this bid, proposal or subsequent contract must be brought in the First Judicial District in and for the County of Lewis and Clark, State of Montana and each party shall pay its own costs and attorney fees. (See Mont. Code Ann. § 18-1-401.)

32. SCOPE, AMENDMENT AND INTERPRETATION

32.1 Contract. This contract consists of 12 numbered pages, any Attachments as required, RFP # SPB05-894P**,** as amended and the Contractor's RFP response as amended. In the case of dispute or ambiguity about the minimum levels of performance by the Contractor the order of precedence of document interpretation is in the same order.

32.2 Entire Agreement. These documents contain the entire agreement of the parties. Any enlargement, alteration or modification requires a written amendment signed by both parties.

33. EXECUTION

The parties through their authorized agents have executed this contract on the dates set out below.

DEPARTMENT OF ADMINISTRATION
STATE PROCUREMENT BUREAU
PO BOX 200135
HELENA MT 59620-0135

BY:_____
Penny Moon, Contracts Officer

BY:_____
(Signature)

DATE:_____

HDR ENGINEERING, INC.
412 E PARKCENTER BLVD SUITE 100
BOISE ID 83706-6659
FEDERAL ID # 47-0680568

BY:_____
(Name/Title)

BY:_____
(Signature)

DATE:_____

3.5.4 TMDL Targets

In this section, HDR presents references, a company profile and experience, and a method of providing services according to the Request for Proposal. This section concludes with staff qualifications to conduct the work in this task.

4.1.1 References. The following listing provides references that have used and/or are using services of the type designated by the State of Montana in the RFP. The references include employees of state government, non-profit organization, and private companies. HDR has successfully completed a variety of environmental services for these clients.

Company Name	Location of Services	Contact Person	Telephone Number	Description of Services	Dates of Services
Montana Department of Environmental Quality	Missoula, Montana	Michael Pipp	(406) 444-7424	Water quality analyses and modeling	2001-2004
Tri-State Water Quality Council	Missoula, Montana	Ruth Watkins	(208) 265-9092	Water quality analyses and modeling	2001-2004
Contractor to Tri-State Water Quality Council	Missoula, Montana	Will McDowell	(406) 327-8443	Water quality analyses and modeling	2001-2004
City of Missoula	Missoula, Montana	Bruce Bender	(406) 258-4621	TMDL development, TMDL loading analysis, water quality analysis and modeling	1997-1998
Ada County Highway District (formerly of Idaho Department of Environmental Quality)	Boise, Idaho	Sally Goodell	(208) 387-6129	Environmental, hydrologic, stormwater, and water quality analyses, TMDL Implementation Plan development	1998-2004
Idaho Power Company	Boise, Idaho	Ralph Myers	(208) 388-2358	Water quality analyses and modeling	1996-2004
Idaho Department of Environmental Quality	Coeur d'Alene, Idaho	Glen Rothrock	(208) 769-1422	TMDL Implementation Plan development	2003-2004

4.1.2 Company Profile and Experience. In 1917 H.H. Henningson founded the Henningson Engineering Company and pioneered water and sewer systems for new cities and towns throughout the Midwest. In 1946, Chuck Durham and Willard Richardson are each offered a one-third interest in the business and the company became known as Henningson, Durham and Richardson, Inc. or HDR. In the 1980s HDR expands its services to include environmental and resource management. Today, HDR is a multi-discipline architectural, engineering and consulting firm with more than 3,300 employee-owners in over 90 offices nationally. Resumes for HDR's key staff experienced in water resources and water quality projects are shown in the separate resumes section. Key personnel who will lead TMDL Targets project(s) include the following:

Name	Years of Experience	Private/Public Sector Experience
David Clark	23	MDEQ, IDEQ, TSWQC, City of Missoula, City of Coeur d'Alene, ID, City of Omaha, NE, City of Wichita, KS, City of Stockton, CA, and King County, WA.
Jory Oppenheimer	15	Ecology, PSE, Avista
Michael Kasch	9	MDEQ, IDEQ, TSWQC, Idaho Power Company

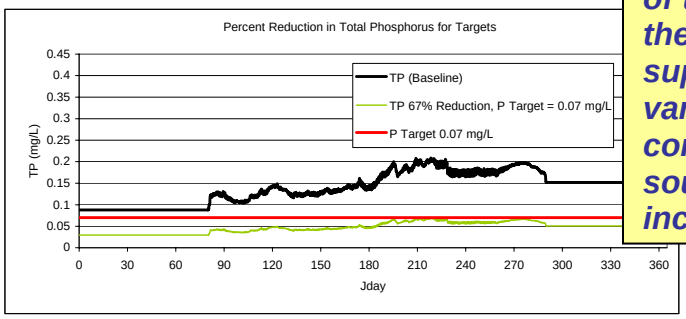
4.1.3 Method of Providing Services & Quality Assurance.

HDR is well qualified to assist the State of Montana in developing TMDL Targets

The methods for developing TMDL targets require reviewing and understanding the water quality dynamics of the entire watershed system. This includes assimilating data and understanding the reference current water quality conditions. Historical evaluation of the changing state of the system requires a review of all data. HDR has completed comparisons of the data to water quality standards and criteria to determine the level, period, and location of exceedences. The analysis to understand the levels of acceptable pollutant loadings to in-stream goals includes understanding physical, chemical and biological functions. Evaluating all conditions includes reviewing numeric water quality criteria, pollutant concentrations or loads, habitat or geomorphic measures and/or biological criteria or populations. Our staff includes water resources, water quality, and biology experts who can interpret and understand all of the parameters that impact watershed water quality. Findings and calculations of the targets will be documented in reports, with the progression of the analysis and presentation of findings.

HDR's experience in developing TMDL Targets highlights key capabilities

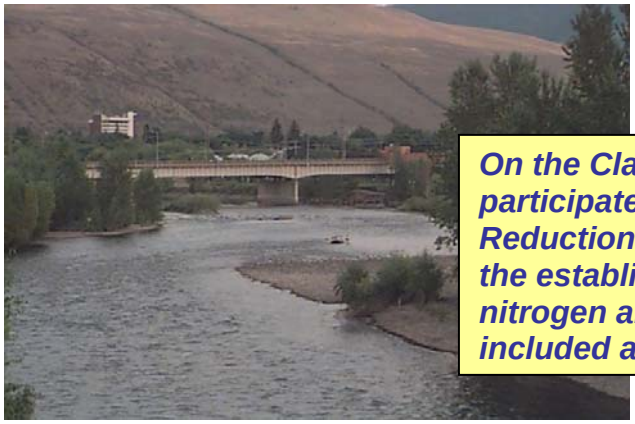
HDR is experience in developing TMDL load targets in multiple project experiences. Of particular relevance are the load allocation analyses conducted for the Snake River and the Clark Fork River Voluntary Nutrient Reduction Program (VNRP).



HDR assisted with the determination of the total phosphorus target for the southwest Snake River to support beneficial uses. HDR used various analyses and modeling to compute the target for multiple sources of total phosphorus including organic matter forms.

HDR's project management approach delivers high-value products for the State of Montana in developing TMDL Targets

Our record speaks for itself – HDR routinely completes water quality project assignments both on-time and on-budget. We understand the importance of providing timely deliverables to meet your schedule needs and we manage our resources to match your authorizations. HDR's project management system is a key element to our success.



On the Clark Fork River, Dave Clark of HDR participated in the Voluntary Nutrient Reduction Program (VNRP) committee in the establishment of in-stream targets for nitrogen and phosphorus. This work included an evaluation of N/P ratios related

HDR has established a project monitoring system that provides the necessary information to measure progress against the schedule, the budget and other appropriate parameters. The purpose of this system can be state in two simple works - No Surprises. We measure the progress toward the project objective, evaluate what needs to be done to reach the objective, and take appropriate action. The process is continuous, which allows us to detect and resolve potential problems, enabling project assignments to remain on schedule, within budget, and generate the products needed by the State of Montana.

On a periodic basis, depending upon the magnitude of the assignment, the project team meets to review the past month's projections, tasks accomplished and project the next month's needs and expectations. HDR's computerized Workplan Projection program is then updated to reflect the current status of the project. A key element of the update includes a cost-to-complete forecast for the reminder of the project or task order assignment. This can then be compared to the budget resources available and a production plan or adjustments can be made before the overall schedule or budget is endangered. These procedures have been used successfully to manage project assignments throughout Montana. HDR will work with you to ensure that project assignments are well planned, expertly performed and efficiently executed.

4.1.4 Staff Qualifications. HDR is committed to providing technical experts and ensuring that they allocate the time required to ensure successful performance for the State of Montana. This is a personal commitment to continuing to build our relationship and provides the single, strongest statement HDR can make regarding our ability to deliver the people and work products required. The State of Montana is an important client and HDR will manage other project assignments to ensure the availability of key HDR staff in this proposal to meet project needs.

Name and Registrations	**Education**	**Years of Experience**	**Years of Project Experience**	**Areas of Expertise**
LEAD WATER QUALITY AND TMDL STAFF				
David Clark, PE	MS and BS Civil Engineering, University of Washington	23	23	Water quality management, TMDL development, loading analysis, NPDES permit negotiations
Jory Oppenheimer	MS Environmental Engineering & Science, University of Washington, BS Environmental Science, Western Washington University	15	15	Water quality analysis and assessment, water quality standards
Michael Kasch, PE, PH	ME and BS Civil Engineering, University of Idaho	9	9	Water quality modeling, water quality assessment

SUPPORTING WATER QUALITY STAFF				
Lyle Christensen, PE	MS Sanitary Engineering and BS Civil Engineering, University of Nebraska	30	5	Watershed management, water quality data analysis, database development, Phase II Stormwater NPDES program development
Jack Harrison, PE, PH-G (HyQual in association with HDR)	MS Civil Engineering, Utah State University, BS Agricultural Engineering, University of Idaho	25	10	Surface water quality including nutrient and organic matter processing
Bob Beduhn, PE	MS and BS Civil Engineering, University of Minnesota	18	15	Watershed and limnology evaluations
Dave Johnson	MS Environmental Biology, University of Minnesota-Duluth, BA Biology, Gustavus Adolphus College	14	11	Land use and watershed planning, environmental and regulatory compliance
Jason Kent, PE	MS Civil Engineering, Colorado State University, BS Biological Life Sciences, Ohio University	9	7	Physical and biological data assessment
Joanna Leu, PE	MS and BS Civil and Environmental Engineering, University of California Davis	5	5	Water quality, water resources and environmental restoration
Mike Garello, EIT	BS, Environmental Resources Engineering, Humboldt State University	4	4	Water quality, river and wetland restoration, and riverine ecology
Jeanne McFall, EIT	BS Environmental Engineering, California Polytechnic State University San Luis Obispo	4	4	Environmental studies
SUPPORTING TECHNICAL STAFF				
Dan Harmon, PE	MS Civil Engineering, Kansas State University, BS Civil Engineering, Montana State University	29	10	Water resources, water supply, and wastewater management
Allison MacEwan, PE	MS Environmental Engineering, University of Washington, BA Engineering, Dartmouth	17	10	Watershed planning and management, ecosystem restoration
John Koreny, PG	MS Civil Engineering, University of Washington, MS Hydrogeology, Ohio State University, BS Environmental Sciences, Rutgers	13	3	Groundwater/surface water studies and modeling
Amanda McInnis, PE	MS Civil Engineering, University of Washington, BS Civil/Environmental Engineering, University of Wisconsin	6	6	Phase II Stormwater NPDES program development, water resources, water supply, and wastewater management

3.5.5 TMDL Source Assessment/Delineation

In this section, HDR presents references, a company profile and experience, and a method of providing services according to the Request for Proposal. This section concludes with staff qualifications to conduct the work in this task.

4.1.1 References. The following listing provides references that have used and/or are using services of the type designated by the State of Montana in the RFP. The references include employees of state government, non-profit organization, and private companies. HDR has successfully completed a variety of environmental services for these clients.

Company Name	Location of Services	Contact Person	Telephone Number	Description of Services	Dates of Services
Montana Department of Environmental Quality	Missoula, Montana	Michael Pipp	(406) 444-7424	Water quality analyses and modeling	2001-2004
Tri-State Water Quality Council	Missoula, Montana	Ruth Watkins	(208) 265-9092	Water quality analyses and modeling	2001-2004
Contractor to Tri-State Water Quality Council	Missoula, Montana	Will McDowell	(406) 327-8443	Water quality analyses and modeling	2001-2004
City of Missoula	Missoula, Montana	Bruce Bender	(406) 258-4621	TMDL development, TMDL loading analysis, water quality analysis and modeling	1997-1998
Ada County Highway District (formerly of Idaho Department of Environmental Quality)	Boise, Idaho	Sally Goodell	(208) 387-6129	Environmental, hydrologic, stormwater, and water quality analyses, TMDL Implementation Plan development	1998-2004
Idaho Power Company	Boise, Idaho	Ralph Myers	(208) 388-2358	Water quality analyses and modeling	1996-2004
Idaho Department of Environmental Quality	Coeur d'Alene, Idaho	Glen Rothrock	(208) 769-1422	TMDL Implementation Plan development	2003-2004

4.1.2 Company Profile and Experience. In 1917 H.H. Henningson founded the Henningson Engineering Company and pioneered water and sewer systems for new cities and towns throughout the Midwest. In 1946, Chuck Durham and Willard Richardson are each offered a one-third interest in the business and the company became known as Henningson, Durham and Richardson, Inc. or HDR. In the 1980s HDR expands its services to include environmental and resource management. Today, HDR is a multi-discipline architectural, engineering and consulting firm with more than 3,300 employee-owners in over 90 offices nationally. Resumes for HDR's key staff experienced in water resources and water quality projects are shown in the separate resumes section. Key personnel who will lead TMDL Source Assessment/Delineation project(s) include the following:

Name	Years of Experience	Private/Public Sector Experience
David Clark	23	MDEQ, IDEQ, TSWQC, City of Missoula, City of Coeur d'Alene, ID, City of Omaha, NE, City of Wichita, KS, City of Stockton, CA, and King County, WA.
Jory Oppenheimer	15	Ecology, PSE, Avista
Michael Kasch	9	MDEQ, IDEQ, TSWQC, Idaho Power Company

4.1.3 Method of Providing Services & Quality Assurance.

HDR is well qualified to assist the State of Montana in developing TMDL source assessment and delineation

The methods for TMDL source assessment/delineation are similar to many of the tasks completed by HDR for various water quality modeling projects and implementation plans. Data compilation, development of investigative monitoring programs, and statistical analysis of data are typical aspects of our water quality project experience. Methods to complete these tasks include contacting and acquiring data from various agencies and owners, reviewing the need for additional monitoring and recommending monitoring programs, and performing statistical analyses on the data. Analysis of the data including spatial and temporal graphs and numerical assessment leads to the identification of potential pollutant sources. Correlating the data to maps including aerial photos, digital images and/or GIS coverages and then field verifying the priority areas is important to further defining potential sources. These analytical steps may be documented in either technical memoranda or project reports as needed. The documentation will include the sources of information and the processes that led to the identification of potential sources and the likely causes and results of these sources.

Combining these methods and the assessment results, the pollutant loadings can be identified and quantified. Based on this analysis, causes of impairment can be identified. Cost/benefit analyses of implementing BMPs can also be estimated. While BMPs have a range of costs, with vary degrees of information available, estimates for either individual BMPs or general estimates based either on linear distance or areas can be used for cost/benefit analysis. HDR has performed similar estimates in previous TMDL implementation plan development.

HDR's experience in developing TMDL source assessments highlights key capabilities

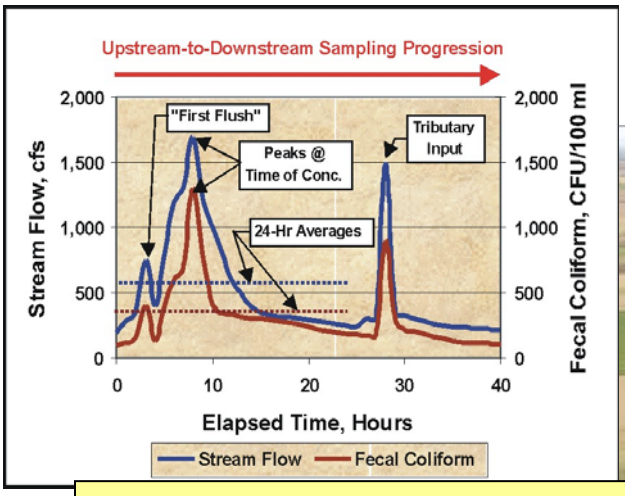
HDR is experienced in developing TMDL source assessments for multiple projects. Of particular relevance are the loading analysis for the Cocolalla Lake TMDL Implementation Plan and the bacteria source tracing for the Wichita Arkansas River water quality study.

HDR has prepared TMDL source assessments as part of the development of the Cocolalla Lake TMDL Implementation Plan, including delineation phosphorus and sediment sources from agriculture, forestry, and

HDR's project management approach delivers high-value products for the State of Montana in developing TMDL source assessments

Our record speaks for itself – HDR routinely completes water quality project assignments both on time and on budget. We understand the importance of providing timely deliverables to meet your schedule needs and we manage our resources to match your authorizations. HDR's project management system is a key element to our success.

HDR has established a project monitoring system that provides the necessary information to measure progress against the schedule, the budget and other appropriate parameters. The purpose of this system can be state in two simple works - No Surprises. We measure the progress toward the project objective, evaluate what needs to be done to reach the objective, and take appropriate action. The process is continuous, which allows us to detect and resolve potential problems, enabling project assignments to remain on schedule, within budget, and generate the products needed by the State of Montana.



On the Arkansas River in Wichita, HDR conducted bacteria source tracing in the watershed and developed a plan for in-stream sampling of bacteria. Aerial helicopter reconnaissance was effective in identify key bacteria

On a periodic basis, depending upon the magnitude of the assignment, the project team meets to review the past month's projections, tasks accomplished and project the next month's needs and expectations. HDR's computerized Workplan Projection program is then updated to reflect the current status of the project. A key element of the update includes a cost-to-complete forecast for the reminder of the project or task order assignment. This can then be compared to the budget resources available and a production plan or adjustments can be made before the overall schedule or budget is endangered. These procedures have been used successfully to manage project assignments throughout Montana. HDR will work with you to ensure that project assignments are well planned, expertly performed and efficiently executed.

4.1.4 Staff Qualifications. HDR is committed to providing technical experts and ensuring that they allocate the time required to ensure successful performance for the State of Montana. This is a personal commitment to continuing to build our relationship and provides the single, strongest statement HDR can make regarding our ability to deliver the people and work products required. The State of Montana is an important client and HDR will manage other project assignments to ensure the availability of key HDR staff in this proposal to meet project needs.

Name and Registrations	Education	Years of Experience	Years of Project Experience	Areas of Expertise
LEAD WATER QUALITY AND TMDL STAFF				
David Clark, PE	MS and BS Civil Engineering, University of Washington	23	23	Water quality management, TMDL development, loading analysis, NPDES permit negotiations

Name and Registrations	Education	Years of Experience	Years of Project Experience	Areas of Expertise
Jory Oppenheimer	MS Environmental Engineering & Science, University of Washington, BS Environmental Science, Western Washington University	15	15	Water quality analysis and assessment, water quality standards
Michael Kasch, PE, PH	ME and BS Civil Engineering, University of Idaho	9	9	Water quality modeling, water quality assessment
SUPPORTING WATER QUALITY STAFF				
Lyle Christensen, PE	MS Sanitary Engineering and BS Civil Engineering, University of Nebraska	30	5	Watershed management, water quality data analysis, database development, Phase II Stormwater NPDES program development
Jack Harrison, PE, PH-G (HyQual in association with HDR)	MS Civil Engineering, Utah State University, BS Agricultural Engineering, University of Idaho	25	10	Surface water quality including nutrient and organic matter processing
Bob Beduhn, PE	MS and BS Civil Engineering, University of Minnesota	18	15	Watershed and limnology evaluations
Dave Johnson	MS Environmental Biology, University of Minnesota-Duluth, BA Biology, Gustavus Adolphus College	14	11	Land use and watershed planning, environmental and regulatory compliance
Jason Kent, PE	MS Civil Engineering, Colorado State University, BS Biological Life Sciences, Ohio University	9	7	Physical and biological data assessment
Joanna Leu, PE	MS and BS Civil and Environmental Engineering, University of California Davis	5	5	Water quality, water resources and environmental restoration
Mike Garello, EIT	BS, Environmental Resources Engineering, Humboldt State University	4	4	Water quality, river and wetland restoration, and riverine ecology
Jeanne McFall, EIT	BS Environmental Engineering, California Polytechnic State University San Luis Obispo	4	4	Environmental studies
SUPPORTING TECHNICAL STAFF				
Dan Harmon, PE	MS Civil Engineering, Kansas State University, BS Civil Engineering, Montana State University	29	10	Water resources, water supply, and wastewater management

Name and Registrations	Education	Years of Experience	Years of Project Experience	Areas of Expertise
Allison MacEwan, PE	MS Environmental Engineering, University of Washington, BA Engineering, Dartmouth	17	10	Watershed planning and management, ecosystem restoration
John Koreny, PG	MS Civil Engineering, University of Washington, MS Hydrogeology, Ohio State University, BS Environmental Sciences, Rutgers	13	3	Groundwater/surface water studies and modeling
Amanda McInnis, PE	MS Civil Engineering, University of Washington, BS Civil/Environmental Engineering, University of Wisconsin	6	6	Phase II Stormwater NPDES program development, water resources, water supply, and wastewater management

3.5.6 TMDL Load Allocations

In this section, HDR presents references, a company profile and experience, and a method of providing services according to the Request for Proposal. This section concludes with staff qualifications to conduct the work in this task.

4.1.1 References. The following listing provides references that have used and/or are using services of the type designated by the State of Montana in the RFP. The references include employees of state government, non-profit organization, and private companies. HDR has successfully completed a variety of environmental services for these clients.

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Contractor to Tri-State Water Quality Council	Missoula, Montana	Will McDowell	(406) 327-8443	Water quality analyses and modeling	2001-2004
City of Missoula	Missoula, Montana	Bruce Bender	(406) 258-4621	TMDL development, TMDL loading analysis, water quality analysis and modeling	1997-1998
Ada County Highway District (formerly of Idaho Department of Environmental Quality)	Boise, Idaho	Sally Goodell	(208) 387-6129	Environmental, hydrologic, stormwater, and water quality analyses, TMDL Implementation Plan development	1998-2004
Idaho Power Company	Boise, Idaho	Ralph Myers	(208) 388-2358	Water quality analyses and modeling	1996-2004

Idaho Department of Environmental Quality	Coeur d'Alene, Idaho	Glen Rothrock	(208) 769-1422	TMDL Implementation Plan development	2003-2004

4.1.2 Company Profile and Experience. In 1917 H.H. Henningson founded the Henningson Engineering Company and pioneered water and sewer systems for new cities and towns throughout the Midwest. In 1946, Chuck Durham and Willard Richardson are each offered a one-third interest in the business and the company became known as Henningson, Durham and Richardson, Inc. or HDR. In the 1980s HDR expands its services to include environmental and resource management. Today, HDR is a multi-discipline architectural, engineering and consulting firm with more than 3,300 employee-owners in over 90 offices nationally.

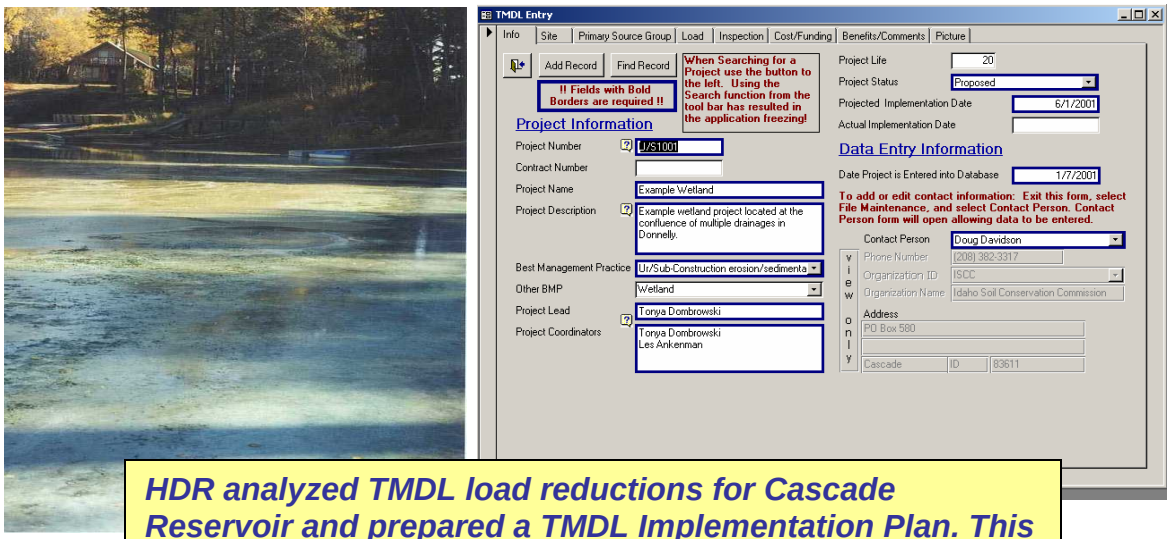
Resumes for HDR's key staff experienced in water resources and water quality projects are shown in the separate resumes section. Key personnel who will lead TMDL Load Allocations project(s) include the following:

Name	Years of Experience	Private/Public Sector Experience
David Clark	23	MDEQ, IDEQ, TSWQC, City of Missoula
Jory Oppenheimer	15	Ecology, PSE, Avista
Michael Kasch	9	MDEQ, IDEQ, TSWQC, Idaho Power Company

4.1.3 Method of Providing Services & Quality Assurance.

HDR is well qualified to assist the State of Montana in developing TMDL Load Allocations
The methods employed will depend on the services and support needed to support the load allocations. Many of the same tools, analysis, and approaches used for projects such as TMDL modeling on the Snake River and TMDL implementation plan development for Cascade Reservoir and Lake Cocolalla will be used. These include data review and analysis, understanding system dynamics, mapping and GIS, and various comparisons to water quality standards and criteria. Our familiarity dealing with TMDL issues in modeling projects and implementation plan development will be relied on for load allocations.
We have performed loading analyses for rivers using various methods including simple spreadsheet and loading software programs. Both point and non-point sources have been accounted for in the loading analyses. Percent reduction analyses have been performed, generally with the use of various modeling tools. A primary objective is to accomplish a complete review and understanding of the concentration and flow data before computing the loading. Review of the pollutant loading results and geographical location in the system is important to understanding processing within the overall watershed system.

HDR's experience in developing TMDL load allocations highlights key capabilities
HDR is experience in TMDL load allocations in multiple project experiences. Of particular relevance are the load allocation analyses conducted for the Cascade Reservoir TMDL Implementation Plan and the Clark Fork River Voluntary Nutrient Reduction Program (VNRP).



HDR analyzed TMDL load reductions for Cascade Reservoir and prepared a TMDL Implementation Plan. This plan included load allocations and reduction plans for agriculture, forestry, and urban/suburban land uses, as well as a database decision support tool to track projects

HDR's project management approach delivers high-value products for the State of Montana in developing TMDL Load Allocations

Our work plan for TMDL load allocations will employ generally similar steps as used on other water quality projects. This includes an initial project review to understand objectives, goals, and roles and responsibilities. Review progress meetings, both internally and externally with the client. Communication using various methods including conference calls, e-mail, and on-line web based methods such as "NetMeeting" and "WebEx" will be used. Reporting of project status and progress will be done in technical memoranda, meetings notes, and other forms. Final documentation as needed by the client will be performed and senior technical review(s) will be conducted to ensure a quality product.

On the Clark Fork River, Dave Clark of HDR participated in the Voluntary Nutrient Reduction Program (VNRP) committee in the development of TMDL load allocations for nitrogen and phosphorus. This work included both point and nonpoint source load allocations.

4.1.4 Staff Qualifications. HDR is committed to providing technical experts and ensuring that they allocate the time required to ensure successful performance for the State of Montana. This is a personal commitment to continuing to build our relationship and provides the single, strongest statement HDR can make regarding our ability to deliver the people and work products required. The State of Montana is an important client and HDR will manage other project assignments to ensure the availability of key HDR staff in this proposal to meet project needs.

Name and Registrations	Education	Years of Experience	Years of Project Experience	Areas of Expertise
LEAD WATER QUALITY AND TMDL STAFF				
David Clark, PE	MS and BS Civil Engineering, University of Washington	23	23	Water quality management, TMDL development, loading analysis, NPDES permit negotiations
Jory Oppenheimer	MS Environmental Engineering & Science, University of Washington, BS Environmental Science, Western Washington University	15	15	Water quality analysis and assessment, water quality standards
Michael Kasch, PE, PH	ME and BS Civil Engineering, University of Idaho	9	9	Water quality modeling, water quality assessment
SUPPORTING WATER QUALITY STAFF				
Lyle Christensen, PE	MS Sanitary Engineering and BS Civil Engineering, University of Nebraska	30	5	Watershed management, water quality data analysis, database development, Phase II Stormwater NPDES program development
Jack Harrison, PE, PH-G (HyQual in association with HDR)	MS Civil Engineering, Utah State University, BS Agricultural Engineering, University of Idaho	25	10	Surface water quality including nutrient and organic matter processing
Bob Beduhn, PE	MS and BS Civil Engineering, University of Minnesota	18	15	Watershed and limnology evaluations
Dave Johnson	MS Environmental Biology, University of Minnesota-Duluth, BA Biology, Gustavus Adolphus College	14	11	Land use and watershed planning, environmental and regulatory compliance
Jason Kent, PE	MS Civil Engineering, Colorado State University, BS Biological Life Sciences, Ohio University	9	7	Physical and biological data assessment
Joanna Leu, PE	MS and BS Civil and Environmental Engineering, University of California Davis	5	5	Water quality, water resources and environmental restoration
Mike Garello, EIT	BS, Environmental Resources Engineering, Humboldt State University	4	4	Water quality, river and wetland restoration, and riverine ecology
Jeanne McFall, EIT	BS Environmental Engineering, California Polytechnic State University San Luis Obispo	4	4	Environmental studies
SUPPORTING TECHNICAL STAFF				

Name and Registrations	Education	Years of Experience	Years of Project Experience	Areas of Expertise
Dan Harmon, PE	MS Civil Engineering, Kansas State University, BS Civil Engineering, Montana State University	29	10	Water resources, water supply, and wastewater management
Allison MacEwan, PE	MS Environmental Engineering, University of Washington, BA Engineering, Dartmouth	17	10	Watershed planning and management, ecosystem restoration
John Koreny, PG	MS Civil Engineering, University of Washington, MS Hydrogeology, Ohio State University, BS Environmental Sciences, Rutgers	13	3	Groundwater/surface water studies and modeling
David Keil, PE	BS Civil Engineering, Seattle University	8	8	GIS and analytical modeling for water resources, water supply, and wastewater systems, Phase II Stormwater NPDES program development, BMP design
Amanda McInnis, PE	MS Civil Engineering, University of Washington, BS Civil/Environmental Engineering, University of Wisconsin	6	6	Phase II Stormwater NPDES program development, water resources, water supply, and wastewater management

3.5.7 Total Maximum Daily Loads

In this section, HDR presents references, a company profile and experience, and a method of providing services according to the Request for Proposal. This section concludes with staff qualifications to conduct the work in this task.

4.1.1 References. The following listing provides references that have used and/or are using services of the type designated by the State of Montana in the RFP. The references include employees of state government, non-profit organization, and private companies. HDR has successfully completed a variety of environmental services for these clients.

Company Name	Location of Services	Contact Person	Telephone Number	Description of Services	Dates of Services
Montana Department of Environmental Quality	Missoula, Montana	Michael Pipp	(406) 444-7424	Water quality analyses and modeling	2001-2004
Tri-State Water Quality Council	Missoula, Montana	Ruth Watkins	(208) 265-9092	Water quality analyses and modeling	2001-2004
Contractor to Tri-State Water Quality Council	Missoula, Montana	Will McDowell	(406) 327-8443	Water quality analyses and modeling	2001-2004

City of Missoula	Missoula, Montana	Bruce Bender	(406) 258-4621	TMDL development, TMDL loading analysis, water quality analysis and modeling	1997-1998
Ada County Highway District (formerly of Idaho Department of Environmental Quality)	Boise, Idaho	Sally Goodell	(208) 387-6129	Environmental, hydrologic, stormwater, and water quality analyses, TMDL Implementation Plan development	1998-2004
Idaho Power Company	Boise, Idaho	Ralph Myers	(208) 388-2358	Water quality analyses and modeling	1996-2004
Idaho Department of Environmental Quality	Coeur d'Alene, Idaho	Glen Rothrock	(208) 769-1422	TMDL Implementation Plan development	2003-2004

4.1.2 Company Profile and Experience. In 1917 H.H. Henningson founded the Henningson Engineering Company and pioneered water and sewer systems for new cities and towns throughout the Midwest. In 1946, Chuck Durham and Willard Richardson are each offered a one-third interest in the business and the company became known as Henningson, Durham and Richardson, Inc. or HDR. In the 1980s HDR expands its services to include environmental and resource management. Today, HDR is a multi-discipline architectural, engineering and consulting firm with more than 3,300 employee-owners in over 90 offices nationally.

Resumes for HDR's key staff experienced in water resources and water quality projects are shown in the separate resumes section. Key personnel who will lead Total Maximum Daily Loads project(s) include the following:

Name	Years of Experience	Private/Public Sector Experience
David Clark	23	MDEQ, IDEQ, TSWQC, City of Missoula
Jory Oppenheimer	15	Ecology, PSE, Avista
Michael Kasch	9	MDEQ, IDEQ, TSWQC, Idaho Power Company

4.1.3 Method of Providing Services & Quality Assurance.

HDR is well qualified to assist the State of Montana in developing TMDLs
The methods employed will depend on the services and skills needed to support the state of Montana's TMDL program. Many of the same tools, analysis, and approaches used for projects such as TMDL modeling on the Snake River, and TMDL implementation plan development for Cascade Reservoir and Lake Cocolalla will be used. These include data review and analysis, understanding system dynamics, mapping and GIS analysis, and various comparisons to water quality standards and criteria. Our familiarity in dealing with TMDL issues in modeling projects and TMDL implementation plan development will be relied upon to support the state of Montana's development of TMDLs. We have experience in all aspects of TMDL development from assessment and establishment of in-stream targets, to pollutant loading analysis and load allocations.

HDR's experience in water quality analysis highlights key capabilities for TMDLs
HDR is brings skills in water quality analysis and TMDL preparation from our project experiences. Of particular relevance are the Cascade Reservoir TMDL Implementation Plan, analyses conducted for the Snake River, and the Clark Fork River Voluntary Nutrient Reduction Program (VNRP).

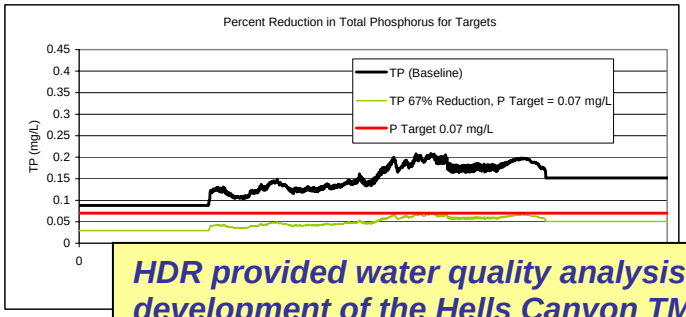
For Cascade Reservoir, Dave Clark of HDR served as consultant to Idaho DEQ in the formulation of the Phase 1 TMDL for phosphorus. HDR prepared the TMDL Implementation Plan for Cascade

HDR's project management approach delivers high-value TMDL products for the State of Montana
Our record speaks for itself – HDR routinely completes water quality project assignments both on-time and on-budget. We understand the importance of providing timely deliverables to meet your schedule needs and we manage our resources to match your authorizations. HDR's project management system is a key element to our success.

HDR has established a project monitoring system that provides the necessary information to measure progress against the schedule, the budget and other appropriate parameters. The purpose of this system can be state in two simple works - No Surprises. We measure the progress toward the project objective, evaluate what needs to be done to reach the objective, and take appropriate action. The process is continuous, which allows us to detect and resolve potential problems, enabling project assignments to remain on schedule, within budget, and generate the products needed by the State of Montana.

On the Clark Fork River, Dave Clark of HDR participated in the Voluntary Nutrient Reduction Program (VNRP) committee that prepared the TMDL for nitrogen and phosphorus as a stakeholder group.

On a periodic basis, depending upon the magnitude of the assignment, the project team meets to review the past month's projections, tasks accomplished and project the next month's needs and expectations. HDR's computerized Workplan Projection program is then updated to reflect the current status of the project. A key element of the update includes a cost-to-complete forecast for the reminder of the project or task order assignment. This can then be compared to the budget resources available and a production plan or adjustments can be made before the overall schedule or budget is endangered. These procedures have been used successfully to manage project assignments throughout Montana. HDR will work with you to ensure that project assignments are well planned, expertly performed and efficiently executed.



HDR provided water quality analysis and data to support the development of the Hells Canyon TMDL. Our analysis and modeling on the southwest Snake River, and Brownlee, Oxbow and Hells Canyon Reservoirs supported the efforts of Idaho and Oregon Departments of Environmental Quality

4.1.4 Staff Qualifications. HDR is committed to providing technical experts and ensuring that they allocate the time required to ensure successful performance for the State of Montana. This is a personal commitment to continuing to build our relationship and provides the single, strongest statement HDR can make regarding our ability to deliver the people and work products required. The State of Montana is an important client and HDR will manage other project assignments to ensure the availability of key HDR staff in this proposal to meet project needs.

Name and Registrations	**Education**	**Years of Experience**	**Years of Project Experience**	**Areas of Expertise**
LEAD WATER QUALITY AND TMDL STAFF				
David Clark, PE	MS and BS Civil Engineering, University of Washington	23	23	Water quality management, TMDL development, loading analysis, NPDES permit negotiations
Jory Oppenheimer	MS Environmental Engineering & Science, University of Washington, BS Environmental Science, Western Washington University	15	15	Water quality analysis and assessment, water quality standards
Michael Kasch, PE, PH	ME and BS Civil Engineering, University of Idaho	9	9	Water quality modeling, water quality assessment
SUPPORTING WATER QUALITY STAFF				
Lyle Christensen, PE	MS Sanitary Engineering and BS Civil Engineering, University of Nebraska	30	5	Watershed management, water quality data analysis, database development, Phase II Stormwater NPDES program development
Jack Harrison, PE, PH-G (HyQual in association with HDR)	MS Civil Engineering, Utah State University, BS Agricultural Engineering, University of Idaho	25	10	Surface water quality including nutrient and organic matter processing
Bob Beduhn, PE	MS and BS Civil Engineering, University of Minnesota	18	15	Watershed and limnology evaluations

Name and Registrations	Education	Years of Experience	Years of Project Experience	Areas of Expertise
Dave Johnson	MS Environmental Biology, University of Minnesota-Duluth, BA Biology, Gustavus Adolphus College	14	11	Land use and watershed planning, environmental and regulatory compliance
Jason Kent, PE	MS Civil Engineering, Colorado State University, BS Biological Life Sciences, Ohio University	9	7	Physical and biological data assessment
Joanna Leu, PE	MS and BS Civil and Environmental Engineering, University of California Davis	5	5	Water quality, water resources and environmental restoration
Mike Garello, EIT	BS, Environmental Resources Engineering, Humboldt State University	4	4	Water quality, river and wetland restoration, and riverine ecology
Jeanne McFall, EIT	BS Environmental Engineering, California Polytechnic State University San Luis Obispo	4	4	Environmental studies
SUPPORTING TECHNICAL STAFF				
Dan Harmon, PE	MS Civil Engineering, Kansas State University, BS Civil Engineering, Montana State University	29	10	Water resources, water supply, and wastewater management
Allison MacEwan, PE	MS Environmental Engineering, University of Washington, BA Engineering, Dartmouth	17	10	Watershed planning and management, ecosystem restoration
John Koreny, PG	MS Civil Engineering, University of Washington, MS Hydrogeology, Ohio State University, BS Environmental Sciences, Rutgers	13	3	Groundwater/surface water studies and modeling
Amanda McInnis, PE	MS Civil Engineering, University of Washington, BS Civil/Environmental Engineering, University of Wisconsin	6	6	Phase II Stormwater NPDES program development, water resources, water supply, and wastewater management

3.5.10 Geographic Information Systems (GIS) Services

In this section, HDR presents references, a company profile and experience, and a method of providing services according to the Request for Proposal. This section concludes with staff qualifications to conduct the work in this task.

4.1.1 References. The following listing provides references that have used and/or are using services of the type designated by the State of Montana in the RFP. The references include employees of state government, non-profit organization, and private companies. HDR has successfully completed a variety of environmental services for these clients.

Company Name	Location of Services	Contact Person	Telephone Number	Description of Services	Dates of Services
Montana Department of Environmental Quality	Missoula, Montana	Michael Pipp	(406) 444-7424	Water quality analyses and modeling	2001-2004
Tri-State Water Quality Council	Missoula, Montana	Ruth Watkins	(208) 265-9092	Water quality analyses and modeling	2001-2004
Contractor to Tri-State Water Quality Council	Missoula, Montana	Will McDowell	(406) 327-8443	Water quality analyses and modeling	2001-2004
Ada County Highway District (formerly of Idaho Department of Environmental Quality)	Boise, Idaho	Sally Goodell	(208) 387-6129	Environmental, hydrologic, stormwater, and water quality analyses, TMDL Implementation Plan development	1998-2004
Idaho Power Company	Boise, Idaho	Ralph Myers	(208) 388-2358	Water quality analyses and modeling	1996-2004
Idaho Department of Environmental Quality	Coeur d'Alene, Idaho	Glen Rothrock	(208) 769-1422	TMDL Implementation Plan development	2003-2004
City of Meridian Public Works Department	Meridian, Idaho	Len Grady	(208) 898-5500	GIS Needs Assessment and Implementation	2002-2004

4.1.2 Company Profile and Experience. In 1917 H.H. Henningson founded the Henningson Engineering Company and pioneered water and sewer systems for new cities and towns throughout the Midwest. In 1946, Chuck Durham and Willard Richardson are each offered a one-third interest in the business and the company became known as Henningson, Durham and Richardson, Inc. or HDR. In the 1980s HDR expands its services to include environmental and resource management. Today, HDR is a multi-discipline architectural, engineering and consulting firm with more than 3,300 employee-owners in over 90 offices nationally.

Resumes for HDR's key staff experienced in geographic information systems projects are shown in the separate resumes section. Key personnel who will lead the GIS services include the following:

Name	Years of Experience	Private/Public Sector Experience
David Keil	8	City of Meridian, Rocky Boy's/North Central Montana Rural Water System, City of Helena
Michael Kasch	9	MDEQ, IDEQ, TSWQC, Idaho Power Company, City of Helena
Michael Miller	12	King County, Seattle Public Utilities, Cascade Water Alliance, Puget Sound Energy

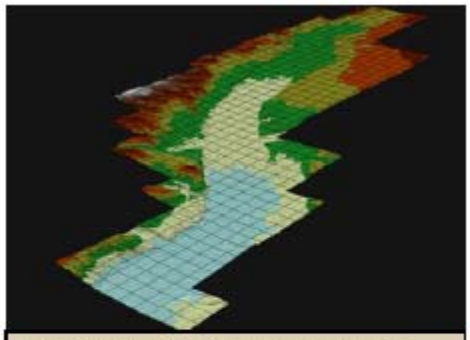
4.1.3 Method of Providing Services & Quality Assurance.

HDR is well qualified to assist the State of Montana with Geographic Information Systems.
HDR provides a multitude of GIS consulting services, including watershed modeling, stormwater management planning, water and wastewater master planning, analysis, and design, environmental impact assessment (NEPA EA/EIS), transportation planning and traffic modeling, comprehensive land use planning, conservation land management planning, water resources modeling & planning, solid waste facility siting and routing, and facility siting.

HDR applies state-of-the-art GIS software including, ArcInfo 9.0, ArcView 3.3, ArcView Spatial Analyst, ArcView 3-D Analyst, ERDAS Imagine 8.5, and MrSID Geo 1.4. HDR has over 30 offices using ArcView 3.3 or ArcView 8.3 across the country.

GIS for Watershed Analysis

FEMA Selects HDR to Prepare Digital Flood Insurance Rate Maps in California, Arizona, and Nevada
HDR was selected by the Federal Emergency Management Agency to provide Coastal and Ravine Studies throughout California, Arizona, and Nevada under an ID/IQ contract. The services required under the contract include collecting and entering map needs assessment parameters into national database including:



HDR's hydrologic modelers developed this Triangulated Irregular Network (TIN) for the Tonto Basin watershed in Arizona. This TIN was used to update 50 and 100 year floodplains for the modernization of FEMA's Flood Insurance Rate Maps to a digital GIS-based product (DFIRMS).

• Routine data entry and update maintenance of the database;

• Determining the flood hazard areas in the assigned communities, as appropriate during normal and post-disaster production of topographic map data using LIDAR, aerial, or other procedures as needed;

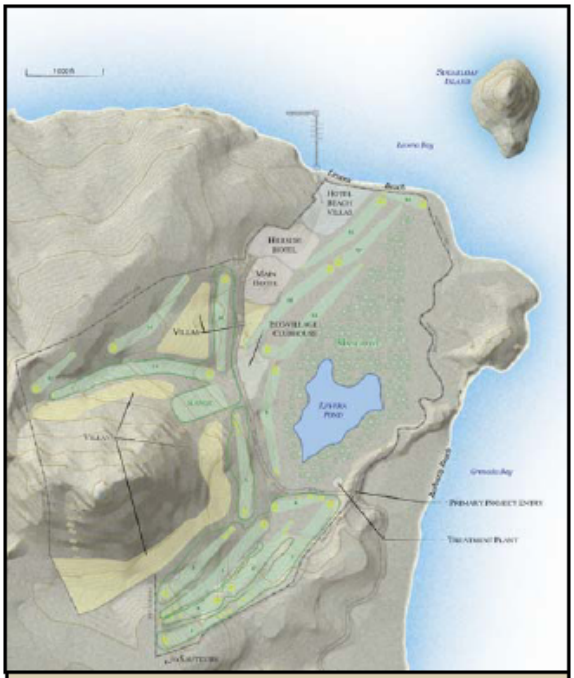
• Conducting hydrologic and hydraulic modeling including the use of automated, geo-referenced procedures;

• Producing flood insurance studies including Digital Flood Insurance Rate Maps suitable for publication in accordance with FEMA Guidelines & Specifications for Flood Hazard Mapping Partners, dated February 2002 and all subsequent revisions;

• Collaborating, coordinating, consulting and meeting with local community officials, FEMA staff, FEMA review contractors, and others, as required;

• Delivering services to review, revise, and/or supplement Cooperative Technical Partners products, and flood study data developed;
• Providing disaster recovery maps in a timely manner that could include the use of automated procedures and geo-referenced database applications; and

• Providing technical assistance to the region during disaster operations. Specific project areas will be assigned by task order, after contract award, and the project must be completed as stipulated in the task order.



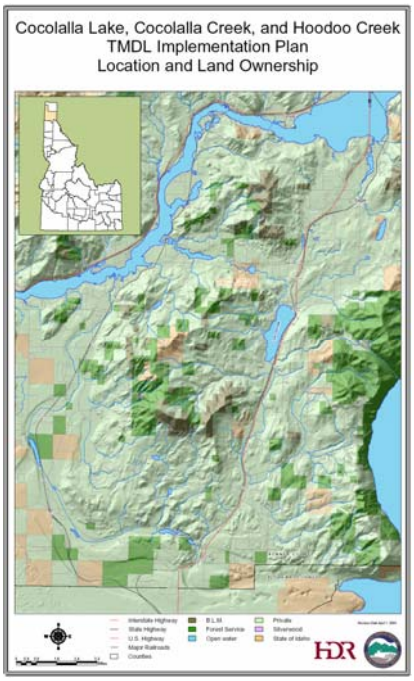
Many of our GIS professionals have extensive cartographic and graphic design experience outside of standard GIS software, a unique combination of skills that provides our clients with maps and deliverables not possible with GIS alone. This image displays graphic design techniques made possible by exporting GIS maps to Adobe Illustrator graphic design suite.

Cartography and Geography
HDR's cartographic expertise extends from it's commitment to detail and quality deliverables. Maps produced by HDR have routinely been included in the ESRI User GIS Map Book, an annual publication dedicated to acknowledging the important and innovative accomplishments of GIS users around the world.

Our cartography staff uses a multitude of tools and processes to ensure accurate, high-quality, map products. Our team regularly produces large and small format products and understands the unique challenges of good cartographic design. HDR's cartography team are experts in the following variables to produce uniform deliverables that are clear, direct, and aesthetically pleasing: scale issues; layering and leveling; color theory; hatch selection; text placement; font selection; printing techniques; and map series production.

Additionally, our GIS staff is experts at converting GIS-based products to a variety of formats to utilize the powerful design tools of leading graphic design packages such as Adobe Photoshop, Adobe Illustrator, Adobe Acrobat (PDF) and Macromedia Freehand.

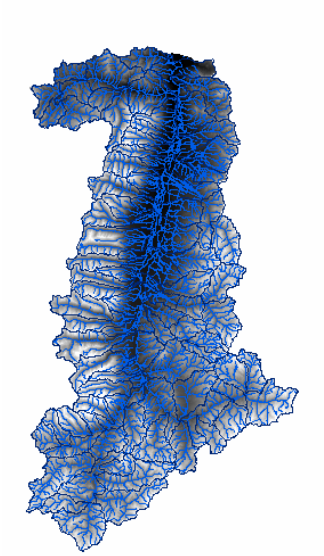
Many of our GIS professionals have extensive cartographic experience outside of standard GIS software, a unique combination of skills that provides our clients with maps and deliverables not possible with GIS alone. Combining our cartography staff's talents with our GIS programmer's abilities yields custom and extended functionality for automation of repetitive tasks and map series creation that provides our clients with efficient quality products at lower cost than conventional cartographic approaches.



HDR employs the top of the line HP Design Jet 5000 color inkjet plotters capable of producing high-quality, large format color hardcopy output at sizes up to 60 inches wide. For report size graphics, plot files are routed to HP8500N color laser printers to quickly produce high-quality color output at letter, legal or tabloid size.

GIS Source Assessment

HDR also utilizes GIS to support our science and engineering practices, such as the pollutant source assessment for the Cocolalla Lake, Cocolalla Creek, and Hoodoo Creek TMDL Implementation Plan.



GIS coverages, including land use and hydrology, were used extensively to develop the pollutant loading estimates for the pollutant source assessment. Shown is one example of a GIS map used to display stream location and land ownership for the TMDL Implementation Plan.

GIS and Dynamic Watershed Loading Models

HDR staff is specially trained on the Soil and Water Assessment Tool (SWAT), including a one-on-one session using coverages of the Bitterroot River watershed. We are ready to employ the SWAT model for watershed analysis in the State of Montana. Shown are SWAT and Bitterroot coverages screen captures.

Custom GIS solutions by HDR meet our Client's needs

HDR has recently conducted a Preliminary GIS Needs Assessment for the City of Meridian, Idaho, and as a follow on to the Needs Assessment, HDR has installed a terminal server for GIS that provides GIS programs to any workstation on the Public Works Department Local Area Network.

HDR understands that agencies and growing communities like the City of Meridian require state of the art tools to meet the demanding needs of their customers. Tools such as a GIS system will help the City to analyze potential projects quickly, efficiently, and to provide needed information. HDR's approach to the needs assessment involved listening to the City of Meridian staff to define and prioritize the City's goals and business objectives and fit the GIS to this end. The project was organized and conducted using a phased approach involving project initiation, requirements inventory and review, system analysis, final analysis and needs assessment document, and prototype development.

HDR's approach delivers high-value GIS applications for the State of Montana

Our record speaks for itself – HDR routinely completes water quality project assignments both on time and on budget. We understand the importance of providing timely deliverables to meet your schedule needs and we manage our resources to match your authorizations. HDR's project management system is a key element to our success.

HDR has established a project monitoring system that provides the necessary information to measure progress against the schedule, the budget and other appropriate parameters. The purpose of this system can be state in two simple works - No Surprises. We measure the progress toward the project objective, evaluate what needs to be done to reach the objective, and take appropriate action. The process is continuous, which allows us to detect and resolve potential problems, enabling project assignments to remain on schedule, within budget, and generate the products needed by the State of Montana.

On a periodic basis, depending upon the magnitude of the assignment, the project team meets to review the past month's projections, tasks accomplished and project the next month's needs and expectations. HDR's computerized Workplan Projection program is then updated to reflect the current status of the project. A key element of the update includes a cost-to-complete forecast for the reminder of the project or task order assignment. This can then be compared to the budget resources available and a production plan or adjustments can be made before the overall schedule or budget is endangered. These procedures have been used successfully to manage project assignments throughout Montana. HDR will work with you to ensure that project assignments are well planned, expertly performed and efficiently executed.

4.1.4 Staff Qualifications. HDR is committed to providing technical experts and ensuring that they allocate the time required to ensure successful performance for the State of Montana. This is a personal commitment to continuing to build our relationship and provides the single, strongest statement HDR can make regarding our ability to deliver the people and work products required. The State of Montana is an important client and HDR will manage other project assignments to ensure the availability of key HDR staff in this proposal to meet project needs.

Name and Registrations	**Education**	**Years of Experience**	**Years of Project Experience**	**Areas of Expertise**
GIS STAFF				
Michael Miller	BA Landscape Architecture, BS Horticulture, University of Idaho	21	12	GIS applications, natural resource management
Robert Kirkman	BA Geological & Related Sciences, BA Environmental Sciences/Studies (Geography), University of Kansas	12	10	GIS, management of information systems and business data processes
Michael Kasch, PE, PH	ME and BS Civil Engineering, University of Idaho	9	9	Water quality modeling, water quality assessment
David Keil, PE	BS Civil Engineering, Seattle University	7	7	GIS and analytical modeling for water resources, water supply, and wastewater systems, Phase II Stormwater NPDES program development, BMP design
Sharon Wright, AICP	MS City Planning, Georgia Institute of Technology, BS Soil and Water Science, University of Florida	5	4	GIS and water and environmental resource management
WATER QUALITY AND TMDL STAFF				
David Clark, PE	MS and BS Civil Engineering, University of Washington	23	23	Water quality management, TMDL development, loading analysis, NPDES permit negotiations
Jory Oppenheimer	MS Environmental Engineering & Science, University of Washington, BS Environmental Science, Western Washington University	15	15	Water quality analysis and assessment, water quality standards

Name and Registrations	Education	Years of Experience	Years of Project Experience	Areas of Expertise
Lyle Christensen, PE	MS Sanitary Engineering and BS Civil Engineering, University of Nebraska	30	5	Watershed management, water quality data analysis, database development, Phase II Stormwater NPDES program development
Jack Harrison, PE, PH-G (HyQual in association with HDR)	MS Civil Engineering, Utah State University, BS Agricultural Engineering, University of Idaho	25	10	Surface water quality including nutrient and organic matter processing
Bob Beduhn, PE	MS and BS Civil Engineering, University of Minnesota	18	15	Watershed and limnology evaluations
Dave Johnson	MS Environmental Biology, University of Minnesota-Duluth, BA Biology, Gustavus Adolphus College	14	11	Land use and watershed planning, environmental and regulatory compliance
Jason Kent, PE	MS Civil Engineering, Colorado State University, BS Biological Life Sciences, Ohio University	9	7	Physical and biological data assessment
Joanna Leu, PE	MS and BS Civil and Environmental Engineering, University of California Davis	5	5	Water quality, water resources and environmental restoration
Mike Garello, EIT	BS, Environmental Resources Engineering, Humboldt State University	4	4	Water quality, river and wetland restoration, and riverine ecology
Jeanne McFall, EIT	BS Environmental Engineering, California Polytechnic State University San Luis Obispo	4	4	Environmental studies
SUPPORTING TECHNICAL STAFF				
Dan Harmon, PE	MS Civil Engineering, Kansas State University, BS Civil Engineering, Montana State University	29	10	Water resources, water supply, and wastewater management
Allison MacEwan, PE	MS Environmental Engineering, University of Washington, BA Engineering, Dartmouth	17	10	Watershed planning and management, ecosystem restoration
Amanda McInnis, PE	MS Civil Engineering, University of Washington, BS Civil/Environmental Engineering, University of Wisconsin	6	6	Phase II Stormwater NPDES program development, water resources, water supply, and wastewater management

3.5.12 Water Quality Modeling

In this section, HDR presents references, a company profile and experience, and a method of providing services according to the Request for Proposal. This section concludes with staff qualifications to conduct the work in this task.

4.1.1 References. The following listing provides references that have used and/or are using services of the type designated by the State of Montana in the RFP. The references include employees of state government, non-profit organization, and private companies. HDR has successfully completed a variety of environmental services for these clients.

Company Name	Location of Services	Contact Person	Telephone Number	Description of Services	Dates of Services
Montana Department of Environmental Quality	Missoula, Montana	Michael Pipp	(406) 444-7424	Water quality analyses and modeling	2001-2004
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Contractor to Tri-State Water Quality Council	Missoula, Montana	Will McDowell	(406) 327-8443	Water quality analyses and modeling	2001-2004
City of Missoula	Missoula, Montana	Bruce Bender	(406) 258-4621	TMDL development, TMDL loading analysis, water quality analysis and modeling	1997-1998
Ada County Highway District (formerly of Idaho Department of Environmental Quality)	Boise, Idaho	Sally Goodell	(208) 387-6129	Environmental, hydrologic, stormwater, and water quality analyses, TMDL Implementation Plan development	1998-2004
Idaho Power Company	Boise, Idaho	Ralph Myers	(208) 388-2358	Water quality analyses and modeling	1996-2004
Idaho Department of Environmental Quality	Coeur d'Alene, Idaho	Glen Rothrock	(208) 769-1422	TMDL Implementation Plan development	2003-2004

4.1.2 Company Profile and Experience. In 1917 H.H. Henningson founded the Henningson Engineering Company and pioneered water and sewer systems for new cities and towns throughout the Midwest. In 1946, Chuck Durham and Willard Richardson are each offered a one-third interest in the business and the company became known as Henningson, Durham and Richardson, Inc. or HDR. In the 1980s HDR expands its services to include environmental and resource management. Today, HDR is a multi-discipline architectural, engineering and consulting firm with more than 3,300 employee-owners in over 90 offices nationally.

Resumes for HDR's key staff experienced in water resources and water quality projects are shown in the separate resumes section. Key personnel who will lead Water Quality Modeling project(s) include the following:

Name	Years of Experience	Private/Public Sector Experience
David Clark	23	MDEQ, IDEQ, TSWQC, City of Missoula
Jory Oppenheimer	15	Ecology, PSE, Avista
Michael Kasch	9	MDEQ, IDEQ, TSWQC, Idaho Power Company

4.1.3 Method of Providing Services & Quality Assurance.

HDR is well qualified to provide water quality modeling for the State of Montana
HDR is familiar with an array of watershed and water quality modeling tools and techniques. We have applied the CE-QUAL-W2 model to the Snake River including four reservoirs, the lower White and Puyallup Rivers, and the Tampa Bay Regional Reservoir. In addition, we have used a previously developed CE-QUAL-W2 model of the Spokane River for additional scenario simulations for water quality analysis. We have applied the QUAL2E model to the Clark Fork and Bitterroot Rivers for nutrient analysis. We developed an SNTEMP of the Lochsa River for a temperature modeling study for Idaho DEQ. HDR has staff trained and familiar with QUAL2K, SWAT and MIKE11 models for analysis of a variety of water quality parameters. Based on our familiarity and use of these modeling tools, we can readily learn and employ these and/or other applicable models to assignments from the State of Montana.

HDR's method of employing water quality model tools to analysis is multifaceted. The general steps are model selection, data assimilation, data and system understanding, data preparation for model input, model setup, model simulation, model parameter optimization or calibration, model sensitivity analysis, model results post-processing, model scenarios, and model results presentation and documentation. We walk the client through the modeling objectives and pros/cons of the various models including capabilities, limitations, expense, and complexity to select the appropriate model for the objective. We assimilate the data needed for both the development of boundary conditions to simulate the model and in-reach data for comparison to model predictions. A general understanding of the data and system is beneficial to developing the model comparing the results. Spatial and temporal graphs and analysis of the data are helpful to understanding the system. The data are then prepared for entry into the model.

HDR's experience in water quality modeling is broad and includes many models and parameters
HDR is experience in water quality modeling includes a variety of major Northwest streams including the Clark Fork River, the White/Puyallup River, and the Snake River. We have applied water quality models ranging from the most straightforward to the most complex.

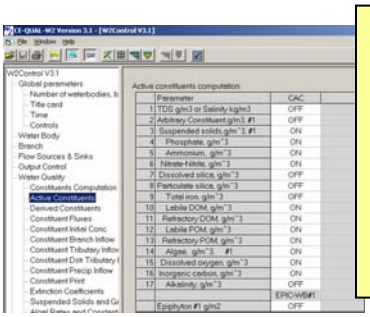
Stream Temperature and Shade Models
HDR has applied stream water temperature models to the Lochsa and Boise Rivers. SNTEMP was used to evaluate canopy cover conditions on the Lochsa River.

Water Quality Fate and Transport Models
HDR has performed fate and transport modeling using a variety of models including QUAL2E on the Clark Fork

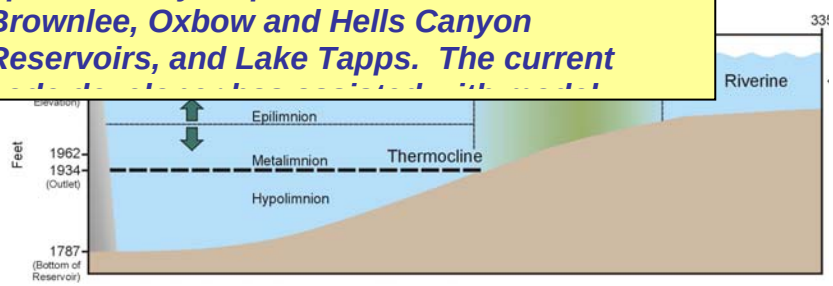
HDR's water quality modeling approach delivers high-value products for the State of Montana
When the data are pre-processed and ready for the model, the model is setup. Depending on the complexity of the model, the model may be setup and simulated or built from an existing model in steps to assist with debugging. The model may be simulated at various stages of development to test that the setup is progressing. The results are reviewed and compared to the in-reach data. The process of parameter optimization or calibration begins. Coefficients within the model may be adjusted and/or the setup of the model modified.

Model sensitivity analysis is performed to understand the most important coefficients or drivers of the system. Typical ranges of these coefficients may be tested during the parameter optimization process. The goal of parameter optimization is to achieve the best representation of the system possible given the constraints of available comparison data, budget, and schedule.

With the model calibrated, the results from the baseline model are post-processed beyond the typical processing needed for parameter optimization comparison, depending on the objectives of the project. This post-processing may include spatial and temporal graphical and numerical analyses. Analyses that have been done include comparisons to standard criteria, exceedences of criteria, volume weighted averages, and various fish growth and survival matrices. Additionally, some model results have been animated to show the temporal changes. Various model scenarios such as reductions or increases in point and/or non-point source loadings may be simulated. These are then post-processed using the selected analyses and compared to the baseline conditions.

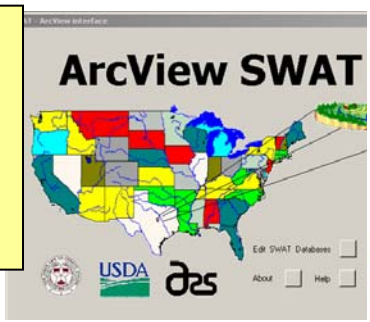


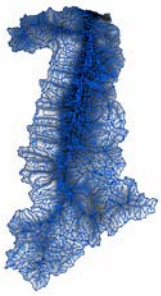
Multi-dimensional River/Lake/Reservoir Models
HDR has extensive experience using CE-QUAL-W2 on such systems as the Snake, Spokane, Puyallup, and White Rivers, Brownlee, Oxbow and Hells Canyon Reservoirs, and Lake Tapps. The current



During the entire process, the modeling steps are documented in technical memoranda. The findings of data review and model results are also documented. The documentation is important to document the process, helpful in reviewing the parameter optimization and sensitivity analysis steps, and available to be incorporated into any reports.

Dynamic Watershed Loading Models
HDR staff is specially trained on SWAT including a one-on-one session using coverages of the Bitterroot River watershed. We are ready to employ SWAT for the State of Montana





The general work plan, or detailed plan setting out how the model is to be developed, involves multiple steps and reviews. Water quality modeling is a complex task but can be developed in a step-wise fashion to achieve the end goal. The work plan includes review at each of these critical steps to stay on course. Reviews with the client are important to understand progress, make important decisions, and meet the challenges of the model development. We review the analysis and findings as a team in a collaborative effort. Based on our review, decisions are made on the additional analyses to perform. We hold regular meetings to review progress. Near the end of the analysis but with sufficient remaining time and budget, a senior technical review is performed. We address the comments and complete the modeling assignment. The work plan may take a few months, to even years, depending on the difficultly of acquiring the data, the volume of data to process, the complexity of the model, and the level of model refinement.

Reporting of the project progress is done on a regular basis with the client(s) via email, telephone and/or in person. Depending on the project and client's needs, the technical memoranda may be sufficient for documentation. Otherwise, the project technical memoranda may be combined into one comprehensive document or a report. The reporting method depends on the project purpose and objective. However, project documentation throughout the project is valuable for documenting the project and rolling into any final documentation. Additionally, electronic media may be supplied as part of the documentation.

4.1.4 Staff Qualifications. HDR is committed to providing technical experts and ensuring that they allocate the time required to ensure successful performance for the State of Montana. This is a personal commitment to continuing to build our relationship and provides gives the single, strongest statement HDR can make regarding our ability to deliver the people and work products required. The State of Montana is an important client and HDR will manage other project assignments to ensure the availability of key HDR staff in this proposal to meet project needs.

Name and Registrations	**Education**	**Years of Experience**	**Years of Project Experience**	**Areas of Expertise**
LEAD WATER QUALITY AND TMDL STAFF				
David Clark, PE	MS and BS Civil Engineering, University of Washington	23	23	Water quality management, TMDL development, loading analysis, NPDES permit negotiations
Jory Oppenheimer	MS Environmental Engineering & Science, University of Washington, BS Environmental Science, Western Washington University	15	15	Water quality analysis and assessment, water quality standards
Michael Kasch, PE, PH	ME and BS Civil Engineering, University of Idaho	9	9	Water quality modeling, water quality assessment
SUPPORTING WATER QUALITY STAFF				
Lyle Christensen, PE	MS Sanitary Engineering and BS Civil Engineering, University of Nebraska	30	5	Watershed management, water quality data analysis, database development, Phase II Stormwater NPDES program development
Jack Harrison, PE, PH-G (HyQual in association with HDR)	MS Civil Engineering, Utah State University, BS Agricultural Engineering, University of Idaho	25	10	Surface water quality including nutrient and organic matter processing
Bob Beduhn, PE	MS and BS Civil Engineering, University of Minnesota	18	15	Watershed and limnology evaluations
Dave Johnson	MS Environmental Biology, University of Minnesota-Duluth, BA Biology, Gustavus Adolphus College	14	11	Land use and watershed planning, environmental and regulatory compliance
Jason Kent, PE	MS Civil Engineering, Colorado State University, BS Biological Life Sciences, Ohio University	9	7	Physical and biological data assessment

Name and Registrations	Education	Years of Experience	Years of Project Experience	Areas of Expertise
Joanna Leu, PE	MS and BS Civil and Environmental Engineering, University of California Davis	5	5	Water quality, water resources and environmental restoration
Mike Garello, EIT	BS, Environmental Resources Engineering, Humboldt State University	4	4	Water quality, river and wetland restoration, and riverine ecology
Jeanne McFall, EIT	BS Environmental Engineering, California Polytechnic State University San Luis Obispo	4	4	Environmental studies
SUPPORTING TECHNICAL STAFF				
Dan Harmon, PE	MS Civil Engineering, Kansas State University, BS Civil Engineering, Montana State University	29	10	Water resources, water supply, and wastewater management
Allison MacEwan, PE	MS Environmental Engineering, University of Washington, BA Engineering, Dartmouth	17	10	Watershed planning and management, ecosystem restoration
John Koreny, PG	MS Civil Engineering, University of Washington, MS Hydrogeology, Ohio State University, BS Environmental Sciences, Rutgers	13	3	Groundwater/surface water studies and modeling
Amanda McInnis, PE	MS Civil Engineering, University of Washington, BS Civil/Environmental Engineering, University of Wisconsin	6	6	Phase II Stormwater NPDES program development, water resources, water supply, and wastewater management

3.5.13 Statistical Analysis

In this section, HDR presents references, a company profile and experience, and a method of providing services according to the Request for Proposal. This section concludes with staff qualifications to conduct the work in this task.

4.1.1 References. The following listing provides references that have used and/or are using services of the type designated by the State of Montana in the RFP. The references include employees of state government, non-profit organization, and private companies. HDR has successfully completed a variety of environmental services for these clients.

Company Name	Location of Services	Contact Person	Telephone Number	Description of Services	Dates of Services
Montana Department of Environmental Quality	Missoula, Montana	Michael Pipp	(406) 444-7424	Water quality analyses and modeling	2001-2004
Tri-State Water Quality Council	Missoula, Montana	Ruth Watkins	(208) 265-9092	Water quality analyses and modeling	2001-2004

Contractor to Tri-State Water Quality Council	Missoula, Montana	Will McDowell	(406) 327-8443	Water quality analyses and modeling	2001-2004
City of Missoula	Missoula, Montana	Bruce Bender	(406) 258-4621	TMDL development, TMDL loading analysis, water quality analysis and modeling	1997-1998
Ada County Highway District (formerly of Idaho Department of Environmental Quality)	Boise, Idaho	Sally Goodell	(208) 387-6129	Environmental, hydrologic, stormwater, and water quality analyses, TMDL Implementation Plan development	1998-2004
Idaho Power Company	Boise, Idaho	Ralph Myers	(208) 388-2358	Water quality analyses and modeling	1996-2004
Idaho Department of Environmental Quality	Coeur d'Alene, Idaho	Glen Rothrock	(208) 769-1422	TMDL Implementation Plan development	2003-2004

4.1.2 Company Profile and Experience. In 1917 H.H. Henningson founded the Henningson Engineering Company and pioneered water and sewer systems for new cities and towns throughout the Midwest. In 1946, Chuck Durham and Willard Richardson are each offered a one-third interest in the business and the company became known as Henningson, Durham and Richardson, Inc. or HDR. In the 1980s HDR expands its services to include environmental and resource management. Today, HDR is a multi-discipline architectural, engineering and consulting firm with more than 3,300 employee-owners in over 90 offices nationally.

Resumes for HDR's key staff experienced in water resources and water quality projects are shown in the separate resumes section. Key personnel who will lead Statistical Analysis project(s) include the following:

Name	Years of Experience	Private/Public Sector Experience
David Clark	23	MDEQ, IDEQ, TSWQC, City of Missoula
Jory Oppenheimer	15	Ecology, PSE, Avista
John Koreny	13	ODOT, Whatcom PUD
Michael Kasch	9	MDEQ, IDEQ, TSWQC, Idaho Power Company

4.1.3 Method of Providing Services & Quality Assurance.

HDR is well qualified to statistical analysis to the State of Montana
Statistical analysis is a common element of many of the water quality projects HDR has completed. Key projects where we have completed similar tasks include the Southwest Snake River for Idaho Power Company and the Clark Fork and Bitterroot Rivers for the Tri-State Water Quality Council. Large data sets with multiple water quality parameters were analyzed for these projects.

The methods used to complete these tasks include data assimilation, data review, statistics, spatial and temporal graphs, and two-dimensional plots. Data were assimilated from various sources including private entities, non-profit organizations, and government monitoring programs. Data assimilation required contacting the owner, understanding the dataset including the parameters collected, the methods used, and appropriate integration of diverse datasets. Data were compiled and organized in spreadsheets with additional tracking documentation for record keeping. Data were extracted from the master database for manipulation and analyses. Anomalies in the data were identified using both visual graphs and statistical tests. Questionable data were identified and labeled. These data were not included in subsequent analyses.

Data were compared between upstream and downstream stations to assess temporal and spatial trends in the data and stream reaches with changes. Data were compared to State standards and criteria to identify periods and locations of violations. The appropriate State standards and criteria were identified, documented, and discussed with State environmental staff.

Nutrient loading analyses were performed on the data. Loads were calculated within a spreadsheet or through the use of watershed loading computer models or another software program. Comparisons between upstream and downstream loads were performed to determine if a stream reach was importing or exporting nutrients. This combination of statistical assessment and loading analyses led to an understanding of key interactions, such as how the system was functioning. The analyses led to understanding of the processing of nutrients and organic matter including the key drivers of the water quality. Without the complete analysis of the data, these findings would not have been available. A complete analysis is necessary to explain and defend the water quality findings.

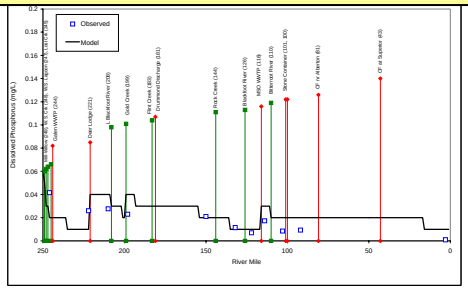
HDR's experience in developing data analysis highlights key capabilities

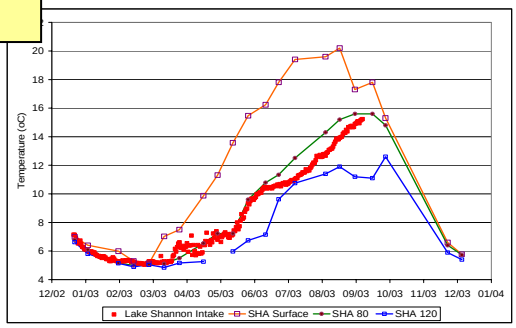
HDR has broad experience in statistical data analysis to support our water quality projects including the analysis of the Clark Fork and Bitterroot Rivers, the Snake River, the Baker River, the White/Puyallup River, the Arkansas River, Papio Creek and Cocolalla Lake.

HDR assessed continuous monitoring data collected over a three-year period from over 30 sampling locations were assessed for the Baker River Project. This extensive database was in support of several water quality studies at the project. Monitoring data from throughout the Clark Fork River system were assessed and used in the

Table 10.
Descriptive Seasonal Temperature Statistics for Study A05 Waterbodies

ocation	Depth (feet)	Absolute Minimum (°C)	Absolute Maximum (°C)	Daily average		
				Fluctuation (°C)	Mean (°C)	Maximum (°C)
Summer (July – September)						
aker Lake forebay	33	13.8	18.9	0.7	15.3	15.7
aker Lake forebay	120	8.4	16.3	0.3	12.5	12.6
aker Lake forebay	140	8.4	15.7	0.5	11.7	11.9
aker Lake forebay	160	8.0	15.1	0.9	10.4	10.8
aker Lake forebay	190	6.3	9.1	0.8	7.4	7.9
aker Lake forebay	225	6.2	7.3	0.1	6.8	6.9
pper Baker tailrace	3	9.1	16.7	0.6	13.0	13.3
wer Baker intake	95	7.8	16.9	1.3	12.5	13.1
wer Baker tailrace at ult fish trap	10	7.3	16.2	2.6	12.4	13.3
agit River upstream Baker River nfluence	3	7.9	16.5	2.0	12.4	13.4
agit River wnstream of Baker ver confluence	3	8.4	16.5	1.8	12.7	13.6





HDR's disciplined approach to data analysis delivers high-value products for the State of Montana

HDR's previous approaches and general method for water quality assessment includes a complete statistical assessment including spatial and temporal analysis both graphically and numerically. This comprehensive analysis provides the opportunity to understand the dynamic interactions within the system.

The general work plan and detailed plan for performing statistical analysis involves multiple steps and reviews. HDR establishes the objectives of the water quality assessment based on the clients' needs. The procedures for assessing water quality data depends on what questions are asked, which allows us to focus on assessment techniques that address the concerns of our clients. Once the objectives of the project are established, potential sources of data are identified followed by data requests and compilation into a complete dataset. We review the data and formulate the dataset for analysis. We analyze the data to meet the address the project's objectives. We document data sources. The key items and steps are documented in various forms including technical memoranda, meeting notes, and conservation records. We review the analysis and findings as a team in a collaborative process. Based on our review, we decide on additional analyses to perform if required. We hold regular meetings to review progress. Near the end of the analysis but with sufficient remaining schedule and budget, a senior technical review is performed. We address the comments and complete the project. The work plan may take weeks to months depending on the difficultly of acquiring the data, the level of review, and the volume of data to process.

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throughout the project is valuable for the integrity of the project and to build a foundation for any final documentation. Additionally, electronic media may be supplied as part of the documentation.

4.1.4 Staff Qualifications. HDR is committed to providing technical experts and ensuring that they allocate the time required to ensure successful performance for the State of Montana. This is a personal commitment to continuing to build our relationship and provides the single, strongest statement HDR can make regarding our ability to deliver the people and work products required. The State of Montana is an important client and HDR will manage other project assignments to ensure the availability of key HDR staff in this proposal to meet project needs.

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LEAD STATISTICAL ANLAYSIS WATER RESOURCES AND WATER QUALITY STAFF				
David Clark, PE	MS and BS Civil Engineering, University of Washington	23	23	Wastewater and water quality management
Jory Oppenheimer	MS Environmental Engineering & Science, University of Washington, BS Environmental Science, Western Washington University	15	15	Water quality analysis and assessment, water quality standards
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