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BRIAN SCHWEITZER

STATE OF MONTANA

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Governor's Executive Budget  
Fiscal Years 2010 – 2011

Reclamation and Development  
Grants Program

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Department of Natural Resources  
and Conservation

Conservation and Resource  
Development Division

Volume 5



# Reclamation and Development Grants Program

Project Evaluations and Funding Recommendations  
For the 2011 Biennium

and

2009 Biennium Status Report

Prepared by the

Montana  
Department of Natural Resources  
and Conservation

Conservation and Resource Development Division  
Resource Development Bureau

Alice Stanley, Bureau Chief

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## LIST OF ABBREVIATIONS

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ACOE	Army Corps of Engineers
ADA	Americans with Disabilities Act of 1990
AMS	Abandoned Mine Section
AST	above ground storage tank
BLM	Bureau of Land Management, U.S. Department of the Interior
BLMS	Berg Lumber Mill Site
BNSF	Burlington Northern & Santa Fe Railroad
BOGC	Montana Board of Oil and Gas Conservation
CAES	Compressed Air Energy Storage
CBM	coalbed methane
CD	conservation district
CECRA	Comprehensive Environmental Cleanup and Responsibility Act of 1989
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act of 1980
COCs	Contaminants of Concern
CY	cubic yard
DEQ	Montana Department of Environmental Quality
DFWP	Montana Department of Fish, Wildlife and Parks
DNRC	Montana Department of Natural Resources and Conservation
DOT	Montana Department of Transportation
EDC	Endocrine Disrupting Compounds
EEE/CA	Expanded Engineering Evaluation/Cost Analysis
EIS	environmental impact statement
EPA	U.S. Environmental Protection Agency
ESRI	Environmental Systems Research Institute, Inc.
FBC	Flathead Basin Commission
FEMA	Federal Emergency Management Agency
FS	feasibility study
FYE	fiscal year end
gpm	gallons per minute
GAC	granular activated carbon
GWIC	Groundwater Information Center
KPT	Kalispell Pole and Timber
KRY	Kalispell Pole and Timber, Reliance Refinery, Yale Oil Facilities
LAD	land application discharge
LCCD	Lewis and Clark Conservation District
LIDAR	Light Detection and Ranging
LP	leach pad
LUST	leaking underground storage tank
MBMG	Montana Bureau of Mines and Geology
MCA	<i>Montana Code Annotated</i>
MCCD	Meagher County Conservation District
MCL	maximum contaminant level
Mg/kg	milligram per kilogram
MWCB	Mine Waste Cleanup Bureau
NAPL	nonaqueous phase liquid
NEPA	National Environmental Policy Act
NRCS	Natural Resources Conservation Service
NRIS	Natural Resource Information System
OSM	Office of Surface Mining
OWC	organic waste compound
PCP	pentachlorophenol
PDM	Pre-Disaster Mitigation

PLP..... potentially liable parties  
 PRB..... Powder River Basin  
 R..... Range  
 RBSL..... risk based screening level  
 RCRA..... Resource Conservation and Recovery Act  
 RDGP..... Reclamation and Development Grants Program  
 RFP..... Request for Proposal  
 RHPP..... Regional Historic Preservation Plan  
 RI/RA/FS..... resource inventory/risk assessment/feasibility study  
 RIT..... Resource Indemnity Trust  
 ROD..... record of decision  
 RRGL..... Renewable Resource Grant and Loan  
 SAR..... sodium adsorption ratio  
 SHPO..... State Historical Preservation Office  
 SMRWG..... St. Mary Rehabilitation Working Group  
 SSCL..... site specific screening level  
 SSRA..... State Special Revenue Account  
 T..... Township  
 TLMD..... Trust Land Management Division  
 TMDL..... Total Maximum Daily Load  
 USBR..... U.S. Bureau of Reclamation  
 USCOE..... U.S. Army Corps of Engineers  
 USFS..... U.S. Forest Service  
 USGS..... U.S. Geological Survey  
 VCP..... Voluntary Cleanup Plan  
 VCRA..... Voluntary Cleanup and Redevelopment Act  
 WPPS..... Well Plugging Prioritization System  
 WR..... Waste Rock  
 WRD..... Water Resources Division  
 WWTP..... wastewater treatment plant  
 YRCDC..... Yellowstone River Conservation District Council

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## CHAPTER I

### Program Description and Procedures

#### Program Information

The Reclamation and Development Grants Program (RDGP) is a state-funded grant program designed to fund projects that *"indemnify the people of the state for the effects of mineral development on public resources and that meet other crucial state needs serving the public interest and the total environment of the citizens of Montana"* (90-2-1102, MCA). The program, established by the 1987 Montana Legislature, is administered by the Montana Department of Natural Resources and Conservation (DNRC).

In February 2008, DNRC mailed application materials to all Montana communities, counties, the university system, conservation districts, state agencies, state legislators, and others who might benefit by program participation. The application deadline was May 15, 2008. DNRC received 29 applications for RDGP funding totaling over \$7.8 million. These projects are listed alphabetically by applicant on pages v and vi.

Since 1986, 210 projects totaling nearly \$41 million have been authorized for funding by previous Legislatures. The 1993 Legislature authorized, beginning in state fiscal year (FY) 1996, a minimum allocation of \$3 million for grants. In 1993, the Legislature also directed DNRC to give priority to grant requests from the Montana Board of Oil and Gas Conservation (BOGC). This priority is not to exceed \$600,000 for the biennium and does not preclude BOGC from submitting additional grant requests. Additional BOGC grant requests are received and ranked by DNRC in the same manner as all other grant requests. DNRC is also statutorily required to give priority to abandoned mine reclamation projects in the amount of \$800,000 (90-2-1113 [3] MCA). These projects may not include personnel costs or operating expenses.

In 2007, the Legislature approved a major new component of RDGP with the authorization of \$800,000 in project planning grant funding. Chapter IV describes DNRC's role in the administration of planning grants and lists the 21 projects that were approved for funding.

The 2007 Legislature also revised the funding structure of the Reclamation and Development Grants Program by establishing two Natural Resources State Special Revenue Accounts (SSRA): the Natural Resources Projects SSRA and the Natural Resources Operations SSRA. The Projects SSRA receives revenue to be used exclusively for grants for designated projects authorized in statute. Funds from this account are shared by the RDGP and the Renewable Resource Grant Program. The Natural Resources Operations SSRA funds expenses necessarily incurred in the administration of these two natural resource grant programs. Other related agency expenses are also charged to the operations account. This change in funding structure is designed to ensure that resource indemnity trust (RIT) funds are expended consistent with the original intent of the RIT.

The RDGP Act requires that the Governor submit, by the first day of each regular session of the Legislature, a list of all grant proposals received with his or her recommended priorities for funding (see Table 1). Administrative rules further provide that DNRC must furnish to the Legislature a status report on previously funded projects, provided here in Chapter III. This report is the result of those directives.

#### Project Eligibility

The following excerpt from the RDGP Act (90-2-1112, MCA) establishes criteria that projects must meet in order to be eligible for funding.

1. Except as provided under subsection (2), to be eligible for funding under the Reclamation and Development Grants Program, the proposed project must provide benefits in one or more of the following categories:



- a. Reclamation of land, water, or other resources adversely affected by mineral development;
  - b. Mitigation of damage to public resources caused by mineral development;
  - c. Research, demonstration, or technical assistance to promote the wise use of Montana minerals, including efforts to make processing more environmentally compatible;
  - d. Investigation and remediation of sites where hazardous wastes or regulated substances threaten public health or the environment; and
  - e. Research to assess existing or potential environmental damage resulting from mineral development.
2. If a crucial state need exists to protect Montana's environment, the DNRC may evaluate and the Governor may recommend that the Legislature approve funding for projects in addition to those described in subsection (1).

### **Applicant Eligibility**

Any department, agency, board, commission, or other division of state government or any city, county, or other political subdivision or tribal government within the state may apply for a grant from the Reclamation and Development Grants Program.

### **Funding Limits**

No grant may exceed \$300,000, and there is no minimum funding limit. An applicant proposing more than one project may submit a separate application for each.

### **Application Review and Ranking Procedures**

The grant applications were evaluated for the technical and financial feasibility of the proposed projects, provision of public benefits, need and urgency, and impacts on the environment. Reviewers included staff members of the Conservation and Resource Development Division of DNRC, contracted engineering firms, and federal, state, and university personnel with expertise in specific project areas. For each application, project reviewers wrote a descriptive project assessment incorporating their concerns, ideas, and comments.

More funds are requested than are available. Therefore, the department ranks feasible projects, so that it can recommend funding priority and funding level to the Governor and the Legislature. Evaluation criteria established by the 1987 Legislature include, but are not limited to:

1. The degree to which the project will provide benefits in its eligibility category or categories.
2. The degree to which the project will provide public benefits.
3. The degree to which the project will promote, enhance, or advance the policies and purposes of the Reclamation and Development Grants Program.
4. The degree to which the project will provide for the conservation of natural resources.
5. The degree of need and urgency for the project.
6. The extent to which the project sponsor or local entity is contributing to the costs of the project or is generating additional non-state funds.
7. The degree to which jobs are created for persons who need job training, receive public assistance, or are chronically unemployed.
8. Any other criteria DNRC considers necessary to carry out the policies and purposes of the Reclamation and Development Grants Program.

Under the ranking system, a proposal could receive 215 points. Specific criteria were established for each category to provide consistency of review. Of the following criteria, public benefits and need and urgency were weighted most heavily.

	<u>Maximum Points Possible</u>
1. Public benefits	90
2. Need and urgency	50
3. Appropriateness of technical design	40
4. Financial feasibility	15
5. Project management organization	<u>2</u>
<b>Total possible points:</b>	<b>215</b>

### **Recommendations**

After ranking the projects and recommending funding, the Conservation and Resource Development Division made its recommendations to the DNRC director. The director then presented the recommendations by DNRC to the Governor. Final ranking of the proposed projects is presented in Table 1, along with funding recommendations.

An appropriations bill listing the Governor's recommendations will be introduced to the 2009 Legislature. By appropriation or other means, the Legislature may approve grants for those projects it finds consistent with the policies and purposes of RDGP.

The appropriations bill will also contain a request for RDGP planning grant funds. These funds, to be administered by DNRC, can be accessed by local governments statewide to assist in planning and developing local natural resource projects within their jurisdictions.



TABLE 1

RANKING AND FUNDING RECOMMENDATIONS

RANK	APPLICANT	AMOUNT REQUESTED	AMOUNT RECOMMENDED	CUMULATIVE AMOUNT
1	<b>MT Board of Oil and Gas Conservation</b> 2009 Northern District Orphaned Well Plug and Abandonment, and Site Restoration	\$300,000	\$300,000	\$300,000
2	<b>MT Board of Oil and Gas Conservation</b> 2009 Southern District Orphaned Well Plug and Abandonment, and Site Restoration	\$300,000	\$300,000	\$600,000
3	<b>MT Department of Natural Resources and Conservation</b> Reliance Refinery	\$300,000	\$300,000	\$900,000
4	<b>Shelby, City of</b> Shelby Refinery	\$300,000	\$300,000	\$1,200,000
5	<b>Missoula County</b> St. Louis Creek Mine Reclamation	\$300,000	\$300,000	\$1,500,000
6	<b>MT Department of Environmental Quality</b> Spring Meadow Lake Reclamation	\$300,000	\$300,000	\$1,786,000
7	<b>Cascade County Commission</b> County Shops Remediation of Wood Treatment Preservatives	\$300,000	\$300,000	\$2,086,000
8	<b>MT Department of Environmental Quality</b> McLaren Tailings Reclamation Project	\$300,000	\$300,000	\$2,386,000
9	<b>Lewistown, City of</b> Reclamation of Berg Lumber Mill Site	\$220,590	\$300,000	\$2,700,000
10	<b>Ryegate, Town of</b> Former Ryegate Conoco	\$259,200	\$259,200	\$2,959,200
11	<b>MT Department of Environmental Quality</b> Emery Reclamation Project	\$300,000	\$300,000	\$3,259,200
12	<b>Park County</b> Fleshman Creek Urban Restoration	\$300,000	\$300,000	\$3,559,200
13	<b>Butte-Silver Bow City-County Government</b> Butte Mining District Reclamation and Protection	\$300,000	\$300,000	\$3,859,200
14	<b>Missoula County</b> Ninemile Creek Mining District Reclamation	\$200,800	\$200,800	\$4,060,000
15	<b>MT Department of Environmental Quality</b> Beal Mountain Mine, Waste Rock Dump Soil Cover	\$300,000	\$300,000	\$4,360,000
16	<b>Lewis and Clark Conservation District</b> York Gulch Old Amber Mine Reclamation	\$83,207	\$83,207	\$4,443,207
17	<b>Ruby Valley Conservation District</b> Big Hole Cooperative Ditch Improvement Project	\$239,658	\$239,658	\$4,682,865
18	<b>MT Department of Natural Resources and Conservation</b> Monitoring Coalbed Methane Development Effects on Surface Water Quality of the Tongue and Powder River Basins	\$300,000	\$195,000	\$4,877,865

19	<b>MT Public Service Commission</b> Geologic Evaluation of Potential Sites for Compressed Air Energy Storage (CAES) in Montana	\$293,460	\$135,000	\$5,012,865
20	<b>Flathead Basin Commission</b> Flathead Regional LiDAR Mapping Project	\$294,977	\$294,977	\$5,307,842
21	<b>Jefferson County</b> Groundwater Quality Assessment with an Emphasis on Radionuclides	\$300,000	\$300,000	\$5,607,842
22	<b>Meagher County Conservation District</b> Hydrologic Framework and Water Budget of the Upper Smith River Watershed	\$300,000	\$300,000	\$5,907,842
23	<b>Custer County Conservation District</b> Yellowstone River Riparian Restoration	\$299,926	\$177,881	\$6,085,723
24	<b>Cascade County Commission</b> Sustainable Water Supplies from the Madison Aquifer, Central Montana	\$290,817	\$286,792	\$6,372,515
25	<b>Butte-Silver Bow-City County Government</b> Irrigation Demonstration Project for Butte Acidic Mine Waters - On-Site Treatment and Resource Recovery	\$289,607	\$289,607	\$6,662,122
	<b>Total</b>	<b>\$6,972,242</b>	<b>\$6,662,122</b>	<b>\$6,662,122</b>
<b>Projects Below This Line Were Not Recommended for Funding</b>				
NF	<b>Carter County Conservation District</b> Groundwater Monitoring Near a Proposed <i>In Situ</i> Uranium Mine in Carter County	\$295,407	\$0	\$6,662,122
NF	<b>MT Department of Environmental Quality</b> Systematic Statewide Reconnaissance of Occurrence and Effects of Organic Wastewater Compounds from Wastewater Treatment Plants in Receiving Streams in Montana	\$300,000	\$0	\$6,662,122
NF	<b>Flathead County</b> Flathead Regional Wastewater Management Group	\$89,983	\$0	\$6,662,122
NF	<b>MT Bureau of Mines and Geology</b> Assessment of Deep Coals in Eastern Montana-Potential Targets for <i>In situ</i> Gasification of Unmineable Resources	\$159,784	\$0	\$6,662,122
	<b>Total</b>	<b>\$7,817,416</b>	<b>\$6,662,122</b>	<b>\$6,662,122</b>

## CHAPTER II

### **Project Abstracts, Evaluations, and Recommendations for the 2011 Biennium**

This chapter combines summary evaluations of 25 recommended projects presented in the order of their ranking (Part 1). Of the \$6,662,122 recommended for these projects, approximately \$5.0 million is expected to be awarded by the 2009 Legislature. The actual amount awarded will depend on the availability of program revenues. To find any particular evaluation quickly, consult the alphabetical listing of projects by the name of the applicant on pages v and vi.

Part 2 contains the projects not recommended for funding.

For projects recommended for RDGP funding, "TOTAL PROJECT COST" is the sum of "OTHER FUNDING SOURCES" plus the "AMOUNT RECOMMENDED".

## Part I. Projects Recommended for Funding

### Project Nos. 1 & 2

<b>Applicant Name</b>	Montana Board of Oil and Gas Conservation (BOGC)
<b>Project Names</b>	2009 Southern District Orphaned Well Plug and Abandonment, and Site Restoration And 2009 Northern District Orphaned Well Plug and Abandonment, and Site Restoration
<b>Amount Requested</b>	\$ 600,000
<b>Other Funding Source</b>	\$ <u>37,455</u> Applicant
<b>Total Project Cost</b>	\$ 637,455
<b>Amount Recommended</b>	\$ 600,000

**Project Abstract** (Prepared and submitted by applicant)

The purpose of this grant request is to provide funding to properly plug orphaned secondary enhanced water injection wells, old abandoned oil/gas wells, partially plugged cased wells, and unrestored plugged locations. This project would plug these orphaned wells and perform surface reclamation on these sites. The wells are not useful and are a blight on the landscape; some have the potential of causing damage and/or pollution to subsurface formations, the state's water, air, and the surface around each well.

The BOGC will eliminate the threat of contamination by soliciting bids to plug and restore these wells. Under supervision of the BOGC staff, the successful bidder will properly plug and abandon each well, dispose of and/or remediate contaminants, and reclaim the surface location.

The wells were drilled originally for production. Some were converted to water injection and some were drilled, but never produced. The operator could no longer afford to produce wells and the wells were shut in or abandoned. The operator's assets will not cover the liabilities to creditors, leaving the operator insolvent. The operator's bond has been forfeited and the bond is not sufficient to cover the cost of plugging and restoration. Since the operator is insolvent or long since defunct, responsibility for the wells and any potential environmental damage rests with the BOGC and the state. The wells will be properly plugged and abandoned when funding is available.

The orphaned wells are in Glacier, Toole, Liberty, Blaine, McCone, Garfield, Musselshell, Petroleum, Wheatland, Golden Valley, and Dawson counties. By prioritizing the list of orphaned wells, those that present the highest potential to damage the environment because of leaking or loss of mechanical integrity will be plugged first.

The project is estimated to take 24 months. The work will generally begin during the first suitable field season following funding availability.

### **Technical Assessment**

The priority and funding amount for BOGC applications, 2009 Southern District and 2009 Northern District, are established pursuant to 90-2-1113(2) (a-c), *Montana Code Annotated* (MCA). For reference, this statute states:

- (2)(a) Subject to the conditions of this part, the department shall give priority to grant requests, not to exceed a total of \$600,000 for the biennium, from the BOGC. The BOGC shall use a grant that received priority under this subsection (2) (a) for oil and gas reclamation projects. The board may use a maximum of 2.5% of the amount of a

grant for administrative costs associated with implementing the projects covered in the grant.

- (b) Any unobligated fund balance of a grant that received priority under subsection (2) (a) remaining at the end of the current biennium must be included as part of the \$600,000 limitation for the next biennium.
- (c) The priority given to the BOGC under subsection (2) (a) does not preclude the BOGC from submitting additional grant requests. The department shall evaluate additional grant requests from the BOGC in accordance with the provisions of subsection (1).

These two applications represent 18 wells, in Glacier (five wells), Blaine (three wells), Toole (two wells), and one well each in: Garfield, Musselshell, Petroleum, Wheatland, Golden Valley, Liberty, McCone, and Dawson counties. All have been evaluated using Montana's Well Plugging Prioritization System (WPPS). WPPS rates such factors as the threat the well poses to groundwater and surface water, mechanical condition of the wellhead casing, public safety, and potential for cross-contamination of mineral-bearing formations and aquifers. All of these wells are leaking some combination of oil, gas, and/or water to the ground surface or they exhibit loss of mechanical integrity in the wellhead or casing. Delays in proper plugging and abandonment of these wells will result in continued threats to the environment and increased future costs.

The wells are abandoned, and all attempts by BOGC to hold a party responsible for plugging these wells have been unsuccessful. The plugging of these wells involves standard oil-field equipment and procedures and will be performed by qualified oil-field plugging contractors.

**Financial Assessment**

The two RDGP grant applications are for \$300,000 each. Totals for major budget categories and matching contributions are as follows:

	<b>RDGP</b>	<b>Matching Funds</b>	<b>Total</b>
Salaries and Wages	\$ 0	\$ 20,678	\$ 20,678
Employee Benefits	\$ 0	\$ 2,764	\$ 2,764
Contracted Services	\$ 600,000	\$ 0	\$ 600,000
Supplies and Materials	\$ 0	\$ 1,000	\$ 1,000
Communications	\$ 0	\$ 504	\$ 504
Travel	<u>\$ 0</u>	<u>\$ 12,509</u>	<u>\$ 12,509</u>
<b>Total</b>	<b>\$ 600,000</b>	<b>\$ 37,455</b>	<b>\$ 637,455</b>

Cost estimates are based on bids on past projects contracted by BOGC and are reasonable for the work performed. As with any oil- and- gas-plugging project, unknown or unforeseen circumstances may be encountered underground, and costs may vary considerably.

The 2009 Southern and 2009 Northern applications constitute the BOGC \$600,000 priority allocation for the 2011 biennium.

**Environmental Evaluation**

No long-term adverse environmental impacts should be created in the plugging and abandonment of the proposed wells, provided reclamation activities are conducted properly. Short-term adverse impacts associated with movement of equipment to the sites are expected. Compacted soil and destroyed vegetation on access routes would be reclaimed upon project completion, and any debris would be hauled off-site and disposed of in a licensed landfill. Short-term air pollution (e.g., dust, emissions from combustion engines) would be minimal, provided that equipment and traffic routes are watered as necessary and mechanized equipment is in proper working condition. If the sites involve cleanup and disposal of drilling fluids, oil sludge, brine wastes, or other contaminants, these materials must be



identified and characterized, and this information must be used to develop site-specific reclamation plans. Depending on the material and contaminants encountered, remedial action may involve burning, burial, landfarming, and addition of soil amendments for materials disposed of onsite, or it may involve hauling materials to a licensed off-site landfill or waste disposal facility. If disposal poses unusual difficulty or necessitates remedial actions not normally implemented by the board, appropriate regulatory or reclamation experts would need to be contacted.

### **Public Benefits Assessment**

The proper plugging and abandonment of these wells benefits all Montanans by eliminating severe impacts to groundwater and surface water caused by oil-field development. Statewide, many abandoned and unplugged wells threaten water supplies used for drinking water, stock watering, and irrigation. Safety hazards (e.g., open holes, gas emissions, blowout potential) affect not only humans, but also stock and wildlife. Proper plugging eliminates site-specific problems and helps ensure long-term protection of soil, water, and vegetative resources. Moderate economic benefit will be realized by contractors, equipment suppliers, and other area retailers.

### **Recommendation**

As per the priority contained in 90-2-1113 (2), MCA, a grant of up to \$600,000 is recommended for the 2009 Southern District and 2009 Northern District projects, contingent upon DNRC approval of the project scope of work and budget.

### Project No. 3

<b>Applicant Name</b>	Montana Department of Natural Resources and Conservation (DNRC)
<b>Project Name</b>	Reliance Refinery
<b>Amount Requested</b>	\$ 300,000
<b>Other Funding Sources</b>	\$ 9,940 Applicant \$ 5,454,692 General Fund
<b>Total Project Cost</b>	\$ 5,764,632
<b>Amount Recommended</b>	\$ 300,000

**Project Abstract** (Prepared and submitted by applicant)

The Kalispell Pole and Timber (KPT), Reliance Refinery (Reliance), and Yale Oil Facilities (Yale), collectively referred to as the KRY site, occupies an area of approximately 55 acres on the northeastern edge of the City of Kalispell. The three facilities are in relatively close proximity to each other and are adjacent to the Stillwater River and nearby residential areas. Montana owns the Reliance Refinery site and leased it out for refinery operations from the 1930s to 1960s. The state was one of several potentially liable parties (PLPs) sued by DEQ under state superfund law. Other PLPs for this project include Burlington Northern & Santa Fe Railroad (BNSF), KPT Company, Montana Mokko, Inc., Klinger Lumber Company, Exxon Corporation, and Swank Enterprises. CECRA statutes encourage settlement of claims. Montana, through DNRC Trust Lands Management Division (TLMD) negotiated a settlement agreement with DEQ, which acknowledged the state's partial liability for site remediation and indemnified the state from cross-claim litigation from other PLPs. The Montana First Judicial District Court reviewed the consent decree and opposition testimony and exhibits by BNSF, and approved the DNRC DEQ consent decree on March 24, 2006.

DEQ is proceeding with remediation activities of the site. The Final Remedial Investigation Report (RI) was released in March 2008. The Final Feasibility Study (FS) and Record of Decision (ROD) will be released in the next couple of months, which will outline in detail DEQ's selected preferred remedy. Upon finalization of the FS and ROD, the Remedial Design process will be initiated, followed by initiation of the remediation work around spring 2009. Pursuant to the consent decree, Montana is liable for 27.5 per cent of invoiced remediation costs.

DEQ invoices PLPs for their costs, unless covered by other direct sources of funding. DNRC TLMD's settlement agreement with DEQ resulted in a negotiated settlement of \$126,890 for the state's share of costs invoiced through December 31, 2004. The final payment for past costs pursuant to this consent decree was made on September 11, 2007. Per the settlement agreement, the state is responsible for 27.5 per cent of all invoiced costs after January 1, 2005. DNRC has paid \$544,518.94 to cover expenses incurred through February 2008. This grant is intended to cover a portion of the department's share of invoiced costs through fiscal year end.

### **Technical Assessment**

Under provisions of state superfund law (75-10-705, MCA), DEQ will administer and have oversight of all project cleanup activities. As a result of the consent decree, the project is decidedly straightforward. The state of Montana is liable for its proportionate share of all cleanup costs. The major issue facing DEQ/DNRC/state of Montana centers on what funding source(s) is/are used to meet this court-mandated obligation as described in the Abstract. The Reclamation and Development Grants Program (RDGP) is one feasible option for a portion of the required obligation. The other major option is the general fund. Legislators must determine what source of funding (or combination of funding) is in the best interests of Montana. Noteworthy in this particular project is a clause found in the RDGP statute (90-2-1112[5] MCA). This provision states, "A proposed project is not eligible for funding under the reclamation and development grants program if there is a liable party who would be relieved of financial or legal

responsibility and who can reasonably be expected to be held responsible.” RDGP would argue that this provision is moot since the state of Montana will ultimately pay for its share of remedial costs regardless of what funding source is used or which agency is designated to pay these costs on behalf of the state. Ultimately, it seems that using RDGP, or not, is an issue of legislative prerogative.

### Financial Assessment

DNRC/TLMD is currently seeking an appropriation through the state budget process to cover the department’s obligation to cover invoiced expenses that exceed the amount through RDGP. Since the Reliance Refinery was acquired through tax lien foreclosure, it is sovereign property of the State of Montana, and not school trust land. Therefore, the obligation to meet the state’s share of expenses can be addressed from general fund or other funds that may be available, such as RDGP. Estimated remedial costs for this project are based on comparisons with similar sites. Such costs, conducted under the authority of CECRA, are typically higher than conventional design/construction projects.

The total overall budget for this project consists of the following:

	<b>RDGP</b>	<b>Matching Funds</b>	<b>Total</b>
Salaries and Wages	\$ 0	\$ 6,480	\$ 6,480
Fringe Benefits	\$ 0	\$ 2,160	\$ 2,160
Contracted Services	\$ 300,000	\$ 5,059,557	\$ 5,359,557
Communications	\$ 0	\$ 300	\$ 300
Travel	\$ 0	\$ 1,000	\$ 1,000
Miscellaneous	\$ 0	\$ 395,136	\$ 395,136
<b>Total</b>	<b>\$ 300,000</b>	<b>\$ 5,464,632</b>	<b>\$ 5,764,632</b>

Matching funds include a DNRC match of \$9,940 for salaries, and \$1,300 for travel and communications for two years. The balance of matching funds is the cost to liable parties by DEQ for actual and expected expenses through 2011.

The budget is typical of a DEQ-administered project under superfund and reasonable if the project is conducted in a timely manner.

### Environmental Evaluation

For this project, DEQ is responsible for compliance with all environmental standards, regulations, and statutes dealing with protection of health, safety, environment, and public welfare. The transfer of funds from RDGP to DEQ in itself has no environmental impact.

### Public Benefits Assessment

Remediation of this site is designed to protect human health, safety, public welfare and the environment. The cleanup of contaminated soils and groundwater benefits all Montanans in the long- term. Of lesser impact, the project will result in short-term economic impact to remedial action contractors and suppliers.

### Recommendation

A grant of up to \$300,000 is recommended for this project contingent upon DNRC approval of the project scope of work and budget.

## **Project No. 4**

<b>Applicant Name</b>	Shelby, City of
<b>Project Name</b>	Shelby Refinery
<b>Amount Requested</b>	\$ 300,000
<b>Other Funding Sources</b>	\$ 242,605 Applicant
	\$ 200,000 U.S. EPA Brownfields Grant
	\$ <u>50,000</u> DNRC Reclamation Development Planning Grant
<b>Total Project Cost</b>	\$ 792,605
<b>Amount Recommended</b>	\$ 300,000
<b>Project Abstract</b>	(Prepared and submitted by applicant)

The proposal seeks \$300,000 to clean up petroleum-contaminated soil at the abandoned Shelby Refinery in Toole County, in the corporate city limits of Shelby. The legal description of the entire property is: N ½, SE ¼, SW ¼ and that part or portion of the N ½, SW ¼, SE ¼ lying west of the Burlington Northern Railroad Company right-of-way, all in S27, T32 N, R2 W, Montana Principal Meridian.

The Petroleum Refining Company, a subsidiary of Pacific National Oils, was built in 1940 to refine crude oil from the nearby Kevin-Sunburst oil field northwest of Shelby. Crude oil was delivered to the site either by truck or rail and processed into gasoline. The refinery was designed to be a small operation (500 barrel capacity) and only operated for three years before closing for a lack of market. According to newspaper records, the plant was reactivated in 1952 and changed ownership in 1954. It was temporarily shut down again in 1954 so that company officials could identify new marketing strategies and sources of crude oil. No records could be found indicating how long the refinery operated under the new owners. The plant reopened some time in the late 1960s or early 1970s under the name North Star Refinery to produce jet fuel for the Glasgow Air Force Base. The refinery has been abandoned since the early 1970s.

Environmental samples from the site reveal elevated concentrations of petroleum hydrocarbons in soil. Average thickness of the petroleum-impacted soils is estimated to be 7.5 feet. The affected area covers approximately 30,000 square feet. Total estimated volume of contaminated soils is 8,333 cubic yards. Four partial crude oil storage tank bottoms remain on the site.

Shelby owns the property and hopes to redevelop the property as an industrial park. This proposal would fund a two-year clean-up project overseen by the Department of Environmental Quality (DEQ). Potential remedial alternatives include no action, capping in place, on-site landfarming, and excavation with off-site disposal. The alternatives were assessed for long-term reliability and effectiveness; reduction of toxicity, mobility, and volume of contamination; short-term effectiveness; implementability; cost effectiveness; and protectiveness. The preferred alternative is off-site disposal at the Shelby landfill.

### **Technical Assessment**

The primary goal of this project is to reduce or eliminate risks to human health and the environment at the Shelby Refinery site. The objective for the project is to remove or isolate the petroleum-contaminated soil from human or environmental contact to allow the site to be redeveloped as an industrial park.

Investigation of the Shelby Refinery site was initiated in 1988 when a hazard ranking was conducted by DEQ. The investigation identified the following contaminants of concern at the site: (1) 2-methylnaphthalene and phenanthrene in sludge; (2) lead and mercury in soil; and (3) asbestos and sodium carbonate in buildings. As a result, the DEQ listed the site under the state Comprehensive Environmental Cleanup and Responsibility Act (CECRA) program.

From 1991 to 1993, asbestos and refinery operations chemicals were removed from the site. The process piping was removed and the above-ground storage tanks (ASTs) were cut to approximately 16-

inches above ground in 1995. Approximately 80 cubic yards of material was removed from the southern sludge pit and disposed of by landfarming at the Shelby Class II Landfill in 1995.

The property owner conducted several phases of soil sampling from 1997 to 2000. Those investigations were conducted by excavating test pits and submitting 12 soil samples for laboratory analysis. Based on these investigations, an estimated 8,333 cubic yards of hydrocarbon-contaminated soil was present at the site.

The DEQ completed a Targeted Brownfields Assessment and Groundwater Investigation in 2006 and reported the results in 2008. The investigation included completion of 25 soil borings and installation of monitoring wells in five of the borings. Results were consistent with the previous investigations in which approximately 8,333 cubic yards of hydrocarbons-contaminated soil was identified. In addition, soil contamination extends to groundwater, impacted down-gradient of the northern and southern tank farms and sludge pits. DEQ recommended soil excavation in the vicinity of the northern and southern tank farms and sludge pits.

The City of Shelby evaluated four alternatives to address the hydrocarbon contamination, including: (1) no action; (2) capping in place; (3) on-site landfarm; and (4) excavation and off-site disposal. The no-action alternative would not alter the site. The capping in place alternative involves constructing a cap above the impacted soil that would reduce infiltration of surface water to prevent leaching of contaminants to groundwater and reduce exposure through direct contact. The on-site landfarm alternative involves treating the contaminated soil onsite using landfarming. Landfarming removes the contaminants via volatilization and biodegradation processes. The excavation and off-site disposal alternative would involve excavating contaminated soil and transporting it to an off-site landfill for disposal. Each of the alternatives would meet the project goal with the exception of no action. The excavation and off-site disposal alternative is the most reliable and effective alternative. The cost estimates for the three active alternatives were \$223,700 for capping in place, \$658,000 for on-site landfarm, and \$764,305 for excavation and off-site disposal. While the capping in place alternative is the least expensive, it restricts future activities at the site. The on-site landfarm option would restrict property development for a number of years as the landfarm was operated. While the excavation and off-site disposal alternative is the most expensive, the greater reliability, effectiveness, and toxicity reduction justify the additional cost.

### Financial Assessment

	RDGP	Matching Funds	Total
Salaries and Wages	\$ 0	\$ 4,000	\$ 4,000
Fringe Benefits	\$ 0	\$ 1,000	\$ 1,000
Materials and Supplies	\$ 0	\$ 41,650	\$ 237,405
Contracted Services	\$ 270,000	\$ 250,000	\$ 520,000
Communications	\$ 0	\$ 200	\$ 200
Misc. – Applicant Landfill Fees	\$ 0	\$ 195,755	\$ 195,755
Misc. - DEQ Review and Oversight	\$ 30,000		\$ 30,000
<b>Total</b>	<b>\$ 300,000</b>	<b>\$ 492,605</b>	<b>\$ 792,605</b>

No costs for salaries and wages and fringe benefits are included in the RDGP application. Costs presented in the application are typical for remediation projects. The matching funds include: administrative costs for the City of Shelby to manage the project, disposal at the municipal landfill, and backfill material.

### Environmental Evaluation

The removal of contaminated soil will have long-term environmental benefits by effectively eliminating health and environmental threats. The adverse environmental impacts associated with this project are short-term and associated with construction. The construction impacts include fugitive dust emissions and storm water runoff, both of which can be controlled with best management practices.

### **Public Benefits Assessment**

Investigations conducted by the DEQ have shown that the contamination at the Shelby Refinery site represents a threat to human health and the environment. The property was abandoned for taxes and is now owned by the City of Shelby. The requested funding is adequate to return the site to a condition that is suitable for industrial use. Once the cleanup is completed, the City of Shelby would redevelop the site as an industrial park. If the cleanup is not completed, the site would remain as it is indefinitely. When complete, the project will have turned an unproductive, vacant, and potentially hazardous piece of property into an industrial facility that provides jobs and an expanded tax base.

### **Recommendation**

A grant of up to \$300,000 is recommended for this project contingent upon DNRC approval of the project scope of work and budget.

## Project No. 5

<b>Applicant Name</b>	Missoula County
<b>Project Name</b>	St. Louis Creek Mine Reclamation
<b>Amount Requested</b>	\$ 300,000
<b>Other Funding Sources</b>	\$ 118,000 U.S. Forest Service
	\$ 35,000 319 Non-Point Source Pollution Grant
	\$ 3,000 Trout and Salmon Foundation
	\$ 3,000 Westslope Chapter Trout Unlimited
	\$ 2,400 Missoula County
	\$ 2,000 Tiffany and Company Foundation
	<u>\$ 48,500</u> Remaining unsecured amount
<b>Total Project Cost</b>	\$ 511,900
<b>Amount Recommended</b>	\$ 300,000

**Project Abstract** (Prepared and submitted by the applicant)

The Joe Wallit Mine is at 4,500 feet in the headwaters of the Ninemile Creek watershed. The legal description is T17N, R24W, S8. Now abandoned, the strip mine was operated in the 1970s and terminated in 1981. Bond left by the claimants was insufficient for full reclamation. A responsible party search has determined that no past owners or operators are liable.

The site is approximately 1,200 feet long and 800 feet wide. It includes 68,000 cubic yards of tailings and waste material. Environmental impacts include a large eroding cut in the hillside and a pond with heavy metal laden water. Exposed tailings are leaching arsenic and copper into St. Louis Creek at levels exceeding standards for aquatic life. The middle portions of the waste rock dumps are eroded by the East Fork of St. Louis Creek; the lower edges of the waste rock dumps are eroded by mainstem St. Louis Creek. Monitoring of fish and macroinvertebrates shows populations decreasing downstream from the mine.

The Joe Wallit Mine is listed as priority #100 on the priority site list developed by DEQ's Mine Waste Cleanup Bureau (MWCB). It was also identified as a priority mine reclamation site in the Ninemile TMDL planning area and in a post-burn environmental impact statement developed by the Lolo National Forest in 2002.

The tailings removal and stream rehabilitation project is a cooperative effort between Missoula County, Trout Unlimited, and the Forest Service. Pre-project monitoring, surveying, and planning were initiated in 2005. The Forest Service Region 1 Abandoned Mine Land program is coordinating the project. The final engineering survey and stream channel design will be completed in fall 2008. Project construction is planned for summer 2009.

### **Technical Assessment**

The St. Louis Mine Reclamation project is a partnership between Missoula County, Trout Unlimited, and U.S. Forest Service (USFS). As stated in the grant application, the project has two primary goals to address the environmental problems associated with the Joe Wallit Mine and its effects on the East Fork of St. Louis Creek and St. Louis Creek. These are:

- (1) Protect water quality in St. Louis Creek from potentially leaching heavy metals that could adversely affect surface and groundwater; and
- (2) Improve fisheries in St. Louis Creek and attain naturally functioning stream processes.

The project is expected to take 14 months and be completed by August 2010.

The project involves two basic components: (1) removal of waste rock, and (2) stream restoration along 2,500 feet (total) of the East Fork St. Louis Creek and St. Louis Creek. The project proposes to remove 30,000 cubic yards (44%) of the estimated 68,300 cubic yards of waste rock. Waste rock will be used to backfill an eroding cut slope. The cut slope will be contoured, capped with topsoil, and revegetated. Waste rock not used as backfill will be moved to a small tailings storage area west of the Joe Wallit Mine where it will be graded and revegetated. The remaining 38,300 cubic yards of waste rock will be capped with topsoil in-situ and revegetated.

Stream restoration is a component of the overall project, but funds from RDGP will not be used for that component. Upstream reaches of St. Louis Creek will be used as reference reaches and will drive design of the stream channel. These upstream reaches are classified as Rosgen A3 and A4 channel types, high-gradient (7% to 15%) step-pool, cobble/gravel systems with width/depth ratios ranging between 5.6 and 6.4. Bankfull (or design) discharge is not mentioned for either of the creeks.

Detail in the proposal is sparse. However, a conversation with a U. S. Forest Service geologist involved with the project clarified several details. The concept is feasible and utilizes standard practices for abandoned mine cleanup on relatively small, minimally contaminated sites. The geologist mentioned that the most contaminated areas will be excavated and placed at the bottom of the cut-slope repository, less contaminated soils placed on top of that, followed by topsoil. According to the geologist, subsoils found below the waste rock will be sampled and excavated until an acceptably low level of arsenic and copper is found in the soils (e.g., 100 mg/kg). Logging roads upgradient of the project area will be decommissioned to reduce runoff entering the repository at the cut bank.

Alternatives to the proposed approach include no action and complete removal of all waste rock. The no-action alternative will not address the purpose and need of the project. Complete removal of all waste rock was considered cost prohibitive.

Several items will be monitored over three summers: soil and water, fish populations, temperature (ambient air or water temperature is not specified), macroinvertebrates, Wolman pebble counts, bank erosion (Rosgen Bank Erosion Hazard Index), and vegetation. However the applicant failed to provide quantifiable success criteria for these monitoring parameters. Without success criteria, the success or failure of the project cannot be gauged. Should the project not progress as expected (e.g., site does not revegetate or becomes infested with noxious weeds), a contingency or adaptive management plan is not discussed. The following monitoring parameters should be included in the monitoring plan and developed into quantifiable success criteria: monumented channel cross-sections of the completed channel, residual pool depths (of designed pools), percent fines in pools (in reach and downstream of project), percent woody plant survival (bare root, cuttings, etc.), and percent of herbaceous plant vegetative cover.

### Financial Assessment

	RDGP	Matching Funds	Total
Salaries and Wages	\$ 0	\$ 29,900	\$ 29,900
Contracted Services	\$ 300,000	\$ 120,000	\$ 420,000
Supplies and Materials	\$ 0	\$ 62,000	\$ 62,000
<b>Total</b>	<b>\$ 300,000</b>	<b>\$ 211,900</b>	<b>\$ 511,900</b>

Of the \$300,000 requested from the Reclamation and Development Grant fund, \$290,000 would be paid to a local contractor for tailings removal and slope contouring, and \$10,000 to a local engineering firm to develop an erosion control plan, mine waste stabilization plan, surface runoff routing, and any other measures affecting placement and containment of mine waste at the site. Outside funding commitments have been obtained from the USFS, 319 non-point source grant program, Trout and Salmon Foundation, Trout Unlimited, and the Tiffany and Company Foundation. An additional \$48,500 will be needed but has



not yet been secured. (Trout Unlimited has requested additional funding through Senator Max Baucus that may cover this deficit).

### **Environmental Evaluation**

No long-term adverse impacts are anticipated under this project. Adverse impacts would be temporary and of short duration. Potential adverse impacts include increased sedimentation and turbidity in the creeks during construction, both from erosion of side slopes during precipitation and from in-stream restoration. Westslope cutthroat trout (a sensitive species) inhabit Ninemile Creek downstream from the project area, and bull trout (federally listed as threatened) are considered an incidental species in Ninemile Creek. Spawning times of resident fish must be considered during cleanup and stream restoration so impacts associated with increases in turbidity will be avoided/minimized. Applicants indicate that the U.S. Fish and Wildlife Service will be consulted before project implementation.

The project would benefit aquatic organisms by reducing copper and sediment loading to Ninemile Creek, (which DEQ lists as being impaired by sediment). The project would also benefit downstream communities by improving water quality.

### **Public Benefits Assessment**

Montanans, and especially downstream residents of Ninemile Valley, would benefit from this project because of the expected reduction in the level of contamination in the area, improved water quality, reduced sedimentation to Ninemile Creek, and the increased possibility of an improved fishery on St. Louis Creek. The cleanup and capping of the waste rock reduces possible health risks to campers visiting the site. Aquatic life would benefit from reductions in sediment loading and reduced copper concentrations in the sediment. Terrestrial wildlife would also benefit by increased foraging opportunities.

### **Recommendation**

A grant of up to \$300,000 is recommended for this project contingent upon DNRC approval of the project scope of work and budget.

The project has considerable momentum and support from several different agencies and will provide substantial public and environmental benefits. However, it is recommended that before initiating any work, that a more detailed, comprehensive monitoring plan, complete with quantifiable success criteria, be provided for review and approval.

## **Project No. 6**

**Applicant Name** Montana Department of Environmental Quality (DEQ)  
**Project Name** Spring Meadow Lake Reclamation Project

**Amount Requested** \$ 300,000  
**Other Funding Sources** \$ 1,142,180 Applicant  
**Total Project Cost** \$ 1,442,180

**Amount Recommended** \$ 300,000

**Project Abstract** (Prepared and submitted by applicant)

Spring Meadow Lake State Park is an urban (Helena) state park with 85,000 visitors annually. The park is adjacent to the Montana Wildlife Shelter. Both the park and the shelter are administered by the Department of Fish Wildlife & Parks (DFWP).

Both the park and the shelter are contaminated with mineral processing waste, principally lead and arsenic, residuals from milling and tailings disposal during the World War I era. The Spring Meadow Lake Reclamation Project would remove these hazardous substances from the park and shelter, and transport them to the Luttrell Pit Repository. They will be encapsulated with wastes removed from mining sites in the Basin Creek and Tenmile Creek National Priorities List Superfund sites.

Approximately 34,300 cubic yards of tailings and contaminated soils have been identified within the Spring Meadow Lake site. Contaminated sediments have also been identified along the eastern and southern edges of the park lake (Eastern Arm area). These contaminated sediments correlate with an area within the lake where surface water concentrations of arsenic are elevated.

The overall objective of the Spring Meadow Lake Reclamation Project is to protect human health and the environment. Specifically, site reclamation will limit human and ecological exposure to mineral processing-related contaminants in the soils and reduce the mobility of those contaminants.

Reclamation will be completed within one field season, or 90 days.

Steps include:

- Improve access roads within the Spring Meadow lake site;
- Excavate and haul wastes to Basin Creek Mine Leach Pad (LP)1 and consolidate the materials with other mine wastes at LP1;
- Backfill, grade, and place cover soil over the excavated areas; and
- Revegetate the disturbed areas at the Spring Meadow Lake site.

### **Technical Assessment**

The primary goal of the Spring Meadow Lake reclamation project is to reduce or eliminate risks to human health and the environment. The objective for the project is to remove the tailings and other mineral processing wastes for disposal in an off-site repository.

Investigation of the Spring Meadow Lake site was initiated by the DEQ in 2004, following work conducted by Carroll College students in 2002 that identified elevated levels of lead and manganese in sediment samples from the lake. DEQ conducted several phases of investigation and engineering design, including a site inspection and hazardous materials inventory, cultural resources and reclamation site investigations, and an expanded engineering evaluation and cost analysis (EEE/CA).

Six alternatives were evaluated in the EEE/CA, including: (1) no action; (2) institutional controls; (3) containment; (4) excavation and on-site disposal, (5) excavation and off-site relocation at LP1 at the Basin Creek Mine; and (6) excavation and off-site disposal at a local municipal landfill. The no action

alternative would not reduce risks to public health and the environment. Institutional control would reduce, but not eliminate, risks to public health and the environment. Containment would eliminate risks but there would be long-term site maintenance and contaminated materials remaining on site would be incompatible with park land uses. Excavation and on-site disposal would eliminate risks but there would be long-term site maintenance and contaminated materials remaining on site which would be incompatible with park land uses. Excavation and off-site disposal at the Basin Creek Mine would eliminate risks, reduce long-term on-site maintenance, and be compatible with future park land uses. The excavation and off-site disposal at a local municipal landfill is similar to excavation and off-site disposal at the Basin Creek Mine in terms of risk reduction and future land use, but would be more expensive. The preferred alternative identified in the EEE/CA is excavation and off-site disposal at LP1 at the Basin Creek Mine. However, LP1 has been closed and can no longer be used for disposal. The Luttrell Pit, also at the Basin Creek Mine and currently in use, has been selected as the substitute disposal facility.

**Financial Assessment**

	<b>RDGP</b>	<b>Matching Funds</b>	<b>Total</b>
Contracted Services	<u>\$ 300,000</u>	<u>\$ 1,142,180</u>	<u>\$ 1,442,180</u>
<b>Total</b>	<b>\$ 300,000</b>	<b>\$ 1,142,180</b>	<b>\$ 1,442,180</b>

No costs for salaries and wages and fringe benefits are included in the RDGP application. DEQ staff salaries, benefits, travel, and equipment will be paid for by DEQ using federal Office of Surface Mining (OSM) funds. Costs presented in the EEE/CA are typical for mine reclamation projects.

**Environmental Evaluation**

The removal and off-site disposal of mine wastes at the Basin Creek Mine site will reduce health risks to acceptable levels for a park/lake recreational site. Ecological risks, including exposure of deer to lead through ingestion of surface salts and plant phytotoxicity, would also be reduced to acceptable levels. The adverse environmental impacts associated with this project are short-term and associated with construction. Construction impacts are generally associated with dust emissions and storm water runoff, both controlled with best management practices.

**Public Benefits Assessment**

General problems at the Spring Meadow Lake site that could impact human health include elevated concentrations of metals in waste materials, surface water, and sediments. Accessing the waste materials may result in significant health-related consequences to the human population. To address that problem, DEQ developed and screened various reclamation alternatives. Removal of waste to the Luttrell Pit was selected because it was the most protective of human health and the environment of the alternatives.

Most of the DEQ mine reclamation construction projects are conducted by local or in-state contractors. These contractors often hire or have local workers working on the projects. DEQ requires that all contractors pay Davis-Bacon wages which are generally better than the usual wage for a similar job. The Spring Meadow Lake site will likely have a positive impact on the local economy due to local employment and items such as fuel that will likely be purchased locally.

The benefits to Montanans will be both direct and indirect. Direct benefits will be removal of contaminated waste and the resulting water quality improvements and employment of local workers. Indirect benefit could include possible economic benefits from increased recreation in the area and an increase in wildlife habitat. These benefits are permanent with the removal of the waste and reclamation of the land.

**Recommendation**

A grant of up to \$300,000 is recommended for this project contingent upon DNRC approval of the project scope of work and budget.

**Project No. 7**

**Applicant Name** Cascade County Commission  
**Project Name** County Shops Remediation of Wood Treatment Preservatives

**Amount Requested** \$ 300,000  
**Other Funding Sources** \$ 737,619 Applicant  
**Total Project Cost** \$ 1,037,619

**Amount Recommended** \$ 300,000

**Project Abstract** (Prepared and submitted by applicant)

The Cascade County Shops, in Great Falls between Third Street NW and the Missouri River, have suffered historic environmental degradation, the result of former refining operations, petroleum releases, and other substances released onto the surface and into the subsurface. Numerous assessments and investigations have been conducted throughout the property, and the characteristics of various contaminant plumes have been properly documented.

One contaminated area is associated with a former pentachlorophenol (PCP) oil treatment/dipping tank. Cascade County used PCP, a common wood preservative, to treat bridge timbers before installation. These actions resulted in contamination of the site by PCP and its by-products, dioxin and furans.

An environmental consultant has conducted multiple investigations, including test-hole advancement, monitoring well construction, soil and groundwater sampling, analytical testing, exhibit preparation, and reporting. Conclusions depict the areas of contamination and remedial alternatives considered most cost effective and reliable.

The proposed remediation project will consist of excavation and removal of impacted soils, installing a groundwater collection and conveyance system, and installing a groundwater pumping and treatment system. The pumping and treatment system will be operated until acceptable concentrations are achieved. Treated system effluent will be sampled, analyzed, and sent to the Great Falls wastewater treatment plant. Contaminated soils will be hauled and discarded at a certified landfill or hazardous waste treatment facility. Soil and groundwater analyses will document remediation success. A final remedial action report will document field work, clean-up efficacy, and analytical findings. On behalf of the Cascade County Commissioners, the environmental consultant will manage all remedial activities. Estimated time for completion, including groundwater treatment system operation, is 24 to 36 months.

**Technical Assessment**

This site has been under investigation since March 2006, with additional investigations in May, July, and fall 2006. The most recent phase of field investigation occurred in March 2008. The dip tank and post drying area, likely sources of the PCP and its by-products, have been removed. The preferred alternative described in this application proposes to excavate and dispose of the contaminated soil. A “pump and treat” system would then be installed to treat the area groundwater. The contaminated groundwater would be piped to a sump, pumped through a treatment tower (granular activated carbon [GAC]) and then the treated water would be discharged to the Great Falls wastewater treatment system.

Cascade County states its primary project goal is to mitigate environmental problems and potential threats to public health associated with the former operation of the wood preservative dipping tanks at Cascade County property in Great Falls. The objectives Cascade County proposed are to remove contaminated soils and pump and treat the contaminated water.

A GAC treatment tower would remove PCP and by-products from the groundwater; however, the design details and thus the cost cannot be established with confidence because cleanup or discharge limits have

not been established. In addition, the application suggests an operation and maintenance time for the “pump and treat system” of three years. However, it is likely this system would operate longer.

According to the letter provided in Appendix E of the application, DEQ anticipates that a voluntary clean-up plan will be submitted under the Voluntary Cleanup and Redevelopment Act (VCRA) for this project. Because a voluntary clean-up plan has not been submitted to DEQ, clean-up levels have not been established and DEQ has not reviewed the alternative. In addition, discussions with the Great Falls wastewater treatment plant have not been conducted.

The final product of cleaning up this site would be environmentally “clean” land that could be commercially developed.

**Financial Assessment**

	<b>RDGP</b>	<b>Matching Funds*</b>	<b>Total</b>
Salaries and Wages	\$ 0	\$ 35,880	\$ 35,880
Fringe Benefits	\$ 0	\$ 6,789	\$ 6,789
Contracted Services	<u>\$ 300,000</u>	<u>\$ 694,950</u>	<u>\$ 994,950</u>
<b>Total</b>	<b>\$ 300,000</b>	<b>\$ 737,619</b>	<b>\$ 1,037,619</b>

\* Cascade County will provide all matching funds.

A reasonable cost estimate for remediation at the site is difficult to prepare because a plan has not been prepared and submitted to DEQ. The cost estimate for the preferred alternative is based on unsubstantiated quantities of contaminated soil to be disposed of locally versus a more expensive out-of-state location, overly optimistic operational period for groundwater treatment, and an unverified discharge location for treated groundwater. In addition, VCRA permit preparation costs and DEQ oversight costs have not been included in the cost estimate.

Funding is recommended with the stipulation that a voluntary cleanup plan application must be prepared before implementation of the proposed plan. The final preferred plan may change after DEQ reviews, however, it is likely soil would still be removed and the majority of the requested grant money is proposed for this task. The remaining grant money is proposed for use by a consulting engineer. This money would likely be used to prepare the VCRA permit.

**Environmental Evaluation**

Sort-term adverse impacts during construction include increased truck traffic and blowing dust; in addition, Cascade County would not be able to use the area. Safe driving practices by operators of heavy equipment and vehicles would reduce the impact of the increased traffic. The blowing dust would be reduced by watering the construction area. Since Cascade County is moving from this site, it is not likely to be a problem if the area is unavailable.

A possible adverse long-term impact may be that the drawdown from the proposed pump and treatment system may affect adjacent properties and ongoing remediation. Other anticipated long-term impacts are beneficial to human health and the environment and to economic development of this area. The project would reduce contaminant concentrations in soil and groundwater to a level that would protect both human health and the environment.

**Public Benefits Assessment**

The application states that the project would: remove contaminants from soils and groundwater, thereby improving the quality of natural resources; conserve natural resources by reducing the spread of contaminants; indirectly benefit adjacent landowners and recreational users; and protect public health,

safety, and welfare. In addition, construction and oversight jobs would be created during remediation, during which county personnel would receive on-the-job training.

The selected alternative would remove contaminants from the property, thus providing for perpetual benefits.

**Recommendation**

A grant of up to \$ 300,000 is recommended for this project contingent upon DNRC approval of the project scope of work and budget.

## **Project No. 8**

**Applicant Name** Montana Department of Environmental Quality (DEQ)  
**Project Name** McLaren Tailings Reclamation Project

**Amount Requested** \$ 300,000  
**Other Funding Sources** \$ 3,870,878 Applicant  
**Total Project Cost** \$ 4,170,878

**Amount Recommended** \$ 300,000

**Project Abstract** (Prepared and submitted by applicant)

The McLaren Tailings site is an abandoned hard rock mine/mill site in Park County in S25, T9S, R14E. The site, approximately 20 acres, includes one waste rock dump containing approximately 56,000 cubic yards (CY) of waste rock, and a tailings impoundment with an estimated volume of 239,000 CY. The waste rock and tailings are contaminated with heavy metals which have leached into the surrounding soil, groundwater, and surface water. The contaminants of concern (COCs) at the McLaren Tailings site include: copper, iron, manganese, and acid rock drainage (resulting from water seeping through the on-site waste sources).

The primary objective of this project is to improve the human health and environment of the area by isolating the wastes and contamination from the natural elements and the public. Reclamation will remove the wastes from the waterways and adjacent areas and place them into a capped repository onsite. This action will isolate mine waste from groundwater and surface water. All disturbed areas would be regraded, topsoiled, and revegetated. When the above tasks are completed, heavy metals exposure and migration will be significantly reduced or eliminated. After tailings are removed, the Soda Butte Creek stream channel will be re-established in its original location in the floodplain. Once tailings are removed from the former stream channel and floodplain and mining wastes encapsulated in the waste repository, water quality will be improved and the site and stream areas will again be able to support a native stand of vegetative species.

The DEQ Mine Waste Cleanup Bureau's (MWCB) and Abandoned Mines Section (AMS) will conduct this reclamation project. The work will be completed over two construction seasons.

### **Technical Assessment**

The McLaren Tailings site is ranked number 39 of 294 on the DEQ MWCB's, Abandoned Mine Lands Priority Site List. This project requests funding to reclaim approximately 20 acres and 267,200 cubic yards of mining impacted soil and tailings. Mining-impacted material will be removed from stream channels and adjacent areas and placed into an on-site, unlined repository. The contaminated material will then be covered with an 18-inch multilayered cap to prevent precipitation infiltration and percolation.

The applicant adequately documented the history of the problem and previous investigations. Supporting documents were provided electronically with the application, including the draft Expanded Engineering Evaluation and Cost Analysis (EEE/CA) for the McLaren Tailings site. The cost-benefit analysis was very detailed comparing the cost of each alternative related to the percentage of risk reduction of the alternative. The alternatives analysis was detailed and provided adequate information and comparison data for the considered alternatives. The applicant listed the following nine possible alternatives to the project:

- Alternative 1: No action;
- Alternative 2: Institutional controls;
- Alternative 3: In-place containment;
- Alternative 4: Partial removal and in-place containment;
- Alternative 5a: On-site disposal in a fully encapsulated repository;

- Alternative 5b: On-site disposal in an un-lined repository with a multi-layered cap;
- Alternative 5c: On-site disposal in a constructed repository with a soil cover;
- Alternative 6: Off-site disposal in a nearby mine waste repository; and
- Alternative 7: Off-site disposal in a Montana Class II landfill.

Alternatives were evaluated based on protection of human health, compliance with Applicable or Relevant and Appropriate Requirements (ARARs), long-term effectiveness, reduction of toxicity and mobility, short-term effectiveness, implementability, and cost. Alternative 5b was selected as the remedial action best meeting the above criteria. The applicant demonstrated adequate need and urgency for supporting the selected alternative, and detailed supporting documents were provided on the attached EEE/CA document. Administration and staff have more than adequate experience to carry out the project, and similar projects have been completed at many previous sites.

The goals/objectives outlined in the application were adequate. Most task descriptions were not overly detailed, but provided enough information to properly evaluate the application. The project schedule is detailed and provides measurable and achievable milestones.

### Financial Assessment

The total budget for this project:

	<b>RDGP</b>		<b>Matching Funds</b>		<b>Total</b>
Salaries and Wages	\$ 0		\$ 0		\$ 0
Fringe Benefits	\$ 0		\$ 0		\$ 0
Contracted Services	\$ 300,000		\$ 3,870,878		\$ 4,170,878
Supplies	\$ 0		\$ 0		\$ 0
Communications	\$ 0		\$ 0		\$ 0
Travel	\$ 0		\$ 0		\$ 0
Rent	\$ 0		\$ 0		\$ 0
Equipment	\$ 0		\$ 0		\$ 0
Miscellaneous	<u>\$ 0</u>		<u>\$ 0</u>		<u>\$ 0</u>
<b>Total</b>	<b>\$ 300,000</b>		<b>\$ 3,870,878</b>		<b>\$ 4,170,878</b>

The application states that the entire grant will be used for "Contracted Services." A preliminary cost estimate detailing the line item requirements for the entire project was provided. Matching funds will be provided solely by the DEQ Mine Waste Cleanup Bureau. The budget appears reasonable to fund the project. The applicant provided a detailed breakdown of costs, and no budget or funding irregularities were found. The unit costs used to develop the budget appear reasonable and adequate; however, the cost estimate for the EEE/CA was developed in 2002. DNRC believes that due to the relatively small portion of RDGP funds sought compared to the entire project budget, and the commitment by the applicant to assume all additional costs, the potentially low cost estimate is not a major concern. A detailed cost comparison of several project alternatives was provided.

The proposed project will directly affect approximately 20 acres, but will indirectly affect several thousand acres through improvement of surface water and groundwater quality in the Soda Butte Creek watershed.

### Environmental Evaluation

Environmental impacts associated with this project were evaluated and no apparent adverse long-term impacts will result. Beneficial results are primarily related to the removal of contaminated, mining-impacted soils affecting surface and groundwater. Minimal short-term, construction-related impacts will be controlled through permitting, proper construction methodology, and implementation of best management practices.



### **Public Benefits Assessment**

Successful completion of this project would lead to significant benefits to area landowners and Montana citizens. Direct benefits include improved human health and improved quality of natural resources resulting from the removal of contaminated waste. Indirect benefits resulting from this project include increased recreation and increase of wildlife habitat. The Soda Butte Creek watershed, which flows into Yellowstone National Park, would be significantly improved.

### **Recommendation**

A grant of up to \$300,000 is recommended for this project contingent upon DNRC approval of the project scope of work and budget.

## **Project No. 9**

<b>Applicant Name</b>	Lewistown, City of
<b>Project Name</b>	Reclamation of Berg Lumber Mill Site
<b>Amount Requested</b>	\$ 220,590
<b>Other Funding Sources</b>	\$ 6,100 Applicant
<b>Total Project Cost</b>	<u>\$ 226,690</u>
<b>Amount Recommended</b>	\$300,000

**Project Abstract** (Prepared and submitted by applicant)

This proposal seeks cleanup of soils contaminated with pentachlorophenol (PCP), dioxin/furan, and petroleum at the Berg Lumber Mill Site (BLMS) in Lewistown. The site is in the East ½ of the Southeast ¼ of Section 9, of T15 N and R18 E.

The BLMS property has historically been used for a lumber mill and associated activities, post and pole treating, and as a storage area for miscellaneous equipment, machine parts, vehicles, lumber, and sawdust piles. Most of the site's buildings, machinery, and other equipment and scrap metal have been removed; however, soil sampling has shown that the past activities have caused contamination of soils with PCP, dioxin/furan, and petroleum. PCP and dioxins in the soil appear to pose an unacceptable risk to human health, and PCP appears to pose an unacceptable risk of migration to groundwater. Petroleum hydrocarbon fractions exceed residential risk-based screening levels (RBSL) in surface soils and threaten beneficial uses, human health, and, potentially, groundwater.

Site cleanup will lower risk to acceptable levels, thus allowing transfer of ownership and redevelopment. Possible plans for redevelopment include (1) an industrial park or (2) a recreational facility for ball fields. Site cleanup would also allow for public access to Big Spring Creek.

### **Technical Assessment**

The primary goal of this project is to reduce or eliminate risks to human health and the environment at the Berg Lumber Mill site, which would allow the site to be transferred to the City of Lewistown. The objective for the project is to remove contaminated surface and subsurface soil from human or environmental contact.

The site was initially brought to the attention of the DEQ by a complaint about a white substance emanating from a culvert. The DEQ investigated the site to assess soil, surface and groundwater contamination. The investigations have identified soil contamination with dioxin and PCP concentrations that present a risk to human health through direct contact. In addition, the PCP concentrations are high enough to potentially leach to groundwater. The quantity of soil with PCP at concentrations above site-specific cleanup levels (SSCLs) is estimated at 40 cubic yards. The DEQ remedial investigation report was not completed when the RDGP application was prepared and subsequent review of site data indicated that dioxin-contaminated soil is also present at the site at concentrations exceeding SSCLs. The DEQ has estimated that 2,040 cubic yards of soil have dioxin concentrations above SSCLs calculated for industrial exposure, and 8,279 cubic yards of soil with dioxin concentrations above SSCLs calculated for residential exposure. The RDGP application addresses alternatives for remediating the 40 cubic yards of PCP- contaminated soil but not the 2,040 to 8,279 cubic yards of dioxin-contaminated soil.

Four alternatives were evaluated to address the PCP contamination: They include: (1) no action; (2) cap in place; (3) stabilization/solidification; and (4) excavation and off-site soil incineration. The no- action alternative would not alter the site. The cap in place alternative involves constructing a cap above the impacted soil that would reduce infiltration of surface water and reduce the likelihood of contaminants leaching to groundwater; it would also reduce exposure through direct contact. The stabilization/solidification alternative involves mixing the contaminated soil with a stabilizing agent that

would prevent leaching. The excavation and off-site soil incineration alternative would involve excavating contaminated soil and transporting it to an off-site facility for incineration. With the exception of no action, each of the alternatives would meet the project goal. The excavation and off-site incineration alternative is the most reliable and effective alternative and the only alternative that reduces toxicity of the contaminants. Cost estimates for the three active alternatives range from \$165,470 to \$210,900, with the proposed alternative the most expensive. The greater reliability, effectiveness, and toxicity reduction of the proposed alternative justify the additional cost. The alternatives analysis addresses the typical presumptive remedial technologies for PCP-contaminated soil and provides sufficient detail for evaluation.

### Financial Assessment

The proposed budget:

	<b>RDGP</b>	<b>Matching Funds</b>	<b>Total</b>
Salaries and Wages		\$ 5,000	\$ 5,000
Fringe Benefits		\$ 1,000	\$ 1,000
Contracted Services	\$ 220,590		\$ 220,590
Communications		\$ 100	\$ 100
<b>Total</b>	<b>\$ 220,590</b>	<b>\$ 6,100</b>	<b>\$ 226,690</b>

No RDGP funds for salaries and wages and fringe benefits are requested in the RDGP application. Costs in the application are typical for remediation projects. Matching funds are administrative costs for the City of Lewistown to manage the project. The RDGP application did not contemplate cleanup of dioxin-contaminated soil, which was not identified at the time the application was prepared. Cleanup of the dioxin-contaminated soil will add considerably to remediation costs for the site. While the budget submitted with the RDGP application is reasonable for the scope of work known at the time, it is insufficient to meet the overall goals; additional funds are needed. The applicant may be able to procure additional funding, up to \$200,000, from the EPA Brownfields Program.

### Environmental Evaluation

Removal of contaminated soil will have long-term environmental benefits by effectively eliminating health and environmental threats. The adverse environmental impacts associated with this project are short-term and associated with construction. Construction impacts are generally associated with dust emissions and storm water runoff, both controlled with best management practices.

### Public Benefits Assessment

DEQ investigations conducted have shown that contamination at the Berg Lumber Mill Site represents a threat to human health and the environment. The property is part of a Chapter 7 bankruptcy proceeding, controlled by a court-appointed bankruptcy trustee, and therefore cannot be held financially liable. No other sources of funding have been identified. Requested funding is inadequate to return the site to a condition suitable for recreational or industrial use. Once the cleanup is completed, the City of Lewistown would acquire the property for development. If the cleanup is not completed the site would remain as it is indefinitely.

### Recommendation

The RDGP application requested a grant for \$220,590. Due to uncertainties regarding the volume of PCP-contaminated soil requiring remediation and the need to also address dioxin-contaminated soil to meet project goals, additional funding is needed. A grant of up to \$300,000 is recommended for this project, contingent upon DNRC approval of the project scope of work and budget. While this grant increase will aid in meeting project goals, additional funds will probably be required from other sources to complete the cleanup.

**Project No. 10**

**Applicant Name** Ryegate, Town of  
**Project Name** Former Ryegate Conoco

**Amount Requested** \$ 259,200  
**Other Funding Sources** \$ 0  
**Total Project Cost** \$ 259,200

**Amount Recommended** \$ 259,200

**Project Abstract** (Prepared and submitted by applicant)

The abandoned Ryegate Conoco gas station is on Highway 12 and Kemp Street in Ryegate, Golden Valley County. Petroleum products released from the facility's underground storage tank have contaminated soil and groundwater at the site. The uppermost aquifer is unconfined 20 feet below ground and flows generally southeasterly. Free-floating petroleum has migrated on the water table at least 125 feet south, beneath and across Highway 12. A dissolved phase hydrocarbon plume, with concentrations of petroleum hydrocarbons exceeding water quality standards, extends approximately 300 feet from the site. The plume appears to be migrating farther from the source area. Residential water supply wells, the Ryegate town well intake, and the Musselshell River are downgradient of the leading edge of the hydrocarbon plume; a city water main borders the site on the south. The primary project goal is to stabilize the plume and remediate impacted groundwater that threatens local water supply sources and the Musselshell River. The secondary goal is to rehabilitate the site so the property can be developed and returned to the city/county tax rolls. Removing soil that contains petroleum at the site is the primary objective for attaining primary and secondary goals. Secondary objectives include installation of infrastructure for potential future *in situ* remedial measures and free product recovery. Installation of additional groundwater-monitoring wells and continued groundwater monitoring are objectives for plume delineation and assessment of project activities. The objectives, excluding ongoing groundwater monitoring and free product recovery, can be completed within one year. The town has retained a firm to conduct the project under regulatory authority of the DEQ and Montana Department of Transportation (DOT).

**Technical Assessment**

The groundwater and soil have been contaminated with petroleum products at this former gas station in Ryegate. Annual monitoring from 2003 through 2007 showed the extent of nonaqueous phase liquid (NAPL) or floating free product appears to be relatively well defined. The NAPL plume is migrating off the site to properties south. Based on analytical results for soil samples, source material remains at the facility. The leading edge of the dissolved-phase plume is approximately 450 feet downgradient of the site and within 400 feet of the nearest downgradient residential well.

Multiple technical studies and reports are referenced in the application, with the earliest report dated December 1993 and the most recent dated August 2007. Three remedial investigations and reports, one groundwater sampling investigation and report, and five monitoring reports were completed for this site. As a part of the ongoing investigation, a natural attenuation assessment was also conducted in 2003. The assessment concluded that although natural attenuation is occurring, it cannot control plume migration or provide site remediation within at least 100 years. The majority of these investigations have been conducted for the Leaking Underground Storage Tank (LUST) program.

The application provides a table that specifies project goals and objectives. Goals include (1) plume stabilization and (2) groundwater remediation. Objectives for these goals include soil excavation, installation of subsurface infrastructure for potential future *in situ* remedial measures, free product recovery, installation of downgradient monitoring wells, replacement of monitoring wells destroyed during soil excavation, and groundwater monitoring. The other goal is property rehabilitation. Objectives for this

latter goal include building demolition, soil excavation, and treatment of excavated soil through landfarming.

The applicant provided text and a table that summarize the evaluation of five action alternatives for remedial technology. The preferred alternative is a combination of these action alternatives. The level of detail adequately supports the alternative selection.

The proposed preferred alternative would verify that the contaminated soil can be landfarmed, permit two one-time landfarms, inspect on-site buildings for asbestos, demolish two on-site buildings, obtain an encroachment permit from the DOT, excavate contaminated soil (including source material), install horizontal piping in the excavation, landfarm the contaminated soil, install monitoring wells, sample and analyze groundwater-monitoring wells, recover free product, and present a report. Horizontal piping would be part of the infrastructure used for possible future remediation of dissolved-phase contaminants in groundwater. A description of air sparging well installation was also included in the preferred alternative; however, installing these wells was not included in the cost estimate. Tasks described in the application should meet stated goals.

Two of the three goals would be completely met as a result of the preferred plan. The third goal, groundwater remediation, would be partially met under the preferred plan when NAPL would be pumped from the ground and the infrastructure for possible remediation of dissolved-phase contaminants in groundwater would be installed.

According to the application, NAPL and dissolved-phase contaminants in groundwater have been migrating off site toward residential houses and wells. In addition, the source soil is still contributing to groundwater contamination.

Letters of support from the director of the DEQ and the DEQ LUST Brownfields Section were included in the application.

### Financial Assessment

The project budget:

	<b>RDGP</b>	<b>Matching Funds</b>	<b>Total</b>
Salaries and Wages	\$ 1,100	\$ 0	\$ 1,100
Fringe Benefits	\$ 0	Not applicable	\$ 0
Contracted Services	<u>\$ 258,100</u>	<u>\$ 0</u>	<u>\$ 258,100</u>
<b>Total</b>	<b>\$ 259,200</b>	<b>\$ 0</b>	<b>\$ 259,200</b>

The budget is detailed and reasonable; however, multiple assumptions had to be made to develop the cost. The assumptions are reasonable; some increased estimated cost, and some decreased it. The overall effect on the cost should be minimal. Although the air sparging system would not be implemented under the preferred alternative, the cost of installing horizontal pipe before backfill would be negligible. The town is likely to incur administrative costs above those requested from RDGP.

### Environmental Evaluation

When this project is completed, groundwater would still be contaminated with dissolved hydrocarbons; however, the contaminated soil source would be gone, some NAPL would be removed from multiple monitoring wells and one recovery well, and air sparging wells would be in place to use as needed, depending on results from samples from groundwater-monitoring wells. The project would reduce overall contamination.

There would be minimal, short-term adverse impact, which can be reduced or mitigated by a site safety plan and standard operating procedures.

### **Public Benefits Assessment**

This project would remove and treat petroleum-contaminated soil and remove floating petroleum or NAPL from the groundwater surface. This removal would eliminate most of the source of petroleum that has contributed to the dissolved-phase groundwater contamination. This removal would also likely slow migration of the dissolved-phase contaminant plume toward residential water supply wells, the Ryegate town well intake, and the Musselshell River. In addition, this removal eliminates the possibility that hydrocarbon compounds would permeate Ryegate water main that runs through the contaminated soil.

### **Recommendation**

A grant of up to \$259,200 is recommended for this project contingent upon DNRC approval of the project scope of work and budget.

**Project No. 11**

**Applicant Name** Montana Department of Environmental Quality (DEQ)  
**Project Name** Emery Reclamation Project

**Amount Requested** \$ 300,000  
**Other Funding Sources** \$ 1,985,917 Applicant  
**Total Project Cost** \$ 2,285,917

**Amount Recommended** \$ 300,000

**Project Abstract** (Prepared and submitted by applicant)

The purpose of this project is to address human health and environmental safety hazards associated with exposed and accessible heavy metals and acid mine drainage originating from the Emery Mine. The Emery Mine is in the Emery Mining District in southern Powell County near Deer Lodge. The site is in the east-central portion of S10 and the west-central portion of S11, T7N, R8W.

The Emery Mine consists of 13 waste rock dumps containing 235,817 cubic yards of waste rock, 12 shafts, 17 adits, and one tailings pond with an estimated volume of 24,600 cubic yards. Waste rock and tailings are contaminated with heavy metals, which have eroded and leached into the surrounding soil, groundwater, and surface water. Site wastes contain significantly elevated levels of antimony, arsenic, cadmium, copper, lead, manganese, and zinc.

The primary objective of this project is to improve the human health and environment of the area by isolating the wastes and contamination from the natural elements and the public. Reclamation will remove the wastes from the waterways and adjacent areas, and place them in a capped repository onsite. Site surface water would be isolated from contact with contaminant mine wastes and all disturbed areas would be regraded, topsoiled, and revegetated. When the above tasks are completed, heavy metals exposure and migration will be significantly reduced or eliminated. Water quality will be improved, and the site and stream areas will again be able to support native vegetative species.

The DEQ Mine Waste Cleanup Bureau (MWCB) Abandoned Mines Section (AMS) will conduct this reclamation project. Once construction is implemented, the project should be completed in 150 calendar days.

**Technical Assessment**

The application provides a list of previous investigations and analysis conducted at the Emery Mine, with the earliest document completed in 1993 and the most recent in 2002. These investigations and reports have provided the information needed to implement the preferred alternative.

An Expanded Engineering Evaluation/Cost Analysis (EEE/CA) for reclamation of selected abandoned tailings and waste rock piles at the Emery Mine Site was completed 2002. Section 5.0 in the EEE/CA provided a baseline human health and ecological risk assessment. The assessment showed risk to recreational users and ecological receptors in the area stream and native terrestrial plant communities; it also supported the need for and urgency of site remediation.

Twelve alternatives, including no action, were considered in the EEE/CA. The preferred alternative is expected to attain all applicable or relevant and appropriate requirements (ARARs); however, it is not expected to reduce human health and ecologic risk to a level that complies with risk reduction goals for the site. According to the EEE/CA, three of the alternatives evaluated would likely attain ARARS, but would not meet risk reduction goals. The EEE/CA states that two of these alternatives are "significantly more expensive" than the preferred alternative.

Alternative 4b, the preferred alternative, involves removing and consolidating waste at two separate on-site containment areas (near a barrow pit area [BA2] and a waste rock area [WR1]), depending on ownership of the various sources.

The Rocker Gulch stream would be returned to its original location in the valley bottom because the tailings impoundments would be completely removed. To the extent practical, the portion of WR1 on land administered by the U.S. Forest Service (USFS) would be recontoured, covered, and reclaimed separately from the portion of WR1 on private land. Per USFS policy, this activity would be completed in a manner to avoid intermixing “private” wastes with “federal” wastes.

A factor that could limit implementation of this alternative is the potential to encounter groundwater beneath waste sources targeted for removal (especially tailings). If significant groundwater were encountered, pretreatment of wet materials might be necessary to eliminate free liquids.

Groundwater samples collected indicate that on-site wastes are not impairing groundwater quality in the area; however, modeling results indicate that lead and cadmium concentrations in local groundwater may exceed drinking water standards.

Water quality data indicate that streams flowing in the area of the Emery Mine Site are affected by mine and mill wastes. Returning the Rocker Gulch stream to its original streambed as proposed would likely eliminate this impact.

The following technical issues should be addressed before the project is implemented. (1) Wastes from several landowners have been placed in a single repository in recent mine waste cleanup projects. If this approach can be followed, cost may be reduced. (2) The USFS should be contacted to verify that a separation of wastes plan is needed and appropriate. (3) A 12-inch vegetated cover soil layer may not be thick enough to prevent upward migration of contaminants into the root zone of the new cap. Several past mine waste cleanup projects with a shallow cover of soil have experienced long-term failure through migration.

## Financial Assessment

The project budget:

	<b>RDGP</b>	<b>Matching Funds</b>	<b>Total</b>
Salaries and Wages	\$ 0	\$ 0	\$ 0
Fringe Benefits	\$ 0	\$ 0	\$ 0
Contracted Services	\$ 300,000	\$ 1,985,917	\$ 2,285,917
Supplies and Materials	\$ 0	\$ 0	\$ 0
Communications	\$ 0	\$ 0	\$ 0
Travel	\$ 0	\$ 0	\$ 0
Rent and Utilities	\$ 0	\$ 0	\$ 0
Equipment	\$ 0	\$ 0	\$ 0
Miscellaneous	\$ 0	\$ 0	\$ 0
<b>Total</b>	<b>\$ 300,000</b>	<b>\$ 1,985,917</b>	<b>\$ 2,285,917</b>

The application requests no RDGP funds for salaries and fringe benefits. The cost estimate is reasonable for completing the preferred alternative. However, the technical issues discussed in the previous section may affect project cost. These issues include consolidating the waste into one repository, contacting the USFS about separation of wastes, and evaluating whether a 12-inch vegetated cover soil layer is thick enough. Any change in costs would be borne by the Mine Waste Cleanup Bureau.



## **Environmental Evaluation**

Most of the adverse impacts associated with this project are short-term and associated with the field work portion of the project. Short-term potential impacts include: increased demand on environmental resources of land, water, air, and energy and on government services; and traffic. Best management practices and adhering to a site safety plan could reduce or mitigate short-term impacts. In addition, the site would be monitored for three years to ensure completed construction does not fail.

Improving the road into Emery Mine would improve human access, which could adversely affect area wildlife. The impact is expected to be minimal, however. The Emery Mine site may be eligible for the National Register, so a Memorandum of Understanding would be signed between DEQ and the State Historic Preservation Office (SHPO), which would define necessary steps that DEQ will have to take before the project begins.

Unless the waste repositories fail, no other anticipated long-term adverse environmental impacts are anticipated.

## **Public Benefits Assessment**

Protection of human health and the environment would increase when the preferred alternative is implemented. Prevention of direct human contact would be achieved. Remediation at the Emery Mine would significantly reduce surface water contamination, which currently presents long-term risks to environmental resources as well as potential human health risks. Completion of the preferred action would eliminate the pathway that affects human health through the food chain through uptake of contaminants by fish, other aquatic life, and streamside vegetation. Toxicity, mobility, and volume of contaminants would be reduced under the preferred alternative.

## **Recommendation**

A grant of up to \$ 300,000 is recommended for this project contingent upon DNRC approval of the project scope of work and budget.

**Project No. 12**

<b>Applicant Name</b>	Park County
<b>Project Name</b>	Fleshman Creek Urban Restoration
<b>Amount Requested</b>	\$ 300,000
<b>Other Funding Sources</b>	\$ 2,457,000 FEMA Pre-Disaster Mitigation Grant
	\$ 30,000 Montana Fish & Wildlife Conservation Trust
	\$ 5,000 Montana Trout Foundation
	\$ 60,000 Volunteer Groups
	\$ <u>48,000</u> Park County
<b>Total Project Cost</b>	\$ 2,900,000
<b>Amount Recommended</b>	\$ 300,000

**Project Abstract** (Prepared and submitted by applicant)

Park County began planning the Fleshman Creek Urban Restoration project in April 2006 when the Army Corps of Engineers suggested that Park County apply for grant funds to FEMA's Pre-Disaster Mitigation grant program to replace undersized culverts through which Fleshman Creek flows in Livingston. The Army Corps' concern for the community is that the creek has a history of flooding that could pose a fair risk to property and lives.

When Park County officials began discussing the proposed Fleshman Creek culvert replacement project with FEMA and Montana Disaster and Emergency Services representatives, they were encouraged to take a holistic approach to restoring Fleshman Creek to a more natural and flood-resistant state not only to have undersized culverts replaced, but also to make other improvements to the watershed.

As a result, Park County developed the project to achieve the following goals:

- Mitigate risks to property and life associated with flooding hazards from Fleshman Creek;
- Improve water quality in Fleshman Creek;
- Improve water quantity in Fleshman Creek; and
- Repair riparian and aquatic habitat within the Fleshman Creek corridor.

The project location is a two-mile segment of Fleshman Creek that includes Sacajawea Lagoon and Fleshman Creek downstream to the confluence with the Yellowstone River in Livingston. This segment of Fleshman Creek runs through heavily developed residential, commercial, and public properties in the downtown area. The project area is in the following townships, ranges, and sections: T2S, R10E, S18 and T2S, R9E, S24.

The project is slated to begin July 2009 and be complete July 2010.

**Technical Assessment**

The primary goal of this project is to restore Fleshman Creek to a more natural and flood-resistant state via four primary objectives: (1) mitigate risks to property and life associated with flooding from Fleshman Creek; (2) improve water quality; (3) improve water quantity; and (4) repair and restore riparian and aquatic habitat within the Fleshman Creek corridor.

The application defines the need for restoration to help mitigate conditions before a major disaster strikes. Several local newspaper articles were attached highlighting past environmental and conveyance issues with Fleshman Creek. However, the application did not include any information concerning past restoration efforts or attempts to alleviate conveyance issues associated with the creek. Additional information on these past issues would have been helpful.

Three alternatives were presented in the application: (1) no action, (2) stream restoration and minimize annual flooding risk, and (3) stream restoration, minimize annual flooding risk, and increase conveyance during low frequency flood events. Overall, alternatives 2 and 3 mirror each other in terms of restoration activities. The major differences between the two proposed alternatives are hydraulic structures. Alternative 2 would leave more structures in place at upstream locations, while replacing five of nine structures at downstream locations. The structures proposed are CON/SPAN® Bridge Systems, which allow for a natural streambed and greater overall conveyance. The new structures would span from 12 to 20 feet and have a rise of five to seven feet depending on crossing locations. Conversely, Alternative 3 would replace seven of nine structures. Likewise, CON/SPAN® Bridge Systems are proposed, but with much larger dimensions. The new structures would span 32 feet and have a rise of seven feet for every cross section. The use of a larger structure would maximize flood relief within the confines of the channel bed while minimizing upstream backwater effects at each crossing. For the proposed scope of the project Alternative 2 seems most feasible. Additional information on conveyance capacity at every crossing and how the proposed structures compare to the current situation would have been helpful.

Water quality of Fleshman Creek was briefly addressed. Information about treatment measures that would be implemented along the restored reach was provided. Additional data about current conditions and a prediction of how well future treatments would change current conditions would have been helpful.

The technical aspects of this application all have merit. Both alternatives 2 and 3 have been carefully considered and account for project goals. Based on previous problems with large woody debris causing backwater, both designs would increase the overall conveyance throughout the channel and lessen the amount of large woody debris. The designs would also lower the risk to property from flood damage and potentially increase water quality. Alternative 3 is a sound idea but not realistic based on budget and the extra work that would be involved. Alternative 2 is within the scope of work, would greatly improve channel conditions, and accomplish project goals.

**Financial Assessment**

	<b>RDGP</b>	<b>Matching Funds</b>	<b>Total</b>
Salaries and Wages	\$ 0	\$ 48,000	\$ 48,000
Contracted Services	<u>\$ 300,000</u>	<u>\$ 2,552,000</u>	<u>\$ 2,852,000</u>
<b>Total</b>	<b>\$ 300,000</b>	<b>\$ 2,600,000</b>	<b>\$ 2,900,000</b>

The budget defined in the application is adequate to accomplish the project. A brief overview described each major task of the project. Each of these major tasks had a listed description of duties. The exact dollar amount was not listed for each task. A 20% contingency fund was sufficient for this type of work and current economic status. Documentation showing how costs were derived would have been valuable. It should be noted that the FEMA Pre-Disaster Mitigation (PDM) grant, for which the applicant has applied, has a requirement of a 25% local match.

**Environmental Evaluation**

During construction of this project a potential exists for short-term environmental impacts: higher sedimentation loads, low to no flows in certain reaches, and the potential to harm or kill native species living in the creek. The application does an adequate job of assessing potential impacts to the physical environment. Although all these issues are addressed, careful implementation of mitigation and construction plans is extremely important. To lessen the impacts, the applicant should install bridge sections during low flow times, limit the overall construction footprint, and create best management practices for each specific working location. Predicted duration of the project is about one a year; careful planning and consideration should continue throughout.

## **Public Benefits Assessment**

The project application states that the City of Livingston, Park County commissioners, local landowners, and the general public have requested and support efforts to restore Fleshman Creek to a more natural and flood-resistant state. Letters of support and encouragement for the project were attached to the application and clearly favor the effort. Both alternatives 2 and 3 would help alleviate current conditions by increasing the overall conveyance capacity at affected crossings along the stream. In return this could mitigate potential flood damage caused by the creek and save the community valuable time and money. As a result, restoration and new structures proposed are less invasive to natural species, thus allowing more livable habitat and a greater chance for fish repopulation throughout the reach. Not only will the general public benefit from this stream restoration project, but so will many businesses that rely on the recreational value of rivers and streams.

## **Recommendation**

A grant of up to \$300,000 is recommended for this project contingent upon DNRC approval of the project scope of work and budget. It is further recommended that the requested grant and any subsequent contract with DNRC be contingent upon the county's receipt of the FEMA-PDM grant.

**Project No. 13**

<b>Applicant Name</b>	Butte-Silver Bow City-County Government
<b>Project Name</b>	Butte Mining District Reclamation and Protection
<b>Amount Requested</b>	\$ 300,000
<b>Other Funding Sources</b>	\$ 162,187 Applicant
<b>Total Project Cost</b>	\$ 462,187
<b>Amount Recommended</b>	\$ 300,000

**Project Abstract** (Prepared and submitted by applicant)

The principal goals of this proposed project are to preserve and restore the physical infrastructure of mine yard buildings in the Butte Mining District. The project represents another important step in ongoing efforts by several partners to develop a Mining Heritage Park and further implement the strategy described in the 1994 Anaconda-Butte Regional Historic Preservation Plan (RHPP). The historic mining resources in Butte are deteriorating at an alarming rate, and reclamation and repair measures are critical to preserve these resources for long-term use.

Abandoned Mines and Superfund clean-up programs have been implemented to reclaim a large portion of the Butte Mining District. However, the mine yards proper, due to their historic nature, have not been remediated under standard practices. Such remediation would have required removal of all structures within the yards--a wholly unacceptable outcome with devastating impact on Butte's National Historic Landmark District, and compliance with federal law (Section 106 historic preservation).

The proposed project would preserve and restore the historic mine yards in ways sensitive to historic preservation laws/guidelines while still mitigating exposure to hazardous materials and addressing safety concerns. The proposed project includes several mine yards in the Butte District, all of which would undergo some level of reclamation to complement adaptive reuses. The project is scheduled in phases and would require two years for full implementation. Funds would be used to repair and install roof systems, windows, facades, and other exterior items; secure stairways, and improve access to meet ADA standards.

The project is proposed as a joint effort by the Butte-Silver Bow City-County Government in partnership with the Butte Restoration Alliance. Other major participants include Citizens for Preservation and Revitalization, Parks and Recreation Citizen Board, and the World Museum of Mining.

**Technical Assessment**

The applicant is requesting funding to preserve and restore the physical infrastructure of the historic mine yards in the Butte Mining District. The project proposes to both restore and preserve the Butte Mining District's historic resources, and conserve natural resources through revegetation and landscaping of tailings. Abandoned mine and Superfund clean-up programs have been implemented to reclaim a large portion of the Butte Mining District; however, the mine yards, due to their historic nature, have not been remediated under practices that would likely have required complete demolition and removal of all structures. The proposed project will reclaim and protect the historic mine yards while utilizing applicable historic preservation laws and guidelines, and effectively mitigating exposure to hazardous material and safety concerns.

The applicant defines the need for restoration and reclamation and presents the proposal systematically. The applicant describes historic mining activities, impacts on the Butte area, and deterioration of the Butte Mining District. Pictures document the deteriorated conditions of buildings and property.

The cost benefit analysis presents a sound discussion of the historic value of restoring the infrastructure and how it will beneficially impact the local and area economy.

The applicant lists the following three project alternatives:

1. Retain public ownership of mine yards and provide necessary protection and enhancement to make them safe for workers and visitors;
2. Reclaim natural resources in mine yards to premining environment (complete removal); and
3. Sell or lease the mine yards to private businesses for development, with the developer incurring all costs.

The applicant presented brief discussions on each alternative and a basis for choosing the preferred alternative (1). Additional supporting documents were provided by local organizations, residents, and government officials. Staffing and administration of the project were clearly outlined, along with individual titles and responsibilities, including project coordination.

Two goals were presented: repair of structures and reclamation of land. Project objectives were clearly presented in an understandable table format and construction activities should be achievable with licensed contractors. The applicant indicated deliverables for this project will consist of periodic reports. A monitoring plan was presented that details administration and review to ensure that goals are achieved.

### Financial Assessment

The total budget for this project consists of the following:

	<b>RDGP</b>	<b>Matching Funds</b>	<b>Total</b>
Salary and Wages	\$ 0	\$ 34,120	\$ 34,120
Fringe Benefits	\$ 0	\$ 12,283	\$ 12,283
Contracted Services	\$ 280,000	\$ 90,003	\$ 370,003
Supplies	\$ 20,000	\$ 10,000	\$ 30,000
Communications	\$ 0	\$ 500	\$ 500
Travel	\$ 0	\$ 1,000	\$ 1,000
Rent	\$ 0	\$ 0	\$ 0
Equipment	\$ 0	\$ 5,000	\$ 5,000
Miscellaneous	<u>\$ 0</u>	<u>\$ 9,281</u>	<u>\$ 9,000</u>
<b>Total</b>	<b>\$ 300,000</b>	<b>\$ 162,187</b>	<b>\$ 462,187</b>

The project is divided into two phases consisting of Phase 1 and Phase 2 which will be completed independently with unsecured funds. The applicant has requested funds to complete Phase 1, which will address roofing, temporary window treatments, and land treatments for the open space around the mine yards. Phase 2 consists of additional reclamation work, and is independent of the work proposed in Phase 1. Phase 2 will address permanent and historically appropriate window replacements, staircase upgrades, ADA compliance, and other miscellaneous safety measures. The applicant provided an adequate breakdown of Phases 1 and 2 project expenses. An additional spreadsheet was provided detailing proposed construction materials and labor costs. Matching funds will be provided by the applicant and will consist of staff wages and benefits, construction contractors, supplies and materials, volunteer labor, and indirect costs. No budget or funding irregularities were noted, and the overall project costs appeared reasonable.

### Environmental Evaluation

Environmental impacts associated with this project were reviewed and no apparent adverse impacts will result. Beneficial results are primarily related to restoration of infrastructure and reclamation of soil and vegetation within the mine yards.

**Public Benefits Assessment**

Benefits to both local residents and Montana citizens will be significant when this project is successfully completed. Direct benefits include preservation of historic resources and local culture, enhanced aesthetic improvements, and resource protection. Indirect benefits would include an improved economy resulting from the restored function of the mine yards for recreation, tourism, and education.

**Recommendation**

A grant up to \$300,000 is recommended for this project contingent upon DNRC approval of the project scope of work and budget.

## **Project No. 14**

<b>Applicant Name</b>	Missoula County
<b>Project Name</b>	Ninemile Creek Mining District Reclamation
<b>Amount Requested</b>	\$ 200,800
<b>Other Funding Sources</b>	\$ 52,400 Applicant
	\$ 51,030 U.S. Forest Service
	\$ 23,925 Trout Unlimited
	<u>\$ 6,000</u> Tiffany and Company Foundation
<b>Total Project Cost</b>	\$ 334,155
<b>Amount Recommended</b>	\$ 200,800

**Project Abstract** (Prepared and submitted by applicant)

Mining along Ninemile Creek has a long history. The upper watershed was extensively worked beginning in the late 1800s. Housum Placer is a three-mile-long patented mining claim in this section that was dredge mined in the 1940s. As a result, the valley bottom has been lowered 10 to 15 feet, large piles of cobble 10 to 40 feet high confine the stream channel, and tributaries to Ninemile Creek--such as Mattie V Creek--have massive headcuts near the confluence. These headcuts contribute to high sediment loads and have barred fish passage for nearly 70 years.

Missoula County, Trout Unlimited, and the Lolo National Forest have begun a systematic campaign to mitigate mining impacts in the Ninemile watershed. This collaborative group has characterized major mining impacts in the drainage, restored more than half a mile of mining impacts on Eustache Creek, and is planning to reclaim mines on St Louis Creek, Little McCormick Creek, mainstem Ninemile Creek, and several other tributaries. According to the Ninemile TMDL, historic mining activity contributes 18% of the total sediment load for mainstem Ninemile Creek and a majority of the sediment load coming from major tributaries. These reclamation projects--including proposed actions on Housum Placer and Mattie V Creek--will mitigate environmental damages from mining, improve water quality, and improve fish and wildlife populations.

The collaborative group, spearheaded by Missoula County, has received grants from DNRC for initial stages of reclamation on Housum Placer and Mattie V Creek. This proposal, a continuation of those efforts, is a request for funds to implement reclamation activities on 0.5 miles of Mattie V Creek and prepare reclamation alternatives and final design for Housum Placer. Overall, on-the-ground activities will result in the reclamation of nearly 3.5 miles of stream bottom on Ninemile Creek.

### **Technical Assessment**

Historic placer gold mining in the Ninemile Creek watershed has resulted in stream channel modifications that include dredge pools, tailings piles, and steep headcuts and banks. Impacts caused by these modifications include the lack of floodplain connectivity, reduction of riparian vegetation, increased stream sediment loading, and barriers to fish migration and impediments to native fish reproduction.

The goal of the proposed project is to protect water quality and fish and wildlife habitat on Mattie V Creek and the Housum Placer mine on the mainstem of Ninemile Creek. The primary objectives are to: (1) implement reclamation activities on 0.5 miles of Mattie V Creek (a tributary to Ninemile Creek), and (2) select reclamation alternatives and prepare final designs for the three-mile-long Housum Placer mine on Ninemile Creek.

Three alternatives were considered for this project. The no action alternative would leave tailings in the stream, and revegetation would occur naturally over time. However, the no action alternative, would not fix problems identified in the drainage, such as: eroding banks, sedimentation, channel aggradations, instream ponds, reduced floodplain, fish passage barriers, and channel confinement. A more complex



alternative would involve complete excavation of dredge tailings, removal of the tailings to an off-site repository, and full stream channel reconstruction. Although this alternative would be effective in addressing project objectives, costs for complete channel reconstruction and revegetation would be very high and unnecessary to accomplish the stated goal.

The preferred alternative for reclaiming the 0.5-mile reach of Mattie V Creek is reasonable and will be beneficial in reclaiming this section of the creek. This alternative outlines an approach where a stream channel configuration that will enhance water quality and fish and wildlife habitat will be constructed by removing a portion of the tailings, using some of the placer tailings for landscaping and land-form reconstruction, and revegetating the riparian area adjacent to the stream channel. For the Housum Placer area, the approach to continue research for restoration planning is reasonable. This approach entails review of existing aerial photos to identify the field survey measurements and information that will be required before reclamation of the placer area can commence.

Technical approaches for restoring the natural components and functions of stream dimensions and habitat to the 0.5-mile reach of Mattie V Creek are sound, using research and staff experience in rural landscaping, environmental engineering, geology, hydrology, fish biology, budgeting, and coordination of mine reclamation. Continuing research for restoration planning is a reasonable approach for the Housum Placer area. Technical and administrative leads for the project are Missoula County, US Forest Service, and Trout Unlimited.

### Financial Assessment

The total overall budget for this project:

	<b>RDGP</b>	<b>Matching Funds</b>	<b>Total</b>
Salary and Wages	\$ 800	\$ 16,280	\$ 17,080
Fringe Benefits	\$ 0	\$ 2,750	\$ 2,750
Contracted Services	\$ 200,000	\$ 101,000	\$ 301,000
Supplies and Materials	\$ 0	\$ 13,325	\$ 13,325
Travel	\$ 0	\$ 0	\$ 0
Equipment	\$ 0	\$ 0	\$ 0
Miscellaneous	\$ 0	\$ 0	\$ 0
<b>Total</b>	<b>\$ 200,800</b>	<b>\$ 133,355</b>	<b>\$ 334,155</b>

Expenses listed in this application are reasonable based on the project scale and scope. The applicant provided a detailed breakdown of cost and labor necessary to complete the proposed tasks. No budget or funding irregularities were noted. The estimates are based on previous remediation experience in the Ninemile Creek watershed; salaries, materials, and contracted services are within generally acceptable ranges. RDGP funds are almost 100% committed for contracted services. Letters affirming financial commitment from the organizations presented as matching fund supporters have been requested, but not yet received.

### Environmental Evaluation

Environmental impacts associated with this project were evaluated. Special environmental considerations for the implementation of this project: (1) Phase 1 of this project, which includes the initial construction on Mattie V Creek, will be scheduled after the native cutthroat spawning cycle. Phase 2 of the project, involving revegetation and transplanting, will occur from September 2009 through August 2010 when climate conditions are more favorable to transplant survival. The project will also address recommendations outlined in the Ninemile Total Maximum Daily Load (TMDL) study report.

Since reclamation and construction will take place in the streambed, short-term adverse environmental impacts will result: sedimentation, turbidity, dust, and noise. However, permits will require these impacts to be mitigated to the extent feasible. All permits necessary to complete reclamation in the drainage will

be obtained. These include SPA124, Section 404, Section 7, 318 Permit, and Stormwater Discharge Permits. Short-term environmental impacts will be off-set by the long-term beneficial improvements to the stream channel, streambanks, floodplain, and water quality, as well as restored fishery habitat.

### **Public Benefits Assessment**

Public benefits of this project include: (1) improved water quality through surface runoff control, mine waste removal, and stream restoration; (2) flood capture and attenuation through creation of a new floodplain area; (3) public education and outreach through local resident volunteer service; (4) fish passage; (5) improved fish and wildlife habitat; (6) indirect improvement of public fishing through improved spawning area; (7) indirect improvement of hunting through revegetation and improving surface topography; and (8) public education.

The project will result in repairs to a portion of the Ninemile Creek drainage damaged from mineral development. Public benefits are long-term, including stream channel reconstruction and historic dredge tailings removal. The stream channel will be designed to accommodate high flows and adequately support sediment loads input into the system from upstream sources. The Ninemile TMDL identified the amount of total sediment load to Ninemile Creek from historic placer mining at 18%; the mined reaches of the creek should be restored.

### **Funding Recommendation**

A grant of up to \$200,800 is recommended for this project contingent upon DNRC approval of the project scope of work and budget.

## **Project No. 15**

**Applicant Name** Montana Department of Environmental Quality (DEQ)  
**Project Name** Beal Mountain Mine, Waste Rock Dump Soil Cover

<b>Amount Requested</b>	\$ 300,000
<b>Other Funding Sources</b>	\$ 88,600 Applicant
	\$ 999,716 U.S. Forest Service
<b>Total Project Cost</b>	\$ 1,388,316
<b>Amount Recommended</b>	\$ 300,000

**Project Abstract** (Prepared and submitted by applicant)

The Beal Mountain Mine is in the headwaters of German Gulch in the Pioneer Mountains, Silver Bow County, about 16 miles west-southwest of Butte and 10 miles southwest of Fairmont (Gregson) Hot Springs. The mine primarily sits on land managed or controlled by the U.S. Forest Service (USFS) and Beaverhead-Deer Lodge National Forest (B-DNF). Open pit mining operations at Beal Mountain Mine were completed in 1997 and gold recovery from the heap leach pad was completed in 1999. Reclamation of the mine disturbances continued through 2004; active treatment of heap leach solution with land application operations continued through 2005. With a filing of bankruptcy in 1998 and exhaustion of bonding funds to complete reclamation, the USFS became the lead agency responsible for final mine closure. After exhaustion of reclamation bond monies by the bankruptcy trustee, the tax forfeiture parcels were deeded to the USFS, and the water treatment plant facilities deeded to DEQ. DEQ has worked with USFS as a co-permittee for Beal Mountain Mine, and continues to work with USFS for closure of the Beal Mountain Mine.

The goal for the Beal Mountain Mine project is to close the mine and allow the area to return to its multiple-use condition. Although much of the mine closure plan has been implemented, several ongoing operational, maintenance, and reclamation requirements need to be met for specific facilities before final closure is complete. Outstanding issues that potentially affect the environment need to be addressed: long-term geochemical reactivity of mine wastes (including both acidity and release of selenium to the environment from several potential mine sources), geotechnical stability of the pit highwall and leach pad dike, infiltration of precipitation into the leach pad, and treatment and disposal of remaining heap leach solution.

This grant application addresses one of the outstanding issues at the Beal Mountain Mine: application of cover soil to the upper portion of the waste rock dump, per the mine permit closure plan. Cover soil application was neglected when reclamation bond resources were directed toward leach pad water treatment and away from vegetative cover. Completing cover soil placement on the upper portion of the waste rock dump is an incremental action and consequently a single component of the cumulative actions that, when completed, will allow for eventual discontinuation of the ongoing water treatment operations at the Beal Mountain Mine. DEQ will be the lead agency for the cover soil placement portion of the Beal Mountain Mine response actions. Construction is to be completed in one work season, July-October 2009, and will be managed by DEQ.

### **Technical Assessment**

The waste rock dump covers 48 acres and contains an estimated 5,670,000 cubic yards of waste rock. The lower portion of the waste rock dump (31.4 acres) has been reclaimed by regrading the slope to a 2:1 minimum, placing five feet of compacted South Beal waste, and placing 14 to 20 inches of soil cover. The upper third (16.8 acres) of the waste rock dump (above 7,300 feet) has been regraded and a minimum five-foot thick layer of capping material has been placed. This area has had no topsoil placed and it has not been revegetated.

A significant portion of the waste rock (35% to 65%) is possibly acid generating and the seepage contains selenium. Surface water quality at the mine site is adversely impacted by seepage from the waste rock dump. Water emanating from spring SPR-10A (buried under the upper end of the waste), spring SPR-5 (at the toe of the waste rock dump), and water from the toe drain collection system were historically discharged to drainfields in German Gulch until 2002. These flows are collected and pumped to a storage pond near the processing plant and discharged directly through the Land Application Discharge (LAD) system. This water has elevated selenium, sulfate, and nitrates that cannot be discharged directly to surface or groundwater without treatment.

The cumulative seepage from the waste dump ranges between eight gallons per minute (gpm) at low flow to about 250 gpm during high flow. Average annual flow is about 70 gpm. During high flow, not all of the flow can be captured and pumped to storage before treatment. The average flow that can be pumped using existing collection and pumping is between 30 and 70 gpm. While the source of the seepage water is a combination of infiltration from precipitation and springs buried beneath the waste rock, the relative contributions of these sources is unknown.

Selenium is the principal contaminant of concern in German Gulch and the chronic aquatic life standard is routinely exceeded for surface water. Because seepage from the waste rock dump toe drain is pumped, stored, and eventually treated via land application, this source of selenium is generally not released to German Gulch, although the toe drain capture system is not 100% effective, especially during high flows.

Past actions taken to reduce impacts from seepage include reclamation of the lower portion of the waste rock dump and collection and ongoing treatment of seepage water. Seepage water is currently collected and discharged to the LAD system. The goal of this project is to reduce ongoing water treatment costs by reducing infiltration through the mine waste dump.

An evaluation of alternatives was provided in an Expanded Engineering Evaluation/Cost Analysis (EEE/CA) supplied with the application. Several alternatives were considered but not analyzed in detail. Two of those alternatives included moving the waste rock to either on-site or off-site engineered facilities which would eliminate seepage. These alternatives were discarded for several reasons, including the expected high cost, the difficulty in finding a site to move the approximately 5.7 million cubic yards of rock, the associated disturbance and traffic, and the possible closure of public land in the German Gulch drainage. Eight reclamation alternatives were selected for detailed evaluation including: monitoring, removing waste from contact with water from spring SPR-10A, various regrading and capping configurations of the waste rock dump, and seepage water treatment.

Two alternatives consider removing waste material from the dump above spring SPR-10A and diverting the flow to minimize contact of groundwater with waste rock. These two alternatives (WR-2A and WR-2B) differ in the amount of material removed from above the spring, the scope of reworking the existing dump, and the cover design. Both alternatives would be effective in isolating groundwater from spring SPR-10A from contact with waste rock and could reduce the selenium load from waste rock seepage by as much as 20%. However, neither alternative will completely reduce the selenium load since the amount of seepage beneath the waste rock dump is uncertain. Alternative WR-2B would have a much greater impact on seepage flow since the entire waste rock dump would be regraded to flatter slopes and then covered with a low permeability cap.

Two alternatives would reclaim the upper third of the waste rock dump. These alternatives, WR-3A and WR-3B, would attempt to limit infiltration from this upper and flatter portion of the dump into waste rock. Alternative WR-3A uses a soil cover to achieve this end, while alternative WR-3B uses a composite cover. As with the WR-2 alternatives discussed above, both alternatives WR-3A and WR-3B would be somewhat effective in limiting infiltration into the waste rock dump, although the composite cover design used in alternative WR-3B will be more effective in reducing infiltration and seepage, even though it only covers the upper third of the waste rock dump. Alternative WE-3A was a required component of the mine closure plan.

The four removal and/or cover alternatives have several things in common, including: all meet the ARAR for slope stability criteria, with slope regrading under alternative WR-2B providing greater slope stability than the other alternatives; each of the alternatives has revegetated surfaces to minimize erosion and maximize evapotranspiration in the covers; each alternative utilizes upgradient diversion ditches to control run-on and berms or snowfencing to control snowdrifting; and, long-term maintenance requirements for each alternative would be low once vegetation was established. None of the four alternatives will likely meet surface water ARARs in German Gulch and each is only somewhat protective of the environment (seepage quality will improve an incremental amount and seepage quantity should decrease an incremental amount). None of the alternatives would reduce seepage concentrations to a degree that would permit discharge of the seepage without prior treatment. Alternative WR-2B is the most protective of the four and is the most effective in the long term. Alternative WR-3A is probably the least effective of the four alternatives. The costs to implement the capping and containment alternatives vary considerably and almost directly with protectiveness of the environment and long-term effectiveness. Estimated costs range from \$388,600 for alternative WR-3A to over \$13 million for alternative WR-2B.

Three water treatment or disposal options (WR-4A, WR-4B, and WR-4C) were evaluated in the EEE/CA. Alternative WR-4A, seepage water treatment, involves collecting water from the toe drain and discharging it to the freshwater pond near the processing plant. From there, four active water treatment options are considered for possible use. All four treatment options require that the seepage pumping supply system be upgraded; three of the four treatment options require that the LAD system be upgraded. Operation of both the pumping system and the LAD system involve construction upgrades and operation and maintenance costs. Construction costs for this alternative are estimated to range from \$181,699 to \$643,668 and annual operation and maintenance costs are estimated to range from \$55,264 to \$227,220.

Alternatives WR-4B and WR-4C both propose to discharge waste rock seepage to German Gulch using a mixing zone, as defined by DEQ regulations, to meet water quality standards. Both systems require upgrades to the collection system and pipeline, and both use water from the main Beal Mountain pit drain to dilute the waste rock seepage to meet groundwater standards before discharge to infiltration galleries along German Gulch. The major difference in system operation is alternative WR-4B would discharge to infiltration galleries in upper German Gulch, while alternative WR-4C would extend the pipeline downstream to the confluence of Beefstraight Creek and German Gulch where it would discharge to a new infiltration gallery. Both alternatives WR-4B and WR-4C are effective in meeting water quality ARARs with respect to groundwater standards at the point of discharge and surface water standards at a specified compliance point. Under both alternatives, exceedances of the chronic aquatic standards for selenium would continue to occur at upstream locations, as neither alternative addresses existing sources of selenium in the upper portion of German Gulch. However, alternative WR-4B will likely result in exceeding acute aquatic life standards as well because existing infiltration galleries would be used to discharge to the upstream reach of German Gulch. Alternative WR-4C would not exceed the acute aquatic standards at these locations because infiltration of waste rock seepage would occur in the German Gulch floodplain below the confluence of Beefstraight Creek. Alternative WR-4B may be untenable without an administrative variance to mixing zone regulations since DEQ regulations require that acute aquatic life standards not be exceeded in the mixing zone.

Both alternatives WR-4B and WR-4C would require some level of long-term operation and maintenance, although operation of the system would be mostly passive. The costs to implement alternatives WR-4B and WR-4C are estimated at \$181,699 and \$643,668, respectively. Annual O&M costs are estimated to be the same, \$55,264.

Preferred alternatives identified in the EEE/CA are WR-3A for soil cover and WR-4C for water treatment. The applicant requests funding for alternative WR-3A. The USFS will manage water treatment operations and a final remedy has not yet been selected. The USFS has budgeted \$981,538 for water treatment for fiscal years 2008 and 2009.

## Financial Assessment

The project budget:

	<b>RDGP</b>	<b>Matching Funds</b>	<b>Total</b>
Contracted Services	\$ 300,000	\$ 1,088,316	\$ 1,388,316
<b>Total</b>	<b>\$ 300,000</b>	<b>\$ 1,088,316</b>	<b>\$ 1,388,316</b>

No RDGP funds are requested for salaries and wages and fringe benefits in the RDGP application. All DEQ staff salaries, benefits, travel, and equipment will be paid for by DEQ using Federal OSM funding. Costs presented in the EEE/CA are typical for mine reclamation projects. Matching funds include \$88,600 from the applicant, \$18,178 from the USFS for water quality monitoring, and \$981,538 from the USFS for treating water at the Beal Mountain Mine site during 2008 and 2009.

## Environmental Evaluation

Placement of topsoil with subsequent revegetation would incrementally reduce the quantity of seepage from the waste rock dump and would reduce the potential for erosion and exposure of potential human and environmental receptors. Revegetating the waste rock dump would benefit wildlife and bird habitat. Adverse environmental impacts associated with this project are short-term and associated with construction. Construction impacts include dust emissions and storm water runoff, both controlled with best management practices.

## Public Benefits Assessment

The proposed action is one component of a series of actions that, when completed, will allow for cessation of water treatment. Water treatment operations have been funded through the U.S. Treasury (USFS obligations) and through the sale of Montana reclamation general-obligation bonds authorized under 82-4-314, MCA. Cessation of water treatment operations will provide a direct public benefit in cost-savings. The Montana economy will also benefit from the creation of short-term, but highly paid restoration construction jobs.

## Recommendation

A grant of up to \$300,000 is recommended for this project contingent upon DNRC approval of the project scope of work and budget.

**Project No. 16**

**Applicant Name** Lewis and Clark Conservation District (LCCD)  
**Project Name** York Gulch Old Amber Mine Reclamation

**Amount Requested** \$ 83,207  
**Other Funding Sources** \$ 5,660 Applicant  
\$ 13,650 Montana FWP Foundation  
\$ 4,500 U.S. Forest Service  
\$ 480 York Volunteers  
\$ 560 DFWP  
**Total Project Cost** \$ 108,057  
**Amount Recommended** \$ 83,207

**Project Abstract** (Prepared and submitted by applicant)

The York Gulch Old Amber Mine reclamation project is on patented mining claims in York Gulch about 2.5 miles east of the community of York in T11N, R1W, S11, in the Big Belt Mountains. The site includes approximately 1,500 cubic yards of unconfined metal-laden mill tailings in the bottom of York Gulch, a small mill site, two steep-sided placer pits, and three partially open mine adits (horizontal tunnel). The unconfined tailings present a threat of metal contamination from erosion into Trout Creek which runs through York. The tailings may also threaten groundwater through leaching into the subsurface. The placer pits and open mine adits are already partially collapsed at the portals and pose a danger to people. Reclamation will include removal and permanent containment of the tailings into an onsite repository, backfilling the placer pits, and closure/securing the hazardous mine openings.

Project goals and objectives include:

**Goal 1:** Remove the threat of surface and groundwater contamination.

- Objective: Relocate and stabilize the tailings in the valley bottom so they would not be subject to direct erosion or leaching into surface or groundwater.
- Objective: Remove tailings from mill site area that could erode downslope to the floodplain during snowmelt or storms. Reduce phytotoxic soil conditions.

**Goal 2:** Remove potential for physical harm from mine features to people and wildlife.

- Objective: Remove unsafe mine openings by permanently closing or otherwise securing them and backfilling the valley bottom placer pits.

**Goal 3:** Retain historic context and features to the extent possible.

- Objective: Preserve features onsite to extent possible, or relocate to York historical museum if desired.

**Goal 4:** Restore site so it is suitable for acquisition by a public land-managing entity.

- Objective: Conduct the selected reclamation remedy by fall 2009 so that acquisition activities can be initiated.

Project organization includes grant administration, construction contractor selection, and project oversight by the Lewis and Clark Conservation District; construction contract development and construction administration by the Fish Wildlife & Parks Foundation, with technical assistance from an engineering contractor and Helena National Forest personnel. This project will take approximately 30 to 60 construction days.

## Technical Assessment

This project requests funding to complete several reclamation tasks on the York Gulch Old Amber Mine property. The scope of work proposes to excavate and reclaim an estimated 0.4 acres and 1,500 cubic yards of mining-impacted soil and tailings material. Reclamation tasks will include removal of tailings material from valley bottoms and the mine area, removal of a small mill site, backfill of two placer pits, and closure of three mine adits. Tailings material will be removed using small excavation equipment and hand digging and will be deposited and secured in an on-site repository. Tailings material will be covered with an 18-inch multilayered cap to prevent precipitation infiltration and percolation.

The applicant adequately documented the history, previous investigations, and proposed work. The cost-benefit analysis was adequate, but not overly detailed in comparing cost of the project to potential benefits. However, additional work, including a site investigation, engineering evaluation, cost analysis, and preparation of construction bid packages is being accomplished under a RDGP planning grant. The alternatives analysis was detailed and provided adequate information and comparison data for the considered alternatives. The applicant listed the following three possible alternatives to the project:

- Alternative 1: No action;
- Alternative 2: Institutional controls; and
- Alternative 3: Partial removal of tailings to on-site repository, pit backfill, and secure mine portals.

Given these alternatives, the applicant demonstrated adequate need and urgency for the project; adequate supporting documents were provided with the application. The administration and staff for the project have sufficient experience to carry out the project.

The goals/objectives outlined in the application were adequate. Most task descriptions provided enough detail to properly evaluate the application. The project schedule is detailed and provides measurable and achievable milestones. Supporting documents, letters of support, and a resident petition was provided.

## Financial Assessment

The total budget for this project:

	<b>RDGP</b>	<b>Matching Funds</b>	<b>Total</b>
Salary and Wages	\$ 1,600	\$ 11,980	\$ 13,580
Fringe Benefits	\$ 0	\$ 0	\$ 0
Contracted Services	\$ 81,607	\$ 11,550	\$ 93,157
Supplies	\$ 0	\$ 100	\$ 100
Communications	\$ 0	\$ 500	\$ 500
Travel	\$ 0	\$ 720	\$ 720
Rent	\$ 0	\$ 0	\$ 0
Equipment	\$ 0	\$ 0	\$ 0
Miscellaneous	\$ 0	\$ 0	\$ 0
<b>Total</b>	<b>\$ 83,207</b>	<b>\$ 24,850</b>	<b>\$ 108,057</b>

The application shows that the majority of grant funds will be used for contracted services, which constitutes the construction contract and oversight. Matching funds are provided by the applicant, the landowner, area residents, and other non-state sources. The budget appears reasonable to fund the project. The applicant provided a detailed breakdown of costs. Operation and maintenance costs are identified and provided as matching funds by the landowner until the property can be deeded to a public



agency. No budget or funding irregularities were found. The unit costs used to develop the budget appear reasonable and adequate. A detailed cost comparison of the alternatives was provided.

The proposed project will directly affect approximately 0.4 acres, but will indirectly affect several hundred acres. The project will provide positive impacts for area residents, as well as for fish and wildlife.

### **Environmental Evaluation**

Environmental impacts associated with this project were evaluated and no apparent adverse long-term impacts will result. Beneficial results are related primarily to removal of contaminated, mining-impacted soils affecting surface water, vegetation, and groundwater in the area. Detail documenting impacts to groundwater and fisheries was limited. Minimal short-term, construction-related impacts will be controlled through permitting, proper construction methodology, and the use of best management practices.

### **Public Benefits Assessment**

Successful completion of this project would lead to significant benefit to area landowners and Montana citizens. Direct benefits include improved safety of human health and improved quality of natural resources resulting from removal of contaminated waste. Indirect benefits include increased recreational activities and increased fish and wildlife habitat.

### **Recommendation**

A grant of up to \$83,207 is recommended for this project contingent upon DNRC approval of the project scope of work and budget.

## Project No. 17

<b>Applicant Name</b>	Ruby Valley Conservation District
<b>Project Name</b>	Big Hole Cooperative Ditch Improvement Project
<b>Amount Requested</b>	\$ 239,658
<b>Other Funding Sources</b>	\$ 18,000 Big Hole Cooperative Ditch Company (in-kind)
	\$ 1,000 Big Hole Cooperative Ditch Company (cash)
	\$ 2,450 Big Hole Watershed Committee (in-kind)
	\$ 5,000 Big Hole Watershed Committee (cash)
	\$ 9,000 Montana Department of Environmental Quality 319 Mini Grant (uncommitted)
	\$ 1,000 Montana Fish, Wildlife & Parks (uncommitted)
<b>Total Project Cost</b>	\$ 276,108
<b>Amount Recommended</b>	\$ 239,658

**Project Abstract** (Prepared and submitted by applicant)

A 2007 assessment of irrigation infrastructure on the lower Big Hole River identified and prioritized infrastructure projects with the greatest potential to improve instream flows in support of the Big Hole Drought Management Plan and to benefit the fishery. Big Hole Cooperative Ditch Improvement received the highest priority.

The Big Hole Ditch is a very large diversion used by 22 irrigators on ~4,000 acres. This ditch intercepts water from the Big Hole River and discharges it into the Beaverhead River. DNRC synoptic data indicates this river reach has the greatest loss of streamflow of any reach on the lower Big Hole during irrigation season.

The headgate on the Big Hole Ditch is inoperable and always remains open. The diversion structure prevents fish passage, contributes to degraded water quality, and endangers floaters. There is no flow-measuring device on the ditch.

Project goals are to:

- Reconstruct the headgate structure; this will provide the ability to control irrigation flow and better manage irrigation water;
- Install a flow-measuring device; a flow gauge will inform irrigators regarding use versus actual need and offer valuable information to improve the drought management plan; and
- Reconstruct an engineered diversion structure; a new weir will provide for irrigator needs and benefit the fishery, water quality, and floater safety.

The project is on the south bank of the Big Hole River downstream from Pennington Bridge in Madison County. The nearest town, Twin Bridges, is approximately six miles east of the project site (T6S; R5W, S5).

Responsibilities for the project will be shared by the Ruby Valley Conservation District and the Big Hole Watershed Committee. Once funded, the project is anticipated to be completed within one year, including scoping, hiring, contracting, survey, design, construction, and final reporting.

### **Technical Assessment**

The existing problem was well defined. The proposed diversion structure replacement would solve the problem. Existing facilities and resources were adequately described.

The project is for replacement of an irrigation diversion structure. The structure currently consists of a rock diversion structure and an inoperable radial headgate. The age of the radial headgate was not

estimated but appears to have exceeded its useful life. The existing irrigation structures are continuously open, and it is not possible to manage flows diverted from the Big Hole River. The diversion does not allow for fish to pass during low flow and no flow-measuring devices exist on the existing structure.

The proposed project would replace the existing diversion and headgate and install low-flow weirs in the Big Hole River. The proposed headgate would include a flow-measuring device and a fish passage channel that could be closed or regulated as needed.

The applicant discussed past efforts to correct the problem, including installation of the rock diversion structure in current use. Past efforts also included placement of a Parshall flume in the Big Hole Diversion; however, this installation was unsuccessful because of grade restrictions and was later removed.

The project goals are clearly stated and are included with this review in the project abstract section. In addition to these goals, the application also discusses issues of concern at the Big Hole Ditch including negative effects of the existing rock diversion on stream channel integrity, impairment of fish passage, contribution to streambank erosion, and hazard to boaters, floaters, and anglers.

Three project alternatives were addressed consisting of no action, relocating the point of diversion, and replacing the structure, the preferred alternative. Although few alternatives were explored, it is RDGP's opinion that few alternatives exist to address the goals and issues related to this application. The no action alternative does not adequately address the goals and issues in this application. Relocating the ditch was not a feasible alternative because of a lack of right-of-way and its limited benefit.

A new diversion would be built if this project is funded. The structure would meet the stated goals and contribute to resolving the issues described. The diversion would allow fish to pass during low flows and provide watershed and irrigation managers with the ability to monitor irrigation diversion flows. The project would also provide useful data for the drought management plan, irrigation use accounting, and managing fish habitat. The data obtained from irrigation use would help irrigators efficiently irrigate crops and identify optimal rates related to crop production.

Technical data submitted support the need for and urgency of the proposal. The technical data adequately address the primary concern related to the lack of a proper diversion structure at the site and its impact on fisheries and fish habitat in the Big Hole River. The proposed project provides for fish passage at the diversion to two fisheries, improved flow diversion management, and improved low flow fish passage in the Big Hole River near the diversion by the proposed weirs.

The project has been coordinated through state and local agencies. The project has received letters of support from Fish, Wildlife & Parks, DNRC--Water Resources Division, the Big Hole Cooperative Ditch Company, and the Big Hole Watershed Committee. The project received the highest priority rating from a 2007 irrigation infrastructure assessment conducted in support of the Big Hole River Drought Management Plan.

The applicant has identified two permits and one authorization needed for the project: a Clean Water Act Section 310 permit, a U.S. Army Corp of Engineers 404 Permit and a Department of Environmental Quality authorization. The status of these permits and the authorization is unclear from the application.

Additional information could be provided on the water use management plan as it relates to this structure. It would be useful to know how this diversion would be operated and monitored and how the flows would be allocated during droughts. Back-up documentation for the cost estimate would have enabled better assessment of the adequacy of funding.

## Financial Assessment

The project budget:

	<b>RDGP</b>	<b>Matching Funds</b>	<b>Total</b>
Salaries and Wages	\$ 35,778	\$ 450	\$ 36,228
Fringe Benefits	\$ 0	\$ 0	\$ 0
Contracted Services	\$ 23,350	\$ 0	\$ 23,350
Supplies and Materials	\$ 107,830	\$ 34,000	\$ 141,830
Communications	\$ 0	\$ 2,000	\$ 2,000
Travel	\$ 1,000	\$ 0	\$ 1,000
Miscellaneous	\$ 71,700	\$ 0	\$ 71,700
<b>Total</b>	<b>\$ 239,658</b>	<b>\$ 36,450</b>	<b>\$ 276,108</b>

Two alternatives were compared financially, no action and headgate replacement. The no action alternative includes the cost of replacing the structure in 10 years and higher operation and maintenance costs during this time. This assumption appears reasonable given the poor condition of the existing structure. Because the headgate will have to be replaced, the operation and maintenance costs are higher until the headgate is replaced, considering the two alternatives are economically comparable.

The budget and cost estimates were properly developed. The budget was based on preliminary design plans, included detailed breakdowns for materials and labor, and provided an appropriate contingency for the level of design.

No back-up documentation for project quantities or unit costs was included. Based on the judgment of the RDGP, costs and unit quantities appear accurate; however, a thorough analysis of the cost estimate was not performed.

No overspending is evident, and the cost estimate is based on preliminary design plans and appears adequately detailed to provide accurate funding as requested.

## Environmental Evaluation

The project is unlikely to cause any long-term environmental impacts. The project, should it be operated and managed properly, should provide significant environmental improvements. Improvements likely to occur as a direct result of this project include improved fish habitat as a result of improved water management through the ability to measure and regulate flows, improved fish passage by installing a fish ladder with the diversion structure, and a reduction in streambank erosion by properly channeling water at the diversion and in the Big Hole River.

Short-term impacts will result from construction. These impacts will primarily be from excavation and construction of weirs in the Big Hole River near the diversion. These impacts will primarily be in the form of sediment which can be properly mitigated and is required to be controlled by regulations.

The project has the support of other agencies and watershed groups and committees and is recommended as part of the Big Hole Drought Management Plan. See the discussion above under technical assessment.

## Public Benefits Assessment

This project would improve water quantity and quality through improved water management in the Big Hole River, a nationally known blue-ribbon fishery; would significantly reduce the danger to boaters, floaters, and anglers; would enhance the habitat for the arctic grayling (the arctic grayling's sole Montana habitat is the Big Hole River); would help reduce conflicts between ranchers, conservationists,

recreational river users, and outfitters/guides; would increase crop yields through water management; and would reduce stream channel degradation.

**Recommendation**

A grant of up to \$239,658 is recommended for this project contingent upon DNRC approval of the project scope of work and budget.

**Project No. 18**

**Applicant Name** Montana Department of Natural Resources and Conservation (DNRC)  
**Project Name** Monitoring Coalbed Methane Development Effects on Surface Water Quality of the Tongue and Powder River Basins

**Amount Requested** \$ 300,000  
**Other Funding Sources** \$ 152,200 U.S. Geological Survey, Montana  
\$ 37,300 DEQ  
\$ 28,300 Wyoming DEQ  
\$ 28,300 Wyoming State Engineer Office  
\$ 25,000 DNRC, Water Resources Division

**Total Project Cost** \$ 571,100

**Amount Recommended** \$ 195,000

**Project Abstract** (Prepared and submitted by applicant)

Coalbed methane (CBM) development in the Powder and Tongue rivers basins of southeastern Wyoming and Montana is rapidly expanding; large volumes of water, high in salt and sodium, are produced during extraction of coalbed methane and this water flows downstream into Montana. Agricultural producers rely on Tongue and Powder rivers water for production of hay to support cattle operations critical to southeastern Montana's economy. This project provides for: (1) collection of monitoring data for "real-time" management (for example, irrigation scheduling to obtain good quality water; data use by DEQ and the Montana CBM industry to monitor blending of CBM water and natural flow to meet water quality targets), and (2) analysis of data for trends over time. With location in the Powder and Tongue basins, this analysis will help identify changes in streamflow and water quality, significance of the changes, and if remedial measures are necessary.

The U.S. Geological Survey (USGS) Montana Water Science Center will collect streamflow and water-quality data, analyze the data, and prepare a final report. DNRC Water Resources Division (WRD) will provide technical oversight and assist with the project. The project focuses on the Montana portion of the Tongue and Powder rivers basins, but will also analyze data collected at USGS sites in Wyoming. The project requires 36 months to complete.

**Technical Assessment**

The Tongue and Powder rivers provide important surface water resources for the irrigated, semi-arid, agricultural lands in southeastern Montana. The headwaters of these rivers lie in Wyoming and then flow across the Powder River Structural Basin (PRSB) in Wyoming and Montana before entering the Yellowstone River. Due to aggressive coalbed methane (CBM) development in the PRSB, long-term surface water monitoring continues to be important since CBM extraction involves pumping relatively sodic groundwater from wells and discharging portions of the produced water into rivers. Data generated during the monitoring will be used (1) to continue to evaluate impacts of CBM development on water resources and fisheries in the basin, and (2) to make informed water management decisions in regard to continuing both agricultural applications and CBM-produced water discharge.

The primary objectives include: (1) collect water quality samples for laboratory analysis, (2) collect monitoring data used for "real-time" water management (such as irrigation schedule, water blending to meet water quality targets), (3) process the data for public access, and (4) evaluate data trends over time to help predict influences of natural resource development on the Tongue and Powder rivers. The goal is to provide information that irrigators, CBM developers, and state agencies can use to help maintain natural flow and water quality targets required for agricultural use. In addition, monitoring data will be collected as part of the Yellowstone Compact agreement between Montana and Wyoming.

The USGS has been monitoring surface water quality in the Tongue and Powder rivers watersheds irregularly since the 1970s, and more consistently since 2000. Concerns expressed by citizens, ranchers, agricultural water users, Indian Tribes, and state and federal resource managers since the surge in CBM production has resulted in this increase in water-quality monitoring and the potential for adverse environmental effects. However, funding for monitoring projects has been inconsistent, and funding for rigorous statistical analysis of trends at monitoring sites in Montana has never been obtained. Effective and important water resource management decisions cannot be made by water users in the watershed unless this analysis is completed.

As a result of ongoing uncertainties in funding, DNRC WRD requested the USGS to develop a proposed budget for federal FY 2009 that provides sufficient funding to (1) operate monitoring locations and an enhanced surface water-quality monitoring network in the Tongue River, Powder River, and Rosebud Creek watersheds, and (2) analyze available streamflow and water-quality data collected to date to characterize water quality trends. Although, the FY 2009 congressional funding request was received favorably by the combined Montana congressional delegation, the status of funding remains uncertain. Funding from the DNRC RDGP is requested to cover costs of the project in the event that federal funding is not approved.

Three alternatives were considered for this project: (1) no action, (2) seek funding for the project elsewhere, and 3) contract with a consulting firm to accomplish the work.

The no action alternative would result in a break in data collection and in the continuous monitoring record that has been developed for the watershed. This break in data will occur when continuous monitoring is of critical concern because of rapid and intensive CBM development in these drainage basins.

The alternative of hiring a private firm to accomplish the work is feasible, but could raise questions regarding the continuity and consistency of the existing data set available from the USGS. This alternative may not be cost effective without more long-term planning. However, some aspects of contracting data collection and analysis should be evaluated by DNRC. Locating a source of funding is still necessary.

The preferred alternative to seek funding elsewhere, such as the DNRC- -RDGP, is reasonable and will provide cost-effective, credible water quality data. The USGS has maintained and operated a series of stream gauge stations in the Tongue and Powder rivers basins over the past 50 years and has well-established and scientifically robust monitoring and data management operating procedures. Continuation of this data collection will be beneficial to water resource managers and decision makers. Contracting some portion of the data collection and analysis should be evaluated by DNRC and the USGS before authorization of the contract.

### Financial Assessment

The total overall budget request for this project:

	<b>RDGP</b>	<b>Matching Funds</b>	<b>Total</b>
Salary and Wages	\$ 162,000	\$ 251,300	\$ 413,300
Fringe Benefits	\$ 0	\$ 19,800	\$ 19,800
Contracted Services	\$ 34,760	\$ 0	\$ 34,760
Supplies and Materials	\$ 15,420	\$ 0	\$ 15,420
Travel	\$ 47,100	\$ 0	\$ 47,100
Equipment	\$ 31,120	\$ 0	\$ 31,120
Miscellaneous	\$ 9,600	\$ 0	\$ 9,600
<b>Total</b>	<b>\$ 300,000</b>	<b>\$ 271,000</b>	<b>\$ 571,000</b>

Detailed expenses outlined in this application are reasonable for the scale and scope of the proposed project.

Contracted services and associated costs:

- Water-quality monitoring \$ 158,000
- Continuous conductance \$ 54,000
- SAR estimation \$ 12,500
- Streamflow gauge installation \$ 20,000
- Streamflow gauge operation \$ 125,600
- Trend analysis, report preparation \$ 175,000
- Website development and maintenance \$ 26,000

The three year project budget was provided by the USGS Montana Water Science Center. The budget is based on extensive first-hand experience with data collection analysis in the Tongue and Powder rivers basins. These costs appear reasonable and contain a 5% adjustment over 2008 costs for anticipated inflation. However, it is recommended that the budget be reduced to cover the July 2010 to July 2011 period only. The data analysis and reporting budget of \$201,000, covering the July 2011 through July 2012 is not recommended for RDGP funding. This action equates to a 35% reduction in the amount of RDGP funds requested. The recommended RDGP funding level is \$195,000.

The USGS, Wyoming DEQ, Montana DEQ, and Wyoming State Engineers Office will provide matching funds for the project. The application contains a letter from the USGS supporting the project, but confirmation from the USGS and other tentative sources for matching funds should be obtained. It is also noted that commitments for matching funds are tentative depending on FY 2010 funding.

### **Environmental Evaluation**

Environmental impacts associated with this project were evaluated. There is no new drilling, construction, or other surface disturbances associated with monitoring and data collection. No adverse long-term environmental impacts specific are expected to result. Beneficial results are primarily related to the collection of water-quality data for use in evaluating long-term water quality trends and water resource management. This data will be available for use in future decision making to regulatory agencies, watershed and citizen groups, irrigators, CBM producers, and the general public.

Minimal, if any, environmental impacts will result from proposed activities. Field tasks will include collection of water quality samples. Installation of several stream gauges to measure water-surface elevations will cause minimal, localized, and temporary disturbance.

### **Public Benefits Assessment**

Benefits of this project as listed in the application: (1) maintain or improve the ability of Montana farmers and ranchers to use water and maintain economically feasible operations, (2) maintain or improve the ability of Montana DEQ and EPA to monitor and regulate the CBM industry of Montana and Wyoming, (3) maintain or improve the ability of the Montana CBM industry to meet permit requirements and develop CBM resources responsibly, and (4) provide information useful to the DNRC and attorney general's office in negotiating or litigating with Wyoming in transboundary disputes regarding water use and administration under water-quality laws and the Yellowstone River Compact.

In addition to the letter of support provided by the USGS, one letter signed by the Northern Plains Resource Council, Tongue River Water Users, Tongue and Yellowstone Irrigation District, and Tongue River Watershed Group was received.



## **Recommendation**

A grant of up to \$195,000 is recommended for this project contingent upon DNRC approval of the project scope of work and budget.

At this time, the applicant has not responded with information requested regarding status of the Federal budget request to support this project. In the event that adequate federal funding is obtained, this proposal should be withdrawn from RDGP funding.

## **Project No. 19**

**Applicant Name** Montana Public Service Commission  
**Project Name** Geologic Evaluation of Potential Sites for Compressed Air Energy Storage (CAES) in Montana

**Amount Requested** \$ 293,460  
**Other Funding Sources** \$ 8,216 Applicant  
\$ 75,163 MBMG  
**Total Project Cost** \$ 376,839

**Amount Recommended** \$ 135,000

**Project Abstract** (Prepared and submitted by applicant)

Montana Senate Bill 415, passed during the 2005 legislative session, requires public utilities to procure 15% of their electrical energy which includes wind from renewable resources by 2015. With development of large-scale wind electrical generation in Montana, a balance between fluctuating renewable generation and fluctuating demand becomes more difficult and more expensive to manage. Firming of supply is provided by two companies at substantial cost to the companies and their customers. This problem of firming the supply is a hindrance to reaching the state-mandated requirement of cost effectively sourcing electrical power from a renewable resource. Compressed air energy storage (CAES) is an economically feasible solution for energy storage during peak wind generation, if the proper reservoir for storage is available. Developing CAES facilities would meet this critical need in Montana and benefit ratepayers by reducing the cost of electricity during peak demand.

The goal of this project is to identify sites that have the best potential as CAES facilities based on critical geologic criteria. This goal will be met by: identifying potential geologic formations having favorable reservoir characteristics, determining their distribution, and identifying where they occur in a favorable trapping geometry.

The Montana Public Service Commission will be responsible for this project; Montana Bureau of Mines and Geology (MBMG) will conduct the necessary geologic investigations.

The project will evaluate geologic reservoirs statewide; it is designed to be completed in two years.

### **Technical Assessment**

Funding is requested to conduct a study to identify and evaluate potential sites for CAES in Montana based on critical geologic criteria. The applicant provided an explanation of the problem, supported with general descriptions of other methods that could help balance fluctuating electrical demands.

The applicant presented a narrative of the cost benefits that could occur if CAES is successfully incorporated into the power system by stabilizing available power supplies; however, the applicant did not provide quantifiable direct costs or benefits of the project. A brief discussion was presented on potential energy storage alternatives, but it did not demonstrate that these alternatives were investigated in any detail, or that the implementation of CAES facilities would provide greater benefits. No-cost benefit analysis was presented for the alternatives.

The goals/objectives outlined in the application were very general and brief. The task descriptions and activities lacked clarification and reasons for individual activities. This is probably due to the fact that only two CAES systems operate worldwide and very little supporting documentation is available. In addition, both of these facilities utilize large subsurface caverns, which are not available in Montana. This project proposes to investigate porous and permeable sandstone layers as potential sites. Brief references were made to other CAES facilities under development, but no documentation was provided. The applicant also presents many project goals that may not be fully achievable because of seismic information that

may be unavailable. The project schedule was presented in a table that was easy to follow and understand, with reasonable time schedules to accomplish tasks.

Deliverables for this project will consist of a final report describing and detailing conclusions of the project tasks, and presenting a refined list of potential CAES sites. It was not clear whether these sites would be ready for immediate CAES development, or whether additional study would be necessary. A monitoring plan was presented describing personnel who will be responsible for the quality of the work, and ensuring that overall project goals are met.

### Financial Assessment

The total budget for this project:

	<b>RDGP</b>	<b>Matching Funds</b>	<b>Total</b>
Salary and Wages	\$ 0	\$ 8,216	\$ 8,216
Fringe Benefits	\$ 0	\$ 0	\$ 0
Contracted Services	\$ 215,194	\$ 69,163	\$ 284,357
Supplies	\$ 1,000	\$ 0	\$ 1,000
Communications	\$ 50	\$ 0	\$ 50
Travel	\$ 9,340	\$ 0	\$ 9,340
Rent	\$ 0	\$ 0	\$ 0
Equipment	\$ 0	\$ 0	\$ 0
Miscellaneous	\$ 67,876	\$ 6,000	\$ 73,876
<b>Total</b>	<b>\$ 293,460</b>	<b>\$ 83,379</b>	<b>\$ 376,839</b>

Grant funds will be used to develop a list of sites for development of CAES facilities based on geologic criteria. At the request of DNRC, the applicant provided a more detailed breakdown of supplies and materials, and individual labor costs based on salary plus benefits for each of the five identified tasks. The Recommendation section lists the task/budget recommended by the DNRC ranking committee.

### Environmental Evaluation

Environmental impacts associated with this project were reviewed and no apparent adverse impacts will result. The environmental benefits from this project could result in an effective means of firming the fluctuating power supply acquired from wind generation; however, future impacts to the subsurface environment from CAES storage must be evaluated before full development.

### Public Benefits Assessment

The proposed project has the potential to benefit Montana residents and increase the viability of a renewable energy resource. A public benefit from this project would be the knowledge of potentially favorable geologic sites for CAES which may result in lower energy costs for ratepayers by firming fluctuating power supplies. The project could also contribute to the development of an alternative energy source for power.

The applicant provided a crucial state need based primarily on the assumption that reliance on fossil fuels must be reduced, and that wind energy is developing in Montana. Due to fluctuating wind generation and demand, energy storage technologies must be developed to firm these power supplies. CAES is one of several potential energy storage alternatives, but alternatives to CAES were not addressed. The applicant's discussion in support of a crucial state need also included public support to pursue CAES site feasibility studies.

## **Recommendation**

A reduced funding level of up to \$135,000 is recommended for this project contingent upon DNRC approval of the project scope of work and budget.

The reduced recommended budget consists of the following:

- Task 1 – Identification of Potential CAES Reservoirs (\$13,490-no change);
- Task 2 – Determination of Reservoir Distribution (\$66,715-no change);
- Task 3 – Identification of Potential Traps (\$46,066-no change);
- Task 4 – Seismic Confirmation and Refinement (\$0-eliminated); and
- Task 5 – Final Interpretations, Administrative Cost, and Report (\$8,729-reduced from \$39,689).

**Project No. 20**

<b>Applicant Name</b>	Flathead Basin Commission
<b>Project Name</b>	Flathead Regional LiDAR Mapping Project
<b>Amount Requested</b>	\$ 294,977
<b>Other Funding Sources</b>	\$ 22,546 DNRC Floodplain Program
	\$ 3,161 Flathead Basin Commission
	\$ 1,149 Flathead County
	\$ <u>1,154</u> Flathead County Conservation District
<b>Total Project Cost</b>	\$ 322,987
<b>Amount Recommended</b>	\$ 294,977

**Project Abstract** (Prepared and submitted by the applicant)

The Flathead region is experiencing explosive growth, much of it being adjacent to critical waterways and over shallow aquifers and groundwater sources. According to U.S. census data, 2,782 people moved to this region from other counties and 1,343 people moved from out of state during 2006. This is a significant change for a single year. Without solid scientific information regarding what natural resources are being altered by this development, water quality, critical habitat, and community members' health, safety, and property are at risk. There is no mystery to the draw this region possesses considering the wild character of the streams, the beauty of the many lakes, the easy access to nearby mountain ranges, and bountiful valleys found throughout this region, which make it a true jewel of Montana. The continuing influx of people to this region supports its booming economy driven by growth and tourism oriented sectors. The wealth being expended in this region provides an important economic stimulus to Montana's economy. To ensure that this area can continue to grow and prosper without spoiling the condition of the natural resources that are the impetus for its growth, difficult decisions regarding where and how growth should occur need to be made. This mapping project will significantly improve the decision-making capabilities of local, state, and federal agencies while better protecting, managing, and conserving the natural resources of the Flathead region.

Throughout the United States, lakes, streams, and entire regions have become significantly degraded due to substantial growth and development. In order to prevent this from occurring in the Flathead, decision-makers need to be able to see the full picture and understand how each individual decision they make will affect the overall health of the region. Currently, decision-makers do not have the scientific information necessary to accurately weigh all of the risks to the natural resources and individual property owners. The first step in that direction is to obtain accurate baseline data regarding current conditions so that when decision-makers approve subdivisions or the development of individual parcels they can understand the potential cumulative effects and risks associated with these activities. This will help local jurisdictions avoid putting the lives and property of homeowners at risk while ensuring that the shorelines are developed in a manner that will prevent the degradation of the natural resources present. The second step is to use the baseline data provided by this project to assess the cumulative impacts of development on Flathead Lake, identify restoration opportunities, and increase the accuracy of the local jurisdictions' floodplain maps. These activities are needed to effectively manage and protect Flathead Lake, one of the most unique and beautiful physical features in Montana. The third and final step is for local communities, supported by state and federal agencies, to formulate their vision for development of the Flathead region using sound scientific data and assessments. The information obtained from this project will provide a tool for federal and state agencies, the Flathead Conservation District, Flathead County, Flathead Basin Commission, local Non-Profit groups, and individual landowners to make decisions regarding how the Flathead region will develop over time based on sound scientific data.

The goals of this project are to ensure the health and vitality of the Flathead region and its residents by providing baseline topographic, vegetative cover, and development pattern data in support of resource and development planning decisions. Data collected will be publicly available through the State Natural

Resource Information System Library (NRIS). The collection of this baseline data will greatly assist the local community's natural resource management activities and planning efforts. The project will be overseen by the Flathead Basin Commission and administered by DNRC personnel. Technical LiDAR mapping services will be provided by a subcontractor, to be determined via the request for proposals (RFP) process. Coordination efforts with local jurisdictions, non-profits, and citizen groups have been undertaken and will continue throughout the project.

The project area includes roughly 360 square-miles of Flathead County, specifically: Flathead Lake shoreline and buffer area; all of the mainstream Flathead River from the lake to its confluence with the South Fork Flathead; the entire Whitefish River to Whitefish Lake; the Stillwater River to Table Creek; most of Columbia Falls; Whitefish; Bigfork; Lakeside; and the greater Kalispell area. The anticipated timeframe for the project is July 2009 to June 2011. This will include a six-month to one-year "distribution" period during which a minimum of three public outreach meetings will be held to disseminate the data. The resulting dataset will then reside within the NRIS library for all to access via the internet for an indefinite time period.

### **Technical Assessment**

The goal of the project is to maintain the health and sustainability of Flathead Lake and its tributary streams, while balancing the cumulative impacts of development on floodplains and shorelines in the region. In order to reach this goal the project proposes to gather data and develop baseline topographic, planimetric and canopy elevation data over a large regional area to minimize data collection costs and maximize project benefits. The minimum desired final product would be a 2-foot contour map with additional products produced depending on the selected data collection method.

The application defines the need for accurate topographic data for planning, restoration, and regulation uses. Current topographic data is inaccurate and numerous projects would utilize the new base line data to both evaluate the impact of the ongoing rapid development on natural resources and to assess the true flooding risks for existing and future development. These data would allow refinement of current planning activities via the incorporation of more detailed data and information.

Six alternatives were presented: (1) do nothing, (2) map the region with ground survey techniques, (3) map the region with aerial photogrammetry techniques, (4) map the region with IFSAR mapping technology, (5) map the region with LiDAR technology, and (6) map the region with LiDAR technology collaboratively with Lake County. Each alternative was discussed in terms of ability to collect the desired data and cost. Of the action alternatives, alternative #4 is by far the least expensive. However, this alternative would not produce the level of detail desired for the relatively flat valley bottom and lake shoreline. Alternative 2 is the most expensive and would produce data more accurate than needed. Of the alternatives that produce the desired 2-foot contour maps for the regional area identified, Alternative #6 is the least expensive on a per square mile basis and is the preferred alternative. However, it is contingent upon Lake County receiving a Renewable Resource Grant, which is unknown at this time. Therefore, accounting for this project is based upon the costs associated with this project as a stand-alone from Alternative #5. Cost savings achieved from collaboration with Lake County in the event that they receive a grant, will be utilized to purchase value-added products in the Flathead region which may include color-infrared photography for vegetation species identification or structural planimetrics for E911 system planning.

The selected alternative will produce other bonus products in addition to the 2-foot contour map. The products include: (1) digital, 1-foot, color-ortho-photographic data set of the Flathead Valley, (2) planimetric and canopy elevation data over a large regional area. These data will be placed in GIS formats compatible with standard ESRI products and stored on the State of Montana Natural Resources NRIS library and be available for anyone to use.

The project is divided into 10 tasks that will take approximately two years to complete (July 2009-June 2011). The project timeline may need to be extended six months (July 2009-December 2011) depending on best weather and ground conditions for flight in fall or spring (November 2009 or April 2010). Tasks 1,

2, and 3 involve selection of a contractor. Tasks 4, 5, and 6 involve data collection. Tasks 7, 8, 9 and 10 involve data processing, delivery, storage, and distribution. The project as presented is linear and straightforward.

### Financial Assessment

	RDGP	Matching Funds	Total
Salaries and Wages	\$ 0	\$ 19,932	\$ 19,932
Fringe Benefits	\$ 0	\$ 5,519	\$ 5,519
Contract Services	\$ 294,977	\$ 0	\$ 294,977
Supplies and Materials	\$ 0	\$ 250	\$ 250
Communications	\$ 0	\$ 150	\$ 150
Travel	\$ 0	\$ 2,159	\$ 2,159
<b>Total</b>	<b>\$ 294,977</b>	<b>\$ 28,010</b>	<b>\$ 322,987</b>

As described in the project proposal, the budget appears adequate to accomplish the project. Bids were received from two contractors and presented with the grant application. Both bids were based upon predicted costs in fiscal year 2009 and are comparable in both scope and final cost, lending confidence in the final project budget. A 5%-contingency was also included for cost variations that may occur in the interim period. RDGP funds will be contracted services only. These services include: (1) LiDAR with 2-foot contours (\$241,130) with 5% contingency (\$12,057); (2) Color Ortho-Imagery with 1-foot resolution (\$35,800) with 5% contingency (\$1,790) and (3) State of Montana Library – NRIS web development and data storage (\$4000) with 5% contingency (\$200).

Matching funds come in the form of in-kind services. These services will be provided by the applicant (FBC), DNRC floodplain program, Flathead County, and Flathead County Conservation District through administration of the RDGP grant, the contracting process for LiDAR mapping, contract administration, public outreach and data liaison. In-kind services include an estimated \$19,932 for salaries and wages, \$5,519 for fringe benefits, \$250 for supplies, \$150 for communications and \$2159 for travel.

Funding is recommended for the entire amount requested (\$294,977). The effective implementation of the project will require the entire budget requested.

### Environmental Evaluation

The proposed project is for data collection with remote sensing equipment and will therefore have no environmental impact. However, the data collected will be used to better plan future development activities and will benefit the public by providing baseline scientific data to allow natural resources and planning activities to take place that will protect Flathead Lake and connected waterways as well as riparian areas and floodplains associated with this region. These data will assist in assessment of cumulative impacts of development activities on the natural resources. Restoration opportunities can also be identified and designed using the baseline data.

### Public Benefits Assessment

This project is a collaborative effort. Several public meetings have already taken place to gather support for this project. A multitude of governmental and non-governmental agencies have expressed their support for this project. Lack of baseline data is a hindrance to planning and management of the area. The area is subject to intense development pressure and there is great risk to the life and property of homeowners who build in this area from flooding. The data obtained by this project will allow inaccurate floodplain maps to be refined to better protect property and homeowners. Fire fuel and hazard mapping would also greatly benefit from the extremely accurate vegetative cover data that can be garnered from

the information collected by this project. The data and information obtained will provide decision makers with better tools for their natural resource management and planning. These data can also be used as leverage for additional funding. For example, FEMA will generally not pay for base map data collection but will consider it as in-kind contribution. These data may be used to generate funding for improved floodplain mapping.

The DNRC Floodplain Management Section, Flathead County, Lake County, and the Flathead Conservation District are working together with the Flathead Basin Commission and providing in-kind services for technical administration and public outreach activities for this project.

### **Recommendation**

A grant of up to \$294,977 is recommended for this project contingent upon DNRC approval of the project scope of work and budget.



**Project No. 21**

**Applicant Name** Jefferson County  
**Project Name** Groundwater Quality Assessment with an Emphasis on Radionuclides

**Amount Requested** \$ 300,000  
**Other Funding Sources** \$ 15,138 Applicant  
\$ 190,878 USGS  
**Total Project Cost** \$ 506,016

**Amount Recommended** \$ 300,000

**Project Abstract** (Prepared and submitted by applicant)

Because groundwater is the sole source of drinking water in the county and information on groundwater quality is limited, residents and officials of Jefferson County are concerned about water supplies for the growing population. In addition, human health is a concern because recent, but sparse, data indicate that local groundwater contains harmful levels of uranium and other radionuclides. These radionuclides likely come from the granitic rocks of the Boulder Batholith. The batholith, intensively prospected for uranium in the 1950s, underlies much of Jefferson County and some surrounding areas. Effects of historical uranium mining may also contribute locally to the high levels of radionuclides in groundwater.

Jefferson County, in cooperation with the U.S. Geological Survey (USGS), proposes a three-year investigation to assess the quality of groundwater within the county and neighboring areas, emphasizing occurrence and source of radioactive elements of concern to human health. Project objectives are to: (1) collect and compile water quality data for 125 wells in areas underlain by the Boulder Batholith and associated geologic units; (2) examine the distribution of radioactive elements in groundwater in relation to location, hydrogeologic unit, potential natural geologic and mining-related sources of radionuclides, and geochemical conditions conducive to mobilization of these elements; (3) examine distribution of nitrate and other septic system indicators in groundwater; (4) provide project data through a publicly accessible database; and (5) report project results and provide water treatment information. Results will help inform and guide current and future well owners interested in water quality as well as state and local officials responsible for water resource management, planning, and health.

**Technical Assessment**

Funding is requested to conduct a groundwater-monitoring program to assess the occurrence and source of radioactive elements, and provide preliminary information regarding septic-related contaminants. The project is directed at providing government officials, developers, county planners, and residents with a better understanding and knowledge of groundwater quality conditions for present and future development.

The applicant defines the need for developing a groundwater study, and presents the proposal systematically throughout the application. Development in Jefferson County has increased significantly in the past decade, with over 1,200 single-family lots permitted. The problem history includes an actual case that documents a human illness related to high uranium concentrations, which supports the need for this study. Subsequent sampling has documented widespread occurrence of radionuclides in domestic wells, several exceeding drinking water standards.

The cost-benefit analysis presented a sound discussion relating the higher costs to increased benefits for residents. These benefits include publicly available data documenting groundwater quality in Jefferson County, and health benefits for residents who learn their wells exceed drinking water standards and they then seek water treatment alternatives.

The applicant presented the following three project alternatives:

1. No action;
2. Limited assessment of groundwater conditions; and
3. Comprehensive groundwater assessment (preferred alternative).

The applicant presented a detailed outline and discussion for each alternative, and solid reasoning for choosing the preferred alternative. Additional supporting documents were provided by local organizations, residents, and government officials. The staffing and administration of the project was clearly stated, outlining each person's title and responsibility.

The goal of the project is to assess groundwater quality within Jefferson County and neighboring areas, with an emphasis on the occurrence and source of radioactive elements. Project objectives outlined in the application were clearly stated and described in detail how each objective will be completed. An additional objective is to examine the influence of septic systems by analyzing for nitrate and wastewater indicators. Task descriptions provided further detail and understanding of the project and how the data will be collected, analyzed, interpreted, and evaluated. Deliverables for this project will include a USGS database accessible via Internet, reports, and information disseminated by Jefferson County; however, public outreach and education of residents require more emphasis. A project schedule was presented for the proposed work, which included realistic and achievable milestones. A monitoring plan was not presented, but sufficient information was presented within the task descriptions to adequately evaluate the project outcomes and quality of work conducted.

### Financial Assessment

The total budget for this project consists of the following:

	<b>RDGP</b>	<b>Matching Fund</b>	<b>Total</b>
Salary and Wages	\$ 183,190	\$ 139,419	\$ 322,609
Fringe Benefits	\$ 0	\$ 0	\$ 0
Contracted Services	\$ 81,950	\$ 54,640	\$ 136,590
Supplies	\$ 6,610	\$ 4,400	\$ 11,010
Communications	\$ 0	\$ 0	\$ 0
Travel	\$ 5,680	\$ 6,507	\$ 12,187
Rent	\$ 0	\$ 0	\$ 0
Equipment	\$ 1,570	\$ 1,050	\$ 2,620
Miscellaneous	<u>\$ 21,000</u>	<u>\$ 0</u>	<u>\$ 21,000</u>
<b>Total</b>	<b>\$ 300,000</b>	<b>\$ 206,016</b>	<b>\$ 506,016</b>

Grant funds will be used to assess water quality in Jefferson County and surrounding areas to provide a better understanding of potential impacts from radioactive elements and septic systems. Groundwater sampling and analysis will be conducted by the USGS, with administrative assistance from the applicant and a grant administration agency. The applicant provided an adequate breakdown of project expenses, but did not provide detailed unit costs for individuals, contracted services, and travel. Laboratory analytical costs are a significant portion of the project (\$136,590); however, due to the expensive nature of the constituents to be analyzed (radioactive elements and pharmaceuticals), these costs are likely reasonable. Administrative costs (\$21,000) are high considering the work proposed. The applicant will contribute \$15,138 in matching funds, with remaining matching funds provided by the USGS. No specific costs were presented for other alternatives. No budget or funding irregularities were noted, and the overall budget appears reasonable.

## **Environmental Evaluation**

Environmental impacts associated with this project were reviewed and no apparent adverse impacts will result. Environmental benefits from this project will result in a better understanding and knowledge of the impact from radioactive elements, and their sources, and additional impacts from septic systems.

## **Public Benefits Assessment**

The proposed project has the potential to directly and indirectly benefit Montanans. Direct benefits will consist of a better understanding of groundwater quality to assist Jefferson County officials in making informed decisions for future developments. The proposed project will also indirectly affect residents by providing them with information about local groundwater conditions, and improved health and welfare for those residents who live in impacted areas. Overall, the project will provide long-term benefits and help protect the public health and welfare of Jefferson County residents.

The applicant provided an adequate statement of crucial need based on documented public health impacts and additional concerns due to limited groundwater quality data in the county. Due to increasing residential development and its impact on groundwater resources, the potential risk to public health will be greater. An estimate was presented of increased development, and a letter was included from the DEQ Source Water Protection Program supporting the "crucial state need." The project has strong public support; as the application included 11 letters of support from local conservation organizations, government officials and agencies, and local residents.

## **Recommendation**

A grant up to \$300,000 is recommended for this project contingent upon DNRC approval of the project scope of work and budget.

**Project No. 22**

**Applicant Name** Meagher County Conservation District (MCCD)  
**Project Name** Hydrologic Framework and Water Budget of the Upper Smith River Watershed

**Amount Requested** \$ 300,000  
**Other Funding Sources** \$ 0 Applicant  
\$ 180,000 USGS  
**Total Project Cost** \$ 480,000

**Amount Recommended** \$ 300,000

**Project Abstract** (Prepared and submitted by applicant)

The Upper Smith River Watershed is an important agricultural and recreational area in Meagher and Cascade counties in west-central Montana. About 36,000 acres are irrigated for hay and small grains crops. Thousands of visitors travel there annually to float and fish the river.

During the recent drought, Smith River streamflow was insufficient to meet irrigators' needs and, on several occasions, dropped below levels necessary for healthy fish populations. In 1993 a Montana law closed the watershed to further surface water appropriation. Since, many irrigators are converting from flood to more efficient sprinkler irrigation and/or are using groundwater.

The MCCD and the U.S. Geological Survey (USGS) are conducting a study (October 2006 to March 2010) on the groundwater/surface water interaction within the watershed. This study provides the foundation for the study proposed in this application.

The second study (July 2009 to September 2012) will provide additional understanding of the Smith River's hydrologic system in order to manage competing water needs. The MCCD/USGS will develop a hydrologic framework for the watershed and estimate a water budget based on how much water is entering and leaving the basin, and what various irrigation methods consumed. This data will be critical in making decisions on whether to grant or deny new water rights or changes to existing water rights.

Overall, the study's findings will enhance management of the water resource. Beneficiaries include agriculture, fish and wildlife habitat, recreationists, local citizens, the City of White Sulphur Springs, and DNRC.

There is a "crucial state need" to complete this project. Further hydrologic understanding of a high-profile place like the Upper Smith River Watershed could lead to a better understanding of other Montana watershed systems and, especially, innovative solutions for conserving precious water resources.

**Technical Assessment**

Agricultural and recreational demands on water resources in the Upper Smith River Watershed, combined with effects of the recent drought, have resulted in streamflow dropping below levels necessary to meet irrigator's needs or support healthy fish populations. In conjunction with effects from drought and existing surface water appropriations, many irrigators have converted or are converting from flood irrigation to sprinkler irrigation and using groundwater for their irrigation needs. The effect on flow levels in the Smith River resulting from the increased groundwater use, along with existing surface water appropriations, is poorly understood.

The Meagher County Conservation District, in cooperation with the U.S. Geological Survey (USGS), began a study in 2006 to better understand the groundwater-surface water interaction in the Upper Smith River Watershed. Partial funding for the project was obtained from an RDGP grant. Preliminary results

show that surface water and groundwater are connected and dynamically interact in certain locations as a result of changing climatic and water use conditions. Preliminary results also suggest that changes to irrigation practices could bring about hydrologic changes in the Smith River and its tributaries. This ongoing study is providing key information about how and where streamflow in portions of the Smith River watershed is augmented by groundwater and where stream flow recharges the shallow groundwater system,

This proposed project will develop a hydrologic framework and associated water budget for the Upper Smith River Watershed using data collected in the ongoing study as well as new data collected as part of this proposed study. The primary objectives of this project are to: (1) complete an inventory of both water sources and consumptive water uses in the Upper Smith River Watershed, (2) identify surface water and groundwater interactions, and (3) develop a water budget that accounts for variable inflows, outflows, and surface water/groundwater interactions and illustrates uncertainties in each of the budget's components. The goal of this project is to improve the understanding of the watershed's current water balance for future water management decisions. The alternatives of no action, or generating a water balance model without current data and synoptic sampling, will not meet project goals.

The technical approach for developing a current water budget for the upper Smith River watershed is sound. Compiling historic and current water resource and consumptive use data is key to evaluating impacts related to changing water use practices. Collecting synoptic measurements (a set of measurements taken at virtually the same time) of groundwater levels and surface water flows is an accepted tool for evaluating groundwater flow characteristics and surface/ground water interactions. Modeling is an effective tool for evaluating hydrologic responses to changing conditions. Publishing the data will ensure public access to the information in the future.

The technical and administrative leads for the project are the USGS and MCCD. Project staff backgrounds are in local natural resource and conservation practices, hydrology, soil science, and project management and coordination.

### Financial Assessment

The total overall budget for this project:

	<b>RDGP</b>	<b>Matching Funds</b>	<b>Total</b>
Salary and Wages	\$ 246,150	\$ 144,100	\$ 390,250
Fringe Benefits	\$ 0	\$ 0	\$ 0
Contracted Services	\$ 41,076	\$ 27,384	\$ 68,460
Supplies and Materials	\$ 0	\$ 0	\$ 0
Travel	\$ 9,918	\$ 6,612	\$ 16,530
Equipment	\$ 2,856	\$ 1,904	\$ 4,760
Miscellaneous	\$ 0	\$ 0	\$ 0
<b>Total</b>	<b>\$ 300,000</b>	<b>\$ 180,000</b>	<b>\$ 480,000</b>

Expenses presented in this application are reasonable for the scope and scale of the proposed project. The applicant provided a detailed breakdown of cost and labor necessary to complete proposed tasks. No budget or funding irregularities were noted. The unit costs used in developing the budget appear reasonable and adequate. However, a breakdown of salary and fringe benefits requested but not yet received from the USGS. Administrative costs for MCCD at 10% are reasonable given the extent of community outreach the MCCD performs as well as the amount of statewide scrutiny it receives as a result of the Supreme Court decision.

### Environmental Evaluation

This project is identified under the application's "crucial state need" category. The applicant's goal for the project is maintaining a healthy, sustainable river system while balancing irrigation requirements and

habitat needs. Data sources for this project will include historic and public records, landowner interviews, and data collection from existing infrastructure.

Environmental impacts associated with this project were evaluated. Since no new drilling, construction, or other surface disturbances are identified, no adverse long-term environmental impacts specific to this project are expected. Beneficial results are primarily related to the collection of hydrogeologic data for use in developing the hydrologic framework and associated water budget for the Upper Smith River Watershed. This data will be available to regulatory agencies, other watershed groups, water rights applicants, and the general public for use in future decisions.

This project will have minimal environmental impact. Field tasks will include streamflow and groundwater level measurements. Small metal staff plates and small electronic data loggers will be temporarily installed into some streams or irrigation canals to measure water-surface elevations.

### **Public Benefits Assessment**

This project will both directly and indirectly benefit Montanans. It will provide individuals and organizations engaged in water management issues in the watershed with the following benefits: (1) an improved understanding of the connection between groundwater and surface water, (2) an improved understanding of the watershed's hydrologic characteristics to enable prediction of surface water flows by new groundwater appropriation requests, (3) a baseline water budget including how much water is entering and leaving the watershed annually, climatic changes, and surface water versus groundwater irrigation practices, and (4) a base of historical water consumption that will help evaluate the current effects of surface and groundwater appropriations.

The data collected during the project will directly benefit those living in the Upper Smith River Watershed. Water management decisions, including water rights assessments, will be based on sound scientific data. Results of the project will indirectly benefit Montanans by providing data for use in long-term protection of the fisheries and floating opportunities in the Smith River drainage. Benefits to public health, safety, and welfare are minimal.

### **Funding Recommendation**

A grant of up to \$300,000 is recommended for the project contingent upon DNRC approval of the project scope of work and budget.

**Project No. 23**

<b>Applicant Name</b>	Custer County Conservation District
<b>Project Name</b>	Yellowstone River Riparian Restoration
<b>Amount Requested</b>	\$ 299,926
<b>Other Funding Sources</b>	\$ 255,832 U.S. Army Corps of Engineers
	\$ 88,538 DNRC
	\$ 73,200 Landowners, council, In-Kind
	\$ 66,580 Federal & State Staff, In-Kind
	\$ 10,000 Northern Great Plains Joint Venture
	\$ 20,000 National Fish and Wildlife Foundation
<b>Total Project Cost</b>	\$ 814,076
<b>Amount Recommended</b>	\$ 177,881

**Project Abstract** (Prepared and submitted by the applicant)

Invasive plant species, including saltcedar (*Tamarix ramosissima*) and Russian olive (*Elaeagnus angustifolia*) have impacted the values of the riparian land adjacent to the Yellowstone River. Montana has recognized saltcedar as a threat to natural resources and listed it as a Category 2 noxious weed because it spreads rapidly and renders land unfit for beneficial uses. The state's management criteria for saltcedar includes education, containment of known infestations, and eradication.

Saltcedar and Russian olive rapidly replace native cottonwoods, willows, grasses, and forbs. Dense thickets invade the river's banks and floodplains, leading to degradation of wildlife habitat, reduction in livestock forage, loss of species biodiversity, increased risk of wildfire, limited recreational use of waterways, and the consumption of more water than native vegetation.

The Yellowstone River Conservation District Council (YRCDC) plans to carry out the project along 560 miles of the Yellowstone River from the Yellowstone Park border near Gardiner, Montana, to its confluence with the Missouri River near Fairview, North Dakota. The proposal objectives, components of a larger Yellowstone River Corridor Comprehensive Study, are to:

- Conduct a riparian characterization of the plant community including an invasive plant species inventory of the geographic extent of invasion and to assess effects on the agricultural economy, riparian plant communities, channel geomorphology, river hydraulics, and avian species;
- Create and provide the Yellowstone River Atlas with results from the riparian characterization and invasive plant species inventory;
- Conduct an education and outreach program to increase awareness and gain public support for elimination/control of saltcedar and Russian olive;
- Conduct demonstration projects to assess riparian management including control alternatives, slash management, revegetation, grazing and buffer strips, and maintenance;
- Develop and implement long-term riparian management including reclamation and monitoring; and
- Identify, support, and develop economic opportunities through biomass utilization.

Project duration is estimated at 36 months. By achieving objectives in this proposal, the Yellowstone River will become the statewide model for conservation and restoration of healthy ecosystem function through watershed-scale management of invasive plant species. Because the project depends on local leadership in a partnership with the federal government, funding for this project will ensure that local and state entities play a major role in the long-term management of this great resource.

## Technical Assessment

The project's goal is to, "collect information and assess the current and future state of the Yellowstone River riparian resource." The potential impacts of saltcedar and Russian olive infestations on the degradation of form and function of the Yellowstone River are well stated. The proposal does not mention how woody invasives are managed on the tributaries to the Yellowstone River, which are potential seed sources for infestations of saltcedar and Russian olive on the Yellowstone River. A discussion with the project proponent confirmed that the proposed project would be used to help management efforts of these woody invasives throughout the watershed.

The YRCDC considered four alternatives: (1) no action, (2) utilization of satellite imagery, (3) support individual projects on a county-by-county basis, and (4) an in-depth study of the entire river. The no-action alternative does not accomplish the purpose of the project nor is it in the best interest of the general public. Use of satellite imagery was considered to be too expensive. Also, cloud cover could obscure the land surface, and multistoried forest canopies could confound attempts to accurately map the riparian resource. Supporting individual projects on a county-by-county basis would not take advantage of previous work, and control efforts would not be well-coordinated because there would not be a comprehensive management plan. An in-depth study of the entire river corridor was deemed to be too costly. The proposed project strikes a balance between the need for accurate and repeatable data sets and cost.

The project is divided into six tasks that will generally run concurrently and are anticipated to take three years (July 2009-July 2012) to complete. Under Task 1, historic conditions of riparian resources would be mapped using aerial photography from the 1930s, 1950s, 1976, and 2001. Existing vegetation would be mapped in the field using global positioning system (GPS) technology. Special emphasis on saltcedar and Russian olive infestations would be made, with control efforts (i.e., education, demonstration projects, and long-term management) comprising Tasks 3, 4, and 5, respectively. Task 6 consists of a feasibility study for using biomass generated by control of saltcedar and Russian olive. Detailed analyses of each of these six tasks are provided below.

Task 1--The review and mapping of the historic riparian resources along the Yellowstone River is not well explained. No minimum mapping unit or procedure is provided. The aeriels have already been acquired and are available on the applicant's website. Based on a review of what is available on the Internet, it appears that the best that may be accomplished is to differentiate between areas dominated by trees, shrubs, or herbaceous vegetation, as well as various types of land use such as cultivated, urban, natural, etc. The result will be a relatively coarse assessment of trends over time. This task basically describes the gist of the project, essentially a riparian and land use management assessment and an invasive species inventory. Much of this information can and should be developed from existing data sets to insure consistency and continuity.

Task 2--This task describes the population of the Yellowstone River Atlas database with information gathered in this project and from previous projects on the Yellowstone. The database will be used for management decisions throughout the corridor by the public, agencies, and private landowners. The Yellowstone River Atlas will be the primary means by which information and results of this project are communicated to the public.

Task 3--This task involves various components of education and outreach regarding saltcedar and Russian olive control. Though not explicitly stated in the proposal, a follow-up phone conversation with the project proponent confirmed that technology transfer would occur with states already dealing with saltcedar and Russian olive along the Missouri River, as well as from the Center for Invasive Plant Management.

Task 4--This task describes different types of potential demonstration projects to evaluate control methods. The stated objective is to plan and conduct demonstration and restoration projects in **each** of



the counties adjacent to the Yellowstone River. This seems to be an overly ambitious objective for this project. Instead, one or two well-thought-out demonstration projects would seem to better serve the project goals and would stand a better chance of being useful tools to identify control strategies and convey project concepts and ideas to interested landowners and the public.

Task 5--This task involves the long-term management and maintenance strategies for riparian areas and includes a monitoring plan by landowners for areas treated for saltcedar and/or Russian olive infestations. It appears to be a well-thought-out preliminary approach to how this task can be accomplished. Though not explicitly stated in the proposal, a follow-up phone conversation with the project proponent confirmed that the output of this task would be a comprehensive management plan, similar to the Missouri Saltcedar Management Plan.

Task 6--Under this task a feasibility study would be conducted to evaluate the potential uses of biomass accumulated during the control of woody invasives. Some of the potential uses of the biomass listed appear unreasonable (i.e., school heat production) since the volume or tonnage of biomass available is a limiting factor. While the idea of encouraging a restoration-based economy has good intent, it would seem that utilization of "waste" saltcedar and Russian olive biomass is not a good fit.

### Financial Assessment

	RDGP	Matching Funds	Total
Salaries and Wages	\$ 15,600	\$ 92,000	\$ 107,600
Employee Benefits	\$ 3,900	\$ 28,308	\$ 32,208
Contracted Services	\$ 249,735	\$ 359,032	\$ 608,767
Supplies and Materials	\$ 1,000	\$ 0	\$ 1,000
Communications	\$ 4,000	\$ 0	\$ 4,000
Travel	\$ 6,728	\$ 0	\$ 6,728
Rent and Utilities	\$ 0	\$ 34,810	\$ 34,810
Equipment	\$ 18,963	\$ 0	\$ 18,963
<b>Total</b>	<b>\$ 299,926</b>	<b>\$ 514,150</b>	<b>\$ 814,076</b>

Funding from the DNRC would comprise nearly 50% of the total project budget (RD grant: \$299,926 and \$88,538 from the Conservation and Resource Development Division). Additional funding commitments have been obtained from: ACOE, in-kind contributions from landowners and the Council, in-kind contributions from federal and state staff, the National Fish and Wildlife Foundation, and the Northern Great Plains Joint Venture. The RDGP portion of the budget includes an estimated \$15,600 for salaries and wages, \$3,900 in employee benefits, \$18,963 in equipment costs, \$1,000 in desktop supplies, \$4,000 for copying and mailings, and \$6,728 for travel.

### Environmental Evaluation

The proposed project may have beneficial impacts to the functionality of the Yellowstone River and associated riparian areas. Implementation could help to prevent and minimize degradation of wildlife habitat, reduction in livestock forage, loss of species biodiversity, increased risk of wildfire, limited recreational use of waterways, and consumption of more water than native vegetation. Potential adverse impacts could result due to accidental spillage or misapplication of herbicides, especially since demonstration projects would occur in riparian areas, potentially close to wetlands and open water sources. A spill prevention plan should be developed and implemented and training required for all personnel to ensure the correct usage and application of herbicides.

### Public Benefits Assessment

Governmental and non-governmental agencies have expressed support for this project. Although areas of the Yellowstone River have severe infestations of saltcedar and Russian olive, the overall character of the river has not yet been affected. Staying ahead of the potential proliferation of these species is certainly important; however the problem does not yet merit classification as “a crucial state need.” If left unmanaged, both saltcedar and Russian olive have the potential to adversely affect the character and functionality of the Yellowstone River in a relatively short period of time. These two invasive species represent a potentially serious threat to the Yellowstone River, a prized resource of all Montanans, as well as the counties and communities that occur along it.

**Recommendation**

A grant of up to \$177,881 is recommended for this project contingent upon DNRC approval of a revised scope of work and budget. The following are recommended changes to the funding levels proposed for various expense categories in the project budget detail table on page 33 of the grant application:

<b>Expense Category</b>	<b>Requested RDGP Funding</b>	<b>Recommended RDGP Funding</b>
Salaries and Wages	\$ 15,600	\$ 15,600
Employee Benefits	\$ 3,900	\$ 3,900
Contracted Services		
a. Task 1: riparian assessment and invasive plant inventory:	250 miles @ \$280/mile = \$ 70,000	200 miles @ \$280/mile = \$ 56,000
b. Task 2: information management:	\$ 50,000	\$ 25,000
c. Task 3: education and outreach:	\$ 33,735	\$ 23,690
d. Task 4: demonstration projects:	750 acres @ \$60/acre = \$ 45,000	100 acres @ \$60/acre = \$ 6,000
e. Task 5: long-term management:	\$ 3,000	\$ 3,000
f. Task 6: feasibility studies:	\$ 34,000	\$ 0
g. grant administration:	<u>\$ 14,000</u>	<u>\$ 14,000</u>
Total Contracted Services:	\$249,735	\$127,690
Supplies and Materials	\$ 1,000	\$ 1,000
Communications	\$ 4,000	\$ 4,000
Travel	\$ 6,728	\$ 6,728
Equipment	\$ 18,963	\$ 18,963
<b>ALL CATEGORIES GRAND TOTAL:</b>	<b>\$299,926</b>	<b>\$177,881</b>

**Project No. 24**

<b>Applicant Name</b>	Cascade County Commission
<b>Project Name</b>	Sustainable Water Supplies from the Madison Aquifer, Central Montana
<b>Amount Requested</b>	\$ 290,817
<b>Other Funding Sources</b>	\$ 16,461 Applicant
	<u>\$ 148,477</u> MBMG
<b>Total Project Cost</b>	\$ 455,755
<b>Amount Recommended</b>	\$ 286,792

**Project Abstract** (Prepared and submitted by applicant)

The Madison aquifer is a regional limestone aquifer that underlies most of central Montana. The aquifer is recharged by a combination of precipitation in outcrop areas in the Little Belt, Big Snowy, and Little Snowy mountains, seepage from mountain streams flowing across the porous limestone, and leakage from overlying aquifers. The Madison aquifer supplies groundwater for private, public, agricultural, and industrial uses, as well as Giant Springs in Great Falls and Big Springs near Lewistown.

The aquifer can likely supply water for additional uses without impacting current users. However the characteristics and locations where the Madison Limestone can support additional utilization have not been documented. Responsible development of this valuable resource must be based on detailed water quantity and water quality data, interpretations, and maps.

This project proposes to enhance responsible groundwater utilization and protection for the Madison aquifer in central Montana. This goal will be achieved through several steps including estimation of a water budget for the Madison aquifer, including recharge (precipitation, stream loss, and overlying aquifer seepage), and discharge (springs, wells, and groundwater outflow from the study area). Drilling depths, the potentiometric surface, and chemical characteristics will be determined and enhance the understanding of groundwater resources. Knowledge of the aquifer characteristics will protect existing water users and help county planners and regulatory agencies manage future uses of the aquifer. The project area includes Cascade County and areas surrounding the Little Belt and Big Snowy mountains. The project will build on an MBMG assessment covering much of Cascade County.

The work will be conducted by MBMG. Results will provide detailed understanding of the groundwater resources of the Madison aquifer. Project duration is 24 months.

**Technical Assessment**

Funding is requested to conduct a detailed groundwater study of the Madison aquifer to enhance responsible groundwater utilization and protection. The proposed project outlines acceptable groundwater study methods to characterize groundwater conditions and develop estimates for a Madison aquifer water budget. The applicant defines the need for developing the groundwater study by presenting a brief history of the study area, increasing aquifer usage, and pertinent historical background. The applicant also provides insight into some of the historical water quality data, and how this data and the additional collected data will be used to interpret aquifer characteristics and assist with development of potential water budgets. The proposed project appears to be an expansion of an ongoing MBMG groundwater study.

The goals and objectives outlined in the application were clearly stated and described, followed by further detail of tasks and activities. The task descriptions supported the applicant's understanding of the project and how the data will be collected, analyzed, interpreted, and evaluated. However, the proposed scope of work does not properly address legal issues associated with additional water appropriation or protection

of existing water users. The scope of work should more closely address surface and groundwater interaction in the region, as the recent focus on this interconnection has resulted in increased regulation and study of groundwater use and its impact on existing water users.

Deliverables for this project will consist of reporting the data and interpreting results. The report will be published and publicly available for download from the MBMG website, along with presentations at public meetings. A project schedule was well presented and understandable, and appears reasonable to complete required tasks.

Three alternatives were presented:

1. Pursuing alternate funding;
2. No action; and
3. Pursuing RDGP funding.

The applicant did not provide solid evidence that other alternatives were investigated and that the preferred alternative provides greater benefits or the same benefits at a lower cost. The cost-benefit analysis presented provides additional discussion regarding the study and relates these activities to how the data dissemination will benefit local landowners and other users of the Madison aquifer. The applicant presents a helpful narrative of potential benefits to the public, but does not adequately present or relate costs to benefits that may be either direct or indirect to the public.

The staffing and administration of the project was clearly stated, outlining each person's title, responsibilities, and projected time on the project. The monitoring plan presents the information to be generated, but does not state how the data will be used to ensure the quality of the project or who is responsible for the data quality and project objectives.

### Financial Assessment

The total budget for this project consists of the following:

	<b>RDGP</b>	<b>Matching Funds</b>	<b>Total</b>
Salary and Wages	\$ 110,814	\$ 37,545	\$ 148,359
Fringe Benefits	\$ 51,177	\$ 17,271	\$ 68,448
Contracted Services	\$ 71,250	\$ 0	\$ 71,250
Supplies	\$ 1,500	\$ 0	\$ 1,500
Communications	\$ 750	\$ 0	\$ 750
Travel	\$ 32,620*	\$ 0	\$ 32,620
Rent	\$ 6,245	\$ 0	\$ 6,245
Equipment	\$ 0	\$ 0	\$ 0
Miscellaneous	<u>\$ 16,461</u>	<u>\$ 110,122</u>	<u>\$ 126,583</u>
<b>Total</b>	<b>\$ 290,817</b>	<b>\$ 164,938</b>	<b>\$ 455,755</b>

\*= Recommended Budget Reduction \$4,025

Grant funds will be used to characterize the Madison aquifer resulting in responsible groundwater utilization and protection for the aquifer in central Montana. The applicant provided an adequate breakdown of project expenses, labor based on monthly salaries, and matching costs within the budgeted items. The applicant provided a total cost for office and field supplies, but did not show itemized costs to allow proper evaluation. The figure travel cost was based on \$0.70 per mile, but it is recommended to reduce that figure to the allowable state mileage rate of \$0.585 per mile. Drilling costs were presented as a total cost and may be low, depending on the location, depth, and completion details of the wells, which

were not specified in the application. The overall budget, with the exceptions noted, appeared reasonable.

### **Environmental Evaluation**

Environmental impacts associated with this project were reviewed and no apparent adverse impacts will result. Environmental benefits may result with additional understanding and knowledge of the Madison aquifer to enhance better utilization of this aquifer within the context of Montana Water Laws.

### **Public Benefits Assessment**

The proposed project has the potential to directly and indirectly benefit Montanans. Direct benefits include a better understanding of groundwater quantity and quality to assist Cascade County officials in making informed decisions for future development. The proposed project will also indirectly affect residents by providing them with knowledge about regional groundwater conditions. The project will provide long-term benefits, and protect public health and welfare for Cascade County residents.

The applicant provided a “crucial state need” argument based on increasing groundwater usage in the Madison aquifer. The applicant indicated that increasing development and resulting impact on groundwater create a great potential risk to the public of misuse of both groundwater and surface water resources of the region. Although the Madison aquifer is critical to the residents of central Montana, the grant does not make a strong case for a critical state need project.

### **Recommendation**

A grant up to \$286,792 is recommended for this project contingent upon DNRC approval of the project scope of work and budget. This recommendation includes a \$4,025 reduction in mileage fees.

**Project No. 25**

**Applicant Name** Butte-Silver Bow City-County Government  
**Project Name** Irrigation Demonstration Project for Butte Acidic Mine Waters - On-Site Treatment and Resource Recovery

**Amount Requested** \$ 289,607  
**Other Funding Sources** \$ 31,250 Applicant  
\$ 284,353 MSE, Inc.  
**Total Project Cost** \$ 605,210

**Amount Recommended** \$ 289,607 (see contingency in Recommendation section)

**Project Abstract** (Prepared and submitted by applicant)

Many areas in Butte degraded by mining/smelting activities have been revegetated as part of ongoing remediation and restoration. These newly vegetated areas have become impractical to irrigate using municipal water, due to cost and prolonged drought. To ensure the sustainability of these efforts, an alternative source of irrigation water is needed and may exist in flooded underground mine workings. The Environmental Protection Agency (EPA) and the Department of Energy's Mine Waste Technology Program recently completed characterization and treatability testing at the Belmont Mine. Their study indicated it is feasible to utilize the water for nonagricultural irrigation.

Specific objectives of the proposed project include:

- Task 1--Demonstrate a mobile water treatment system that can successfully upgrade water from the Belmont Mine's workings to meet appropriate irrigation standards;
- Task 2--Characterize the water in another mine's workings to determine whether this concept can be transferred to other sites in Butte; and
- Task 3--Explore the feasibility of recovering geothermal heat from the elevated temperature water at the Belmont Mine for space heating in nearby buildings.

The Butte-Silver Bow City-County Government will carry out the project with appropriate support from other entities. The groundwater in the Belmont Mine and other mine workings is part of the Butte Mine Flooding Operable Unit (of the Silver Bow Creek/Butte Area National Priority List). Ongoing water monitoring in the underground workings and a long-term pumping test at Belmont Mine indicate that water quality is only moderately impacted. With slight improvement it will be suitable for nonagricultural irrigation. This proposed two-year project under the RDGP at the Belmont Mine would complete necessary work to begin to beneficially utilize this previously damaged resource. It would also reduce stress on the municipal water supply and the Big Hole River, the source of 60% of Butte's municipal water supply.

**Technical Assessment**

Groundwater on the Butte Hill is contaminated with heavy metals from historic mining activities and is not suitable for any use in its current state. Butte citizens use treated drinking water to irrigate lawns and Butte-Silver Bow uses this same treated drinking water to irrigate reclaimed sites as part of long-term operation and maintenance of remediated Superfund areas. As more reclamation work is completed in the Butte area, additional irrigation demands will stress the existing water supply, which uses the Big Hole River as its primary water source. The project proposes to demonstrate a mobile water treatment system that can successfully treat groundwater from the Belmont Mine workings to meet applicable irrigation standards; to characterize the water in other mine workings to determine whether this concept can be transferred to other sites in Butte; and to explore the feasibility of recovering geothermal heat from the elevated temperature water at the Belmont mine for space heating in nearby buildings.

An adequate description and history of the problem and reasons for the project are presented:

Goal #1: Recover water that can be used to irrigate remediated areas on the Butte Hill. Five objectives are listed: (1) design, build, and operate a pilot scale water treatment system to treat Belmont mine water; (2) irrigate designated areas for demonstration; (3) locate a site to install a new well at a county-owned mine yard on the Butte Hill, (4) install a new well and characterize the water supply through a long-term pump test, (5) build and operate a pilot scale water treatment system to treat water from the new well for irrigation.

Goal #2: Evaluate heat recovery potential from existing wells and mine waters. Three objectives are detailed: (1) characterize temperature profiles of water treated for irrigation, (2) evaluate corrosion potential of these waters, and (3) conduct a heat recovery feasibility study.

Project goals and objectives were general and brief, with little supporting information making it difficult to determine whether the applicant can achieve desired goals. Various issues and questions were not addressed, such as the ability to treat varying concentrations noted during short-term pumping test; solids volume, handling, management, and legal groundwater appropriation issues associated with production wells. Another issue not addressed was monitoring irrigated parcels for build-up of metals in the soil and potential public safety, since the identified irrigation standards are well above human health standards for drinking water and may present a public safety risk. Also, the potential of contaminated irrigation runoff to nearby surface waters was not addressed. Very little information was provided on the heat recovery portion of the project, and it is unknown what type of processes would be employed to achieve this goal.

The proposed time allotted to complete proposed tasks appears to be aggressive. Irrigation demonstration for the Belmont Mine system is proposed during fall and winter, which will not provide adequate evaluation of irrigation potential since it is outside of the growing season. The proposed project duration is 24 months.

A monitoring plan was presented that described administration of the project and frequency of reporting information; however, the monitoring plan lacked detail of how project outcomes will be measured, what information will be collected, and how it will be used to ensure the quality of the project.

A discussion was presented of the project alternatives that focused on economics of continued use of treated surface water by Butte residents for irrigation. A comparison of the proposed project to the no action alternative was discussed, but other water savings or water conservation alternatives were not investigated.

### Financial Assessment

The total budget for this project consists of the following:

	<b>RDGP</b>	<b>Matching Funds</b>	<b>Total</b>
Salary and Wages	\$ 32,514	\$ 82,464	\$ 114,978
Fringe Benefits	\$ 16,908	\$ 40,063	\$ 56,971
Contract Services	\$ 125,596	\$ 90,000	\$ 215,596
Supplies	\$ 17,313	\$ 6,000	\$ 23,313
Communications	\$ 0	\$ 3,500	\$ 3,500
Travel	\$ 0	\$ 2,000	\$ 2,000
Rent	\$ 0	\$ 3,000	\$ 3,000
Equipment	\$ 55,267	\$ 0	\$ 55,267
Miscellaneous	\$ 42,009	\$ 88,576	\$ 130,585
<b>Total</b>	<b>\$ 289,607</b>	<b>\$ 315,603</b>	<b>\$ 605,210</b>

The majority of funds requested will be used for contracted services, including engineering design and oversight, equipment, well drilling, analytical, and indirect overhead. The applicant has specified a private engineering contractor to perform all engineering design and oversight work; however, the applicant must follow state procurement rules and solicit proposals. In addition, the private engineering contractor is requesting a 52% fringe benefit rate and an 85% indirect rate, which is significantly higher than typical rates for these categories. No detail was provided on the contracted analytical laboratory costs. The applicant does not provide information regarding parameters to be analyzed and sampling frequency needed to properly evaluate this cost. The drilling cost was also presented as a lump sum with no details provided on well completion depth, materials, or location; as a result, the cost appears to be extremely high for one irrigation well, (\$190,000). There is a significant match provided by the engineering contractor from prior feasibility testing associated with the treatment of mine water, but this match may not be applicable if this contractor is not selected. It appears that the project budget is more than adequate to complete the project. If the project is funded, additional details should be requested when developing the final scope of work.

### **Environmental Evaluation**

An environmental impact associated with this project is the metals impacted water used for irrigation. The applicant states the contaminated water will be treated to irrigation standards, but fails to provide detail on how the treated water will be measured to assure it meets these standards, and that no adverse impacts occur to the area being irrigated. It also does not address potential public safety, storm water, and aquatic impacts associated with irrigating with water that exceeds human health standards.

### **Public Benefits Assessment**

Funding is requested to implement a demonstration project to achieve a beneficial use of mining impacted groundwater by treating water from an abandoned mineshaft for irrigation water to assist with ongoing reclamation and restoration efforts in Butte, Montana. If the technology is proven feasible from an engineering and environmental standpoint, the proposed project has the potential to provide a significant positive benefit to the community and Montana residents, by providing an additional irrigation water source for the residents of Butte thus reducing their dependence on potable water for irrigation. Currently, the City of Butte uses the Big Hole River for the majority of their drinking water, and the success of this project would result in water conservation on a blue ribbon Montana trout stream.

### **Recommendation**

A grant of up to \$289,607 is recommended for this project contingent upon the applicant fully satisfying the concerns raised above and DNRC approval of the project scope of work and budget.



## Part 2. Projects Not Recommended for Funding

**Applicant Name** Carter County Conservation District  
**Project Name** Groundwater Monitoring Near a Proposed *In Situ* Uranium Mine in Carter County

**Amount Requested** \$ 295,407  
**Other Funding Sources** \$ 8,173 Applicant  
\$ 84,319 MBMG  
**Total Project Cost** \$ 387,899

**Amount Recommended** \$ 0

**Project Abstract** (Prepared and submitted by applicant)

*In situ* recovery (ISR; also known as *in situ* leaching) uranium mining is proposed in Carter County near Alzada and exploration drilling is under way across the state line in Wyoming. ISR mining involves injection of an oxidized solution into groundwater which dissolves uranium minerals. Factors that contribute to the unintentional migration of recovery solution into groundwater include equipment failures, aquifer heterogeneity, fractures, or improper well completions. In Carter County, the uranium mineralization appears near the aquifer utilized by residents. Therefore, recovery solution excursions, may impact domestic water supplies.

Increasing prices for uranium are spurring increased interest in developing these resources nationwide. The move away from fossil fuels due to their connection to greenhouse gases will drive the development of alternative energy sources, such as nuclear. For Montana to pursue uranium production, and to ensure that groundwater utilized by residents of southern Carter County is protected, the initial foray into uranium production must be well documented. The hydrogeologic parameters must be measured to understand the subsurface processes and changes.

As part of this project, monitoring wells will be installed south of Alzada in areas of interest for uranium production. Monitoring these wells and private wells will help establish baseline groundwater conditions and identify changes due to future uranium production. Several wells will be instrumented to collect real-time water level and quality data. This will be a cooperative project coordinated with concerned landowners and the uranium mining company.

Technical work will be conducted by MBMG. Results will transfer to future uranium mining activities in other areas of the state. Project duration is 24 months.

### Technical Assessment

Funding is requested to establish a groundwater-monitoring program to document baseline groundwater quality and physical characteristics within a water supply aquifer in Carter County. The goal of the project is to establish baseline conditions before a proposed *in situ* uranium leach mining operation begins near Alzada. A ground-water-monitoring network will be developed by inventorying wells within the project area and completed in the Inyan-Kara sandstone unit targeted for uranium mining.

The applicant defines the need for developing a groundwater-monitoring network to generate baseline aquifer conditions. Additional explanation of the *in situ* leaching processes and its potential impact to groundwater is provided. However, the application lacks adequate historical data documenting actual impacts to aquifers from *in situ* leach uranium mining.

The goals/objectives outlined in the application were clearly stated with five tasks describing further detail of the activities to be completed. The deliverable for this project is a report that will include maps of groundwater flows, baseline water quality with data interpretations, and explanations to be shared with landowners and industry. The data will also be published in a publicly available format on the MBMG website. The project schedule outlined tasks and durations of each. The monitoring plan presented

sufficient information to evaluate monitoring activities, but lacked detail on groundwater sampling frequencies and other activities relative to travel costs.

The applicant presented two additional alternatives to the project:

1. No action; and
2. Pursue alternate funding.

Given these alternatives, the applicant justified the need to conduct the proposed third-party monitoring due to the limited funding sources available and the significant burden this study would place on local residents if funded privately. The applicant does, however, acknowledge that monitoring work will be required by state and federal agencies before implementing active mining operations. Most of the tasks proposed would be required of the mining company as part of a mine EIS. No specifics were provided regarding pending mining proposals. The cost-benefit analysis noted the increasing price and demand for uranium, but did not detail costs specific to the proposed project.

The applicant's project is well presented, but the proposed activities and goals presented may be overaggressive and not achievable due to lack of wells and proper installation depth (1,500-2,000 feet) in the formation of interest. Available wells specific to the Inyan-Kara formation may be insufficient to allow adequate monitoring at the level of detail proposed.

The administration and staff have adequate experience to conduct the project.

### Financial Assessment

The total budget for this project consists of the following:

	<b>RDGP</b>	<b>Matching Funds</b>	<b>Total</b>
Salary and Wages	\$ 68,955	\$ 20,087	\$ 89,042
Fringe Benefits	\$ 31,632	\$ 9,498	\$ 41,130
Contracted Services	\$ 156,600	\$ 0	\$ 156,600
Supplies	\$ 1,500	\$ 0	\$ 1,500
Communications	\$ 650	\$ 0	\$ 650
Travel	\$ 9,513	\$ 0	\$ 9,513
Rent	\$ 3,030	\$ 0	\$ 3,030
Equipment	\$ 6,650	\$ 0	\$ 6,650
Miscellaneous	<u>\$ 16,877</u>	<u>\$ 62,907</u>	<u>\$ 79,784</u>
<b>Total</b>	<b>\$ 295,407</b>	<b>\$ 92,492</b>	<b>\$ 387,899</b>

Grant funds will be used to develop a groundwater-monitoring network, conduct onsite groundwater monitoring and aquifer characterization, perform ground-water laboratory analysis, install monitoring wells as necessary, and prepare a report detailing the information compiled during a 24-month groundwater-monitoring program. Matching funds are provided by MBMG and the applicant. The budget appears reasonable to fund the project, with the exception of the mileage rate proposed. The applicant presented a mileage rate of 0.70 per mile, which is above the allowable state mileage rate of 0.585 per mile. The applicant provided a breakdown of costs and use of local personnel to help reduce monthly monitoring costs. Drilling costs are estimated \$40/foot, which may be low considering the depth required to reach the desired formation. The remaining costs used to develop the budget appear reasonable and adequate.

## **Environmental Evaluation**

Environmental impacts associated with this project were reviewed and no apparent adverse impacts will result. Environmental benefits from this project could result in an objective, third-party evaluation of baseline groundwater conditions, and a better understanding of the aquifer physical characteristics and water quality before the proposed mining activities.

## **Public Benefits Assessment**

The proposed project has the potential to directly and indirectly benefit Montanans. Direct benefits include a better understanding of groundwater resources and the potential ability to identify the physical and chemical changes to the groundwater resource due to either natural or mining influences. Montanans would benefit from a monitoring program that may occur directly related to *in situ* uranium leach mining, which may allow for additional natural resource development and indirectly benefit Montanans in terms of increased tax revenue and employment.

Although the project was submitted under the mineral development category, the applicant also provided a crucial state narrative. The applicant identified the need to collect baseline groundwater data to help protect the residents of Carter County before a proposed mining operation. The applicant noted the data may help develop future monitoring programs related to *in situ* recovery uranium mining in other locations. The applicants presented only potential threats. They also did not discuss consequences of no action or delayed action. The severity of the problem was not presented, but this may be due to the lack of knowledge since *in situ* leach mining is believed to be a new technology in Montana. Five letters of support were submitted with the application. Two support letters were submitted by representatives of mining companies.

## **Recommendation**

No funding is recommended for this project.

**Applicant Name** Montana Department of Environment Quality (DEQ)  
**Project Name** Systematic Statewide Reconnaissance of Occurrence and Effects of Organic Wastewater Compounds from Wastewater Treatment Plants in Receiving Streams in Montana

**Amount Requested** \$ 300,000  
**Other Funding Sources** \$ 134,300 U.S. Geological Survey  
\$ 42,700 Montana Department of Fish, Wildlife & Parks  
\$ 23,000 Montana Bureau of Mines and Geology  
**Total Project Cost** \$ 500,000

**Amount Recommended** \$ 0

**Project Abstract** (Prepared and submitted by applicant)

Recent reports have raised concerns about occurrence of organic wastewater compounds (OWCs) in streams and human drinking water in the United States. Most OWCs are unregulated; the U.S. Environmental Protection Agency has not established drinking water standards or aquatic life criteria. Thus, OWCs have the potential to occur in treated effluent of wastewater treatment and discharge to streams, where they might adversely affect aquatic biota.

Various studies have indicated that some OWCs can adversely affect biota primarily by disrupting endocrine systems. These compounds are referred to as endocrine-disrupting compounds (EDCs). Some EDCs can substantially affect aquatic biota at extremely small concentrations, typically measured in parts per trillion. Some researchers have concluded that EDCs are present in most, if not all, treated effluent. Endocrine-disruption effects on aquatic biota have occurred where wastewater treatment plant (WWTP) effluent discharges accounted for between 25% and 50% of the flow of receiving waters for a relatively short time (about one month) and as little as 10% of the flow of the receiving water for longer periods (about four months). Low-level discharges of antibiotics (a class of OWCs) also have caused concern relating to development of antibiotic resistance in pathogenic bacteria.

Data on occurrence of OWCs in Montana waters are relatively sparse, especially for surface waters. However, several studies have detected OWCs in both surface and groundwater in Montana. Although evidence shows that OWCs discharge to natural waters of Montana, little information exists on the extent of occurrence or potential effects of OWCs on biota in receiving streams. This proposal describes a cooperative study to address these information needs. The study will last from July 2009 through September 2011.

### Technical Assessment

The proposed study has seven well-defined goals: (1) compile and analyze available data on treated effluent discharges from permitted WWTPs in Montana as a statewide effort; (2) compile and analyze available streamflow data for receiving stream of treated effluent from the WWTPs evaluated in the statewide screening in Montana; (3) review the WWTP discharge data, streamflow data for receiving streams, and other relevant factors to prioritize the WWTPs to select sampling sites; (4) select eight WWTPs and associated receiving streams for reconnaissance sampling of the treated effluent, stream water, and streambed sediment for occurrence of OWCs; (5) review laboratory results from the reconnaissance sampling for OWCs and select three WWTPs for follow-up detailed sampling of the treated effluent, stream water, streambed sediments, and biota for occurrence of OWCs; (6) sample fish in receiving streams of the three selected WWTPs to investigate the occurrence of physiological indicators of reproductive abnormalities that might be associated with OWCs; and (7) present results in a formal U.S. Geological Survey (USGS) report. Together, the seven objectives would provide initial baseline information on the effects of OWCs discharged from WWTPs to Montana streams in settings with the largest potential for adverse effects.

The first task described in the proposal encompasses the first three objectives. It should be straightforward to complete the screening based on the 10% flow criterion. If the WWTP discharged 10% of the flow of the receiving stream, then no community that discharges to one of Montana's larger rivers-including the Clark Fork, Missouri, Yellowstone, or Kootenai - need be considered. The 10% criterion would force investigators to focus on rivers overallocated for irrigation. Some locations that could be included are Twin Bridges along the Jefferson River, Bozeman along the Gallatin River, Butte along Silver Bow Creek, and several towns along the Milk River. It is probable the investigators would be able to find eight sites, but geographic distribution may be difficult to achieve. Furthermore, sites in the upper Clark Fork or Blackfoot rivers would be poor areas for investigation because of extensive ecological damage from past mining.

The second task includes sampling the eight Phase 1 sites. Few difficulties should be associated with collection or analysis of the samples. However, interpretation of sample results could be complex to the point of incomprehensibility, given the low number of samples collected and the large number of potential variables (WWTP flow rates, septic discharge, potential environmental impacts from agricultural and industrial pollution, and upstream water use). The evaluation of the enzyme-linked immunosorbent assay analytical method is a side study that does not contribute to the objectives of the investigation. However, validation of low-cost analytical methods would help future investigations.

The fourth task addresses the fifth and sixth objectives and includes selection and chemical and biological sampling of three sites. Once again, few difficulties should be associated with collection or analysis of the samples; however, interpretation of sample results could be challenging.

The fifth task addresses the seventh objective and includes report preparation which should present few problems.

The first two goals state that the project would be a statewide effort; however WWTPs discharging into Montana's large rivers are not included in the assessment, and thus this project would not be statewide. In addition, the application does not specify what would be done with the information gathered, other than generation of a USGS report. Nevertheless, this project could identify OWCs downstream from WWTPs which may underscore the need for further study and possibly the need for OWC regulatory standards for WWTP discharge.

### Financial Assessment

The total budget for this project consists of the following:

	<b>RDGP</b>	<b>Matching Funds</b>	<b>Total</b>
Salaries and Wages	\$ 150,350	\$ 144,700	\$ 295,050
Contracted Services	\$ 124,750	\$ 46,400	\$ 171,150
Supplies and Materials	\$ 5,500	\$ 2,000	\$ 7,500
Travel	\$ 15,400	\$ 3,900	\$ 19,300
Equipment	<u>\$ 4,000</u>	<u>\$ 3,000</u>	<u>\$ 7,000</u>
<b>Total</b>	<b>\$ 300,000</b>	<b>\$ 200,000</b>	<b>\$ 500,000</b>

The bulk of the requested RDGP funding is for salaries and wages (\$150,350) and contracted services (\$124,750). No information on the cost of individual analysis is presented. The lack of analytical unit costs makes it difficult to assess whether the proposed budget is adequate to complete the activities.

The project budget appears bloated for the scope and size of the investigation. The USGS labor budget could be trimmed by at least \$30,000, the Department of Fish, Wildlife & Parks (DFWP) by \$11,000, and the Montana Bureau of Mines and Geology (MBMG) by \$14,000. In addition, the supplies and materials and equipment budgets (total of \$9,500) could be eliminated from the proposal. It is likely that the

contracted services budget could also be trimmed; however, unit analytical costs are not included in the proposal. The total amount that should be trimmed from the budget is \$64,500.

### **Environmental Evaluation**

The proposed investigation would have no adverse effect on the environment.

### **Public Benefits Assessment**

The project itself would provide immediate benefit to only a handful of policymakers with state and federal governments. Potential benefits to Montana are directly tied to the degree that OWCs are found to be a problem. Much more information than would be provided by this study must be obtained before it can be determined whether results indicate significant environment degradation.

### **Recommendation**

No funding is recommended for this project.

**Applicant Name** Flathead County  
**Project Name** Flathead Regional Wastewater Management Group

**Amount Requested** \$ 89,983 Grant  
**Other Funding Sources** \$ 23,514 Applicant (in kind)  
**Total Project Cost** \$ 113,497

**Amount Recommended** \$ 0 (This project is recommended for funding under the RRGL Program)

**Project Abstract** (Prepared and submitted by applicant)

This proposal would establish a working group comprised of elected municipal and county officials, public wastewater district board members, citizen members appointed by the Flathead Basin Commission, and members from the Confederated Salish and Kootenai Tribal Council. This group would develop a Flathead River Basinwide plan that clearly identifies existing sewage treatment resources and establishes fiscally sound and effective public policy around sewage treatment to protect water quality resources into the future. This group would meet at least monthly for at least two years.

When addressed, some of these challenges may enhance services in the Flathead and, in turn, protect valuable water resources:

- Lack of clear sewer service planning areas;
- Lack of coordination between sewer service entities;
- Lack of coordination between planning boards and elected officials regarding proposed developments;
- Compliance with the pending Flathead Lake TMDL and ramifications for all pollution and discharge elimination system permits; and
- Lack of understanding of the contribution of on-site sewage treatment systems to the Flathead Lake TMDL.

Proposed 12 members of the Flathead Regional Wastewater Management Group:

- One elected representative from Kalispell City Council;
- One elected representative from Whitefish City Council;
- One elected representative from Columbia Falls City Council;
- One elected representative from Polson City Council;
- One representative from Bigfork Water and Sewer District Board;
- One representative from Lakeside Water and Sewer Board;
- One representative from Evergreen Water and Sewer Board;
- One county commissioner from Flathead County Board of Commissioners;
- One county commissioner from Lake County Board of Commissioners;
- One representative from Confederated Salish and Kootenai Tribal Council; and
- Two citizen members appointed by the Flathead Basin Commission.

### **Funding Recommendation**

This project is recommended for grant funding under the Renewable Resource Grant and Loan program.

**Applicant Name** Montana Bureau of Mines and Geology (MBMG)  
**Project Name** Assessment of Deep Coals in Eastern Montana-Potential Targets for *In situ* Gasification of Unmineable Resources

**Amount Requested** \$ 159,784  
**Total Project Cost** \$ 159,784

**Amount Recommended** \$ 0 (Withdrawn by Applicant)

**Project Abstract** (Prepared and submitted by applicant)

New technology for utilizing deep coals is being developed rapidly in response to the nation's need for new energy sources. *In situ* or underground coal gasification (UCG) is a proven method of gasifying deep, unmineable coal seams and capturing their energy content-in the form of product gases-at the surface. The product gases are fed into pipelines or consumed onsite for direct power generation, conversion to liquid hydrocarbons, or manufacture of various petrochemicals.

During the past few years, Montana has received several inquiries into the potential for *in situ* gasification of coals, as well as requests for identification of specific sites where UCG operations could be implemented. These inquiries come from a variety of companies, including power, petrochemical, liquid fuels, and investment. None have pursued UCG testing in Montana; in part because insufficient data exist to clearly delineate deep coal targets. This is a significant obstacle to future development of Montana's coal resources. Other states able to provide such information hold a significant competitive advantage over Montana.

This project addresses the critical first step toward commercializing Montana's deep coal seams-identifying these resources and categorizing suitability for the UCG process.

The project goal is to facilitate investment into Montana by energy developers and to provide policy makers the information necessary to effectively manage that development. The specific objective of the project is to conduct a comprehensive, regional assessment by December 2010 of the resource potential of "deep" (500 to 3000 feet) coal seams in eastern Montana and to high-grade potential UCG sites. Results will provide a solid, geological basis from which to promote and manage future development and utilization.

The project will be carried out by geologists from the MBMG. Over 18 months, MBMG geologists will use existing oil and gas logs to identify deep coal resources for the major coal-bearing areas of eastern Montana (the area of Montana lying east of 107° W longitude). An assessment of coal resources, along with characteristics of the adjacent geologic layers, will be used to categorize those sites most suitable for the UCG process and, therefore, most likely to attract investment dollars to the state.

The final product will be a comprehensive compilation and assessment of data from existing records on Montana's deep coal resources. It will be compiled in the form of maps, subsurface cross sections, and a detailed report. This information will be used by coal resource owners-private, state, or federal; industry and public agencies responsible for resource promotion or management; and parties interested in developing those resources.

### **Funding Recommendation**

This project was withdrawn by the applicant. Funding was received from another source.





## CHAPTER III

### STATUS REPORT OF 2005 - 2007 PROJECTS

This chapter briefly summarizes the status (as of October 30, 2008) of active projects and projects completed since preparation of the January 2007 Legislative Report. Projects are grouped according to the year in which they received legislative approval; within each grouping, projects are presented in the order of their relative funding priority.

#### **Projects Approved by the 2007 Legislature**

##### **1. MT Board of Oil and Gas Conservation / 2007 Northern District Orphaned Well Plug and Abandonment, and Site Restoration**

This project proposes to plug 15 oil and gas wells in Glacier County. The plugging contractor has been selected and a contract awarded. The work will be completed by September 2010.

##### **2. MT Board of Oil and Gas Conservation / 2007 Southern District Orphaned Well Plug and Abandonment, and Site Restoration**

This project proposes to plug seven oil and gas wells in Big Horn, Musselshell, and Yellowstone counties. The plugging contractor has been selected and a contract has been awarded. The work is scheduled for completion by September 2010.

##### **3. MT Department of Environmental Quality / Snowshoe Mine Reclamation Project**

Water quality in Snowshoe Creek, a tributary to Big Cherry Creek and the Kootenai River, is impacted by mine wastes from the Snowshoe Mine. Snowshoe Creek exceeds human health and aquatic life standards for cadmium, lead, mercury, zinc, and exceeds aquatic life standards for copper. Construction started in 2008 to reduce the risk to human health and the environment by removing approximately 115,000 cubic yards of mine waste material from Snowshoe Creek and adjacent areas and placing these materials in a constructed engineered repository. The project is approximately 60% complete. Project completion is scheduled for fall 2009.

##### **4. MT Department of Environmental Quality / Bald Butte Mine and Millsite Reclamation Project**

The goal of the Bald Butte Mine and Millsite Reclamation Project is to protect human health and the environment by removing the tailings and waste rock along Dog Creek and its tributaries and then placing this contaminated material in an engineered mine waste repository. Project construction was delayed due to a dispute between the U.S. Bureau of Land Management (BLM) and the DEQ on finding a mutually agreeable repository location. Repository location has now been identified and agreed to by DEQ and BLM and both agencies will utilize one repository location. This joint repository will contain DEQ wastes from the Bald Butte project and BLM mine wastes from the Great Divide Ski area. Construction is expected to commence during the 2009 work season and will continue through 2010.

##### **5. MT Department of Natural Resources and Conservation / St. Mary Facilities Rehabilitation**

The purpose of this grant is to continue the State of Montana's efforts to rehabilitate and construct the St. Mary diversion structure and conveyance works before the system suffers catastrophic failure. The contract was signed in October 2008. DNRC is in the process of obtaining spending authority from the Montana Department of Administration. Work will commence soon thereafter.

## **6. Powell County / Milwaukee Roundhouse Voluntary Cleanup**

The project was advertised for bid, but bids exceeded available funds. Powell County is working with DEQ on changes to the cleanup plan which should allow implementation of the project with the available dollars. The changes being discussed involve landfarming of the Bunker C material and recycling the excavated material. Together these two changes, if approved by DEQ, would significantly reduce the bid price. Powell County anticipates a response from DEQ in November 2008.

## **7. MT Department of Natural Resources and Conservation / Reliance Refinery**

The Reliance Refinery facility is a state Superfund facility listed on the Montana Comprehensive Environmental Cleanup and Responsibility Act (CECRA) Priority list. On June 30, 2008, the Montana DEQ issued a Record of Decision (ROD) that sets forth the selected remedial action for the greater KRY Site, of which the Reliance Refinery is a part. The selected remedy consists of remediation of contaminated media coupled with institutional controls. The ROD has been challenged by BNSF Railway Company (a liable party). Montana DEQ is currently working to develop a detailed remedial action work plan. The work plan and subsequent design documents will provide the basis for solicitation of bids from qualified remediation contractors.

## **8. Central Montana Water Authority / Utica Well 2**

The Water Authority has a contract to conduct a formal Alternatives Study Report, which looks at all the existing literature, on-site features and well logs and evaluates if there are other places that could be drilled for pure source water that may be more advantageous than the Utica site. The preliminary draft is now available and shows an area south of the current well that could provide at least the same quality of water and could reduce the annual pumping costs predicted for the Utica site. That savings could be over \$250,000 per year.

The Water Authority believes this report is necessary to defend their case for Congressional Authorization sometime next year. They are still attempting to secure additional funds to supplement the RDGP grant. It is possible that a time extension will be needed because of the timing limitations of current funding requests.

## **9. MT Board of Oil and Gas Conservation / Southern District Tank Battery Cleanup**

This grant provides funding for reclamation of an abandoned tank battery site northeast of Roundup. The site is approximately 2.0 acres and contains an estimated 6,600 cubic yards of contaminated soil material. A Request for Proposals (RFP) has been prepared and a cleanup contractor will be selected soon.

## **10. Meagher County Conservation District / Hydrologic Investigation of the Smith River Watershed**

This project is an investigation of groundwater and surface water interaction within the Upper Smith River Watershed. The U.S. Geological Survey (USGS) is conducting the study and will report study results and recommendations in March 2010.

## **11. MT Department of Environmental Quality / Belt Acid Mine Drainage Mitigation**

This acid mine drainage mitigation project entails opening the abandoned Anaconda Coal Mine, performing a hydrogeologic evaluation within the mine to identify groundwater inflows to the mine, and construction of grout seals to stem these inflows. The project began in September of 2007 and continues to work toward securing a safe working environment within the mine. The project has been stalled due to a mine pool at 650 feet from the mine entrance that is blocking further entry to the mine. Pumping of this mine pool is approximately 50% complete. The project overall is approximately 15% complete with a projected completion date in March 2010.

## **12. MT Department of Environmental Quality / Swift Gulch Placer Tailings and Wetland Establishment**

Engineering design work for access roads and ponds associated with this project was initiated in January 2008, and construction began in June 2008. Assessments of design flows, peak flows and iron loads in Swift Gulch were completed as part of the design work. Five settling ponds have been constructed within and adjacent to Swift Gulch. Dredge tailings deposits within and adjacent to the work area have been re-contoured and seeded. In September 2008, a lime addition system was constructed above the two lower settling ponds adjacent to Swift Gulch and preliminary testing of the treatment system was conducted through October 2008. Monitoring of the effectiveness of the settling ponds is on-going. Performance of the ponds and lime addition system will be reviewed during the winter of 2008 / 2009. Additional pond construction, grading, revegetation, and/or treatment system modification may occur during the summer of 2009 as determined appropriate to optimize performance.

## **13. Broadwater Conservation District / Whites Gulch Reclamation Fish Barrier Project**

Montana Department of Fish, Wildlife & Parks ran short of money and had to seek additional funding due to the increase in building and construction costs. After confirmation of the additional funding the design was completed (September 2008). Current plans indicate that the work will be completed in early spring 2009, sometime between February and May, depending on weather.

## **14. MT Department of Environmental Quality / Landusky Mine – Characterization of Surface Water/Groundwater Interactions in Swift Gulch and the Adjacent Landusky Pit Complex**

The following work has been completed as part of this research grant, with supplemental funding provided by DEQ and BLM: Characterization of stream flow in Swift Gulch occurred between August 2007 and October 2008. Activities included a tracer injection / synoptic sampling survey conducted in cooperation with Montana Tech to define gaining and losing reaches of the stream and variations in iron speciation throughout the length of Swift Creek, installation of flumes at key locations along the stream and frequent measurement of flow at these locations, and diurnal sampling to assess daily variations in stream chemistry. Five monitoring wells were completed between the Landusky mine pit and Swift Gulch during June / July 2008, which significantly helped to characterize the geology and hydrochemistry of the shear zones, followed by aquifer testing during August. A geophysical survey of the area was performed during September / October 2008. Data collected during these studies are being analyzed, and a final report will be prepared in late 2008 or early 2009.

## **15. Big Horn Conservation District / Montana Regional Coalbed Methane**

The purpose of this project is to provide ground-water data needed to support the Montana Coalbed Methane Protection Act and other CBM issues. This will be accomplished by maintaining the CBM monitoring network and by training and equipping individual landowners to monitor their private wells and springs.

The Montana Legislature has given jurisdiction of the CBM Protection Act to conservation districts. This project will help conservation districts fulfill this mandate.

Since the beginning of the project, data loggers have been installed on several CBM ground-watering monitoring wells. Data collection, both manual and automated, continues on a regular basis. All data are in the Montana Ground-Water Information Center (GWIC) and are available to the public. Additionally, there have been several CBM meetings held in the area, including one landowner/operator training meeting with 14 in attendance. Training and equipment will be provided through this grant in various locations within the Montana portion of the Powder River basin. One annual report has been prepared and released and preparation of the second is underway.

The project is on schedule, approximately 50% complete.

## **16. Gallatin Local Water Quality District / Assessment and Distribution of Pharmaceuticals**

The Gallatin Local Water Quality District (GLWQD) and the MBMG are collecting samples of wastewater, surface and groundwater for this project and analyzing the samples for pharmaceuticals and endocrine system disruptors. The goals of the project are: (1) document and quantify the ability of different wastewater treatment systems used in the Gallatin Valley to remove these compounds; (2) quantify the loading of these compounds to surface or groundwater from treated effluent; (3) determine the extent and magnitude of contamination in surface and groundwater in the Gallatin Valley; and (4) recommend options for reducing contamination of state waters by these compounds.

The first round of wastewater and surface water samples was completed summer of 2008, and ground water samples are currently being collected. Along with the sampling, research on these compounds is also ongoing. The project is generally on schedule and due for completion in July 2009. Information on the project can be obtained from the district at (406) 582-3148.

## **17. Flathead Basin Commission / British Columbia - Montana Action Plan**

The purpose of this project is to address potential impacts from a proposed coal mine located in the British Columbia Flathead River Basin near the Montana border. The Flathead Basin Commission has used this grant to develop an action plan and conduct baseline studies to characterize the quality of natural resources in the North Fork Flathead River Basin (the Basin). Results from soil and water quality monitoring will characterize the pre-mine environmental condition of the watershed. Should the mine begin operation, this information will benefit Montana in two ways: (1) it will support the addition of mitigation measures designed to protect Montana's portion of the Basin from mining activities; and (2) if the mine adversely affects Montana's environment, the State may use the information collected by this project to link environmental degradation to mining activities in BC. If needed, this link would support Montana's argument that BC cease environmentally harmful activities. Work on this project is expected to be complete by December 31, 2009.

## **18. Montana Tech of the University of Montana / Butte Native Plant Propagation Nursery**

Since the initiation of the project, Tech has hired an architect for the greenhouse renovation. The initial bid invitation was issued summer 2008. Because of unforeseen and extreme material cost increases, a re-design was necessary. The current design is out for bid and construction is planned this fall.

Forb sods, consisting of a mixture of native grasses and forbs, have been developed and will act as dispersal islands from which seed can spread into already reclaimed areas or can be used in new reclamation. Forb sods are constructed in layers with the bottom a plastic sheet overlain with reclamation mat. Two inches of soil are placed on the mat with mycorrhizal fungi and some fertilizer. Over the soil a layer of reclamation mat and seed is added. When roots are fully grown through the layers and spread across the plastic, the sod is rolled and planted. The plastic is removed at planting and roots move into the soil. The first five forb mats, placed on the Tech campus, are doing very well. Next spring, up to 40 of these will be placed on the reclamation caps in Butte.

Tech has collected seed from about 40 species of forbs that grow on the Butte Hill. The vast majority of these species are not available from commercial growers. Germanization will be attempted on as many of these as possible with follow up planting of seed orchards at Tech.

## **Projects approved by the 2005 Legislature**

### **1. Montana Board of Oil and Gas Conservation / 2005 Eastern District Well Plug and Abandonment and Site Restoration**

This project proposes to plug 27 oil and gas wells in Dawson, McCone, Phillips, Richland, and Valley counties. The grant contract has been executed, and work will be completed by July 2009.

### **2. Montana Board of Oil and Gas Conservation / 2005 Northern District Well Plug and Abandonment and Site Restoration**

This project proposes to plug 20 oil and gas wells in Toole and Glacier counties. The grant contract has been executed, and work will be completed by July 2009.

### **3. Montana Department of Environmental Quality / Bluebird Mine Reclamation Project**

Work on the Bluebird Mine Reclamation Project was awarded to a trucking and excavation company as part of a larger mine waste management contract. Mining waste from three abandoned mine projects in Jefferson and Powell counties is to be transported to the Basin Creek Mine and encapsulated as part of the Leach Pad 1 reclamation at that site. Work on the Bluebird Mine portion of this larger project started on July 17, 2006 with excavation and hauling of mine waste material from the Bluebird to Basin Creek Mine. All work has been completed.

### **4. Montana Department of Environmental Quality / Frohner Mine Reclamation Project**

The Frohner Mine is located 12 miles Southwest of Helena in the Lump Gulch drainage, a tributary to Prickly Pear Creek. The site consists of multiple waste rock dumps and a tailings pond. The 10,000 cubic yards of mine waste on the site exceeds risk-based cleanup guidelines for arsenic, lead, mercury, and silver. Water discharges from the site have a pH of 2.2 and are contaminated with metals due to leaching through the exposed mine wastes. Decision documents are in place for the Frohner Mine, however, lack of a suitable repository location has delayed construction. Additional repository alternatives are being evaluated and it is anticipated that a repository site will be selected and construction initiated in 2009.

### **5. Montana Department of Environmental Quality / Buckeye Mine Reclamation Project**

Work on the Buckeye Mine Reclamation Project, in Madison County, was awarded to a trucking and excavation company on September 14, 2006. The Contractor was issued a notice to proceed on October 16, 2006 for a 45-day construction period. All work on this project is now completed.

### **6. Lewistown, City of / Reclamation of Brewery Flats on Big Spring Creek**

This project has been successfully completed. Metal-contaminated soils have been removed and the area restored. The site, now a suburban park adjacent to Big Spring Creek, is widely used by local residents.

### **7. Montana Department of Natural Resources and Conservation / St. Mary Studies and Design**

The purpose of this project is to provide the necessary administrative, technical, and funding support to help "jump-start" the process of rehabilitating the St. Mary Diversion Facilities by securing completion of the studies and preliminary designs necessary to obtain Congressional authorization and appropriation of construction funds. The engineering contract has been awarded. Phase 1 Engineering (data review, preliminary cost estimates, and proposed rehabilitation plan) and Phase 2 Engineering (preliminary engineering, hydrologic and hydraulic analysis, and preliminary economic analysis) have been completed. Geotechnical investigations at the site of two major siphon crossings and location of a new bridge have been initiated. A detailed topographic survey of the proposed canal route has also been initiated.

Federal funds totaling \$8.5 million have been appropriated to move the project forward. Federal legislation has been introduced in Congress authorizing the Department of Interior, through the U.S. Bureau of Reclamation (USBR), to conduct studies required under the National Environmental Policy Act, and to begin rehabilitation of the St. Mary Diversion Facilities. The St. Mary Rehabilitation Working Group meets monthly to advise the state on appropriate strategy and to monitor progress.

#### **8. Butte-Silver Bow Local Government / Belmont Shaft Failure and Subsidence Mitigation**

This project is designed to mitigate the imminent public safety hazards associated with five identified major mine shaft failures in Butte. A secondary goal is to promote redevelopment of those properties encumbered by these failing shafts. The project sponsor prepared engineering design and bid specifications to address the shafts, selected a general contractor to perform construction work, and also monitored the condition of other failed shaft closures in the Butte area. Mitigation work on the first of five failed shafts-the Belmont-was completed successfully in January 2006. Over the next 18 months, Butte-Silver Bow will work on the other four major shafts: the Buffalo, Parrott, Orphan Boy, and Otisco. In addition, Butte-Silver Bow continues to monitor other subsidence problems in Butte and take mitigation measures as necessary.

#### **9. Pondera County / Oil and Gas Well Plug and Abandonment Project**

This project cost-shares the plugging of abandoned oil and gas wells with small operators in Pondera County. The project has been completed.

#### **10. Custer County Conservation District / Yellowstone River Resource Conservation Project**

The contract for the grant agreement on this project, as authorized by the 59<sup>th</sup> Montana Legislature, was signed in May 2006. Application materials included project history and work completed under the previous grant agreement. The Yellowstone River Conservation District Council (YRCDC) intends to use these grant funds to: conduct further studies into river channel stability, sedimentation, and erosion, and compare these channel processes for select reaches of the river; assemble and process historic aerial photography in(to) a consistent system (GIS) for use in further geomorphic study and analysis; and conduct a cumulative effects assessment. The grant agreement states that the district has until January 1, 2009, to complete the detailed work.

#### **11. Teton County / Oil and Gas Well Plug and Abandonment**

This project cost-shares the plugging of abandoned oil and gas wells with small operators in Teton County. The project has been completed.

#### **12. Toole County / Plugging and Abandonment Aid to Small, Operators**

Much like the Pondera and Teton county grants above, this project shares the cost of plugging and abandoning oil and gas wells with small operators. Participation was slow to start, but has recently gained momentum. The project should be completed in spring 2009.

#### **13. Montana Department of Environmental Quality / Zortman Mine Reclamation- Completion of Preferred Alternative Z-6**

A revised reclamation plan calls for re-direction of storm water from the Alder Gulch waste dump, lining the dump, and topsoiling. No waste rock will be removed and no material from the Alder Gulch site will be placed in the North Alabama pit. The DEQ and Fort Belknap Tribe agreed to this revision in August 2006. The project has been completed.

#### **14. Butte-Silver Bow Local Government / Excelsior Reclamation**

This project will reclaim approximately four acres of land impacted by mineral development in the urban corridor of Butte. The goals are: (1) to mitigate adverse environmental impacts present at the site, (2) to help prevent pollution from storm water runoff by reducing erosion, particularly during storm events, and (3) to improve the visual appearance of the landscape. Construction includes re-contouring steep slopes that characterize major portions of the site, importing clean fill materials, and adding compost to existing soils to enhance plant growth. Also included are planting trees and new vegetation in barren areas and installing storm water control structures, as necessary. The majority of work has been completed with follow-up landscaping in spring 2009.

#### **15. Powell County / Garrison Wetland Reclamation and Redevelopment**

The county recently issued an RFP and selected a consultant to assist in developing a No Action Voluntary Cleanup Action Plan for DEQ approval. The county has completed a cadastral survey of the site and design work is under way. An adjacent landowner has contacted the county about additional recreation trails on 100 acres of land he has acquired. This other site contains significant wetlands. The county may use the cleaned up Garrison site as a base area and apply for Natural Resource Damage Program funds to cover trails and other facilities on the adjacent land. After a slow start, the survey work and preliminary design are now completed. Projected date for final design and construction start-up has been extended to spring 2009.

#### **16. Montana Department of Environmental Quality / Former Harlem Equity Co-Op Bulk Plant Cleanup**

This project has two objectives: (1) removal of petroleum-contaminated soil to reduce the mass of petroleum contamination on-site, and (2) continued groundwater monitoring for up to three years. The first goal has been achieved and groundwater monitoring is ongoing as proposed.

Soil removal activities were completed in October and November 2005. A total of 7,965 bank (in-place) cubic yards of petroleum-contaminated soil was removed from the site and hauled to a disposal facility in Blaine County. The estimated volume of petroleum-contaminated soil originally targeted for removal was 12,000 bank cubic yards; however, that total included the removal of contaminated soil located beneath the main irrigation ditch that crosses the site. A decision was made to leave the irrigation ditch in place due to the high cost replacing it. Unanticipated high diesel fuel costs, partially due to Hurricanes Katrina and Rita, constrained the budget and limited ability to remove any additional petroleum-contaminated soil. In April 2006, 11 groundwater monitoring wells were installed. The first groundwater-monitoring event was completed in July 2006. The groundwater-monitoring will continue through August 2010.





## CHAPTER IV

### Reclamation and Development Grants Program – Project Planning Grants

#### Program Information

The 2007 Legislature authorized \$800,000 for Reclamation and Development Grants Program (RDGP) project planning grants. These grants are intended to assist local governments with the planning and design of technically feasible natural resource projects eligible for funding consideration under the RDGP. Planning grant funds must be used primarily for contracted consulting or engineering services.

The inaugural grant cycle commenced July 1, 2007, with quarterly application deadlines until funds were exhausted. A total of 4 grant cycles were conducted and the \$800,000 was used to fund 21 projects across Montana. Review and ranking methodology was patterned and conducted very similar to the RDGP projects grant program. Of the 21 planning grants, 10 planning projects resulted in an application for a RDGP project grant by the May 15, 2008 deadline. Projects submitted by applicants that received a planning grant tended to rank higher relative to those that did not seek a planning grant (ten projects ranking in the first 17 projects recommended). A listing of planning grant projects can be found in Table 2.

Judging from comments DNRC received from the applicants, the project planning grants have been hugely successful. DNRC will continue to refine the basic structure of the planning grant program regarding funding amounts, application categories, and frequency of cycles based on this input and local needs. Funding of the planning grant projects has proven invaluable for applicants in preparing and submitting a high quality and competitive grant application under the major RDGP, and as a result, DNRC intends to seek planning grant re-authorization from the 2009 Legislature.

**Table 2 Project Planning Grants Awarded During the 2009 Biennium**

<b>Project Sponsor</b>	<b>Project Title</b>	<b>Grant Amount</b>
<b>Applicant</b>		
Cascade County	Cascade County Shops Site Assessment and Remedial Planning	\$ 50,000
Lewis & Clark County	Helena Valley Groundwater Vulnerability Mapping Project	49,490
Blackfeet Tribe	Divide Creek – Preliminary Engineering Report	50,000
Beaverhead CD	Lower Big Hole Flow and Habitat Assessment	40,836
Missoula County	Mattie V Creek Mine Reclamation	20,400
Butte-Silver Bow	Growth Impacts Due to Mining	50,000
Park County	Fleshman Creek Restoration Project	50,000
Missoula County Rural Initiatives	Housum Placer Mine Reclamation Ninemile Creek	31,620
Petroleum County CD	Mosby Water Storage	27,500
McCone CD	Dry – Redwater Planning – Phase 1	50,000
Ruby Valley CD	Big Hole Ditch Diversion	12,260
Mile High CD	Blacktail Creek Assessment and Restoration Study	50,000
Ravalli County	Bitterroot Valley Groundwater Vulnerability Mapping Project	49,490
Ryegate, Town of	Former Ryegate Conoco Clean-up	5,500
Lewis & Clark County CD	York Gulch Old Amber Mine Reclamation	44,700
Anaconda – Deerlodge County	National Summit of Mining Communities	10,502
Shelby, City of	Shelby Refinery	50,000
Lewistown, City of	Berg Lumber Mill	10,502
Superior, Town of	Sampling for Mining Waste in Roadways	47,524
Conrad, City of	Conrad Drinking Water Safety	49,776
Green Mountain CD	Blue Creek Abandoned Mine Planning Project	49,900
	<b>TOTAL</b>	<b>\$ 800,000</b>

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2009

**Montana Department of Natural Resources and Conservation**



1625 Eleventh Avenue  
PO Box 201601  
Helena, Montana 59620  
406/444-6668  
[www.dnrc.mt.gov](http://www.dnrc.mt.gov)

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