



**CITY OF BAYARD  
NEW MEXICO  
ARIZONA WATER SETTLEMENT ACT  
TIER 2 FUNDING PROPOSAL**

**DECEMBER 14, 2011**

**Arizona Water Settlement Act  
Response to Tier 2 Criteria  
City of Bayard Wastewater Treatment Plant  
Phase 2 Effluent Reuse Project**

1.0 Conservation – The City of Bayard Phase 2 Effluent Reuse project will extend the water supply through conservation.

a. Property Location, Ownership, Legal Access – The proposed project is located on City-owned property or is located within existing easements and a public right-of-way. The City of Bayard has full rights of access to construct the project in these areas which include:

- i. City of Bayard Wastewater Treatment Plant (within City limits)
- ii. Chino Mine (Freeport-McMoRan); amended easements
- iii. Southwestern Railroad; amended easements
- iv. Cobre Schools; easements
- v. Grant County; North Hurley Road; Public Right-of-Way

NOTE: See Attachment I for site maps and figures extracted from the Preliminary Engineering Report

b. Source of Water – The source of water to be put to use will be treated effluent from the Bayard Wastewater Treatment Plant.

c. Conservation/ New Water Supply Description – The proposed project will provide a new source of water through the use of treated effluent which is currently disposed of at Chino Mine. The plant currently produces 470 acre-feet/year of usable effluent which will be made available for non-potable uses. The plant's current capacity will enable it to handle 670 acre-ft/year as flows to this facility increase in the future.

In the case of the Bayard wastewater treatment plant, there is no effluent discharged to a natural watercourse from the facility. There is no infiltration to a local aquifer. The treated effluent is pumped to tailings ponds at Chino Mine (Freeport-McMoRan). This is a result of the NMED prohibition of discharge to Whitewater Creek, which is adjacent to the Bayard wastewater treatment plant. The plant's wastewater is treated to a usable standard using an advanced secondary process, reducing biochemical oxygen demand and total nitrogen to low levels. The proposed project will further refine the effluent through a tertiary filtration process, reducing the turbidity of the water to 3 NTU or less. So, 560 acre-ft/year of highly treated wastewater will be made available with the implementation of the proposed project. Otherwise, this water will be lost to the Chino tailings ponds. This treated effluent is not an important source of water for mine operations. It is now being pumped to the tailings ponds because there is no other viable point of discharge for the Bayard regional wastewater treatment plant.

- d. AWSA and CUFA Requirements – The primary requirement of the AWSA and the CUFA for a water utilization alternative is to meet a water supply demand. The water supply demand in question for this project is for a variety of identified irrigation areas in the City of Bayard including the Snell Middle School ball fields, Rominger Field, and the Bayard cemetery (under design). The Cobre High School athletic fields will be added in Phase 2B of the effluent reuse project, which has been included in the Preliminary Engineering Report. The core facilities proposed for Phase 2A of the effluent reuse project will accommodate significantly more irrigation areas in the future such as those previously discussed for the Town of Hurley.

## 2.0 Description of the Proposal and Its Technical Viability

- a. Summary Project Description - This project includes plant facilities providing tertiary treatment of wastewater effluent and distribution lines for delivery of this effluent. The purpose is to provide non-potable reuse water for the irrigation of public facilities, replacing potable water for this use. Potable water resources are thus conserved by the utilization of reclaimed wastewater.
- b. Proposed Facilities – The facilities proposed for the project include the following:
  - i. New effluent reuse filter / pump building at the wastewater treatment plant site.
  - ii. Plant site yard piping.
  - iii. New 200,000 gallon storage tank at the plant site.
  - iv. Transmission lines; 6,500 ft PVC; 4,8,10, and 12 inch diameter
- c. Technical Viability of the Project – The proposed project consists of well-established and relatively simple components including pumps, filtering equipment and standard water system storage and distribution infrastructure. As such, the project is viable from a technical standpoint. It is also designed to be expandable in terms of the volume of reuse water pumping capacity and in terms of enhanced treatment capabilities in the future.
- d. REFERENCE: *City of Bayard Phase 2 Effluent Reuse Project Preliminary Engineering Report; March 2010; Trumm Engineering* – The Preliminary Engineering Report (PER) comprises the study phase of the Bayard Phase 2 Effluent Reuse Project. Excerpts from the PER are attached to this application, including the Executive Summary. A complete copy of this document can be obtained from Trumm Engineering by request at [jtrumm@trummengineering.com](mailto:jtrumm@trummengineering.com).

The PER supports this proposal through discussion of water supply challenges in the project area and offering viable solutions for enhancement of water supplies through the use of an existing resource – reclaimed domestic wastewater. The project history included in the PER is important because it explains the development of the recently constructed wastewater treatment

plant in conjunction with the proposed reuse facilities. The plant process was specifically designed to provide enhanced reduction of wastewater strength (BOD) and nutrients (total nitrogen). This was done to provide a superior effluent in anticipation of the future use of this water for non-potable applications. The ultimate benefits that this facility was designed to provide will only be realized through the implementation of the effluent reuse project. The PER discusses the “No Action” alternative which is not compatible with the goal of continued long-term progress toward alleviating water supply shortages in the project area. As discussed in the PER, approximately 80 percent of all potable water pumped from municipal wells will eventually flow to a wastewater treatment plant. This is an important amount of water that could be utilized to extend the capacity of the City’s existing well field. Water supply sources for other communities in the planning area will also benefit as additional irrigation facilities are brought on line in the future for these locations.

The PER provides technical support for the proposal by providing technical evaluations of various filter technologies and related equipment. Process design and hydraulic calculations are also included in the Appendix. Project feasibility is supported by these efforts.

- e. REFERENCE: *City of Bayard Phase 2 Effluent Reuse Project Environmental Information Document April 2010; Trumm Engineering – The Environmental Information Document (EID)* provides the environmental setting for the project area. Excerpts from the EID are attached to this application. Attachment III provides a discussion of the potential impacts to this setting and appropriate mitigation measures responding to these. A complete copy of this document can be obtained from Trumm Engineering by request at [jtrumm@trummengineering.com](mailto:jtrumm@trummengineering.com). The EID includes a discussion of project purpose and need; a discussion of the considered alternatives; description of the affected environment; a summary of mitigation measures; and public involvement documentation.

The EID provides support for this project through the development of a reasonable plan of action and favorable responses from a variety of state and federal agencies with respect to the potential for impacts to the environment or cultural and biological resources. Reference is made to the Agency Coordination Table in Appendix H of the EID. Agency coordination letters and responses are also included in this Appendix section. There were no responses received that were unsupportive of the project.

- f. REFERENCE: *Geotechnical Engineering Services Job I-10909; Filter/ Pump Building and 200,000 Gallon Water Tank; Bayard, New Mexico; Geo-Test, Inc.* – Included in the report is a description of the soils profiles of two separate test pits. Removal of the top 1.5 feet of existing soils is recommended, to be replaced with engineered fill supporting the building and tank structures. No groundwater was encountered in either test pit.

This geotechnical report provides technical support for the proposed project by providing specific data required for the construction of the building and water storage tank. The report identified no unusual subsurface site conditions that would require extraordinary construction methods. A complete copy of this document can be obtained from Trumm Engineering by request at [jtrumm@trummengineering.com](mailto:jtrumm@trummengineering.com).

- g. REFERENCE : *Southwest New Mexico Regional Water Plan*; Daniel B. Stephens; 2005. As indicated in Section 5 of this document the Bayard well field is not expected to be capable of meeting demands through 2040. In light of this projection, it is imperative that the City of Bayard take steps to optimize the use of existing sources of potable water. The City has already made important progress in these efforts by making extensive repairs to its water distribution system and through conservation efforts. Thus, this Regional Water Plan provides data and support for the proposed project based on the demonstrated need to work toward increasing future water supplies in the region. This report can be found at the following link:

[http://www.ose.state.nm.us/isc\\_regional\\_plans4.html](http://www.ose.state.nm.us/isc_regional_plans4.html)

3.0 Estimated Costs

- a. The estimated costs for the proposed project is summarized below.

PROJECT ACTIVITY	COST
Construction	\$3,574,930.00
Engineering Project Administration; Construction Observation	\$334,475.00

See Attachment II for a detailed, updated estimate.

b. Estimated on-going administrative, operational, and maintenance costs are:

<b>Item No.</b>	<b>Description</b>	<b>Amount</b>
1	Electricity	\$ 7,895.39
2	Labor	\$ 16,848.00
3	Vehicle Expense	\$ 500.00
4	Polymer	\$ 300.00
5	Chemicals	\$ 1,000.00
6	Lab Fees	\$ 500.00
7	Cloth Media Replacement	\$ 600.00
8	Equipment Replacement/Repair	\$ 1,500.00
9	Training	\$ 2,400.00
10	Fixed Infrastructure	\$ 7,002.40
<b>TOTAL</b>		<b>\$ 38,545.79</b>

c. *Environmental Compliance Activities* – Environmental compliance activities for the proposed project consisted of the drafting and submittal of an Environmental Information Document to USDA RD and NMED and conducting a public meeting. The status of these efforts to date is as follows:

4/20/2010	EID submitted to NMED CPB
4/28/2010	EID submitted to USDA RD
5/26/2010	EID approval received from USDA (no comments)
12/6/10	Public Meeting; Bayard Community Center
9/21/2011	EID comments received from NMED Construction Programs Bureau (currently being addressed)

There are no specific costs identified for this project related to environmental mitigation and restoration except for the requirement for a construction Storm Water Pollution Protection Plan (SWPPP). This task is included in the Bid Schedule for the construction contract. The estimated amount for this effort is \$5,000.00.

d. The AWSA funding sought for this project is \$4,000,000.00. The construction time for this project is estimated to be 12 months.

#### 4.0 Project Impacts

- a. Potential impacts to the environment by this project are discussed in Section 3.0 of Phase 2 Effluent Reuse Project Environmental Information Document (EID). This is included in Attachment III of this response.
- b. Mitigation efforts for potential impacts to the environment are discussed in Section 4.0 of the Phase 2 EID, also included in Attachment III of this response.  
Note: There will be no impacts to the Gila Basin resulting from this project due to the project location.
- c. The project will benefit the environment by providing additional water in the project areas for irrigation and other beneficial uses of non-potable reuse water. There is the potential for enhanced vegetation in application areas, which could, in turn, create increased habitat for a variety of species. The Gila Basin will be unaffected by the project.
- d. This project is subject to a variety of regulations including 20.6.2 NMAC Ground and Surface Water Protection (NM WQCC); NEPA compliance regulations (in accordance with the NMED CPB Environmental Review Process); Army Corps of Engineers Nationwide Permit No. 12; New Mexico Environment Department (NMED) Policy for the Above Ground Use of Reclaimed Domestic Wastewater (2007).

The implementation of the proposed project maintains compliance with these rules and regulations through the submittal of the planning documents (Preliminary Engineering Report and Environmental Information Document) and the construction Contract Documents to the appropriate reviewing agencies for review and approval. Upon approval, the construction project will be professionally managed, from bidding through construction, to ensure that it remains in compliance with agency-approved Contract Documents.

#### 5.0 Economic Analysis of Proposed Project

- a. Value of Water – As mentioned above, in considering the use of treated wastewater effluent, an important fact to note is that approximately 80 percent of the fresh water pumped by the City of Bayard, as well as Santa Clara and Fort Bayard, eventually flows to the wastewater treatment plant. For Bayard, this would amount to about 73 million gallons per year in additional water. Potentially, the revenues from this amount of effluent could be from \$230,000 to \$280,000 per year.

The value of water may be better characterized by considering the essential nature of this resource and its potential for the creation and preservation of existing businesses, private and public facilities, recreational facilities,

agriculture and so on. None of these, not even the core population of a community, can exist without adequate water resources.

- b. Estimated Costs – See Section 3 of this response.
- c. Local Contributions- The City of Bayard will offer the funds expended to date for planning and engineering as an in kind contribution to the project funding. To date, the City has spent approximately \$244,000.00, excluding taxes and reimbursable expenses for these efforts. This amounts to 6.24% of the estimated project costs.

Planning/Engineering Costs:	
PER	\$ 79,670.00
EID	\$ 21,564.00
DESIGN	<u>\$142,886.50</u>
Total	\$244,120.50

6.0 Description of How Proposal Meets the Needs Addressed for the Following List of Issues

- a. Historic Uses, Traditions, Cultures, and Customs - With respect to traditions, cultures and customs affecting water use, there are very few negative impacts that will be felt due to the implementation of the proposed project. One exception may be concern regarding the safety of the use of reclaimed wastewater for irrigation. This issue has been, and will in the future, be discussed in public meetings. Written responses to questions on this issue will also be made. Irrigation with reclaimed domestic wastewater is a well established practice in New Mexico. Public discussion and education efforts have historically been successful in mitigating concerns with its use.

The ability to maintain the historic culture and character of the small mining communities in the project area will be enhanced by this project through the increases to water supplies made possible with the use of reclaimed wastewater. The substitution of reuse water for potable water, for appropriate uses, extends potable water resources, which in turn helps to ensure the future viability of these communities.

In summary, the proposed project will have positive affects on future water demands and little to no affect on the traditions, cultures and customs affecting water use in the region.

- b. Current and Future Demands for Water in the Southwest Planning Region - The historic uses of water in the Southwest Region include the following designations from the Office of the State Engineer: Commercial, Domestic, Industrial, Livestock, Mining, Power and, Public Water Supply. Of these categories, the project area will only be concerned with the public water supply use category. Historically, public water supplies have had a variety of

uses including, household, municipal, commercial, institutional and, industrial. Initially, and for the foreseeable future, the proposed project will only affect municipal and institutional facilities. That is, by the provision of reclaimed wastewater, replacing potable water, for the irrigation of various landscaped areas and athletic fields. Through this action, the project will reduce current and future demands for potable water. Therefore, the impact on historic uses and future demands in this case is positive.

- c. Flood Control – Flood control issues are not addressed by the proposed project.
- d. Fire Protection, prevention, or suppression – The initial phase of the Bayard reuse project does not address fire protection issues. However fire protection is a legitimate use for treated effluent. Storage and distribution facilities can certainly be coordinated with installed reuse transmission lines for added or exclusive fire protection systems for public or private facilities, as well as residential housing.

It is feasible and desirable to maintain separation between potable and reuse water systems used for fire protection. The layout of the proposed transmission lines would easily accommodate dedicated piping to fire hydrants located adjacent to public or private structures. This usage would require concurrence from the Construction Industries Division with respect to building code requirements.

- e. Recreation – The project is designed to accommodate future phases which could include recreational facilities. The most frequently anticipated future use of reclaimed water for recreation would be for a golf course. Discussions of such facilities have ongoing since the inception of the project.

Given anticipated uses, adding a facility such as a golf course would be feasible with the available volume of treated effluent. Effluent Reuse Application Area tables are included below which show a breakdown of anticipated reuse water volumes for several planning areas and project phases. Row calculations are left blank for areas not included in the particular phase under consideration.

- f. Environmental Protection and/or Enhancement – This project, in future phases, can contribute to both environmental protection and enhancement with uses such as irrigation of roadside vegetation for aesthetic reasons as well as erosion control. Reclaimed water used for dust control in construction projects would also mean relief for potable water supplies with this use.

**BAYARD EFFLUENT REUSE APPLICATION AREAS**

**PHASE 2A (CURRENT PROJECT)**

Irrigation Rate (Enter Below)	44	in/yr
Irrigation Rate	3.67	ft/yr
Storage Pond Depth	20.00	

**ANNUAL VOLUME REUSE WATER APPLIED**

<b>APPLICATION AREAS</b>	<b>AREA (SF) ~</b>	<b>AREA ACTUAL (SF) ~</b>	<b>AREA (AC) ~</b>	<b>IRR VOL (CF)</b>	<b>IRR VOL (GAL)</b>	<b>IRR VOL (AF)</b>	<b>AREA FACTOR</b>
Football Field Cobre High School	118,000.00	-	-	-	-	-	0
Baseball Field Cobre High School	68,000.00	-	-	-	-	-	0
Practice Field Cobre High School	79,000.00	-	-	-	-	-	0
Rominger Field	110,375.00	110,375.00	2.53	404,708.33	3,027,420.69	9.29	1
Baseball Field Bayard Elementary	71,825.00	71,825.00	1.65	263,358.33	1,970,052.01	6.05	1
Soccer Field Bayard Elementary	14,000.00	14,000.00	0.32	51,333.33	383,999.00	1.18	1
Little League Baseball Field	50,260.00	50,260.00	1.15	184,286.67	1,378,556.41	4.23	1
Practice Field Snell Middle School	69,000.00	69,000.00	1.58	253,000.00	1,892,566.50	5.81	1
Future Area	-	-	-	-	-	-	0
Future Area	-	-	-	-	-	-	0
<i>Bayard Cemetery</i>	1,524,600.00	1,524,600.00	35.00	5,590,200.00	41,817,491.10	128.33	1
<b>Totals</b>	<b>2,105,060.00</b>	<b>1,840,060.00</b>	<b>42.24</b>	<b>6,746,886.67</b>	<b>50,470,085.71</b>	<b>154.89</b>	

Available Treated Effluent	420,000.00	gpd
Available Treated Effluent	153,300,000.00	gpy
Available Treated Effluent	470.46	AFY
Percent Effluent Used	32.92%	

**BAYARD EFFLUENT REUSE APPLICATION AREAS**

**PHASE 2A WITH GOLF COURSE**

Irrigation Rate (Enter Below)	44	in/yr
Irrigation Rate	3.67	ft/yr
Storage Pond Depth	20.00	

**ANNUAL VOLUME REUSE WATER APPLIED**

<b>APPLICATION AREAS</b>	<b>AREA (SF) ~</b>	<b>AREA ACTUAL (SF) ~</b>	<b>AREA (AC) ~</b>	<b>IRR VOL (CF)</b>	<b>IRR VOL (GAL)</b>	<b>IRR VOL (AF)</b>	<b>AREA FACTOR</b>
Football Field Cobre High School	118,000.00	-	-	-	-	-	0
Baseball Field Cobre High School	68,000.00	-	-	-	-	-	0
Practice Field Cobre High School	79,000.00	-	-	-	-	-	0
Rominger Field	110,375.00	110,375.00	2.53	404,708.33	3,027,420.69	9.29	1
Baseball Field Bayard Elementary	71,825.00	71,825.00	1.65	263,358.33	1,970,052.01	6.05	1
Soccer Field Bayard Elementary	14,000.00	14,000.00	0.32	51,333.33	383,999.00	1.18	1
Little League Baseball Field	50,260.00	50,260.00	1.15	184,286.67	1,378,556.41	4.23	1
Practice Field Snell Middle School	69,000.00	69,000.00	1.58	253,000.00	1,892,566.50	5.81	1
Future Area		-	-	-	-	-	0
Future Area		-	-	-	-	-	0
Golf Course	2,613,600.00	2,613,600.00	60.00	9,583,200.00	71,687,127.60	220.00	1
<i>Bayard Cemetery</i>	1,524,600.00	1,524,600.00	35.00	5,590,200.00	41,817,491.10	128.33	1
<b>Totals</b>	<b>4,718,660.00</b>	<b>4,453,660.00</b>	<b>102.24</b>	<b>16,330,086.67</b>	<b>122,157,213.31</b>	<b>374.89</b>	

Available Treated Effluent	420,000.00	gpd
Available Treated Effluent	153,300,000.00	gpy
Available Treated Effluent	470.46	AFY
Percent Effluent Used	79.69%	

**BAYARD EFFLUENT REUSE APPLICATION AREAS**

**PHASE 2A AND PHASE 2B**

Irrigation Rate	44	in/yr
Irrigation Rate	3.67	ft/yr
Storage Pond Depth	20.00	

**ANNUAL VOLUME REUSE WATER APPLIED**

<b>APPLICATION AREAS</b>	<b>AREA (SF) ~</b>	<b>AREA ACTUAL (SF) ~</b>	<b>AREA (AC) ~</b>	<b>IRR VOL (CF)</b>	<b>IRR VOL (GAL)</b>	<b>IRR VOL (AF)</b>	<b>AREA FACTOR</b>
Football Field Cobre High School	118,000.00	118,000.00	2.71	432,666.67	3,236,563.00	9.93	1
Baseball Field Cobre High School	68,000.00	68,000.00	1.56	249,333.33	1,865,138.00	5.72	1
Practice Field Cobre High School	79,000.00	79,000.00	1.81	289,666.67	2,166,851.50	6.65	1
Rominger Field	110,375.00	110,375.00	2.53	404,708.33	3,027,420.69	9.29	1
Baseball Field Bayard Elementary	71,825.00	71,825.00	1.65	263,358.33	1,970,052.01	6.05	1
Soccer Field Bayard Elementary	14,000.00	14,000.00	0.32	51,333.33	383,999.00	1.18	1
Little League Baseball Field	50,260.00	50,260.00	1.15	184,286.67	1,378,556.41	4.23	1
Practice Field Snell Middle School	69,000.00	69,000.00	1.58	253,000.00	1,892,566.50	5.81	1
Future Area	-	-	-	-	-	-	0
Future Area	-	-	-	-	-	-	0
Bayard Cemetery	1,524,600.00	1,524,600.00	35.00	5,590,200.00	41,817,491.10	128.33	1
	<u>2,105,060.00</u>	<u>2,105,060.00</u>	<u>48.33</u>	<u>7,718,553.33</u>	<u>57,738,638.21</u>	<u>177.19</u>	<u>9.00</u>

Available Treated Effluent	420,000.00	gpd
Available Treated Effluent	153,300,000.00	gpy
Available Treated Effluent	470.46	AFY
Percent Effluent Used	37.66%	
		30.88

**BAYARD EFFLUENT REUSE APPLICATION AREAS**

**PHASE 2A AND PHASE 2B WITH GOLF COURSE**

Irrigation Rate (Enter Below)	44	in/yr
Irrigation Rate	3.67	ft/yr
Storage Pond Depth	20.00	

**ANNUAL VOLUME REUSE WATER APPLIED**

<b>APPLICATION AREAS</b>	<b>AREA (SF) ~</b>	<b>AREA ACTUAL (SF) ~</b>	<b>AREA (AC) ~</b>	<b>IRR VOL (CF)</b>	<b>IRR VOL (GAL)</b>	<b>IRR VOL (AF)</b>	<b>AREA FACTOR</b>
Football Field Cobre High School	118,000.00	118,000.00	2.71	432,666.67	3,236,563.00	9.93	1
Baseball Field Cobre High School	68,000.00	68,000.00	1.56	249,333.33	1,865,138.00	5.72	1
Practice Field Cobre High School	79,000.00	79,000.00	1.81	289,666.67	2,166,851.50	6.65	1
Rominger Field	110,375.00	110,375.00	2.53	404,708.33	3,027,420.69	9.29	1
Baseball Field Bayard Elementary	71,825.00	71,825.00	1.65	263,358.33	1,970,052.01	6.05	1
Soccer Field Bayard Elementary	14,000.00	14,000.00	0.32	51,333.33	383,999.00	1.18	1
Little League Baseball Field	50,260.00	50,260.00	1.15	184,286.67	1,378,556.41	4.23	1
Practice Field Snell Middle School	69,000.00	69,000.00	1.58	253,000.00	1,892,566.50	5.81	1
Future Area	-	-	-	-	-	-	0
Future Area	-	-	-	-	-	-	0
Golf Course	2,613,600.00	2,613,600.00	60.00	9,583,200.00	71,687,127.60	220.00	1
<i>Bayard Cemetery</i>	1,524,600.00	1,524,600.00	35.00	5,590,200.00	41,817,491.10	128.33	1
<b>Totals</b>	<b>4,718,660.00</b>	<b>4,718,660.00</b>	<b>108.33</b>	<b>17,301,753.33</b>	<b>129,425,765.81</b>	<b>397.19</b>	

Available Treated Effluent	420,000.00	gpd
Available Treated Effluent	153,300,000.00	gpy
Available Treated Effluent	470.46	AFY
Percent Effluent Used	84.43%	

- 7.0 Support for Project – The project has support from the following:
- a. Bayard City Council
  - b. Mayor City of Bayard
  - c. Representative Rodolpho Martinez, NM District 39 (Letter of support attached on following page; signed copy to be delivered at later date.)
  - d. NMED Groundwater Bureau – See Attachment III Paragraph 3.5.2
- 8.0 Benefits to County – This project will benefit areas situated within Grant County.
- 9.0 Benefits to Various Interests – This project will benefit, or potentially benefit, in the initial phase, or future phases, the following interests:
- a. Municipal – benefits in the initial phase
  - b. Agricultural – future phases
  - c. Ranching – future phases
  - d. Recreational – future phases



State of New Mexico  
House of Representatives  
Santa Fe

**RODOLPHO "RUDY" S. MARTINEZ**

D - Grant & Hidalgo  
District 39

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Bayard, NM 88023  
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Home Phone: (575) 534-7546  
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COMMITTEES:  
Business & Industry  
Taxation & Revenue

INTERIM COMMITTEES:  
Revenue Stabilization & Tax Policy  
Advisory Member:  
Legislative Health & Human Services  
Military & Veterans' Affairs

December 12, 2011

Craig Roepke  
Deputy Director  
New Mexico  
Interstate Stream Commission  
P.O. Box 25102  
Santa Fe, NM 87504-5102

**RE: Arizona Water Settlement Act Funding Application; City of  
Bayard, NM; Phase 2 Effluent Reuse Project**

Dear Mr. Roepke :

This letter is written in support of the City of Bayard Phase 2 Effluent Reuse Project. This project is well suited to the goals of the Arizona Water Settlement Act as a *Water Utilization Alternative*. The project satisfies the requirement of the AWSA for water utilization alternatives to meet a water supply demand. The project accomplishes this by providing reclaimed wastewater for use in irrigation applications. Thus, potable water supplies will be relieved through this substitution and made available for other uses not amenable non-potable water application.

I have been informed that approximately eighty percent of all potable well water pumped by the City of Bayard will eventually flow to the City's regional wastewater treatment plant. At this time, 100% of this flow is pumped to waste at the Chino Mine tailings ponds. This valuable resource could be put to a much higher use with the implementation of the effluent reuse project.

Although it will take multiple future phases to develop infrastructure that will make use of 100% of the available treated effluent, the initial Phase 2 project will put a substantial amount of pumping, filtering, storage and transmission line facilities in place that will form a backbone for future projects. This phased approach is intended to make development of this resource possible while recognizing the reality of our current funding situation.

I have been associated with the Bayard Reuse project as a member of the Bayard City Council, as Mayor of Bayard and now in the New Mexico House of Representatives. This involvement, along with the development of the wastewater treatment plant has spanned the last thirteen years. I have never been more enthusiastic in my support of this project.

Please contact me at your convenience if you should have any questions.

Sincerely,

Rodolpho S. Martinez  
New Mexico House of Representative  
District 39

Cc: Estevan Lopez, Director  
Charles Kelly, Mayor City of Bayard  
Joe Trumm, Trumm Engineering

**ATTACHMENT I**

**PER EXCERPTS**

**EXECUTIVE SUMMARY**

**SITE MAPS AND FIGURES**

## EXECUTIVE SUMMARY

The City of Bayard, as lead agency of the Joint Powers Agreement with the Village of Santa Clara and Fort Bayard Medical Center, has been engaged in a long term planning effort with the goals of building a new wastewater treatment plant and development of an effluent reuse system serving these participating entities. The first of these goals has been accomplished with the construction of a 600,000 gallon per day wastewater treatment facility. This facility was designed for total nitrogen reduction (TN) as well as BOD and TSS removal. The intent of designing nutrient removal (TN) for this facility was to produce a high quality effluent which could easily meet standards regulating the application of reclaimed wastewater to public facilities for purposes of irrigation. The second of these goals is currently in the preliminary planning stage as reflected by the drafting of this Preliminary Engineering Report.

The need for this project originates from two separate issues:

- The need to address the long term water supply issues that face not only this immediate planning area, but the entire southwest region.
- The lack of a permanent point of discharge for the Bayard regional wastewater treatment plant.

With regard to the water supply issues, the Southwest New Mexico Regional Water Plan (2005) indicates that within the Mimbres Basin the water table is generally declining. The Bayard and Santa Clara well fields are not expected to be capable of meeting demand through 2040. Deepening of existing wells is not considered practical due to the relatively small saturated thickness of the aquifers in this area. Under the 1982 Administrative Criteria for the Mimbres Basin (OSE), the administrative block containing the Bayard well field, among others in the area, has been designated as “critical”. This designation is defined for any four-section administrative block with a calculated annual water level decline rate greater than 2.5 feet. Under these circumstances, it is imperative that all avenues of water resource development be

explored. The reuse of high quality reclaimed wastewater for non-potable uses can effectively increase area water supplies by relieving the demand on potable water supplies.

The current point of discharge for the Bayard regional wastewater treatment plant is at Chino Mine (Freeport McMoRan). The agreement between the City of Bayard and the mine is in effect until January 2014. Although it could be anticipated that this agreement will be renewed, this is not a certainty. The ability for the entities included in the planning area to manage their wastewater utilities depends on this uncertain arrangement. This is an untenable situation that requires a solution.

The lack of a permanent discharge point for the Bayard plant is an issue that can be addressed on a phased basis by the effluent reuse project. One-hundred percent use of the available effluent will not occur with the implementation of the initial phases of the project. Other uses, and possibly future disposal options, will be required to fully manage this resource. Given the variety of constraints including funding, land use and ownership, regulatory difficulties, etc, it is important to begin these efforts now to allow sufficient time for the development of reuse infrastructure and beneficial use scenarios.

Recommendations made in this report were developed from the following alternatives:

Treatment Alternatives

- Conventional Gravity Filtration (granular media)
- Cloth Type Disk Filters
- Polyester Media Disk Filters

Reuse/Storage/Disposal Alternatives

- Continued Discharge to Chino Mine
- Discharge to Effluent Reuse Irrigation Areas
- Discharge to percolation/evaporation ponds

Treatment - For the treatment category, cloth type disk filters was the selected alternative. The cloth filter media is a composite system which includes various size pile filaments and “needlefelt” media. These various filaments are enclosed in an exterior “carrier fabric” and these together comprise the disk media system. The flow enters the tank (or basin) completely submerging the cloth media disks. It is then forced by gravity through the cloth media. Solids are accumulated on and within the media. Flow moves from the internal portion of the disk to the center shaft and then to final discharge.

A backwash cycle is initiated in response to water level or a timer. Increased solids accumulation on the filter results in increasing head loss and rising water level in the tank. The disks are rotating during the backwash cycle. Suction is applied on each side of two disks during backwash. The backwash water is then directed to the head works of the plant. Heavier solids fall to the bottom of the tank and are removed from a solids collection manifold to the plant head works by an automatic pumping system.

The effective capacity of the pile type cloth disk filter is estimated to be 6 gpm/ft<sup>2</sup>. An effluent turbidity of 2 NTU can be produced from filter influent of up to 45 NTU. This performance will meet the New Mexico guidelines of 3 NTU for Class 1A effluent reuse purposes.

Reuse/Storage/Disposal – For this category, a combination of continued discharge to Chino Mine (FMI) and effluent reuse irrigation were the selected alternatives. The continued discharge to Chino Mine is an obvious selection since this is the only alternative currently available for effluent discharge. It is also economical since the infrastructure is already in place and in operation.

The effluent reuse irrigation is also selected since this is the central goal of the project and provides an important benefit by augmenting existing water supplies. Income obtained from non-City uses can also serve to provide substantial support for reuse infrastructure costs.

Common Project Elements – The common elements for all project phases include the following:

- Effluent Reuse Equipment Building
  - Filter equipment
  - Transfer pumps to ground storage tank
  - High head vertical turbine effluent reuse pumps
  - Hypochlorite disinfection equipment
  - Polymer feed equipment
- Ground Storage Tank – 500,000 gallon capacity
- Yard piping
- Transmission lines to reuse areas

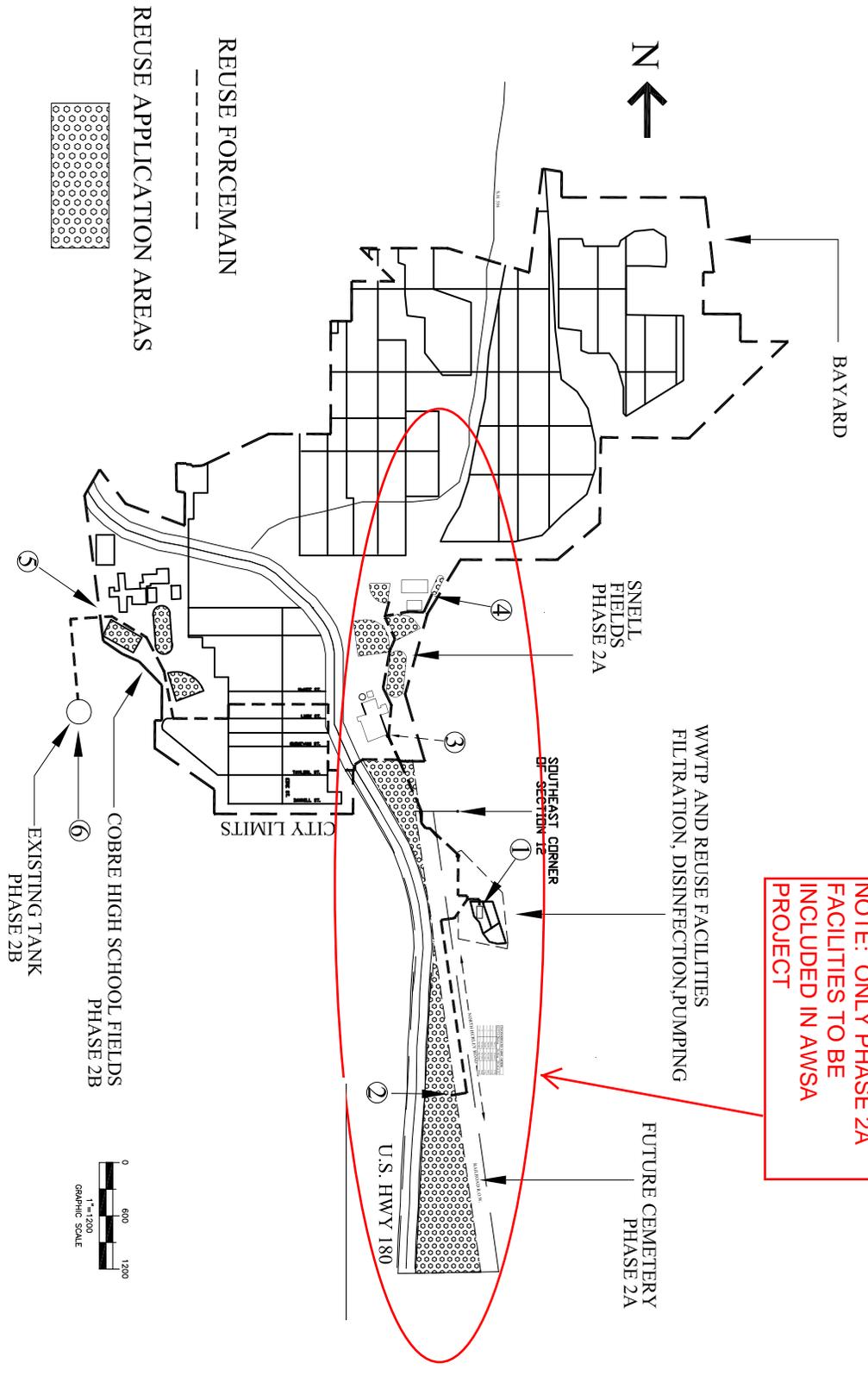
Project Phasing – The project is currently defined in two phases; Phases 2A and 2B. The recommended project is for Phase 2A which will provide irrigation for the cemetery property which has been recently acquired from Chino Mine (FMI) by the City of Bayard. This area, containing approximately forty acres, is located west of the wastewater treatment plant and is aligned along Highway 180 as shown in project area figures. Also included in Phase 2A is the irrigation of the ball fields associated with Snell Middle School, as well as two adjacent community ball fields (Rominger Field and the Little League Field).

A future project will be recommended for Phase 2B which provides irrigation to ball fields at Cobre High School.

The total project cost for the Phase 2A project is \$3,198,144.80. Operations and maintenance cost is estimated at \$45,571.31. The table below summarizes these and the equivalent annual cost and equivalent present worth for this phase of the project.

Estimated Plant Life	20	years	
Interest Rate	1.00%		
<b>Item</b>	<b>Cost</b>	<b>Equivalent Annual Cost</b>	<b>Equivalent Present Worth</b>
New Plant	\$ 3,198,144.80	\$ 177,226.00	\$ 3,198,144.80
O&M Costs	\$ 45,571.31	\$ 45,571.31	\$ 822,360.00
Totals		\$ 222,797.31	\$ 4,020,504.80

COST DATA UPDATED IN ATTACHMENT II OF AWSA APPLICATION



**NOTE: ONLY PHASE 2A FACILITIES TO BE INCLUDED IN AWSA PROJECT**

FIGURE 2-2 PROJECT PLANNING AREA  
 CITY OF BAYARD  
 EFFLUENT REUSE  
 PRELIMINARY ENGINEERING REPORT

# FILTER / PUMP BUILDING

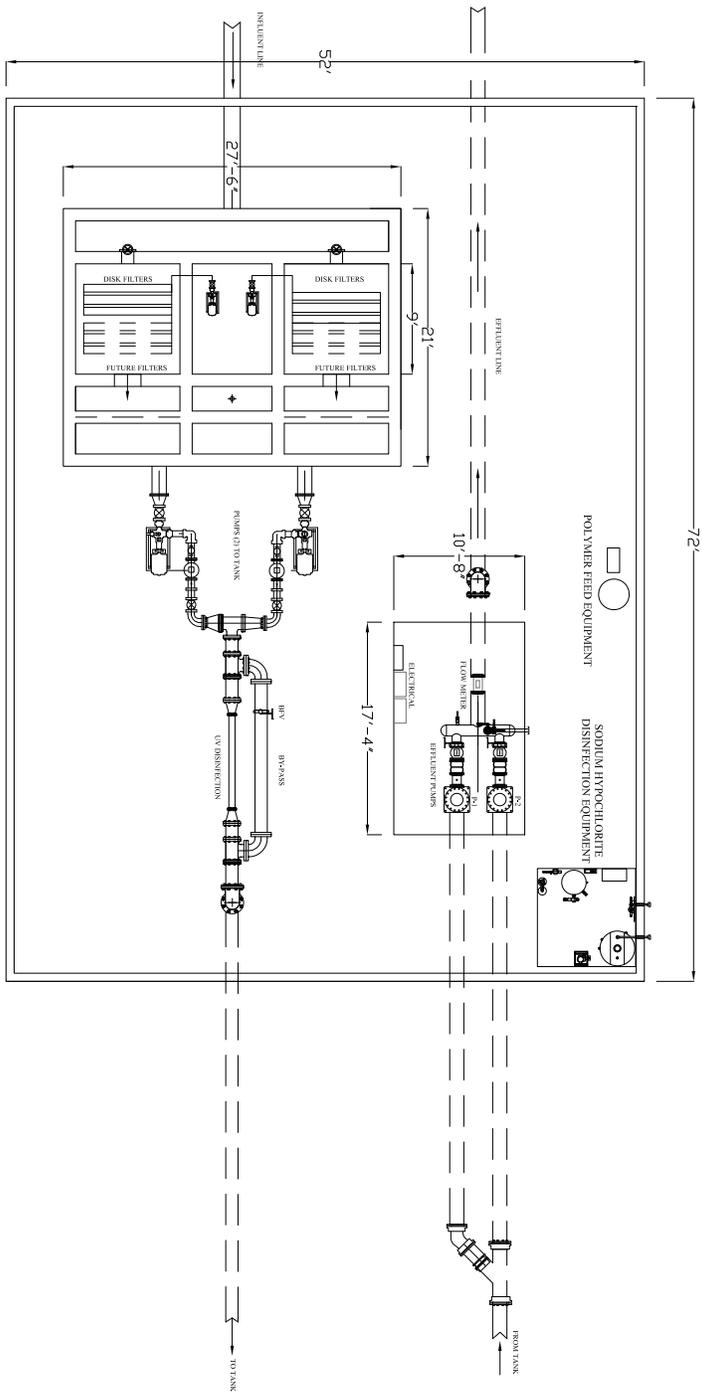
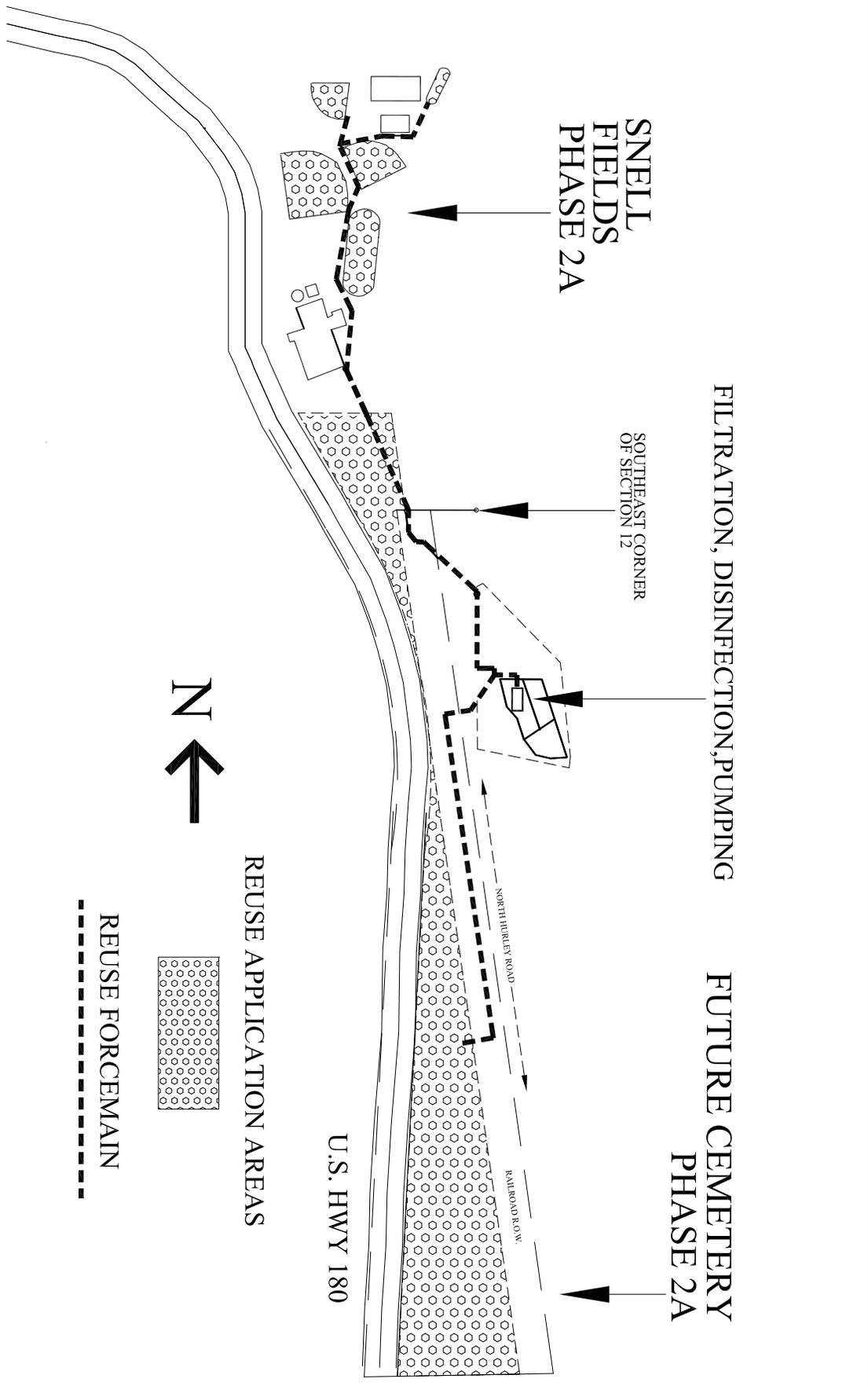


FIGURE 5-3 DISK FILTER /  
 PUMP BUILDING  
 CITY OF BAYARD  
 EFFLUENT REUSE  
 PRELIMINARY ENGINEERING REPORT





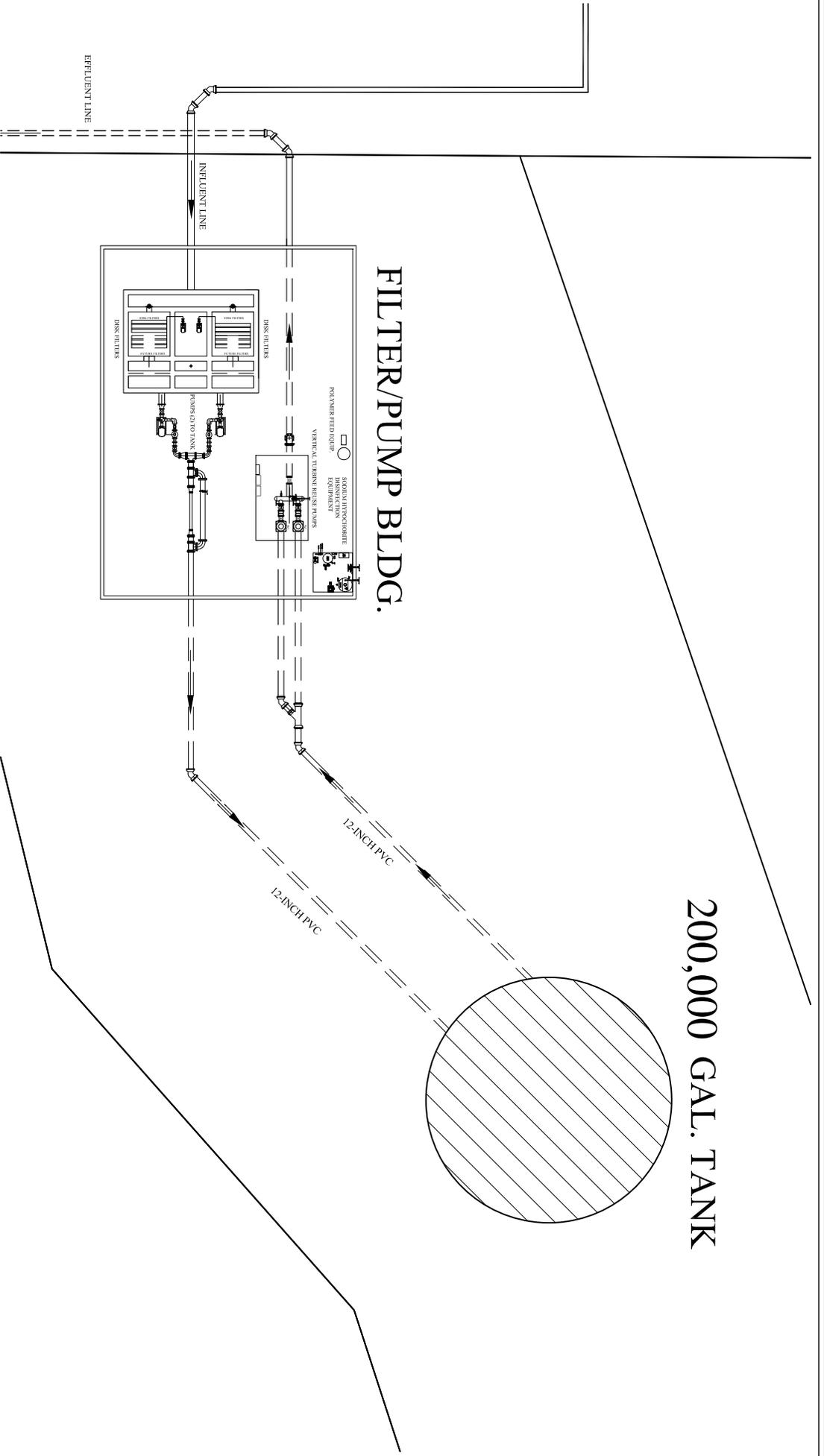


FIGURE 6-2 EFFLUENT REUSE  
 TREATMENT FACILITIES SITE PLAN  
 CITY OF BAYARD  
 EFFLUENT REUSE  
 PRELIMINARY ENGINEERING REPORT

**ATTACHMENT II**

**PROJECT ESTIMATE**

CITY OF BAYARD PHASE 2 EFFLUENT REUSE - DISK FILTER BUILDING  
TOTAL PROJECT

12/12/2011

Item No.	Description	Unit	Unit Price	Quantity	Amount
1	General Requirements; Mobilization, Jobsite Overhead, Shakedown Activities, Demobilization	ls	\$279,000.00	1.00	\$ 279,000.00
2	Demolition	ls	\$339,000.00	1.00	\$ 339,000.00
3	Site Work: Grading, sidewalks, fencing and all other miscellaneous site improvements	ls	\$153,222.50	1.00	\$ 153,222.50
4	Filter / Pump Building	ls	\$893,894.00	1.00	\$ 893,894.00
5	Filter Building Equipment	ls	\$648,751.00	1.00	\$ 648,751.00
6	Process Piping and Appurtenances - Filter / Pump Building	ls	\$ 41,105.00	1.00	\$ 41,105.00
7	12-inch AWWA C-900 PVC water line	lf	\$ 18.00	2,095.00	\$ 37,710.00
8	Trench, Backfill & Compaction 12" water line	lf	\$ 25.00	2,095.00	\$ 52,375.00
9	10-inch AWWA C-900 PVC water line	lf	\$ 15.00	2,040.00	\$ 30,600.00
10	Trench, Backfill & Compaction 10" water line	lf	\$ 23.00	2,040.00	\$ 46,920.00
11	8-inch AWWA C-900 PVC water line	lf	\$ 12.00	1,910.00	\$ 22,920.00
12	Trench, Backfill & Compaction 8" water line	lf	\$ 21.00	1,910.00	\$ 40,110.00
13	4-inch AWWA C-900 PVC water line	lf	\$ 8.00	470.00	\$ 3,760.00
14	Trench, Backfill & Compaction 4" water line	lf	\$ 20.00	470.00	\$ 9,400.00
15	200,000 Gallon Storage Tank at WWTP	ls	\$225,000.00	1.00	\$ 225,000.00
16	6-inch DIP Line; Filter Building to Tank	lf	\$ 15.00	40.00	\$ 600.00
17	Trench, Backfill & Compaction 6" DIP line Filter Bldg. to Tank	lf	\$ 20.00	40.00	\$ 800.00
18	6-inch DIP 22.5 Deg Ell	ea	\$ 60.00	1.00	\$ 60.00
19	12-inch DIP Suction Line; Tank to Effluent Reuse Pumps	lf	\$ 22.00	50.00	\$ 1,100.00
20	Trench, Backfill & Compaction 12" DIP Suction Line Tank to Effluent Reuse Pumps	lf	\$ 25.00	50.00	\$ 1,250.00
21	12-inch 45 Deg Ell	ea	\$ 125.00	24.00	\$ 3,000.00
22	12X12-inch 45 Deg Wye	ea	\$ 600.00	1.00	\$ 600.00
23	12"x12" DIP Tee	ea	\$ 250.00	1.00	\$ 250.00
24	12-inch 22.5 Deg Ell	ea	\$ 135.00	6.00	\$ 810.00
25	12-inch 90 Deg Ell	ea	\$ 200.00	1.00	\$ 200.00
26	8-inch 45 Deg Ell	ea	\$ 150.00	10.00	\$ 1,500.00
27	4-inch 45 Deg Ell	ea	\$ 80.00	2.00	\$ 160.00
28	10x12 DIP Wye	ea	\$ 480.00	1.00	\$ 480.00
29	12-inch Gave Valves	ea	\$ 500.00	4.00	\$ 2,000.00
30	Valve Box for Gate Valves	ls	\$ 8,500.00	1.00	\$ 8,500.00
31	12-inch DIP Overflow Line; Tank to Influent Pump Station	lf	\$ 22.00	780.00	\$ 17,160.00
32	Trench, Backfill & Compaction 12" DIP Overflow Line Tank to Influent Pump Station	lf	\$ 25.00	780.00	\$ 19,500.00
33	10-inch 11.25 Deg Ell DIP	ea	\$ 60.00	1.00	\$ 60.00
34	10-inch DIP 45 Deg. Ell	ea	\$ 125.00	1.00	\$ 125.00
35	16-inch PVC Influent line; Existing Distribution Box to New Filter Basin	lf	\$ 30.00	415.00	\$ 12,450.00
36	Trench and Back Fill - 16-inch PVC	lf	\$ 40.00	415.00	\$ 16,600.00
37	16-inch 11.25 Deg Ell	ea	\$ 120.00	2.00	\$ 240.00
38	16-inch 45 Deg Ell	ea	\$ 130.00	7.00	\$ 910.00
39	16-inch 22.5 Deg Ell	ea	\$ 120.00	1.00	\$ 120.00
40	PRV Stations - CIP	ea	\$ 6,000.00	3.00	\$ 18,000.00
41	Inspection Testing Allowance	allow	\$ 40,000.00	1.00	\$ 40,000.00
42	Relocation of Underground Utilities Allowance	allow	\$ 20,000.00	1.00	\$ 20,000.00
43	Special Inspections Per IBC 2009	allow	\$ 40,000.00	1.00	\$ 40,000.00

Subtotal		\$ 3,030,242.50
Contingency	10.00%	\$ 303,024.25
Subtotal		\$ 3,333,266.75
NMGRT on construction	7.2500%	\$ 241,661.84
Total Construction		<b>\$ 3,574,928.59</b>
Engineering	9.10%	\$ 303,327.27
Completed Engineering Design		\$ (142,886.50)
Engineering Adjusted (Construction Administration)		\$ 160,440.77
NMGRT On Engineering	7.00%	\$ 11,230.85
Subtotal		\$ 171,671.63
Construction Observation	4.56%	\$ 152,153.19
NMGRT On Observation	7.00%	\$ 10,650.72
Subtotal		\$ 162,803.92
Total engineering and observation		<b>\$ 334,475.54</b>

**TOTAL PROJECT COSTS** **\$ 3,909,404.13**

**CITY OF BAYARD PHASE 2 EFFLUENT REUSE - DISK FILTER BUILDING**

**GENERAL REQUIREMENTS**

12/14/11 9:46 AM

**BUILDING AND SITE**

<b>Item</b>	<b>Description</b>	<b>Unit</b>	<b>Unit Price</b>	<b>Quantity</b>	<b>Total</b>
1	Mobilization General Contractor	ls	\$ 40,000.00	1	\$ 55,000.00
2	Jobsite Overhead	ls	\$ 125,000.00	1	\$ 130,000.00
3	Shakedown	ls	\$ 25,000.00	1	\$ 25,000.00
4	Demobilization	ls	\$ 27,000.00	1	\$ 33,000.00

Subtotal \$ **243,000.00**

**FIXED INFRASTRUCTURE**

<b>Item</b>	<b>Description</b>	<b>Unit</b>	<b>Unit Price</b>	<b>Quantity</b>	<b>Total</b>
1	Mobilization General Contractor	ls	\$ 15,000.00	1	\$ 15,000.00
2	Jobsite Overhead	ls	\$ 15,000.00	1	\$ 15,000.00
3	Demobilization	ls	\$ 6,000.00	1	\$ 6,000.00

Subtotal \$ **36,000.00**

TOTAL \$ **279,000.00**

**CITY OF BAYARD PHASE 2 EFFLUENT REUSE - DISK FILTER BUILDING**

**DEMOLITION**

12/14/11 9:46 AM

**BUILDING AND SITE**

<b>Item</b>	<b>Description</b>	<b>Unit</b>	<b>Unit Price</b>	<b>Quantity</b>	<b>Total</b>
1	General Demolition	ls	\$ 350,000.00	1	\$ 300,000.00
2	Sludge Removal from Pond Area	cy	\$ 30.00	1300	\$ 39,000.00
3		ls			\$ -
4		ls			\$ -
5		ls			\$ -
6		ls			\$ -

Subtotal

**\$ 339,000.00**

**CITY OF BAYARD PHASE 2 EFFLUENT REUSE - DISK FILTER BUILDING**

**SITE WORK**

12/14/11 9:46 AM

<b>Item</b>	<b>Description</b>	<b>Unit</b>	<b>Unit Price</b>	<b>Quantity</b>	<b>Total</b>
1	Construction Staking	ls	\$ 1,500.00	1	\$ 1,500.00
2	Unclassified Fill (Pond)	cy	\$ 10.00	6745	\$ 67,450.00
3	Subgrade prep for paving	sy	\$ 7.00	1900	\$ 13,300.00
4	Base course for paving - 6"	sy	\$ 20.00	1900	\$ 38,000.00
5	Sidewalks	sy	\$ 40.00	214	\$ 8,560.00
6	Fencing	sf	\$ 5.25	4650	\$ 24,412.50
7					\$ -
8					\$ -
9					\$ -
10					\$ -

Subtotal

**\$ 153,222.50**

**CITY OF BAYARD PHASE 2 EFFLUENT REUSE - DISK FILTER BUILDING**

**FILTER BUILDING**

12/14/11 9:46 AM

<b>Item</b>	<b>Description</b>	<b>Unit</b>	<b>Unit Price</b>	<b>Quantity</b>	<b>Total</b>
1	Construction Staking	ls	\$ 5,000.00	1.00	\$ 5,000.00
2	Engineered Fill	cy	\$ 30.00	711.00	\$ 21,330.00
3	Footings	cy	\$ 600.00	23.00	\$ 13,800.00
4	Floor Slab	cy	\$ 850.00	70.00	\$ 59,500.00
5	Tank Walls and Floor	cy	\$ 1,000.00	82.00	\$ 82,000.00
6	CMU Walls	sf	\$ 15.00	4,794.00	\$ 71,910.00
7	Wall Insulation	sf	\$ 4.00	4,794.00	\$ 19,176.00
8	Roof Joists	ls	\$ 10,530.00	1.00	\$ 10,530.00
9	Roof Joists - Install	ls	\$ 10,000.00	1.00	\$ 10,000.00
10	Miscellaneous Metals - CIP	ls	\$ 30,000.00	1.00	\$ 30,000.00
11	Roof Deck cip	ls	\$ 4.00	3,744.00	\$ 14,976.00
12	Painting	ls	\$ 75,000.00	1.00	\$ 75,000.00
13	Doors, windows	ls	\$ 25,000.00	1.00	\$ 25,000.00
14	Roofing w/ 3" insulation	sf	\$ 13.00	3,744.00	\$ 48,672.00
15	Mechanical/Plumbing	ea	\$ 210,000.00	1	\$ 195,000.00
16	Building Electrical	ea	\$ 225,000.00	1	\$ 212,000.00
17					
18					\$ -

**\$ 893,894.00**

**CITY OF BAYARD PHASE 2 EFFLUENT REUSE - DISK FILTER BUILDING**

**DISK FILTER EQUIPMENT**

12/14/11 9:51 AM

<b>Item</b>	<b>Description</b>	<b>Unit</b>	<b>Unit Price</b>	<b>Quantity</b>	<b>Total</b>
1	Disk Filter Equipment	ls	\$ 300,751.00	1	\$ 300,751.00
2	Pumps to Tank - End Suction Centrifugal	ls	\$ 45,000.00	1	\$ 45,000.00
3	Pumps to MF Equipment	ls	\$ 60,000.00	0	\$ -
4	Effluent Pumps Skid - Vertical Turbine	ls	\$ 225,000.00	1	\$ 225,000.00
5	Hypochlorite Disinfection Equipment	ls	\$ 60,000.00	1	\$ 60,000.00
6	Polymer Feed Equipment	ls	\$ 18,000.00	1	\$ 18,000.00

Subtotal

**\$ 648,751.00**

**CITY OF BAYARD PHASE 2 EFFLUENT REUSE - DISK FILTER BUILDING**

**PROCESS PIPING**

12/14/11 9:51 AM

Item	Description	Unit	Unit Price	Quantity	Total
1	12" DIP	lf	\$ 17.00	130	\$ 2,210.00
2	12" ELL 90-deg / 45-deg	ea	\$ 240.00	8	\$ 1,920.00
	12" TEE	ea	\$ 425.00	5	\$ 2,125.00
3	8" ELL 90-deg	ea	\$ 200.00	6	\$ 1,200.00
4	Pressure Gauge - SS WIKA	ea	\$ 1,200.00	4	\$ 4,800.00
5	8" Gate Valve	ea	\$ 1,900.00	6	\$ 11,400.00
6	8" Check Valve	ea	\$ 2,500.00	2	\$ 5,000.00
7	12" Gate Valve	ea	\$ 3,500.00	2	\$ 7,000.00
8	8"x12" reducer	ea	\$ 800.00	4	\$ 3,200.00
9	12" DIP Spools - 24" long	ea	\$ 525.00	2	\$ 1,050.00
10	12" DIP Spools - 36" long	ea	\$ 600.00	2	\$ 1,200.00

Subtotal

**\$ 41,105.00**

**ATTACHMENT III**

**EID EXCERPTS**

**ENVIRONMENTAL IMPACTS**  
**AND**  
**MITIGATION**

### **3.0 AFFECTED ENVIRONMENT/ ENVIRONMENT CONSEQUENCES**

#### **3.1 Environmental Setting**

The proposed project area is located within Grant County, New Mexico. Elevations range from 5740 feet at the wastewater treatment plant site south of Bayard to about 5962 feet at the Phase 2B tank at Cobre High School. The proposed project will affect about 5 acres of land at the existing wastewater facility in Bayard and about 14,000 feet by approximately 50 feet of mostly developed land for the transmission and distribution pipelines. The area is close to the Gila Wilderness and the Black Range and is home to a major copper mine (Chino Mine) currently owned and operated by Freeport McMoRan Copper and Gold, Inc. (FMI). Copper and other metals, principally silver, have been mined in this area for over one hundred years. [2]

##### **3.1.1 Project History**

Since 1981 the City of Bayard, the Village of Santa Clara and the Fort Bayard State Hospital (City of Bayard) have sent untreated wastewater to the Phelps-Dodge Santa Rita (Chino) Mine. Due to health and environmental concerns, Phelps-Dodge, in 1997, decided to halt its acceptance of raw wastewater to the mine when the discharge agreement with the City of Bayard expired in April 2003. In response, the City of Bayard, as lead agency for the Joint Powers Authority, initiated an effort to develop a wastewater treatment and disposal plan. Phase 1 of this effort culminated in the completion of a new wastewater treatment facility (2008) on the site of the old facility south of Bayard. Treated effluent is pumped to the same location at Chino mine by extension of the existing discharge agreement.

Phase 2 of the facilities planning provides for the beneficial reuse of the treated effluent. This effort will accomplish two objectives. The first of these is to provide a permanent point(s) of discharge to replace discharge to the mine, which could be disallowed in the future. The second is to make use of the effluent as a valuable component of the available water supply in the planning area. The Phase 2 Effluent Reuse project will be

divided into sub-phases which are planned to eventually serve all of the application areas as described in the PER and this EID.

### 3.1.2 Population

According to the 2000 U.S. census, the City of Bayard had a population of 2,534. The Village of Santa Clara had a population of 1,944. The Fort Bayard Medical Center is a 250 bed facility with a maximum population estimated at 480 persons. More detailed information on population trending is included in the PER. Tables from the 2000 U.S. Census are included in the Appendix. Since this report covers Phases 2A and 2B which only pertains to Bayard, the remaining population data for Santa Clara and Fort Bayard is not included in this EID.

### 3.1.3 Economy

The 2000 Census indicates that 809 citizens of Bayard were employed. In the Village of Santa Clara this number was 603. The largest employer category for both communities, consistent with Grant County in general, is the educational, health and social services sector – about 30 percent on average. The largest single employer, as a general rule, is Freeport-McMoRan (Chino mines). Mining employment has fallen off, however, with recent workforce reductions in early 2009.

### 3.1.4 Climate

The elevation of Bayard is 5,820 feet above sea level. Monthly averages for high and low temperatures and precipitation are given in Tables 3-1 and 3-2 respectively.

**TABLE 3-1 BAYARD AVERAGE TEMPERATURES IN °F**

Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.
High	53	56	62	70	78	88	87	85	81	71	60	52
Low	26	28	32	37	45	55	59	57	53	53	32	26

**TABLE 3-2 BAYARD MONTHLY AVERAGE PRECIPITATION IN INCHES**

Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.
0.94	0.76	0.53	0.20	0.59	0.81	3.6	3.14	1.91	1.63	0.97	1.17

## 3.2 Land Use

### 3.2.1 General Land Use

The proposed project area is located in Grant County, New Mexico. The communities of Bayard and Santa Clara are included in this area along with the properties of the Fort Bayard State Hospital. Land use is characterized by a mix of residential and commercial development, transportation right-of-way, utility corridors and cemetery property. The project area is bordered by mine property (FMI), private ranches and U.S. Forest Service land.

### 3.2.2 Growth and Population Trends

The project area has experienced slow to negative growth in the past few years. This is illustrated in Table 3-3.

**TABLE 3-3 TOTAL POPULATION ESTIMATES [3]**

Year	2000	2001	2002	2003	2004	2005	2006	2007
Population	2,534	2,489	2,442	2,387	2,341	2,357	2,359	2,376

This pattern is largely attributable to workforce reductions at local mines. Approximately 800 mine employees were laid off in early 2009. The correlation of this event to the potential for further population decline is unclear because of the widespread economic slowdown affecting the entire country.

### 3.2.3 Important Farmland

The National Resource Conservation Service (Silver City, New Mexico), for previous phases of this project, has determined that none of the proposed project locations or sites contains prime, unique, statewide or local important farmlands. An updated request for comments has been submitted to this agency requesting confirmation of this former opinion.

### 3.2.4 Soils

The soils descriptions in this section are based on information obtained from the NRCS Web Soil Survey (maps in Appendix). Eleven soil types were identified within the project area. These are given in Table 3-4 with accompanying data shown for each soil type.

**TABLE 3-4 SOIL CHARACTERISTICS**

Map Unit Symbol	Map Unit Name	Flooding Frequency	Slope Range %	Soil Erodibility Factor (K)
2	Abrazo-Luzena Complex	None	15-45	(A) 0.24-0.28 (L) 0.05-0.17
4	Boysag Clay Loam	None	15-35	0.15-0.17
11	Dagflat-Santa Fe Complex	None	1-25	(D) 0.24-0.37 (S) 0.17-0.20
25	Lonti Gravelly Loam	None	15-35	0.17-0.28
26	Lonti gravelly Clay Loam	None	0-8	0.20-0.28
33	Manzano Loam	Rare	1-3	0.28-0.32
40	Oro Grande-Rock Outcrop Complex	None	25-75	0.32
44	Paymaster-Ellicot Complex	Rare	1-3	(P) 0.10-0.28 (E) 0.10
49	Plack Variant-Guy Complex	None	15-35	(P) 0.32-0.37 (G) 0.15-0.24
57	Sampson-Dagflat Complex	None	3-12	(S) 0.17-0.24 (D) 0.24-0.37
63	Santana-Rock Outcrop Complex	None	1-25	0.32-0.37

The soil data above, with other factors included in the Universal Soil Loss Equation (USLE), can be used to determine the likelihood of soil erosion over time. The (USLE) predicts the long term average annual rate of erosion on a field slope based on rainfall pattern, soil type, topography, crop system and management practices. USLE only predicts the amount of soil loss that results from sheet or rill erosion on a single slope and does not account for additional soil losses that might occur from gully, wind or tillage

erosion. This erosion model was created for use in selected cropping and management systems, but is also applicable to non-agricultural conditions such as construction sites.

Five major factors are used to calculate the soil loss for a given site. Each factor is the numerical estimate of a specific condition that affects the severity of soil erosion at a particular location. The erosion values reflected by these factors can vary considerably due to varying weather conditions. Therefore, the values obtained from the USLE more accurately represent long-term averages.

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### **3.2.5 Formally Classified Lands**

There are no national parks, historic landmarks or sites, wilderness areas, wildlife refuges, wild and scenic rivers, state parks, grasslands or Native American owned lands within the project area. The National Parks Service was consulted and provided confirmation that there were no parks that would be affected by the proposed project.

### **3.3 Floodplains**

The Federal Emergency Management Agency Flood Hazard Boundary Map (Appendix) for unincorporated areas of Grant County, New Mexico and the City of Bayard Floodplain Manager was consulted to identify any floodplains within the project area. The plant facilities for the Phase 2 Effluent Reuse project are located close to, but not

within the designated flood plain – Special Flood Hazard Zone A. Since the proposed facilities will be immediately adjacent to the designated hazard area, measures will be taken to provide drainage away from the building pad and tank foundation.

### **3.4 Wetlands**

There are ephemeral streams in the project area which are tributary to Whitewater Creek. There are not any observable wetlands areas within the project boundaries. The U.S. Army Corps of Engineers was consulted for comment on the presence of wetlands in the project area. This agency concurred with the conclusion that no wetlands occur in the project area.

### **3.5 Water Resources**

#### **3.5.1 Surface Water**

The most important surface water features in the project area include Whitewater Creek, Twin Sisters Creek and Cameron Creek. There are also a number of ephemeral drainages associated with these streams. Twin Sisters and Cameron Creeks drainages recharge the Bayard well field which is located approximately one-half mile west of the city limits in Section 13 Range 13W Township 18S. There are no effluent application areas planned for these drainage locations. The U.S. Army Corps of Engineers was consulted on this project and has advised that a jurisdictional review will not be necessary for this area since all of the waterways of interest have previously been designated to be under the jurisdiction of the Corps.

The New Mexico Environment Department Surface Water Quality Bureau (SWQB) was contacted to request comment on potential impacts to surface water features in the region. (Ref. 3/22/2010 Letter to Georgia Cleverley – NMED Environmental Impact Review Coordinator). Comments received from SWQB are as follows:

*“The U.S. Environmental Protection Agency (USEPA) requires National Pollutant Discharge Elimination System (NPDES) permit coverage for storm water discharges from construction projects (common plans of development) that will result in the*

*disturbance (or re-disturbance) of one or more acres (as of June 30, 2008), including expansions, of total land area. If this project exceeds one acre, it requires appropriate NPDES permit coverage prior to beginning construction.*

*Among other things, this permit requires that a Storm Water Pollution Prevention Plan (SWPPP) be prepared for the site and that appropriate Best Management Practices (BMPs) be installed and maintained both during and after construction to prevent, to the extent practicable, pollutants (primarily sediment, oil & grease and construction materials from construction sites) in storm water runoff from entering waters of the U.S. This permit also requires that permanent stabilization measures (revegetation, paving, etc.), and permanent storm water management measures (storm water detention/retention structures, velocity dissipation devices, etc.) be implemented post construction to minimize, in the long term, pollutants in storm water runoff from entering these waters.*

*You should also be aware the EPA requires that all “operators” (see Federal Register/Vol. 63 No. 128/Monday, July 6, 1998 pg 36509) obtain NPDES permit coverage for construction projects. Generally, this means that at least two parties will require permit coverage. The owner/developer of this construction project who has operational control over project specifications (probably the City of Bayard in this case), the general contractor who has day-to-day operational control of those activities at the site, which are necessary to ensure compliance with the storm water pollution plan and other permit conditions, and possibly other “operators” will require appropriate NPDES permit coverage for this project.” End of SWQB comments.*

### **3.5.2 Ground Water**

The NMED Ground Water Quality Bureau (GWQB) was contacted through the NMED Environmental Impact Review Coordinator with a request for comments on the project. The following comments were received:

*“The primary ground water issues are related to the proximity of the cemetery reuse area to Whitewater Creek. Under a ground water Discharge Permit, applications of reclaimed wastewater will need to be strictly controlled in order to avoid mobilization of known contaminants in the creek. This does not limit the reuse project but is a consideration for design of the irrigation system at the cemetery site and will result in specific ground water Discharge Permit conditions. The GWQB and the consulting engineer have agreed to address the issues in the design and permitting phase of the project.*

*This project does provide a path to significantly off-set potable water demand through beneficial reuse, thus preserving the scarce water resources of this area. Because of this, GWQB is supportive of the project. However, the project does not completely resolve the issue of where the discharge from the City’s treatment facility will go, even when the second phase has been implemented. The City and their consultant are aware that further planning remains necessary in order to address all of the outstanding issues.*

*Construction associated with the reuse project will likely involve the use of heavy equipment, thereby leading to the possibility of contaminant releases (e.g. fuel, hydraulic fluid, etc.) associated with heavy equipment malfunctions. The GWQB advises all parties involved in the project to be aware of discharge notification requirements contained in 20.6.2.1203 NMAC. Compliance with the notification and response requirements will ensure the protection of ground water quality in the vicinity of the project.” End GWQB comments.*

### **3.6 Coastal Resources**

There are no coastal resources in New Mexico.

### 3.7 Air Quality

The project is within a federal attainment area for air quality standards. Air particulate matter in Bayard, which is less than 10 microns, is in compliance with federal primary air quality standards. The project area is also in compliance with federal and state secondary standards. The Town of Hurley, formerly a non-attainment area with respect to sulfur dioxide (SO<sub>2</sub>) standards, is now in attainment/maintenance status. The center of the area of concern was the Hurley smelter which has been decommissioned and its stacks demolished. The radius of the former non-attainment area was 3.5 miles and 8 miles for land above 6470 feet. There is an SO<sub>2</sub> monitoring site operated by the state located in the City of Bayard. There are eight SO<sub>2</sub> monitoring sites total in the area [4]. Comments from the NMED Air Quality Bureau via the NMED Environmental Impact Review Coordinator are as follows:

*“The proposed City of Bayard Phase 2 Effluent Reuse Project is located in Grant County. A small portion of Grant County surrounding Hurley is in maintenance for the sulfur dioxide national ambient air quality standard. The City of Bayard is not located within the Grant County sulfur dioxide maintenance area, but is in very close proximity to it.*

*The project as proposed should have no long-term significant impacts to ambient air quality. However, dust control measures should be taken to minimize the release of particulates during construction of the proposed project. Long-term dust control can be achieved by revegetating disturbed areas following construction.”* End AQB comments.

### 3.8 Biological Resources

A report on the biological resources of the project area is included in the Appendix. In general, the report indicates that there will be no significant impact to threatened or endangered species as a result of this project. There may be a need for migratory bird nest surveys depending on when construction actually starts and a short plant survey on western end in undisturbed areas (Phase 2B).

### 3.9 Archaeological, Cultural, and Historic Resources

A report on the archaeological, cultural and historic resources is included in the Appendix. The findings of this report indicate no discovery of cultural resources in the proposed project area. Much of the corridors have been previously disturbed or subjected to prior archaeological surveys.

### 3.10 Socioeconomic / Environmental Justice

The proposed Bayard Phase 2 Effluent Reuse Project is not expected to have an adverse or disproportionate impact on low income or minority populations. The project is expected to have a beneficial impact on the planning area. In accordance with Executive Order 12898, the proposed project will be conducted in a manner to ensure that there will be no exclusions of any persons or populations from participating in the project or its benefits, and no discrimination due to race, color, income level, or national origin. The demographic characteristics of the City of Bayard are summarized in Table 3-5 and 3-6.

**TABLE 3-5 BAYARD DEMOGRAPHIC CHARACTERISTICS [5]**

Racial Characteristics	Number	Percentage
White	1,664	65.7
Black or African American	8	0.3
American Indian and Alaska Native	42	1.7
Vietnamese	1	-
Some Other Race	736	29.0
Two or More Races	83	3.3
Total Population	2534	100.00
Hispanic or Latino (any race)	2,137	84.3
Elderly (over 65 years)	429	16.9

**TABLE 3-6 BAYARD DEMOGRAPHIC CHARACTERISTICS – INCOME [5]**

Median Household Income	\$21,957.00
Per Capita Income	\$11,066.00
Persons Below Poverty Level	24.1%

Environmental justice is addressed under Executive Order 12898 ; *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations* [6]. The stated goal of this EO is for each Federal agency to make achieving environmental justice a part of its mission by “identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations in the United States ...”

To address environmental justice concerns in the project area, mapping and indices were acquired from EPA, developed from 2000 census data. These include:

- Economic Status – Degree of Vulnerability (DVECO)
- Potential Environmental Justice Index (EJ)
- Minority Status – Degree of Vulnerability (DVMAV)

For all three maps the Environmental Justice Index was 8 and 9 for a one square mile and fifty square mile area, respectively. These values indicate “low vulnerability” (1-12) for disproportionate impacts to minority and low-income populations in the project area. The EJ maps and Executive Order 12898 are included in the Appendix.

### **3.11 Other Resources**

#### **3.11.1 Public Health and Safety**

The City of Bayard acquired an NPDES permit for the newly constructed wastewater treatment plant. There are no compliance requirements except for reporting “no discharge” on the discharge monitoring reports (DMR’s), which are sent to EPA. This is due to the fact that discharge to Whitewater Creek has been disallowed through intervention by the New Mexico Groundwater Quality Bureau (GWQB). Treated effluent is currently pumped, by agreement with FMI Chino Mine, to the mine tailings ponds. In order to use the treated effluent for irrigation purposes, a groundwater discharge permit will likely be required by the GWQB. The reuse facilities proposed will be designed to produce a Class 1A reclaimed wastewater, which is the highest quality

effluent as defined by current NMED guidelines. This class of reclaimed wastewater affords the highest protection for public health and safety and can be used with the fewest restrictions under current guidelines.

Other areas of safety concern include the following:

Construction Traffic – Accepted methodologies (NMDOT, etc.) will be employed to provide effective traffic control including dust control for the duration of the project.

Underground Utilities – Use of the New Mexico One-Call service will be required to determine the location of underground utilities prior to excavation.

Construction Site Hazards – Open trenches, equipment and other potential construction site hazards will be restricted from public access to reduce the risk of accidents in these areas. These efforts will include excavations in public roads and streets.

This project is not expected to have significant impacts on the health and safety to the public in the City of Bayard or adjacent communities.

### 3.11.2 Energy

The project is currently in the design phase. Energy costs for the new plant facilities will be estimated as a part of this effort. Preliminary estimated energy costs based on available data are included in Table 3-7 below.

**TABLE 3-7 BAYARD PHASE 2A PLANT FACILITIES POWER COSTS**

	\$/kw-hr	\$ 0.08			
<b>EQUIPMENT</b>	<b>HP</b>	<b>KW</b>	<b>Operating Hr/Yr</b>	<b>KW-HR</b>	<b>Energy Costs</b>
Filter Motors	5.00	3.73	2,080	7,758	\$ 620.67
Polymer Equip And Misc		5.00	1,000	5,000	\$ 400.00
Building; Lights;Heat		20.00	1,040	20,800	\$ 1,664.00
Transfer Pumps To Tank	7.50	5.60	2,080	11,638	\$ 931.01
Hypochlorite Unit		10.00	700	7,000	\$ 560.00
Lift Pumps To Reuse Storage	40.00	29.84	2,080	62,067	\$ 4,965.38
				-	\$ -
<b>TOTAL</b>	52.50	74.17	8,980	114,263	<b>\$ 9,141.06</b>

### **3.11.3 Transportation**

The proposed project is not expected to significantly affect transportation facilities or infrastructure in the project area. The current phase, 2A, does not affect any major streets or highways in the area. There could be some traffic control required on North Hurley Road during the installation of the effluent transmission line in this location, however, the only vehicular traffic on this road are vehicles traveling to the wastewater treatment plant. In the future phase, 2B, there is one proposed perpendicular crossing of Highway 180 at Taylor Street. This will be proposed as a jack and bore and will require minimal traffic control during the execution of this task.

### **3.11.4 Visual Impacts**

There will be few visual impacts resulting from the construction of Phase 2A or 2B of this project. All of the construction activities occur in previously disturbed areas adjacent to buried utilities. Transmission lines follow existing easements, established city rights-of-way, or are within Cobre Schools property boundaries.

### **3.11.5 Noise**

Noise levels at the wastewater treatment plant construction site will typically be higher than the normal levels at this location during working hours. Heavy traffic area noise levels are typically estimated at 85 decibels. Construction noise at the wastewater treatment plant will stay at this level only on an intermittent basis. Noise levels along the transmission line alignment are anticipated to generate lower levels of noise than those at the plant construction site. The aggregate affect of increased noise levels is not expected to significantly impact the project area.

## **3.12 Cumulative Impacts**

As described above, the areas of construction are all in previously disturbed areas, most of which already accommodate built structures or buried utilities. As such, the proposed project is not expected to result in any cumulative impacts.

## **4.0 SUMMARY OF MITIGATION MEASURES**

### **4.1 Physical Resources Measures**

#### **4.1.1 Land**

Land clearing will be kept to the minimum necessary and preconstruction contours restored. Construction sites will be well marked and traffic control measures implemented to ensure construction site safety. Vegetated areas will be re-seeded immediately.

#### **4.1.2 Water Resources**

##### **4.1.2.1 Surface Water**

Pipeline installation through ephemeral creeks in the reuse application area will follow guidelines of Nationwide Permit No. 12. Facility construction will follow EPA guidelines for prevention of discharge of pollutants in stormwater. Erosion control and construction of catch-basins will be employed, as necessary, to minimize stormwater flow from site.

##### **4.1.2.2 Ground Water**

Possible excavation, dewatering, and discharge will follow NMED ground water protection guidelines. Effluent quality will be within NMED Class 1A standards for turf irrigation.

### **4.2 Biological Resource Measures**

#### **4.2.1 Vegetation**

Vegetation disturbance will be kept to the minimum necessary and disturbed areas will be backfilled, regraded and immediately seeded with native species.

#### **4.2.2 Wildlife**

Habitat disturbance will be kept to the minimum necessary and disturbed areas will be backfilled, regraded to natural contours and seeded immediately with native species. The filter/pump building will be enclosed to minimize noise disturbance or wildlife access.

### **4.3 Threatened and Endangered Species Measures**

There is no indication from the initial conclusions from the biological survey that there are threatened or endangered species observed within the project area. Although there are no species which fall under formal protection of the Endangered Species Act measures will be taken to ensure the protection of potential habitat and local wildlife. Construction activities should respect recommendations by the New Mexico Department of Game and Fish regarding the minimization of the amount of open trenches in the reuse transmission line alignments, leaving escape ramps for wildlife, and checking trenches for wildlife prior to backfilling. Also, surface habitat should be reclaimed and re-seeded as soon as possible after backfilling of trenches.

### **4.4 Socioeconomic/Environmental Justice Measures**

Socioeconomic and environmental justice measures should include ongoing communication of project activities and schedules within the affected community. Responsive communication from the local governing body should be prompt in response to concerns and questions from local residents as well as the various government agencies and interest groups.

### **4.5 Archeological, Cultural, and Historic Resources Measures**

There were no archaeological, cultural, or historic resources found in the project area. If buried cultural deposits are discovered during any project-related activities, work should be stopped immediately and the New Mexico State Historic Preservation Officer should be notified.

### **4.6 Environmentally Sensitive Areas**

There were no environmentally sensitive areas identified in the project area including farmlands, classified lands, floodplains and wetlands.

## **4.7 Other Resources**

### **4.7.1 Public Health and Safety**

Reclaimed Wastewater - The reclaimed wastewater proposed for use in irrigation applications will be treated to the highest standards (Class 1A) as described in the *NMED Guidelines for Above Ground Use of Reclaimed Domestic Wastewater* [7]. This level of treatment includes effective disinfection of the reuse water which will mitigate the exposure of the public to pathenogenic organisms.

Construction Traffic/Transportation – Traffic control measures will be employed to mitigate any risks associated with heavy truck traffic and construction work occurring within public thoroughfares.

Underground Utilities – Potholing and utility line location will be used to find and avoid hazards associated with excavation in close proximity to buried utilities.

Construction Site Hazards – Methods such as restricted access to construction sites and trenched areas will be employed to mitigate safety hazards to the public.

Noise – Construction schedules should be maintained that confine noise producing activities to normal working hours.

## **4.8 Cumulative Impact Measures**

The project is not expected to result in any cumulative impacts, as stated in Section 3.

**ATTACHMENT III**

**ENVIRONMENTAL IMPACTS**  
**AND**  
**MITIGATION**

### **3.0 AFFECTED ENVIRONMENT/ ENVIRONMENT CONSEQUENCES**

#### **3.1 Environmental Setting**

The proposed project area is located within Grant County, New Mexico. Elevations range from 5740 feet at the wastewater treatment plant site south of Bayard to about 5962 feet at the Phase 2B tank at Cobre High School. The proposed project will affect about 5 acres of land at the existing wastewater facility in Bayard and about 14,000 feet by approximately 50 feet of mostly developed land for the transmission and distribution pipelines. The area is close to the Gila Wilderness and the Black Range and is home to a major copper mine (Chino Mine) currently owned and operated by Freeport McMoRan Copper and Gold, Inc. (FMI). Copper and other metals, principally silver, have been mined in this area for over one hundred years. [2]

##### **3.1.1 Project History**

Since 1981 the City of Bayard, the Village of Santa Clara and the Fort Bayard State Hospital (City of Bayard) have sent untreated wastewater to the Phelps-Dodge Santa Rita (Chino) Mine. Due to health and environmental concerns, Phelps-Dodge, in 1997, decided to halt its acceptance of raw wastewater to the mine when the discharge agreement with the City of Bayard expired in April 2003. In response, the City of Bayard, as lead agency for the Joint Powers Authority, initiated an effort to develop a wastewater treatment and disposal plan. Phase 1 of this effort culminated in the completion of a new wastewater treatment facility (2008) on the site of the old facility south of Bayard. Treated effluent is pumped to the same location at Chino mine by extension of the existing discharge agreement.

Phase 2 of the facilities planning provides for the beneficial reuse of the treated effluent. This effort will accomplish two objectives. The first of these is to provide a permanent point(s) of discharge to replace discharge to the mine, which could be disallowed in the future. The second is to make use of the effluent as a valuable component of the available water supply in the planning area. The Phase 2 Effluent Reuse project will be

divided into sub-phases which are planned to eventually serve all of the application areas as described in the PER and this EID.

### 3.1.2 Population

According to the 2000 U.S. census, the City of Bayard had a population of 2,534. The Village of Santa Clara had a population of 1,944. The Fort Bayard Medical Center is a 250 bed facility with a maximum population estimated at 480 persons. More detailed information on population trending is included in the PER. Tables from the 2000 U.S. Census are included in the Appendix. Since this report covers Phases 2A and 2B which only pertains to Bayard, the remaining population data for Santa Clara and Fort Bayard is not included in this EID.

### 3.1.3 Economy

The 2000 Census indicates that 809 citizens of Bayard were employed. In the Village of Santa Clara this number was 603. The largest employer category for both communities, consistent with Grant County in general, is the educational, health and social services sector – about 30 percent on average. The largest single employer, as a general rule, is Freeport-McMoRan (Chino mines). Mining employment has fallen off, however, with recent workforce reductions in early 2009.

### 3.1.4 Climate

The elevation of Bayard is 5,820 feet above sea level. Monthly averages for high and low temperatures and precipitation are given in Tables 3-1 and 3-2 respectively.

**TABLE 3-1 BAYARD AVERAGE TEMPERATURES IN °F**

Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.
High	53	56	62	70	78	88	87	85	81	71	60	52
Low	26	28	32	37	45	55	59	57	53	53	32	26

**TABLE 3-2 BAYARD MONTHLY AVERAGE PRECIPITATION IN INCHES**

Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.
0.94	0.76	0.53	0.20	0.59	0.81	3.6	3.14	1.91	1.63	0.97	1.17

## 3.2 Land Use

### 3.2.1 General Land Use

The proposed project area is located in Grant County, New Mexico. The communities of Bayard and Santa Clara are included in this area along with the properties of the Fort Bayard State Hospital. Land use is characterized by a mix of residential and commercial development, transportation right-of-way, utility corridors and cemetery property. The project area is bordered by mine property (FMI), private ranches and U.S. Forest Service land.

### 3.2.2 Growth and Population Trends

The project area has experienced slow to negative growth in the past few years. This is illustrated in Table 3-3.

**TABLE 3-3 TOTAL POPULATION ESTIMATES [3]**

Year	2000	2001	2002	2003	2004	2005	2006	2007
Population	2,534	2,489	2,442	2,387	2,341	2,357	2,359	2,376

This pattern is largely attributable to workforce reductions at local mines. Approximately 800 mine employees were laid off in early 2009. The correlation of this event to the potential for further population decline is unclear because of the widespread economic slowdown affecting the entire country.

### 3.2.3 Important Farmland

The National Resource Conservation Service (Silver City, New Mexico), for previous phases of this project, has determined that none of the proposed project locations or sites contains prime, unique, statewide or local important farmlands. An updated request for comments has been submitted to this agency requesting confirmation of this former opinion.

### 3.2.4 Soils

The soils descriptions in this section are based on information obtained from the NRCS Web Soil Survey (maps in Appendix). Eleven soil types were identified within the project area. These are given in Table 3-4 with accompanying data shown for each soil type.

**TABLE 3-4 SOIL CHARACTERISTICS**

Map Unit Symbol	Map Unit Name	Flooding Frequency	Slope Range %	Soil Erodibility Factor (K)
2	Abrazo-Luzena Complex	None	15-45	(A) 0.24-0.28 (L) 0.05-0.17
4	Boysag Clay Loam	None	15-35	0.15-0.17
11	Dagflat-Santa Fe Complex	None	1-25	(D) 0.24-0.37 (S) 0.17-0.20
25	Lontl Gravelly Loam	None	15-35	0.17-0.28
26	Lonti gravelly Clay Loam	None	0-8	0.20-0.28
33	Manzano Loam	Rare	1-3	0.28-0.32
40	Oro Grande-Rock Outcrop Complex	None	25-75	0.32
44	Paymaster-Ellicot Complex	Rare	1-3	(P) 0.10-0.28 (E) 0.10
49	Plack Variant-Guy Complex	None	15-35	(P) 0.32-0.37 (G) 0.15-0.24
57	Sampson-Dagflat Complex	None	3-12	(S) 0.17-0.24 (D) 0.24-0.37
63	Santana-Rock Outcrop Complex	None	1-25	0.32-0.37

The soil data above, with other factors included in the Universal Soil Loss Equation (USLE), can be used to determine the likelihood of soil erosion over time. The (USLE) predicts the long term average annual rate of erosion on a field slope based on rainfall pattern, soil type, topography, crop system and management practices. USLE only predicts the amount of soil loss that results from sheet or rill erosion on a single slope and does not account for additional soil losses that might occur from gully, wind or tillage

erosion. This erosion model was created for use in selected cropping and management systems, but is also applicable to non-agricultural conditions such as construction sites.

Five major factors are used to calculate the soil loss for a given site. Each factor is the numerical estimate of a specific condition that affects the severity of soil erosion at a particular location. The erosion values reflected by these factors can vary considerably due to varying weather conditions. Therefore, the values obtained from the USLE more accurately represent long-term averages.

The range of K, the erodibility factor, is 0.02 to 0.69. The K values in Table 3-4 are either low or mid-range values. This, in addition to rainfall and slope data, indicates that there will be a low probability of significant erosion in most project areas. Those project locations which are included within soil map areas with higher slopes are generally in the lower end of the ranges shown for slope values. There are two specific areas included in Phase 2B which are pipeline alignments on slopes which may require soil stabilization. The first of these is an alignment dropping down from the Bayard cemetery property to Highway 180 at Taylor Street. The second is the alignment from Cobre High School up to the existing 250,000 gallon water tank on the ridge above the school. These areas could be moderately susceptible to soil detachment.

### **3.2.5 Formally Classified Lands**

There are no national parks, historic landmarks or sites, wilderness areas, wildlife refuges, wild and scenic rivers, state parks, grasslands or Native American owned lands within the project area. The National Parks Service was consulted and provided confirmation that there were no parks that would be affected by the proposed project.

### **3.3 Floodplains**

The Federal Emergency Management Agency Flood Hazard Boundary Map (Appendix) for unincorporated areas of Grant County, New Mexico and the City of Bayard Floodplain Manager was consulted to identify any floodplains within the project area. The plant facilities for the Phase 2 Effluent Reuse project are located close to, but not

within the designated flood plain – Special Flood Hazard Zone A. Since the proposed facilities will be immediately adjacent to the designated hazard area, measures will be taken to provide drainage away from the building pad and tank foundation.

### **3.4 Wetlands**

There are ephemeral streams in the project area which are tributary to Whitewater Creek. There are not any observable wetlands areas within the project boundaries. The U.S. Army Corps of Engineers was consulted for comment on the presence of wetlands in the project area. This agency concurred with the conclusion that no wetlands occur in the project area.

### **3.5 Water Resources**

#### **3.5.1 Surface Water**

The most important surface water features in the project area include Whitewater Creek, Twin Sisters Creek and Cameron Creek. There are also a number of ephemeral drainages associated with these streams. Twin Sisters and Cameron Creeks drainages recharge the Bayard well field which is located approximately one-half mile west of the city limits in Section 13 Range 13W Township 18S. There are no effluent application areas planned for these drainage locations. The U.S. Army Corps of Engineers was consulted on this project and has advised that a jurisdictional review will not be necessary for this area since all of the waterways of interest have previously been designated to be under the jurisdiction of the Corps.

The New Mexico Environment Department Surface Water Quality Bureau (SWQB) was contacted to request comment on potential impacts to surface water features in the region. (Ref. 3/22/2010 Letter to Georgia Cleverley – NMED Environmental Impact Review Coordinator). Comments received from SWQB are as follows:

*“The U.S. Environmental Protection Agency (USEPA) requires National Pollutant Discharge Elimination System (NPDES) permit coverage for storm water discharges from construction projects (common plans of development) that will result in the*

*disturbance (or re-disturbance) of one or more acres (as of June 30, 2008), including expansions, of total land area. If this project exceeds one acre, it requires appropriate NPDES permit coverage prior to beginning construction.*

*Among other things, this permit requires that a Storm Water Pollution Prevention Plan (SWPPP) be prepared for the site and that appropriate Best Management Practices (BMPs) be installed and maintained both during and after construction to prevent, to the extent practicable, pollutants (primarily sediment, oil & grease and construction materials from construction sites) in storm water runoff from entering waters of the U.S. This permit also requires that permanent stabilization measures (revegetation, paving, etc.), and permanent storm water management measures (storm water detention/retention structures, velocity dissipation devices, etc.) be implemented post construction to minimize, in the long term, pollutants in storm water runoff from entering these waters.*

*You should also be aware the EPA requires that all “operators” (see Federal Register/Vol. 63 No. 128/Monday, July 6, 1998 pg 36509) obtain NPDES permit coverage for construction projects. Generally, this means that at least two parties will require permit coverage. The owner/developer of this construction project who has operational control over project specifications (probably the City of Bayard in this case), the general contractor who has day-to-day operational control of those activities at the site, which are necessary to ensure compliance with the storm water pollution plan and other permit conditions, and possibly other “operators” will require appropriate NPDES permit coverage for this project.” End of SWQB comments.*

### **3.5.2 Ground Water**

The NMED Ground Water Quality Bureau (GWQB) was contacted through the NMED Environmental Impact Review Coordinator with a request for comments on the project. The following comments were received:

*“The primary ground water issues are related to the proximity of the cemetery reuse area to Whitewater Creek. Under a ground water Discharge Permit, applications of reclaimed wastewater will need to be strictly controlled in order to avoid mobilization of known contaminants in the creek. This does not limit the reuse project but is a consideration for design of the irrigation system at the cemetery site and will result in specific ground water Discharge Permit conditions. The GWQB and the consulting engineer have agreed to address the issues in the design and permitting phase of the project.*

*This project does provide a path to significantly off-set potable water demand through beneficial reuse, thus preserving the scarce water resources of this area. Because of this, GWQB is supportive of the project. However, the project does not completely resolve the issue of where the discharge from the City’s treatment facility will go, even when the second phase has been implemented. The City and their consultant are aware that further planning remains necessary in order to address all of the outstanding issues.*

*Construction associated with the reuse project will likely involve the use of heavy equipment, thereby leading to the possibility of contaminant releases (e.g. fuel, hydraulic fluid, etc.) associated with heavy equipment malfunctions. The GWQB advises all parties involved in the project to be aware of discharge notification requirements contained in 20.6.2.1203 NMAC. Compliance with the notification and response requirements will ensure the protection of ground water quality in the vicinity of the project.” End GWQB comments.*

### **3.6 Coastal Resources**

There are no coastal resources in New Mexico.

### **3.7 Air Quality**

The project is within a federal attainment area for air quality standards. Air particulate matter in Bayard, which is less than 10 microns, is in compliance with federal primary air quality standards. The project area is also in compliance with federal and state secondary standards. The Town of Hurley, formerly a non-attainment area with respect to sulfur dioxide (SO<sub>2</sub>) standards, is now in attainment/maintenance status. The center of the area of concern was the Hurley smelter which has been decommissioned and its stacks demolished. The radius of the former non-attainment area was 3.5 miles and 8 miles for land above 6470 feet. There is an SO<sub>2</sub> monitoring site operated by the state located in the City of Bayard. There are eight SO<sub>2</sub> monitoring sites total in the area [4]. Comments from the NMED Air Quality Bureau via the NMED Environmental Impact Review Coordinator are as follows:

*“The proposed City of Bayard Phase 2 Effluent Reuse Project is located in Grant County. A small portion of Grant County surrounding Hurley is in maintenance for the sulfur dioxide national ambient air quality standard. The City of Bayard is not located within the Grant County sulfur dioxide maintenance area, but is in very close proximity to it.*

*The project as proposed should have no long-term significant impacts to ambient air quality. However, dust control measures should be taken to minimize the release of particulates during construction of the proposed project. Long-term dust control can be achieved by revegetating disturbed areas following construction.”* End AQB comments.

### **3.8 Biological Resources**

A report on the biological resources of the project area is included in the Appendix. In general, the report indicates that there will be no significant impact to threatened or endangered species as a result of this project. There may be a need for migratory bird nest surveys depending on when construction actually starts and a short plant survey on western end in undisturbed areas (Phase 2B).

### 3.9 Archaeological, Cultural, and Historic Resources

A report on the archaeological, cultural and historic resources is included in the Appendix. The findings of this report indicate no discovery of cultural resources in the proposed project area. Much of the corridors have been previously disturbed or subjected to prior archaeological surveys.

### 3.10 Socioeconomic / Environmental Justice

The proposed Bayard Phase 2 Effluent Reuse Project is not expected to have an adverse or disproportionate impact on low income or minority populations. The project is expected to have a beneficial impact on the planning area. In accordance with Executive Order 12898, the proposed project will be conducted in a manner to ensure that there will be no exclusions of any persons or populations from participating in the project or its benefits, and no discrimination due to race, color, income level, or national origin. The demographic characteristics of the City of Bayard are summarized in Table 3-5 and 3-6.

**TABLE 3-5 BAYARD DEMOGRAPHIC CHARACTERISTICS [5]**

Racial Characteristics	Number	Percentage
White	1,664	65.7
Black or African American	8	0.3
American Indian and Alaska Native	42	1.7
Vietnamese	1	-
Some Other Race	736	29.0
Two or More Races	83	3.3
Total Population	2534	100.00
Hispanic or Latino (any race)	2,137	84.3
Elderly (over 65 years)	429	16.9

**TABLE 3-6 BAYARD DEMOGRAPHIC CHARACTERISTICS – INCOME [5]**

Median Household Income	\$21,957.00
Per Capita Income	\$11,066.00
Persons Below Poverty Level	24.1%

Environmental justice is addressed under Executive Order 12898 ; *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations* [6]. The stated goal of this EO is for each Federal agency to make achieving environmental justice a part of its mission by “identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations in the United States ...”

To address environmental justice concerns in the project area, mapping and indices were acquired from EPA, developed from 2000 census data. These include:

- Economic Status – Degree of Vulnerability (DVECO)
- Potential Environmental Justice Index (EJ)
- Minority Status – Degree of Vulnerability (DVMAV)

For all three maps the Environmental Justice Index was 8 and 9 for a one square mile and fifty square mile area, respectively. These values indicate “low vulnerability” (1-12) for disproportionate impacts to minority and low-income populations in the project area. The EJ maps and Executive Order 12898 are included in the Appendix.

### **3.11 Other Resources**

#### **3.11.1 Public Health and Safety**

The City of Bayard acquired an NPDES permit for the newly constructed wastewater treatment plant. There are no compliance requirements except for reporting “no discharge” on the discharge monitoring reports (DMR’s), which are sent to EPA. This is due to the fact that discharge to Whitewater Creek has been disallowed through intervention by the New Mexico Groundwater Quality Bureau (GWQB). Treated effluent is currently pumped, by agreement with FMI Chino Mine, to the mine tailings ponds. In order to use the treated effluent for irrigation purposes, a groundwater discharge permit will likely be required by the GWQB. The reuse facilities proposed will be designed to produce a Class 1A reclaimed wastewater, which is the highest quality

effluent as defined by current NMED guidelines. This class of reclaimed wastewater affords the highest protection for public health and safety and can be used with the fewest restrictions under current guidelines.

Other areas of safety concern include the following:

Construction Traffic – Accepted methodologies (NMDOT, etc.) will be employed to provide effective traffic control including dust control for the duration of the project.

Underground Utilities – Use of the New Mexico One-Call service will be required to determine the location of underground utilities prior to excavation.

Construction Site Hazards – Open trenches, equipment and other potential construction site hazards will be restricted from public access to reduce the risk of accidents in these areas. These efforts will include excavations in public roads and streets.

This project is not expected to have significant impacts on the health and safety to the public in the City of Bayard or adjacent communities.

### 3.11.2 Energy

The project is currently in the design phase. Energy costs for the new plant facilities will be estimated as a part of this effort. Preliminary estimated energy costs based on available data are included in Table 3-7 below.

**TABLE 3-7 BAYARD PHASE 2A PLANT FACILITIES POWER COSTS**

	\$/kw-hr	\$ 0.08			
<b>EQUIPMENT</b>	<b>HP</b>	<b>KW</b>	<b>Operating Hr/Yr</b>	<b>KW-HR</b>	<b>Energy Costs</b>
Filter Motors	5.00	3.73	2,080	7,758	\$ 620.67
Polymer Equip And Misc		5.00	1,000	5,000	\$ 400.00
Building; Lights;Heat		20.00	1,040	20,800	\$ 1,664.00
Transfer Pumps To Tank	7.50	5.60	2,080	11,638	\$ 931.01
Hypochlorite Unit		10.00	700	7,000	\$ 560.00
Lift Pumps To Reuse Storage	40.00	29.84	2,080	62,067	\$ 4,965.38
				-	\$ -
<b>TOTAL</b>	52.50	74.17	8,980	114,263	<b>\$ 9,141.06</b>

### **3.11.3 Transportation**

The proposed project is not expected to significantly affect transportation facilities or infrastructure in the project area. The current phase, 2A, does not affect any major streets or highways in the area. There could be some traffic control required on North Hurley Road during the installation of the effluent transmission line in this location, however, the only vehicular traffic on this road are vehicles traveling to the wastewater treatment plant. In the future phase, 2B, there is one proposed perpendicular crossing of Highway 180 at Taylor Street. This will be proposed as a jack and bore and will require minimal traffic control during the execution of this task.

### **3.11.4 Visual Impacts**

There will be few visual impacts resulting from the construction of Phase 2A or 2B of this project. All of the construction activities occur in previously disturbed areas adjacent to buried utilities. Transmission lines follow existing easements, established city rights-of-way, or are within Cobre Schools property boundaries.

### **3.11.5 Noise**

Noise levels at the wastewater treatment plant construction site will typically be higher than the normal levels at this location during working hours. Heavy traffic area noise levels are typically estimated at 85 decibels. Construction noise at the wastewater treatment plant will stay at this level only on an intermittent basis. Noise levels along the transmission line alignment are anticipated to generate lower levels of noise than those at the plant construction site. The aggregate affect of increased noise levels is not expected to significantly impact the project area.

## **3.12 Cumulative Impacts**

As described above, the areas of construction are all in previously disturbed areas, most of which already accommodate built structures or buried utilities. As such, the proposed project is not expected to result in any cumulative impacts.

## **4.0 SUMMARY OF MITIGATION MEASURES**

### **4.1 Physical Resources Measures**

#### **4.1.1 Land**

Land clearing will be kept to the minimum necessary and preconstruction contours restored. Construction sites will be well marked and traffic control measures implemented to ensure construction site safety. Vegetated areas will be re-seeded immediately.

#### **4.1.2 Water Resources**

##### **4.1.2.1 Surface Water**

Pipeline installation through ephemeral creeks in the reuse application area will follow guidelines of Nationwide Permit No. 12. Facility construction will follow EPA guidelines for prevention of discharge of pollutants in stormwater. Erosion control and construction of catch-basins will be employed, as necessary, to minimize stormwater flow from site.

##### **4.1.2.2 Ground Water**

Possible excavation, dewatering, and discharge will follow NMED ground water protection guidelines. Effluent quality will be within NMED Class 1A standards for turf irrigation.

### **4.2 Biological Resource Measures**

#### **4.2.1 Vegetation**

Vegetation disturbance will be kept to the minimum necessary and disturbed areas will be backfilled, regraded and immediately seeded with native species.

#### **4.2.2 Wildlife**

Habitat disturbance will be kept to the minimum necessary and disturbed areas will be backfilled, regraded to natural contours and seeded immediately with native species. The filter/pump building will be enclosed to minimize noise disturbance or wildlife access.

### **4.3 Threatened and Endangered Species Measures**

There is no indication from the initial conclusions from the biological survey that there are threatened or endangered species observed within the project area. Although there are no species which fall under formal protection of the Endangered Species Act measures will be taken to ensure the protection of potential habitat and local wildlife. Construction activities should respect recommendations by the New Mexico Department of Game and Fish regarding the minimization of the amount of open trenches in the reuse transmission line alignments, leaving escape ramps for wildlife, and checking trenches for wildlife prior to backfilling. Also, surface habitat should be reclaimed and re-seeded as soon as possible after backfilling of trenches.

### **4.4 Socioeconomic/Environmental Justice Measures**

Socioeconomic and environmental justice measures should include ongoing communication of project activities and schedules within the affected community. Responsive communication from the local governing body should be prompt in response to concerns and questions from local residents as well as the various government agencies and interest groups.

### **4.5 Archeological, Cultural, and Historic Resources Measures**

There were no archaeological, cultural, or historic resources found in the project area. If buried cultural deposits are discovered during any project-related activities, work should be stopped immediately and the New Mexico State Historic Preservation Officer should be notified.

### **4.6 Environmentally Sensitive Areas**

There were no environmentally sensitive areas identified in the project area including farmlands, classified lands, floodplains and wetlands.

## **4.7 Other Resources**

### **4.7.1 Public Health and Safety**

Reclaimed Wastewater - The reclaimed wastewater proposed for use in irrigation applications will be treated to the highest standards (Class 1A) as described in the *NMED Guidelines for Above Ground Use of Reclaimed Domestic Wastewater* [7]. This level of treatment includes effective disinfection of the reuse water which will mitigate the exposure of the public to pathenogenic organisms.

Construction Traffic/Transportation – Traffic control measures will be employed to mitigate any risks associated with heavy truck traffic and construction work occurring within public thoroughfares.

Underground Utilities – Potholing and utility line location will be used to find and avoid hazards associated with excavation in close proximity to buried utilities.

Construction Site Hazards – Methods such as restricted access to construction sites and trenched areas will be employed to mitigate safety hazards to the public.

Noise – Construction schedules should be maintained that confine noise producing activities to normal working hours.

## **4.8 Cumulative Impact Measures**

The project is not expected to result in any cumulative impacts, as stated in Section 3.