Appendix A

Existing Water System Deficiencies Summary

Drinking Water Issues for Existing Facilities or Water Sources

Facility	Water Source	Documented Deficiencies/ SDWA Violations for Facility or Water Source	Other Known or Potential Issues for Facility or Water Source
Crow Agency Treatment Plants	Little Bighorn River	-Needs WTP isolation valves; installation of water meters (IHS 2015) -SDW Rule exceeded in many samples for Iron and Manganese; MCLs exceeded for Beryllium and Radon (USGS 2003) -Failure to address treatment technique deficiencies for LT2ESWTR (EPA 2015, 2014) -Multiple single combined filter effluent violations for turbidity, IESWTR/LT1 (EPA 2013, 2012) -Multiple residual disinfectant concentration/treatment technique violations, SWTR (EPA 2013, 2012) -MCL violation for total coliform (TC) (EPA 2006,2003) -Failure to address treatment technique deficiencies for the IESWTR (EPA 2011) -Failure to produce filter assessment IESWTR (EPA 2013, 2012) -Various monitoring and record keeping violations (EPA 2015, 2014, 2013, 2012, 2011, 2010, 2008, 2004, 2003, 2001, 2000, 1998, 1997, 1996, 1995, 1994, 1993, 1992, 1991, 1990, 1989, 1988)	-High concentrations of Copper, Selenium and Arsenic in brown trout within water supply (USGS 2000) -Receives drainage from large coal bearing strata; High levels of *E. coli* (Eggers 2011)
Fort Smith	Ground-water	-Multiple residual disinfectant concentration/ treatment technique violations (DEQ 2014, 2013) -Multiple monitoring violations including disinfectant residual, total coliform, SOCs, VOCs, Radionuclides, DPBs (EPA 2015, 2014, 2013, 2012)	-Non-potable water hydrants were installed in system retrofit (Tim Donovan 2012) -Backflow prevention assemblies were not installed on water services in system retrofit (Tim Donovan 2012)
Hardin	Bighorn River	-Violation of MCL for total coliform (DEQ 1989, 1985) -Violation of disinfectant residual/treatment technique (DEQ 1995) -Violation of Consumer Confidence Rule (DEQ 2013, 2012, 2010, 2007) -Violation of Lead & Copper Rule (EPA 2014) -Multiple monitoring and reporting violations including total coliform, DBPs, Alkalinity, Cyanide, Asbestos, Arsenic (EPA 2005, 2002, 1997, 1996, 1994, 1988, 1987, 1986, 1981)	-High mercury concentrations in walleye; Susceptible to runoff from uranium mine (USGS 2000)

Facility	Water Source	Documented Deficiencies/ SDWA Violations for Facility or Water Source	Other Known or Potential Issues for Facility or Water Source
Lodge Grass	Ground-water	-Needs new water tank; installation of water meters (IHS 2015) -Violation of MCL for total coliform (DEQ 2005, 2004, 2001, 1990, 1989, 1988, 1985) -Violation of minimum disinfectant level (DEQ 2009) -Violation of Lead & Copper Rule (EPA 2000, 1997, 1994) -Violation of Consumer Confidence Rule (DEQ 2013, 2003, 2002) -Multiple monitoring and reporting violations including total coliform, Nitrate-Nitrite, DBPs, VOCs, SOCs, Arsenic, P5 Inorganics, Chlorine (DEQ 2015, 2014, 2012, 2010, 2009, 2007, 2003, 2002, 2000, 1996, 1995, 1994, 1992, 1990, 1989, 1988, 1987, 1986, 1984, 1981)	None reported.
Pryor	Ground-water	-Needs new water tank (IHS 2015) -Violation of MCL for total coliform (EPA 2007, 2005, 2004, 2001, 1998) -Multiple monitoring and reporting violations for Total Coliform Rule, and Nitrate-Nitrite (EPA 2015, 2014, 2008, 2006, 2005, 2004, 2003, 2002, 2001, 1999, 1997, 1996, 1990, 1989, 1988)	None reported.
Saint Xavier/ Pretty Eagle School	Ground-water	-Monitoring violations including DBPs (EPA 2015, 2011) -Violation of Lead & Copper Rule (EPA 2009)	None reported.
Wyola	Ground-water	-Needs new community well (IHS 2015) -Violation of MCL for total coliform (EPA 2008, 2007, 2003, 2002, 1998) -Violation of Consumer Confidence Rule (EPA 2007, 2006) -Multiple monitoring and reporting violations including: SOCs Nitrate-Nitrite, DBPs, Chlorine, total coliform (EPA 2014, 2011, 2009, 2006, 2005, 2003, 2002, 2001, 2000, 1999, 1998, 1997, 1996, 1995, 1994, 1993)	None reported.
Yellowtail Dam GC Lower, MK Upper & Visitor Center.	Ground-water	-Many monitoring and reporting violations including: Asbestos, Nitrate-Nitrite, VOCs, SOCs, Arsenic, Chlorine, Total Coliform, Barium, Selenium, Thallium, Mercury, Beryllium, Antimony, Nickel, Chromium, Cadmium, Silver, Lead, Fluoride, Cadmium (DEQ 2015, 2014, 2007, 2006, 2005, 2003, 1997, 1995, 1994, 1990, 1986, 1982, 1981) -Violation of Consumer Confidence Rule (DEQ 2013, 2012, 2003, 2002) -Violation of Lead & Copper Rule (DEQ 2011)	None reported.

Facility	Water Source	Documented Deficiencies/ SDWA Violations for Facility or Water Source	Other Known or Potential Issues for Facility or Water Source
Rural Residents	Wells, Hauling, Natural Spring, or Other	-Of 439 rural users surveyed in 2013, 330 cited "well" as their primary water source. Of these 330, 21 cited hard water, 7 cited mineral deposits, 1 cited cannot drink due to bacteria, 32 cited not drinkable, 9 cited bad or very bad water, 4 cited iron, 9 cited using a softener, 4 cited gross, pesticides, metal taste, or dirty well, 1 cited laundry problems, 1 cited lawn problems, 5 cited bad taste, 4 cited alkali, 3 cited using filters, 1 cited sulfur, 2 cited magnesium or sodium, 11 cited as hauling water. (CTWRD 2013) -Of 439 rural users surveyed, 115 said their water "stains", 148 said their water "rusts", 101 said their water "smells", and 99 said their water "tastes". -Of 439 rural users surveyed, 69 cited "hauling" as their primary water source, 6 of these cited their well as not usable. (CTWRD 2013) -Of 439 rural users surveyed, 13 cited "other" or "spring" as their primary water source. (CTWRD 2013)	None reported.
Reservation-wide Concerns	N/A	-Groundwater has high corrosive index, high alkalinity; four wells had manganese concentrations above EPA standards; 54% of wells tested positive for coliforms (Eggers 2011)	-Original wells drilled by Indian Health Service are to first available water e.g. shallow alluvial gravels; -Both surface and groundwater used extensively for irrigation; -Reservation in range for deposition of mercury from coal-burning power plants (Eggers 2011)

Sources: CTWRD 2013b, Eggers 2011, IHS 2015, USEPA 2015d, MTDEQ 2015a, USGS 2000, USGS 2003

Appendix B

Alternatives Considered and Dismissed

ALTERNATIVES CONSIDERED AND DISMISSED

The alternatives screening process evaluated 13 project-level alternatives and 21 water treatment process alternatives. The *Engineering Report* identified and evaluated six project-level alternatives, and the *Master Plan* identified and evaluated seven project-level alternatives, which included the Authorized Alternative (Alternative 6 from the *Engineering Report*), five new alternatives, and a no action alternative. Of the 13 project-level alternatives evaluated during the screening process, 11 alternatives were rejected for various reasons based on the selection criteria summarized in Section 2.2 of the Environmental Assessment (EA). Of the 21 water treatment alternatives evaluated, 20 were rejected based on criteria described in Section 2.2. Each alternative and the reasons for dismissal are summarized in this appendix. The No Action Alternative is described in further detail in Section 2.3. The Proposed Action Alternative is described in further detail in Section 2.4.

Engineering Report Alternatives

Six alternative water systems were analyzed in the *Engineering Report*. In all of the alternatives, the intake would be from the Afterbay Reservoir below the Yellowtail Dam on the Bighorn River. The WTP would be nearby, south of Fort Smith. In all of the alternatives, water would be delivered to Pryor and Pryor Creek through a pipeline originating in Fort Smith that intersects and follows the Pryor Cutoff Road. The water would be pumped to a tank at an elevation of 4,480 feet at the highest point along the road with two pump stations. Once the water reaches Pryor, it would be reduced in pressure through a series of pressure reducing valves as it flows down Pryor Creek.

Alternative 1 – Base Service, Direct Route to Little Bighorn Valley

All water delivered to Lodge Grass would be diverted near St. Xavier from a pipeline running down the Bighorn Valley and be pumped up Rotten Grass Creek along the Good Luck Road (BIA Route 73) and over the divide into the Willow Creek drainage. From there a portion of water would be pumped to serve homes further upstream of Willow Creek, as well as to residences in upper Rotten Grass Creek. The majority of the water would be conveyed to serve Lodge Grass and other demands along the Little Bighorn River Valley above Crow Agency. A branch in the pipeline above Lodge Grass would allow water to be pumped up the Little Bighorn Valley to Wyola and beyond. Water can be delivered to Crow Agency by this route, however, this option would only be used as an emergency supply. The majority of the water delivered to Crow Agency would run down the Bighorn Valley to where it intersects the Little Bighorn River near Hardin and then be pumped up to Crow Agency from the north. The WTP for Alternative 1 would be sized for a peak day flow of 5.35 mgd to meet the water needs of the projected population in 2060, as determined in the initial evaluation of water needs in the *Engineering Report*. Alternative 1 was rejected because it only addressed basic water demands and no additional industrial or livestock demands.

Alternative 2 – Base Service, Indirect Route to Little Bighorn Valley

Alternative 2 is different from Alternative 1 in that there is no pipeline following Good Luck Road. On the contrary, all water delivered to the Lodge Grass area would flow down the Bighorn River to the Hardin area and then pumped up the Little Bighorn Valley. This alternative also includes a pipeline branching off the Bighorn Valley pipeline at the Crow-St. Xavier Road, which would allow most of the demand for Crow Agency to be pumped over the ridge from the west. Alternative 2 requires significantly more pumping than Alternative 1. The WTP for Alternative 2 would be sized for a peak day flow of 5.35 mgd.

Alternative 2 was rejected, because of higher costs for larger pipe and long-term higher costs of pumping due to indirect routing for water delivery to the Little Bighorn Valley.

Alternative 3 – Direct Route, Service to Hardin

Alternative 3 follows the layout of Alternative 1 except that the demands of Hardin would be added and all facilities upsized as necessary. Alternative 3 also includes a pipeline following Crow-St. Xavier Road allowing most of the demand for Crow Agency to be pumped over the ridge from the west. The pipeline looping near Hardin and up the Little Bighorn Valley would contain a pump station so that Crow Agency could be supplied from this direction in the case of an emergency. The WTP for Alternative 3 would be sized for a peak day flow of 8.0 mgd. Alternative 3 was rejected because Hardin did not commit to taking water and the Tribe did not want to pay to upsize the WTP, pipes, and other facilities to provide water where it is not needed.

Alternative 4 – Direct Route, Service for Industrial Demands

In this alternative an additional 1,100 gpm of peak day flow would be added to Alternative 3 and be delivered to the southeast portion of the reservation. This water would be available for coal related ventures or other economic development identified in the Owl Creek drainage. The WTP for Alternative 4 would be sized for a peak day flow of 9.55 mgd. Alternative 4 was rejected because it only addressed industrial water demands, which were also included in Alternative 6.

Alternative 5 – Direct Route, Service for Livestock Demands

Alternative 5 would add 500,000 gallons (on peak day) of water to Alternative 4 for livestock watering. Water quantity was based on providing 18 gallons of water per animal per day (a peak demand) to approximately half of the cattle on the Reservation (27,775 cattle served). The WTP for Alternative 5 would be sized for a peak day flow of 10.05 mgd. Alternative 5 was rejected because it only addressed livestock demands, which were also included in Alternative 6.

Alternative 6 (Authorized Alternative) – Direct Route, Industrial and Livestock Service

Alternative 6 is similar to both alternatives 5 and 3; however, in Alternative 6, the city of Hardin would not be served. The WTP would be sized to treat and deliver 7.43 mgd to meet peak day water needs of the projected population (year 2050) in each of the six communities (i.e., Fort Smith, St. Xavier, Crow Agency, Lodge Grass, Wyola, Pryor) and rural residents. Alternative 6 would also provide 1,100 gpm for industrial use to the southeast corner of the reservation, and 500,000 gallons would be distributed throughout the reservation to water approximately half of the livestock. The Tribe chose this alternative as the preferred alternative for the purposes of the Settlement Act. Alternative 6 combined all desired portions of Alternatives 1-5. Section 0 provides further analysis of Alternative 6 for the second iteration of alternatives development and reasons it was rejected as the proposed project.

Master Plan Alternatives

Seven alternatives were considered within the *Master Plan*. A No Action Alternative was presented, summarized in Section 2.3, which represented a continuation of existing conditions. A satellite system alternative was considered, which would build upon existing water systems to expand to rural and industrial service. The remaining alternatives were regional water systems. *Engineering Report* Alternative 6, referred to as the Authorized Alternative, was used as a baseline alternative to compare with the other alternatives. The primary alternatives (Alternatives 1 and 2) differ mainly in the location

of the intake and WTP. Sub-alternatives (i.e., Alternatives 1A and 2A) associated with each of these two primary alternatives would include upfront water service to the city of Hardin.

The five regional water system alternatives in the *Master Plan* provide water to the communities of Fort Smith, St. Xavier, Crow Agency, Lodge Grass, Wyola, Pryor, and the rural residents of the reservation with water supply from the Bighorn River. The systems were designed to provide water for the needs of expected population growth through the year 2060, livestock watering, and industrial needs. In general, the main transmission and distribution pipeline alignments are also common to the five alternatives – although the sizing of the pipelines, and the locations and sizing of pump stations and associated accessory structures vary. Alternatives 1 and 2 facilities are sized to deliver a design flow of 3,154 gpm (4.54 mgd); whereas facilities associated with Alternatives 1A and 2A, which include upfront water service to Hardin, are sized to deliver a design flow of 4,660 gpm (6.71 mgd).

Satellite System

The satellite system alternative would build upon existing water systems by expanding water service to surrounding rural areas not currently served by one of the eight public water systems (see Section 3.3.3 for description of existing infrastructure). The satellite system alternative was rejected because distinct disadvantages were identified, namely, greater anticipated costs, insufficient quantity and quality of groundwater sources, and the inability of the Tribe to use their water rights for beneficial use through this option. These reasons are further explained below.

The existing satellite water system facilities on the Reservation are in various operating conditions. Most are in fair to moderate condition, some are in poor condition, and several facilities lack a reliable source of quality water, according to recent sanitary surveys. The difficulties and costs associated with operating and maintaining multiple separate systems on a long-term basis would be greater than the costs and difficulties of a regional system. This is consistent with the principle of economies of scale. One larger water treatment plant would have lower operating and maintenance costs per unit of water than multiple smaller systems. It would also be comparatively easier to reliably and cost-effectively meet EPA Safe Drinking Water Standards for a regional system with a single treatment plant. A regional system owned and operated by a single entity can provide consistent service and can more easily hire and retain qualified staff to operate, maintain, and manage the water system. Smaller entities often lack the resources to sustain efficient system operations. Additionally, costs for repairs in a regional system can be distributed across the population of system users, whereas in local systems the costs are assumed by a small local population.

Review of Montana Bureau of Mines and Geology data for Big Horn County indicates that groundwater resources within the reservation are generally not of suitable quality or quantity to meet Reservation-wide domestic water needs (*Master Plan*, GWIC database review p. 77-81). The majority of the groundwater wells on the Reservation were developed to reach the shallowest level of the groundwater, which exists at a shallow depth below the ground surface in the valleys. These wells tend to have large fluctuations in water levels and are at risk of contamination from private septic systems and local agricultural practices. Shallow wells would therefore not contribute to improving overall public health and meeting EPA standards. Deeper groundwater wells also exist on the Reservation which draw from bedrock formations, but are typically limited in aquifer size. Attempting to draw from these groundwater sources would add to the risk, uncertainty, and ultimately cost, in meeting the Reservation's water needs. In contrast, a regional system would develop the most reliable quality water source on the Reservation, the Bighorn River.

Finally, the Tribe's water right settlement clearly authorized a regional system. Using Settlement funds to upgrade and expand individual community water systems to serve surrounding rural residents (i.e., satellite systems) would represent a significant change from the plan authorized by the Settlement Act. A regional system also provides economic development opportunities for new commercial and industrial initiatives that depend on a reliable source of water to develop their products and deliver their services.

Authorized Alternative (*Engineering Report* Alternative 6)

This system would draw water from the Afterbay of Yellowtail Dam on the Bighorn River near Fort Smith. A WTP would be located near the intake. Treated water would be distributed to the communities and rural residents in the Bighorn and Little Bighorn Service Areas through a looped pipeline network, with storage tanks and pump stations to maintain pressure within the distribution pipelines. A branched pipeline system, with storage tanks and pump stations, would distribute water throughout the Pryor Service Area. This system would provide livestock water (500,000 gallons per day (gpd)) for one-half the number of livestock (28,649 head) on the reservation, and 1,100 gpm for industrial use in the southeast corner of the reservation. This system would not provide a water supply to the city of Hardin. This alternative served as an example of what the Settlement Act provided for and served as a baseline for which other alternatives were compared. The Authorized Alternative was ultimately rejected because it used outdated assumptions for sizing and technology requirements of system facilities, thus requiring more water to be diverted compared to the other alternatives.

Alternative 1 - Fort Smith Intake and WTP

Alternative 1 would treat and deliver 4.54 mgd to meet peak day water needs in the Reservation. The system would provide livestock water (864,000 gpd) for one-half the number of livestock (48,000 head) on the reservation, 300 gpm for a Tribal industrial park southeast of Hardin, and 150 gpm for industrial use by the Cloud Peak Mine in the southeast corner of the Reservation. The system would draw water below the Afterbay Reservoir of Yellowtail Dam on the Bighorn River near Fort Smith. A WTP would be located near the intake. This alternative is similar to the Authorized Alternative except that it uses updated estimates of water demands for system sizing.

Water treatment would be expandable to 6.71 mgd in order to provide future capacity to serve Hardin should they have decided to connect to the MR&I system. This system would not immediately include intake or WTP equipment sized to provide a water supply to the city of Hardin, but would provide a large enough footprint to allow for future expansion. The transmission pipeline is sized and configured in a way that would minimize system expansion costs in the event Hardin expressed an interest at some future date to receive water service from the regional system. The transmission pipeline from the WTP to the Bighorn Valley storage reservoir is sized with sufficient capacity to serve Hardin. If Hardin elects to connect at some point in the future, they would be responsible for installing a parallel pipeline from the intersection of the mainline to Hardin and the mainline to the storage reservoir on the Crow Agency cut-across road.

The main difference between Alternative 1 and Alternative 2 is the location of the intake and WTP. Alternative 1 locates the WTP near Fort Smith below the Afterbay Reservoir, which may have additional permitting requirements, construction issues due to bedrock geology of the site, potential for fish entrainment, and viewshed impacts. Alternative 2 locates the WTP near St. Xavier, which is more centrally located and results in reduced pumping costs as well as shorter travel times for operation and maintenance facilities.

Alternative 1A – Fort Smith Intake, Service to Hardin

Alternative 1A is the same as Alternative 1, except that system facilities were fully sized to deliver water to the city of Hardin, and would have a total system capacity of 6.71 mgd. Service to Hardin may generate more economic activity.

Alternative 2 – St. Xavier Intake and WTP (Proposed Action Alternative)

Alternative 2 is designed to provide 4.54 mgd with no initial service to the city of Hardin. However, the facility would be designed to be capable of expanding to 6.71 mgd if service to Hardin was desired at a later date, as described above for Alternative 1. The proposed intake system would be a series of angled wells that would collect water from the ground underneath the Bighorn River. The WTP would be located near the town of St. Xavier.

In general, Alternative 2 was deemed to best meet the selection criteria. Compared to Alternative 1, the central location of the WTP would shorten main transmission lines, minimize travel times for commuters and for operating and maintenance activities, as well as reduce pumping costs. Compared to the Authorized Alternative (Alternative 6), Alternative 2 was more technically complex, however the additional technology provides significant advantages relative to operational flexibility; constructability; and system redundancy, reliability, and efficiency. The proposed WTP would produce much higher quality finished water that would more consistently meet EPA Safe Drinking Water Standards throughout the system, and be able to adjust more readily to variations in raw water quality. In addition, Alternative 2 has the lowest construction and operating and maintenance costs of the regional systems alternatives analyzed.

Alternative 2 is the Proposed Action Alternative described in further detail in Section 2.4 of the EA.

Alternative 2A

Alternative 2A is the same as the Alternative 2, except that system facilities were fully sized to deliver water to the city of Hardin, and would have a total system capacity of 6.71 mgd. Service to Hardin may generate more economic activity.

Water Treatment Alternatives

Twenty-one preliminary water treatment process alternatives were presented in the *WTP Alternatives Report* and *Final WTP Alternatives Report*. The intake type and location, WTP location, and distribution system design would be the same for the alternatives, in other words the treatment process is independent of these aspects of the proposed project. The 21 alternatives differed in combinations of a variety of water treatment technologies that would be used for each of the main stages of water treatment, which are filtration, softening, pretreatment and post-treatment. These specific treatment train and type of treatment technologies for each are detailed in the *WTP Alternatives Report* (Bartlett & West and CTWRD 2015a, p. 20-21).

Seven water treatment process alternatives were carried forward and compared in greater detail in the *WTP Alternatives Report* (p. 21-44); an eighth treatment alternative was added and evaluated with the other seven in the *Final WTP Alternatives Report* (Bartlett & West and CTWRD 2016). The main differences were the types of treatment technologies, OM&R costs, and TOC-DBP precursor reduction

goals. Capital (i.e., construction) costs and operational complexity did not differ widely between the eight treatment alternatives.

Select treatment steps of each of the Alternative Trains 1 through 8 were carried forward into bench and pilot scale testing for further study. Alternative Train 7 and the filtration component of Alternative Train 5 were carried forward into pilot scale testing. The lime softening component of Alternative Trains 1 through 5, and the ion exchange component of Alternative Trains 1, 3 and 8 were carried forward into bench scale testing. Adequate existing information was available to analyze the cost and process performance of the remaining treatments steps in each alternative train.

Alternative Train No. 1

Future Pretreatment Oxidation, Lime Softening Clarification (including Flocculation, Coagulation, Sedimentation), Magnetic Ion Exchange (MIEX), Micro/Ultra Filtration; Chlorine

Treatment Train No. 1 would incorporate lime softening clarification for particle removal, iron and manganese removal, taste and odor reduction, hardness reduction, and organics reduction. Following lime softening would be a recarbonation step, which lowers the pH and creates a stable water. The water from the recarbonation step would flow to a magnetic ion exchange (MIEX) process for additional softening and organics reduction. The water would then be filtered through microfiltration/ultrafiltration (MF/UF) membranes for final particle removal of pathogens, turbidity, etc. to ensure the water meets the removal requirements for drinking water standards. The final step is disinfection via the addition of free chlorine to the filtered water, which ensures the water meets the inactivation requirements for drinking water standards prior to distribution. Space would be left for a future ammonia feed system, which would allow for the use of chloramines as the residual disinfectant in the distribution system, if deemed necessary.

Accommodations in the design would be made for the addition and appropriate contact time for pre-treatment oxidation. The pretreatment oxidation would promote oxidation of iron and manganese in the source water as well as aid in controlling taste and odor issues. Oxidants under consideration are ozone, permanganate, and chlorine.

Alternative Train No. 2

Future Pretreatment Oxidation, Lime Softening Clarification (including Flocculation, Coagulation, Sedimentation) Micro/Ultra Filtration; GAC Vessels, Chlorine

Treatment Train No. 2 would incorporate lime softening clarification for particle removal, iron and manganese removal, taste and odor reduction, hardness reduction, and organics reduction. Following lime softening would be a recarbonation step, which lowers the pH and creates a stable water. The water would then be filtered through microfiltration/ultrafiltration (MF/UF) membranes for final particle removal of pathogens, turbidity, etc. to ensure the water meets the removal requirements for drinking water standards. The filtered water would be pumped through granular activated carbon (GAC) pressure filters for additional organics removal. The final step is disinfection via the addition of free chlorine, which ensures the water meets the inactivation requirements for drinking water standards prior to distribution. Space would be left for a future ammonia feed system, which would allow for the use of chloramines as the residual disinfectant in the distribution system, if deemed necessary.

Accommodations in the design would be made for the addition and appropriate contact time for pre-treatment oxidation. The pretreatment oxidation would promote oxidation of iron and manganese in the source water as well as aid in controlling taste and odor issues. Oxidants under consideration are ozone, permanganate, and chlorine.

Alternative Train No. 3

Future Pretreatment Oxidation, Lime Softening Clarification (including Flocculation, Coagulation, Sedimentation), Magnetic Ion Exchange (MIEX); Media Filtration; Chlorine

Treatment Train No. 3 would incorporate lime softening clarification for particle removal, iron and manganese removal, taste and odor reduction, hardness reduction, and organics reduction. Following lime softening would be a recarbonation step, which lowers the pH and creates a stable water. The water from the recarbonation step would flow to a magnetic ion exchange (MIEX) process for additional softening and organics reduction. The water would then be filtered through conventional media filtration for final particle removal of pathogens, turbidity, etc. to ensure the water meets the removal requirements for drinking water standards. The final step is disinfection via the addition of free chlorine to the filtered water, which ensures the water meets the inactivation requirements for drinking water standards prior to distribution. Space would be left for a future ammonia feed system, which would allow for the use of chloramines as the residual disinfectant in the distribution system, if deemed necessary.

Accommodations in the design would be made for the addition and appropriate contact time for pre-treatment oxidation. The pretreatment oxidation would promote oxidation of iron and manganese in the source water as well as aid in controlling taste and odor issues. Oxidants under consideration are ozone, permanganate, and chlorine.

Alternative Train No. 4

Future Pretreatment Oxidation, Lime Softening Clarification (including Flocculation, Coagulation, Sedimentation); Media Filtration; GAC Vessels, Chlorine

Treatment Train No. 4 would incorporate lime softening clarification for particle removal, iron and manganese removal, taste and odor reduction, hardness reduction, and organics reduction. Following lime softening would be a recarbonation step, which lowers the pH and creates a stable water. The water would then be filtered through conventional media filtration for final particle removal of pathogens, turbidity, etc. to ensure the water meets the removal requirements for drinking water standards. The filtered water would be pumped through granular activated carbon (GAC) pressure filters for additional organics removal. The final step is disinfection via the addition of free chlorine, which ensures the water meets the inactivation requirements for drinking water standards prior to distribution. Space would be left for a future ammonia feed system, which would allow for the use of chloramines as the residual disinfectant in the distribution system, if deemed necessary.

Accommodations in the design would be made for the addition and appropriate contact time for pre-treatment oxidation. The pretreatment oxidation would promote oxidation of iron and manganese in the source water as well as aid in controlling taste and odor issues. Oxidants under consideration are ozone, permanganate, and chlorine.

Alternative Train No. 5

Pretreatment Oxidation (Ozone); Lime Softening Clarification (including Flocculation, Coagulation, Sedimentation); Bio GAC Media Filtration, Chlorine

Treatment Train No. 5 would incorporate a pre-treatment oxidation basin to oxidize the source water with ozone, which would oxidize iron and manganese, taste and odor, and organics. After the oxidation step, the water would flow to lime softening clarification for particle removal, iron and manganese removal, taste and odor reduction, hardness reduction, and organics reduction. Following lime softening would be a recarbonation step, which lowers the pH and creates a stable water. The water would then be filtered through Granular Activated Carbon (GAC) biofilters for final particle removal of pathogens, turbidity, etc. to ensure the water meets the removal requirements for drinking water standards as well as additional organics reduction. The final step is disinfection via the addition of free chlorine, which ensures the water meets the inactivation requirements for drinking water standards prior to distribution. Space would be left for a future ammonia feed system, which would allow for the use of chloramines as the residual disinfectant in the distribution system, if deemed necessary.

Alternative Train No. 6

(Pretreatment Oxidation, Coagulation, Sedimentation); Greensand Media Filtration; NF/RO Softening; Chlorine

Treatment Train No. 6 would incorporate a pre-treatment oxidation basin to oxidize the source water with ozone, which would oxidize iron and manganese, taste and odor, and organics. After the oxidation step, the water would flow to flocculation and sedimentation (via plate settlers) for particle removal, iron and manganese removal, and organics reduction. The water would then be filtered through greensand media filtration additional iron and manganese removal as well for final particle removal of pathogens, turbidity, etc. to ensure the water meets the removal requirements for drinking water standards. A portion of the water would then be pumped through nanofiltration/reverse osmosis membranes for dissolved solids reduction, which would reduce the total dissolved solids, hardness, sulfates, organics, etc. The remaining portion of the water would by-pass the NF/RO membranes and would be blended with the NF/RO permeate to achieve the desired finished water. The final step is disinfection via the addition of free chlorine, which ensures the water meets the inactivation requirements for drinking water standards prior to distribution. Space would be left for a future ammonia feed system, which would allow for the use of chloramines as the residual disinfectant in the distribution system, if deemed necessary.

Alternative Train No. 7

Pretreatment Oxidation, Coagulation, Sedimentation; Micro/Ultra Filtration; NF/RO Softening; Chlorine

Treatment Train No. 7 would incorporate a pre-treatment oxidation basin to oxidize the source water with ozone, which would oxidize iron and manganese, taste and odor, and organics. After the oxidation step, the water would flow to flocculation and sedimentation (via plate settlers) for particle removal, iron and manganese removal, and organics reduction. The water would then be filtered through microfiltration/ultrafiltration (MF/UF) for final particle removal of pathogens, turbidity, etc. to ensure the water meets the removal requirements for drinking water standards. A portion of the water would then be pumped through nanofiltration/reverse osmosis membranes for dissolved solids reduction, which would reduce the total dissolved solids, hardness, sulfates, organics, etc. The remaining portion of

the water would by-pass the NF/RO membranes and would be blended with the NF/RO permeate to achieve the desired finished water. The final step is disinfection via the addition of free chlorine, which ensures the water meets the inactivation requirements for drinking water standards prior to distribution. Space would be left for a future ammonia feed system, which would allow for the use of chloramines as the residual disinfectant in the distribution system, if deemed necessary.

Alternative Train No. 7 is the proposed water treatment process for the Proposed Action Alternative described in further detail in Section 2.6.

Alternative Train No. 8

Pretreatment Oxidation, Coagulation, Sedimentation; Micro/Ultra Filtration; Higgins Loop Ion Exchange; Chlorine

Treatment Train No. 8 would incorporate a pre-treatment oxidation basin to oxidize the source water with ozone, which would oxidize iron and manganese, taste and odor, and organics. After the oxidation step, the water would flow to flocculation and sedimentation (via plate settlers) for particle removal, iron and manganese removal, and organics reduction. The water would then be filtered through microfiltration/ultrafiltration (MF/UF) for final particle removal of pathogens, turbidity, etc. to ensure the water meets the removal requirements for drinking water standards. A portion of the water would then be processed through the Higgins Loops Ion Exchange for dissolved solids reduction, which would reduce the total dissolved solids, hardness, sulfates, organics, etc. The remaining portion of the water would by-pass the ion exchange and would be blended with the ion exchange effluent to achieve the desired finished water. The final step is disinfection via the addition of free chlorine, which ensures the water meets the inactivation requirements for drinking water standards prior to distribution. Space would be left for a future ammonia feed system, which would allow for the use of chloramines as the residual disinfectant in the distribution system, if deemed necessary.

Appendix C

Typical Construction Steps for Major Project Components

Typical Construction Steps for Major MR&I Components

Project Component	Sub-Component	Proposed Construction Steps
Raw Water Intake	Installation of angle wells, caissons, radial collector wells, sloped tube, or infiltration galleries	Topsoil would be stripped and stockpiled at the aboveground structure site. Subsoil material would be excavated, redistributed, and compacted according to design specifications and stabilized with erosion prevention measures. Depending on intake type, directional drilling, micro-tunneling, augering, boring, or open trench excavation would be used to install the pipes or wells. Drilling fluids used in drilling or boring activities would be collected and disposed of according to EPA regulations. Construction of an infiltration gallery parallel to the riverbank would involve excavation of an open trench along the riverbank, placement of a gathering pipe and associated plumbing, and placement of aggregate around the pipe in the trench to allow infiltration of surface water to the system. Installing a diversion headworks and ditch to supply water to the infiltration gallery would involve excavating into the riverbank and placing a concrete structure and riprap in the bank. Construction of the surface water intake options would involve installation of a screened inlet at the end of a pipeline exiting above the river bottom, which may require minor excavation of the riverbed or riverbank, and would likely involve placing concrete structures in the river.
	Access Road	Topsoil would be removed and stockpiled along the proposed route. Subsoil material would be cut, filled, and compacted to create the roadway according to design specifications. The road would be surfaced with a gravel base aggregate or similar material for year round (all weather) use. Topsoil would be replaced and seeded as applicable on the road edges.
Water Treatment Plant	Buildings and Facilities	Topsoil would be stockpiled around the perimeter of the building footprint, and would be graded to manage storm water. Excavations for footings, clear wells (underground storage reservoirs), conduits, pipes, and other related features would be completed according to approved plans. Depending on the site location and depth to groundwater, excess water would be removed and discharged in compliance with EPA regulations. Excavations would be backfilled and compacted to an elevation that allows for replacement of topsoil around the proposed project footprint. Excess fill would be disposed offsite at an approved location. Topsoil would be replaced and seeded.
	Sludge Lagoons/Sludge Drying Beds	Topsoil would be removed and stockpiled away from construction work zones. Sludge lagoons/sludge drying beds and associated features would be excavated and constructed according to approved plans. A portion of the excavated material would be used to allow proper drainage and prevent storm water erosion near the WTP and sludge containment areas. Excess fill would be stockpiled for future use or removed and disposed offsite at an approved location. Topsoil would be replaced and seeded as applicable.
	Evaporation Ponds	Construction would follow the sequence for sludge lagoons as above.
	Discharge Pipeline and Diffuser	If some or all of the concentrate water were discharged back into the river, a pipeline from the WTP would exit into the deepest part of the river bottom. Construction of the pipeline would proceed as described below. A diffuser, consisting of a perforated cap, would be installed at the end of the pipe.

Project Component	Sub-Component	Proposed Construction Steps
	Parking Lot and Access Road	Topsoil would be stockpiled away from the construction area. The surface of the parking lot and driveway would be designed to handle anticipated storm water. Placement and compaction of fill material may be required to achieve proper surface elevations. Downspouts, catch basins, swells, and water canals would be located for quick and effective removal of storm water. Material that is excavated and redistributed would be compacted according to approved plans. The area would be surfaced with a gravel base aggregate or similar material for year round (all weather) usage and access.
	Fencing, Storage Areas, and Related Items	Exterior fencing and aboveground features would be installed and marked according to approved plans. Temporary storage areas used during construction would have topsoil replaced after use.
Pipelines	Transmission and Distribution Lines	Topsoil would be stripped and placed inside the construction easement. A trench would be dug using heavy equipment, centered approximately in the middle of the easement. Subsoil would be stored separately from topsoil within the easement. The trench typically would be open for no more than seven (7) days at any one location and would be limited to one (1) mile in length. Access ways across the ditch would be placed at established points to allow crossing by landowners, livestock, and wildlife. The pipe segments would be strung and lined up, lowered into the trench, and joined together. Pipe materials may include PVC, Ductile Iron (DI), High Density Polyethylene (HDPE) and others. The trench would be backfilled by incrementally replacing and compacting subsoil according to approved plans. Excess excavation material generally would be crowned on top of the backfill to compensate for further settlement. Where materials exceed amounts recommended for crowning and/or in areas where crowning is impractical (e.g., farmed fields), surplus materials would be feathered over the area, blended between easements, and/or removed from the site and disposed at an approved location. Topsoil would be spread evenly on the surface of the backfill. Pipeline markers would be installed at intervals along the route. Dewatering procedures would be employed in areas where the water table is higher than the bottom of the pipeline trench, using various methods depending on site-specific soils. Excess water would be discharged in compliance with EPA regulations in suitable areas away from the open trench. In areas where bedrock or large boulders are encountered, trenching would be performed using chain trenchers and backhoes, or similar special heavy equipment, to break up and remove the rock. Blasting would not be used. These geologic conditions may require placement of pipe bedding before backfilling and compacting the trench. Prior to being put into service, the pipeline would be pressure tested and disinfected according to EPA, MTDEQ, and Ten States Standards, and approved plans. If leaks are detected, the pipeline segment would be repaired. Upon completion of testing and disinfection, highly chlorinated waters used during the process would be discharged from the pipeline according to National Pollution Discharge Elimination System (NPDES) permit requirements.

Project Component	Sub-Component	Proposed Construction Steps
	Service Lines	Service lines are trenched in from the distribution pipe to each rural residence or pasture tap. Service meters would be installed at each user's building or livestock hydrant to track water usage. Meters would be equipped with pressure-reducing valves to prevent pressure spikes. In urban areas, meters could be located in the basement of houses. Rural users would have the service line extended to within 50 feet of their house where a meter box would be installed. Up to 100 feet of pipe would be extended from the meter box to connect with the user's plumbing. Meter pits and service lines are typically installed using backhoes. Topsoil would be stripped, set aside, and replaced during trench reclamation. MR&I funding includes making the connection to each user's plumbing. The connection to the plumbing can be done with either a backhoe or a continuous bore. The pipe typically enters the home from a hole in the foundation. For mobile homes, insulation and heat tape would be used to reduce the potential for freezing.
	Trenched Crossings	Trenching would be required across certain features such as utilities, minor roads, minor streams, intermittent drainages, etc. Each type of crossing would require site-specific construction procedures. Crossings would be backfilled and covered as quickly as possible to recover use. Underground utility lines and other pipelines along the easement would be identified and flagged immediately prior to construction. Trenching operations in the vicinity of such utilities would proceed only after the exact location of existing lines has been determined. Water lines would generally be deflected around existing gas lines. Where a larger water pipeline crosses an existing water line or sewage main, the existing water line or sewage main would be relocated or deflected if possible. Other utilities such as underground power lines, telephone lines, fiber optic lines, and cable television systems are generally buried at depths shallower than would be required for the water line, and these utilities would remain in place above the water pipeline. Trenching of larger waterways, if conducted, would require flow diversion to one side of the existing channel; installation of pipe beneath the exposed channel bed; re-diversion of flow to the portion of the channel above the installed pipe; installation of pipe beneath the remaining portion of the channel bed; and re-establishment of predisturbance channel flows.
	Horizontal Directional Drilling (HDD) Crossings	HDD would be used to avoid direct surface disturbance across sensitive features, such as major roads, railroads, irrigation canals, major streams, wetlands, etc. Sedimentation pits would be excavated at each end of the bore and lined with geotechnical fabric. Topsoil would be segregated from subsoil and would be protected with erosion control features at each pit. A pilot hole would be drilled through the entire length of the bore, and incrementally widened to the specified pipeline diameter. Driller's mud, a combination of bentonite clay, water, and drill cuttings, would lubricate the bit, with returns collected in the sedimentation pits. The pipe would be pulled through the bore hole. After drilling is complete and water has

Project Component	Sub-Component	Proposed Construction Steps
		evaporated, the remaining sediment would be excavated into a roll-off steel container and disposed of at an approved location. Pipe connections would be made on each end and the sedimentation ponds would be filled in with subsoil, overdressed with the stored topsoil, and seeded.
Pump Stations and Pipeline Appurtenances	Pitless Boosters, Below Grade Boosters, Above Grade Boosters, Valves below and above ground	Applications listed to left are possible types of stations used to regulate pressure and flow in transmission and distribution pipelines. Each type would be constructed similarly but would vary in size. Topsoil would be stripped and stockpiled. Excavations of subsoil would mostly be done with excavators. The facility would be installed on an underground or aboveground concrete slab, foundation, or appropriate anchoring system to maintain stability. Subsoil would be used for backfill around facility and piping according to approved plans.
Storage Tanks	Elevated and Ground Storage Reservoirs	Topsoil would be stripped and stored on site, out of work zones. Footings and underground excavations would be determined by tank size and diameter. Excavations of subsoil would be done by an excavator and related equipment and stockpiled on site. Concrete forms would be used to form footings and associated concrete work; the amount of concrete would depend on whether the tank is above or below ground. After the concrete has cured the subsoil material would be replaced and compacted according to approved plans. The excess soil would be removed and disposed at an approved location.
Electrical Lines	Single Phase and Three Phase Overhead Electrical Lines	Electrical line extensions would be constructed by the electrical service provider (Big Horn County Rural Electric Co-op or Yellowstone Valley Electric) according to industry standards, and company construction standards and policies. Single pole, overhead power lines will be the preferred method for extending electrical service. Construction sequence would generally consist of preparing the ROW and work area, removing or trimming trees where avoidance is not possible, digging the holes, raising and setting the poles, stringing wire, and reclaiming the work area. Where conditions may prevent overhead installation, power lines may be installed by trenching or boring. Work would be done by trucks, cranes, and other heavy equipment.
Operations Buildings	Administration Building, Maintenance Shops, Storage Yards	Topsoil would be removed and stockpiled away from the construction area. Footings and underground excavations would be completed according to approved plans. Excavations of subsoil would be done by an excavator and related equipment and stockpiled on site. Concrete forms would be used to form footings and associated concrete work. After the concrete cures the subsoil material would be replaced and compacted to engineering design and specifications. The surface of parking lots, storage yards, and driveways would be designed to manage storm water. Excess soil would be removed and disposed at an approved location. Certain areas would be surfaced with a gravel base aggregate or similar material. Topsoil would be replaced and seeded as applicable. Exterior fencing and aboveground features would be installed and marked according to design, plans and specifications.

Appendix D

Interagency Environmental Review Team Guidelines

1.1 PURPOSE AND BACKGROUND

The Interagency Environmental Review Team (IERT) guidelines will be followed in developing an agreement that will direct the activities of the Interagency (IERT). The purpose of the IERT is to provide assurance that Crow Tribe MR&I System (MR&I System) activities are completed in full compliance with the environmental commitments described in *National Environmental Policy Act* (NEPA) documents (e.g., Environmental Assessment [EA] and Finding of No Significant Impact [FONSI]), *National Historic Preservation Act* (NHPA) documents, as well as all other relevant and current tribal, state, and federal environmental rules and regulations. The IERT will ensure that environmental commitments remain concurrent with construction progress.

1.2 ORGANIZATION

The IERT is comprised of representatives from each of the following agencies and organizations:

- U.S. Bureau of Reclamation, Great Plains Regional Office (Reclamation);
- Crow Tribe Water Resource Department (CTWRD);
- Bureau of Indian Affairs, Crow Agency (BIA);
- Crow Tribal Historic Preservation Office (THPO);
- U.S. Army Corps of Engineers (COE);
- U.S. Environmental Protection Agency (EPA);
- U.S. Fish and Wildlife Service (USFWS);
- Montana Department of Environmental Quality (MDEQ), if applicable;
- Montana Fish, Wildlife, and Parks (MFWP), if applicable;
- Other entities as deemed appropriate.

Agencies may also be represented by technical consultants (i.e., Crow Tribe's Engineering Team). When construction takes place on lands administered by agencies other than those listed above or on private lands, specialists of the other agencies or landowners would be invited to participate as members of the team for the MR&I System components that potentially affect their lands.

1.3 RESPONSIBILITIES, GOALS, AND OBJECTIVES

- Assist Reclamation and the CTWRD in Environmental and Cultural Resource compliance activities during design and construction of the Crow MR&I water delivery system.
- Assist Reclamation and the CTWRD with all other environmental aspects of the Project, including assurance that environmental commitments are fully implemented concurrent with MR&I System construction.
- Review and evaluate all MR&I System plans and specifications (e.g., pipeline routes, building and facility sites, access roads, etc.) to identify opportunities for preventing, minimizing, or offsetting the occurrence of or potential for adverse environmental effects, and to protect fish and wildlife resources, important habitats and sensitive areas, and cultural resources. Based on this review, the IERT will make recommendations to the design team for modifications (reroutes, implementation of environmental commitments, etc.) that will better meet environmental objectives. Reviews may be completed by the entire IERT on an annual basis, or on an as-needed basis if routes or facilities are modified during the design process, or if there are species status changes.
- Annually review and evaluate all MR&I System plans and specifications (e.g., pipeline routes, building and facility sites, access roads, etc.) to promote wetland avoidance where possible, and

in areas where wetlands cannot be avoided to develop mitigation measures such that there will be no net loss of wetland habitat.

- Annually review and evaluate all MR&I System plans and specifications (e.g., pipeline routes, building and facility sites, access roads, etc.) to determine whether required field surveys for cultural resources, wildlife, fish, T&E and state-listed species, and/or their habitats have been conducted as follows: within appropriate survey time frames; prior to construction disturbances; and for the cultural surveys, in accordance with *36 CFR 800.4: Identification of Historic Properties.* Ensure that consultations with THPO have been completed in accordance with the programmatic agreement prior to any ground disturbing activities. Make sure that any required mitigation measures relative to NHPA or NRHP (e.g., avoidance, boring, testing, data recovery, etc.) have been approved by Reclamation and THPO, and have been implemented.
- Conduct field reviews and/or surveys (annually or as needed) prior to and following construction to identify environmentally sensitive areas where avoidance measures should be evaluated, or site-specific mitigation may be required.
- Review the previous year's construction activities to determine if required environmental commitments and mitigation measures have been accomplished and are sufficient.
- Review seed mixtures used to reclaim disturbed construction sites, and determine whether reclamation efforts have been successful, particularly where native species are required to minimize contrast between disturbed (i.e., easements and facility sites) and un-disturbed areas (i.e., native prairie, wooded coulees, etc.).
- Consult with Tribal, Federal, and state agencies as appropriate to help identify site-specific environmental or cultural resource concerns.

1.4 TASKS/FUNCTIONS

All IERT members will provide input and expertise during meetings and field reviews. Tasks may include representing their respective agency or area of expertise, conducting site visits to identify potential environmental issues, developing mitigation plans, consulting with other agency personnel concerning environmental issues, researching regulations, and preparing reports. Delegation of duties will be agreed upon by the IERT.

1.5 ACCOUNTABILITY

IERT members will participate in meetings and field reviews whenever possible; will communicate openly about impact, mitigation, and enhancement issues; and will complete assignments.

IERT members may be called upon to provide an update on Crow MR&I System environmental issues and activities to their respective agencies or constituency, and to local interest groups.

1.6 SCOPE AND BOUNDARIES

The EIRT will focus on the environmental and cultural resource effects pursuant to commitments described in the various NEPA, ESA, and NHPA documents, and specifically associated with the Crow MR&I System within the exterior boundaries of the Crow Indian Reservation. The IERT will interact with the Crow Tribes Engineering Team as necessary to ensure that environmental commitments and mitigation measures are incorporated into MR&I System designs, and implemented during construction. Mitigation of Crow MR&I System-related impacts and associated NEPA, ESA, and NHPA requirements

are to be completed concurrently with construction. The IERT will complete activities and provide appropriate guidance and oversight in a timely manner.

1.7 AUTHORITY

The IERT will identify the projects that must be reviewed (in coordination with the design team), will collect and analyze information, will formulate recommendations, make decisions, and upon review/approval by the Team Sponsor and CTWRD, will work with the design team to carry out decisions.

1.8 TEAM SPONSOR

Because Reclamation, as the lead Federal Agency for the Crow MR&I System, is responsible for compliance with various environmental and cultural resource laws, the Team Sponsor for the IERT will be a staff member from the Native American Affairs Group in Reclamation's Great Plains Regional Office. The Team Sponsor will carry out their roles in close cooperation and coordination with the CTWRD.

Key responsibilities of the Team Sponsor will be:

- to identify and clarify team scope and boundaries;
- to communicate decision-making authority to the Team Leader and team members;
- to facilitate team consensus decision making, and together with CTWRD, provide leadership for conflict resolution as may be necessary; and
- to review and approve team recommendations in consultation with the CTWRD, before any actions are taken.

1.9 TEAM LEADER

IERT Team Leader will be a staff member from the Resource Services Group in Reclamation's Great Plains Regional Office.

Key responsibilities of the Team Leader will be:

- to schedule and facilitate IERT meetings and field reviews;
- to coordinate agenda items;
- to monitor assignments; and
- to maintain minutes, reports, and various team products.

1.10 GROUND RULES

- The IERT will meet as often as necessary, but not less than once a year to accomplish its responsibilities, goals, and objectives.
- Meetings may involve field reviews.
- The Team Leader will call for agenda items from team members, and prepare the proposed agenda. The agenda will be reviewed at the start of each meeting. Agenda items may be added or deleted at that time.
- Each IERT member is expected to represent their respective agency and area of expertise.

- Decisions will be made by consensus; individual IERT members may disagree with a decision of the IERT, and go on record as such, but will not block the implementation of IERT decisions.
- Action items and responsible IERT member(s) will be identified at the close of each meeting.
- Individual IERT members shall be accountable for accomplishing their own assignments.
- Additional ground rules – as may be adopted by the team.

1.11 INFORMATION MANAGEMENT

Team meeting minutes will be prepared and distributed by the Team Leader to all IERT members. Official files containing minutes, data, evaluations, reports, and other team products will be maintained by the Team Leader and filed at the Great Plains Regional Office, Billings, Montana.

Appendix E

Scoping Letter to Agencies and Mailing List
Summary of Public Scoping Comments

Date

Name
Title
Address Line 1
Address Line 2

RE: Scoping Request for Proposed Crow Municipal, Rural, and Industrial (MR&I) Water System, Crow Reservation, Montana

Dear Agency or Organization:

This letter is to notify you of the proposed Crow Tribe Municipal, Rural, and Industrial (MR&I) Water System – a water supply, treatment, and delivery system to be constructed for residents and communities of the Crow Indian Reservation. The authorization of the Crow MR&I System is a component of the historic Crow Tribe Water Rights Settlement Act of 2010 (P.L. 111-291). The Act provides the funding which allows the Crow Tribe to proceed with the planning and construction of water infrastructure facilities on the Crow Reservation.

The Bureau of Reclamation is the agency providing federal oversight of construction funding and is serving as the lead agency for preparation of an Environmental Assessment (EA) under the National Environmental Policy Act. The EA will evaluate the environmental effects of the proposed project and any issues that will be analyzed in depth including the project's effects on soil resources, water resources, wetlands, vegetation and wildlife, cultural and recreational resources, as well as other social, economic, and environmental effects.

The Crow Reservation is in south-central Montana with a total land area of 2.3 million acres and a population of 6,863 (2010 census). The MR&I system would deliver approximately 4.5 million gallons of potable water per day to major community centers as well as rural users as is feasible, providing water for the reservation for domestic, commercial, and industrial uses, as well as for a portion of livestock needs for the next 50 years. The MR&I System is divided into three regional service areas: the Bighorn Valley, the Little Bighorn Valley, and the Pryor Extension (**Figure 1**). Communities that could be served by the system are Crow Agency, Fort Smith, Lodge Grass, Pryor, Saint Xavier, and Wyola, with Hardin also being analyzed as a possible recipient.

The MR&I System facilities would be constructed in a phased approach. A new water supply intake, along with a new surface water treatment plant, would be constructed at St. Xavier. The initial plan calls for approximately 750 miles of PVC and ductile iron pipe, 10 mainline transmission pressure reducing valves, 13 distribution pressure reducing valves, 1,415 service connections, 480 pasture taps, 10 master meter vaults, 9 storage reservoirs, 13 transmission pump stations, and 34 service area pump stations. The enclosed figure (Figure 1) shows the general layout of the system along with the location of the major components.

Name
Address
Date

Your input is being requested in regards to the proposed MR&I System. Specifically, we are interested in other existing or related developments near or connected to the proposed project; resources that might be impacted; and if applicable, mitigation measures pertaining to potential impacts. Comments are most valuable if they are specific to the proposed action and include supporting reasons for us to consider in the EA.

Please note that the project has been authorized; therefore comments regarding the approval or refutation of the project will be disregarded. Comments should be focused on environmental/resource issues.

For your input to be considered in preparing the Draft EA, we request comments by Date. Comments may be submitted in the following ways:

- Online at the project website: http://www.usbr.gov/gp/nepa/mr&i/index.html
- By mail:
  Bureau of Reclamation
  Attn: Crow Water Projects (GP-4000)
  P.O. Box 36900
  Billings, MT 59107-6900
- By email to a listed project contact:

Bureau of Reclamation:		**Crow Nation:**
Environmental Review	*Engineering and Design*	*Crow Tribe Water Resource Dept.*
Christina Lasater	Bryce Blackley	Titus Takes Gun, Director
406-247-7753	406-247-7308	406-638-4235
clasater@usbr.gov	BBlackley@usbr.gov	Titus.TakesGun@crow-nsn.gov

- In writing at a public open house meeting:
  - Date, Time, Location
  - Date, Time, Location
  - Date, Time, Location

If you have any questions, or need more information about the project, please contact the individuals listed above or attend a public open house.

Sincerely,

<insert applicable name, title>

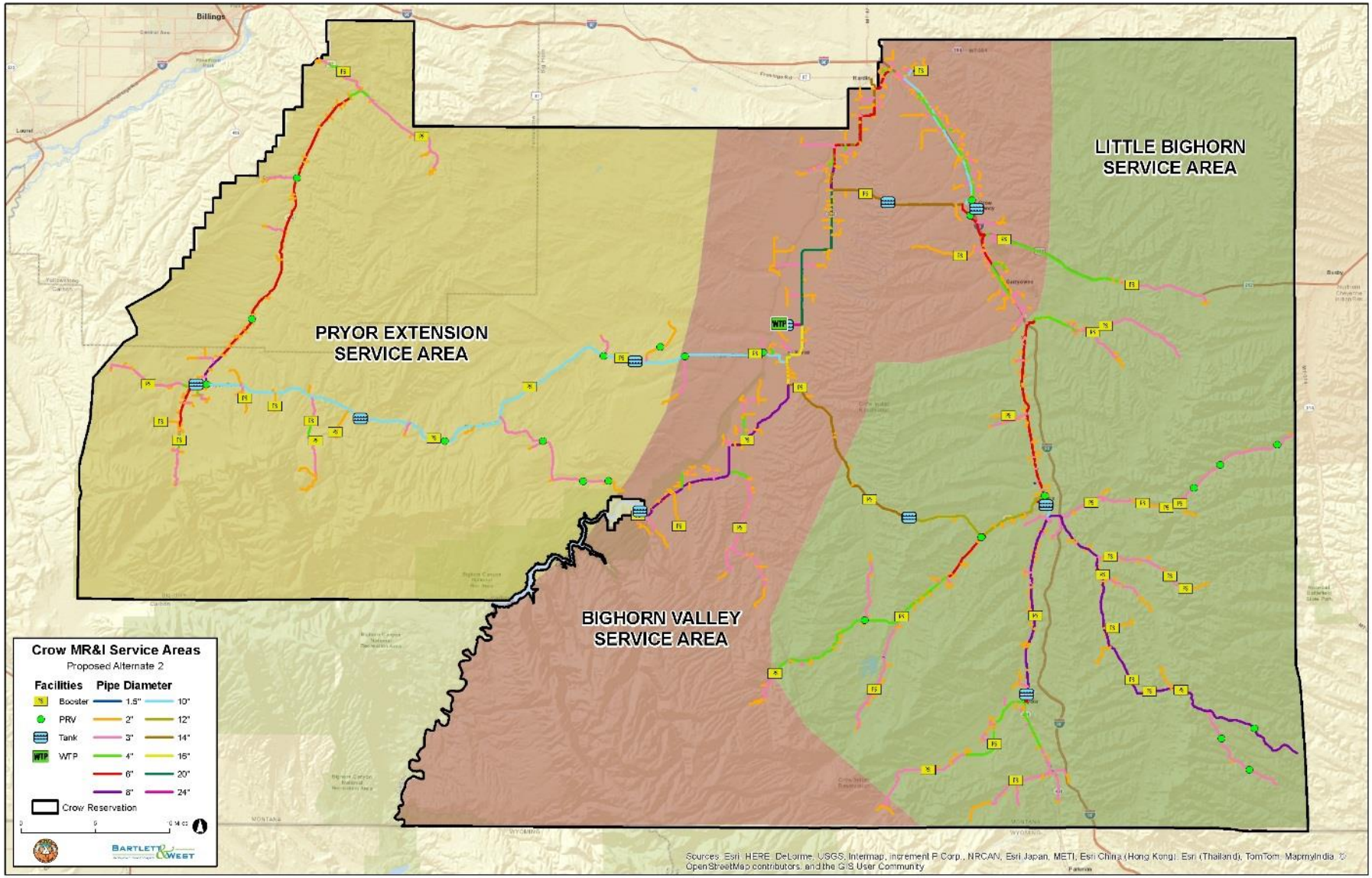

Figure 1: General System Layout

City of Yellowtail
City Government
Yellowtail, MT 59035

City of Lodge Grass
City Government
Lodge Grass, MT 59050

Crow Tribe Water Resources Department
Attn: Mr. Titus Takes Gun
P.O. Box 159
Crow Agency, MT 59022

Big Horn County Electric Co-op
PO Box 410
Hardin, MT 59034

Big Horn County Commission
PO Box 908
Hardin, MT 59034

Bureau of Indian Affairs
Rocky Mountain Regional Office
316 N 26th Street
Billings, MT 59101

Bureau of Indian Affairs
P.O. Box 69
Crow Agency, MT 59022

Bureau of Land Management
Attn: Jim Sparks
5001 Southgate Drive
Billings, MT 59101

Bureau of Land Management
Attn: Diane Friez
111 Garryowen Road
Miles City, MT 59301

Custer National Forest
1310 Main Street
Billings, MT 59105

National Park Service
Attn: John Wessels

12795 Alameda Parkway
Denver, CO 80225

Little Bighorn Battlefield National Monument
PO Box 39
Crow Agency, MT 59022-0039

Bighorn Canyon National Recreation Area
PO Box 7458
Fort Smith, MT 59035-7458

Natural Resources Conservation Service
Crow Agency Field Office
PO Box 699
Crow Agency, MT 59022

Natural Resources Conservation Service
Hardin Field Office
724 Third St. West
Hardin, MT 59034

US Army Corps of Engineers
Billings Regulatory Office
Post Office Box 2256
Billings, MT 59103

US Army Corps of Engineers
Omaha District Headquaters
1616 Capital Ave, Ste. 9000
Omaha, NE 68128

US Environmental Protection Agency
Attn: Suzanne Bohan
Region 8 (8EPR-N)
1595 Wynkoop St.
Denver, CO 80202

US Fish and Wildlife Service
Ecological Services Montana Field Office
585 Shepard Way, Suite 1
Helena, MT 59601

US Fish and Wildlife Service
Attn: Robbin Wagner
P.O. Box 61
Lewistown, MT 59457

Montana Dakota Utilities Co.
400 N Fourth St
Bismarck, ND 58501

Western Area Power Administration
Upper Great Plains Region
P.O. Box 35800
Billings, MT 59107

NorthWestern Energy
1944 Monad Road
Billings, MT 59102

Montana Dept. of Agriculture
Attn: Ron de Yong
302 North Roberts
Helena, MT 59620

Montana Dept. of Commerce
Attn: Meg O'Leary
PO Box 200501
Helena, MT 59620-0501

Montana Dept. of Environmental Quality
1520 E Sixth Avenue
PO Box 200901
Helena, MT 59620-0901

Montana Dept. of Environmental Quality
Airport Business Park IP-9
1371 Rimtop Drive
Billings, MT 59105-9702

Montana Dept. of Health and Human Services
111 North Sanders, Room 301
Helena, MT 59620

Montana Dept. of Labor and Industry
P.O. Box 1728
Helena, MT 59624-1728

Montana Dept. of Natural Resources and Conservation
Airport Industrial Park
1371 Rimtop Drive
Billings, MT 59105

Montana Dept. of Transportation
District 5 Office
424 Morey St.
PO Box 20437
Billings, MT 59104-0437

Montana Electric Cooperatives Association
PO Box 1306
Great Falls, MT 59403

Montana Fish, Wildlife, and Parks
FWP Region 5 Office
2300 Lake Elmo Drive
Billings, MT 59105

Montana Historical Society
State Historic Preservation Office
1410 Eighth Avenue
Helena, MT 59620

Montana Office of Indian Affairs
Attn: Jason Smith
PO Box 200801
Helena, Montana 59620

Yellowstone County Commission
217 N 27th St.
Billings, MT 59101

Summary of Public Comments during Scoping Period (September 16 – November 10, 2014)

Comment Number	Entity	Date of Comment	Comment	Response	Comment Topic
1-1	Agency Scoping Meeting, Billings, verbal	September 30, 2014	What are the endangered species in the area?	Endangered plant species are discussed in Section 3.7, Vegetation & Land Use. Endangered wildlife species are discussed in Section 3.10, Wildlife.	Endangered Species
1-2	Agency Scoping Meeting, Billings, verbal	September 30, 2014	There is currently a proposal to build a new rest stop near the NPS's Little Big Horn Battlefield. NPS is also working to replace/repair their pipelines and other facilities at the battlefield. • Request continued coordination (timelines, location of service connection to the monument) between the NPS and Reclamation.	Comment acknowledged. The project proponent would communicate and coordinate with the NPS as project activities commence.	Project construction coordination
2-1	Pryor Public Meeting, verbal	September 30, 2014	Is Hardin in the project area?	As discussed in Section 2.2.2 and 2.4, Hardin is not in the project area at this time because they have not committed to using the water; however, the design of the proposed action includes the capacity to expand to Hardin in the future.	Project Scope; Alternatives analysis
2-2	Pryor Public Meeting, verbal	September 30, 2014	Will the water treatment plant be located on tribal lands?	Yes, as discussed in Section 2.4.1, the water treatment plant will be located near St. Xavier on tribal land.	Land ownership, Easement acquisition
2-3	Pryor Public Meeting, verbal	September 30, 2014	Concerns about rights-of-way and ensuring that the project stays on easements, and obtaining the appropriate landowner approval before accessing private land.	Right-of-way and easements were considered during evaluation of Alternatives (see Table 2.2). Easements are further discussed throughout Section 2.4 and its subsections, including Tables 2.8. and 2.9.	Land ownership, Easement Acquisition
2-4	Pryor Public Meeting, verbal	September 30, 2014	Expressed a desire to see the tribal legislators attend the public meetings for this project.	Comment acknowledged. As discussed in Section 5.2.1, tribal government has been involved and periodically updated on proposed action.	Public meeting administration
2-5	Pryor Public Meeting, verbal	September 30, 2014	Concerns about water quality in the Bighorn – pesticides, herbicides, sediment, etc.	Water Quality is discussed for existing drinking water in Section 3.3.2. Existing Surface Water Quality is discussed in Section 3.4.3 and 3.4.4. Water quality is also discussed Section 3.5, Fisheries and Aquatic Life. The *Engineering Report* (DOWL HKM 2009) also discussed water quality for the Bighorn River Basin.	Water Resources & Quality

Comment Number	Entity	Date of Comment	Comment	Response	Comment Topic
2-6	Pryor Public Meeting, verbal	September 30, 2014	Where will the proposed evaporation/sludge ponds be located? How big will the ponds be?	Pond locations and sizes are discussed in Section 2.4.1, Water Treatment Plant and shown on Figure 2.6, Conceptual WTP Site Plan.	Water Treatment Plant Technologies & Distribution System; Waste & Pollution Management
2-7	Pryor Public Meeting, verbal	September 30, 2014	Who will control the "shut-off" valve? Concerns about a disruption in service, similar to the incident in Lodge Grass and during power outages.	The Tribe would own and operate the proposed project, as described in Section 2.4.2, Operations, Maintenance and Replacement. Project operation and design criteria, which address system storage and reliability, are discussed for the evaluation of *Master Plan* Alternatives in Section 2.2.2 (Tables 2.1 and 2.2).	Long-term Operations and Maintenance; Project cost, funding
2-8	Pryor Public Meeting, verbal	September 30, 2014	Will residents have to pay for the water delivered to their houses? Expressed the opinion that residents shouldn't have to pay for the water they own.	*Economic Effects to Individuals and Households* is discussed in Section 3.2.5, Direct, Indirect, and Cumulative Effects to Socioeconomics.	Long-term Operations and Maintenance; Project cost, funding
2-9	Pryor Public Meeting, verbal	September 30, 2014	Concerns were raised regarding the BIA's ability to operate a new system, considering the difficulties BIA has had in operating/maintaining the current system.	Comment acknowledged. Operation of a new system, including staffing needs, are discussed in Section 2.4.2, Operations, Maintenance, & Replacement. The Tribe would own and operate the proposed project.	Long-term Operations and Maintenance; Project cost, funding
2-10	Pryor Public Meeting, verbal	September 30, 2014	What will be the cost per household?	Estimated household costs are discussed in *Economic Effects to Individuals and Households* found in Section 3.2.5, Direct, Indirect, and Cumulative Effects to Socioeconomics. A detailed rate study will be completed later in design phase after CTWRD Water Code and Rules and Regulations are complete. Tribe is committed to establishing affordable rates.	Long-term Operations and Maintenance; Project cost, funding
2-11	Pryor Public Meeting, verbal	September 30, 2014	Will I be charged while the system is being built, before my household is receiving service?	No, only when potable water is connected to a service connection would charges be incurred. The CTWRD Water Code and Rules and Regulations, currently under development, will address system charges and rates.	Project cost, funding

Comment Number	Entity	Date of Comment	Comment	Response	Comment Topic
2-12	Pryor Public Meeting, verbal	September 30, 2014	Concerns were raised about the possibility of running out of money before all the service connections can be connected to housing units in more remote areas, such as Pryor.	Pryor is part of proposed service area as described in Section 2.4, Proposed Action Alternative. *Phasing and Priorities* of proposed action is discussed in Section 2.4.4, Project Construction.	Project cost, funding
2-13	Pryor Public Meeting, verbal	September 30, 2014	Tribal members were told that the aquifer and groundwater belongs to them. If this is untrue, members' lands will be worthless.	Comment acknowledged, but out of the scope of this EA. Trust resources are discussed in Section 3.8 and Tribal Water Rights are discussed in Section 3.4.2.	Water Resources & Quality
2-14	Pryor Public Meeting, verbal	September 30, 2014	Landslides and acidic soils may cause problems in the Pryor area.	Comment acknowledged. Geology and Soils are discussed in Section 3.6.	Soil Resources; Geomorphology
2-15	Pryor Public Meeting, verbal	September 30, 2014	What will happen in a severe drought? Will the system still be in service?	The MR&I diversion is such a small percentage of instream flow, adverse effects are not anticipated during low flow conditions as discussed in Section 3.4.4, *Proposed Action Alternative* (Water Resources section). Historical range of Bighorn River instream flow, including periods of severe drought, discussed in *Surface Waters*, Section 3.4.2.	Long-term Operations and Maintenance
2-16	Pryor Public Meeting, verbal	September 30, 2014	A Crow coal mine is located in the northeast section of the reservation – why wasn't this facility identified in the service area?	Service area is discussed in Section 2.4, Proposed Action Alternative. During *Master Plan* development the mines within the Reservation indicated they have their own source for service water and would likely only be interested in potable service for office use. Additional water was allocated in the northeast portion of the Reservation and is available for usage as the Tribe determines. See Section 2.2.2 for design criteria and reference to *Master Plan*.	Project scope; Water demands
3-1	Crow Agency Public Meeting, verbal	October 20, 2014	Would like to see undisturbed areas left undeveloped, especially in regards to the pumping stations between St. Xavier and Pryor.	Viewshed impacts and mitigation measures are discussed in Section 3.11.2, Direct, Indirect, and Cumulative Effects to Aesthetic/Visual Resources.	Aesthetics/Visual Resources

Comment Number	Entity	Date of Comment	Comment	Response	Comment Topic
3-2	Crow Agency Public Meeting, verbal	October 20, 2014	Will there be erosion caused by lower water levels in the river? This is a concern because artifacts or other resources (burial sites, historical battle sites, etc.) may be damaged by erosion and/or exposure.	The MR&I diversion is small percentage of instream flow, a detectable lower water level in the Bighorn River is not anticipated, as discussed in Section 3.4.4, Direct, Indirect, and Cumulative Effects to Water Resources. Cultural & Trust Resources are discussed in Section 3.8, Cultural & Trust Resources. Practices to minimize erosion are presented in Table 2.9, Required Mitigation Measures for the Proposed Action.	Sediment/ Erosion Control; Cultural Resources
3-3	Crow Agency Public Meeting, verbal	October 20, 2014	Concerns during construction: • increased road kill, • construction noise, • trash/pollution, • vehicle traffic.	Mitigation measures to protect wildlife during construction are discussed in Section 3.10.3, Direct, Indirect, and Cumulative Effects to Wildlife. Construction noise is discussed in Section 3.12.3, Direct, Indirect, and Cumulative Effects to Air Quality, Noise, and Traffic. Trash/pollution is discussed in Section 3.3.6 Direct, Indirect, and Cumulative Effects to Public Health. Vehicle traffic is discussed in Section 3.12.3, Direct, Indirect, and Cumulative Effects to Air Quality, Noise, and Traffic.	Wildlife Resources; Noise; Waste & Pollution Management; Traffic
3-4	Crow Agency Public Meeting, verbal	October 20, 2014	Will treated water be used for irrigation purposes?	Treated water will be used for livestock needs, but not for irrigation (see design criteria Section 2.2.2 and description *Pipeline Appurtenances and Service Connections* in Section 2.4.1, Project Components).	Water demands
3-5	Crow Agency Public Meeting, verbal	October 20, 2014	Will there be a water meter at each house? Who will pay for installation of the water meter?	Water meters and their installation are discussed in *Pipeline Appurtenances and Service Connections* in Section 2.4.1, Project Components.	Long-term Operations and Maintenance; Project cost, funding
3-6	Crow Agency Public Meeting, verbal	October 20, 2014	What happens if a new resident builds a home in the service area? Or if a new resident moves into a house where the previous owner chose to not participate in the water system?	These scenarios will be addressed during development of CTWRD Water Code and Rules and Regulations and on a case by case basis as the issue arises.	Long-term Operations and Maintenance; Project cost, funding

Comment Number	Entity	Date of Comment	Comment	Response	Comment Topic
3-7	Crow Agency Public Meeting, verbal	October 20, 2014	Very concerned about the affordability of water service.	The Tribe is committed to establishing affordable rates. Estimated costs are discussed in *Economic Effects to Individuals and Households* found in Section 3.2.5, Direct, Indirect, and Cumulative Effects to Socioeconomics. A preliminary rate study has determined affordable rates can be established for all water users that would generate the revenue necessary to cover the required share of annual OM&R costs. The proposed project, with the funding mechanism established by the Settlement Act, represents the most affordable option for developing a high quality, reliable water supply on the Reservation.	Long-term Operations and Maintenance; Project cost, funding
3-8	Crow Agency Public Meeting, verbal	October 20, 2014	Elders have trouble driving at night – suggest having a daytime meeting or earlier in the evening.	Comment acknowledged.	Public meeting administration
4-1	Environmental Protection Agency (EPA)	October 30, 2014	The EPA fully supports drinking water infrastructure improvements on the Crow Indian Reservation that are being made possible by the Water Rights Settlement Act of 2010.	Comment noted.	Project support
4-2	EPA	October 30, 2014	In our experience, the main impediment to sustained delivery of safe drinking water on tribal lands is adequate funding for operations and maintenance of the system and for a sinking fund or capital improvement fund to replace equipment and facilities as they wear out.	As part of the Crow Tribe Water Settlement Act the Tribe was awarded $47 million to set up and fund an operations and maintenance fund. This fund can be spent in a variety of different ways and the Tribe is currently considering their options to utilize this fund for O&M expenses, future capital improvement expenses, and subsidizing Tribal Member water rate. A preliminary rate study has determined affordable rates can be established for all water users that would generate the revenue necessary to cover the required share of annual OM&R costs. Further discussion provided in *Economic Effects to Individuals and Households* found in Section 3.2.5, Direct, Indirect, and Cumulative Effects to Socioeconomics.	Project cost, funding

Comment Number	Entity	Date of Comment	Comment	Response	Comment Topic
4-3	EPA	October 30, 2014	The summary of alternatives should discuss the pros and cons of the various alternatives and explain why the proposed alternative was selected.	Section 2.2, Alternatives Development and Screening, discussed how the proposed alternative was selected.	Alternatives analysis
4-4	EPA	October 30, 2014	We recommend the EA summarize the major alternatives to the proposed action considered in the facility plan and discuss why those alternatives were dismissed.	Appendix B, Alternatives Considered and Dismissed, discusses other major alternatives considered for the proposed action.	Alternatives analysis
4-5	EPA	October 30, 2014	The EA should explain the tradeoffs between the regional system and replacing/expanding the groundwater systems and existing water treatment plants in Crow Agency.	Discussed in Section 2.2.2, Master Plan Screening Summary, with further detail in Appendix B, Alternatives Considered and Dismissed.	Alternatives analysis
4-6	EPA	October 30, 2014	*We recommend that the alternatives summary and proposed action description…*summarize the water system alternatives that were considered in the development of the master plan for the MR&I system.	Section 2.2, Alternatives Development and Screening, discussed how the proposed alternative was selected. Appendix B, Alternatives Considered and Dismissed, discusses other major alternatives considered for the proposed action.	Alternatives analysis
4-7	EPA	October 30, 2014	*We recommend that the alternatives summary and proposed action description…*include phases of the proposed MR&I project: e.g., what components of the project will be built first and an approximate timeline.	*Phasing and Priorities* of proposed action is discussed in Section 2.4.4, Project Construction, with reference to detail in *Master Plan*.	Alternatives analysis
4-8	EPA	October 30, 2014	*We recommend that the alternatives summary and proposed action description…*include a discussion regarding whether there are interim or sub-alternatives that include upgrading or expanding existing water treatment, storage and distribution facilities.	Discussed in Section 2.4.3, Community Upgrades.	Alternatives analysis
4-9	EPA	October 30, 2014	Do any of the existing, easier to operate groundwater systems have the potential to be expanded or upgraded for use by communities or as part of the regional system? For example, the tribal communities of Pryor and Wyola have reliable sources of groundwater….	Evaluation of groundwater capacity for use in regional system was evaluated in the *Engineering Report*, as summarized in Section 2.2.1, Needs Assessment and Engineering Report. Also discussed in Section 2.2.2, Master Plan Screening Summary. Further detail in Appendix B, Alternatives Considered and Dismissed.	Alternatives analysis

Comment Number	Entity	Date of Comment	Comment	Response	Comment Topic
4-10	EPA	October 30, 2014	Similarly, the Lodge Grass municipal water system is an existing groundwater system. Could the settlement funding could be used for improvements to the existing groundwater systems either as interim phases or as part of the full area-wide water system? Can these funds be used to drill additional wells?	Improvements to existing system during interim phases discussed in Section 2.4.3, Community Upgrades. Funds may be used to drill new community wells in the interim phases as the Tribe determines necessary due to the schedule for delivered water to each community. Evaluation of groundwater capacity for use in regional system was evaluated in the *Engineering Report*, as summarized in Section 2.2.1, Needs Assessment and Engineering Report. Also discussed in Section 2.2.2, Master Plan Screening Summary. Further detail in Appendix B, Alternatives Considered and Dismissed. The Settlement Act specifically authorized a regional water system similar to the preferred alternative in the *Engineering Report*, which did not include drilling wells for the regional system.	Alternatives analysis
4-11	EPA	October 30, 2014	For rural users that haul water or have substandard wells, could settlement funding be used to drill new wells or improve existing wells to provide service as part of the area-wide system?	Evaluation of groundwater quality and capacity for use in regional system was evaluated in the *Engineering Report*, as summarized in Section 2.2.1, Needs Assessment and Engineering Report. Also discussed in Section 2.2.2, Master Plan Screening Summary. Further detail in Appendix B, Alternatives Considered and Dismissed. The Settlement Act specifically authorized a regional water system that did not include drilling new individual rural wells.	Alternatives analysis
4-12	EPA	October 30, 2014	*We recommend that the alternatives summary and proposed action description…*include alternatives to serve the larger population center of Crow Agency including a new, replacement treatment plant, located in Crow Agency. Raw water would be diverted from the Big Horn River as in the proposed action. Treating and delivering water in close proximity to the population center should reduce the potential for development of disinfection byproducts in the transmission pipeline.	The proposed action moves the WTP near St. Xavier, closer to the population center of Crow Agency compared to earlier alternatives with the WTP near Fort Smith. The location near St. Xavier allows for a centralized WTP which decreases the transmission time and DBP formation when serving northern area (Crow Agency), southern area (Lodge Grass and Wyola), and western area (Pryor and outskirts of Billings) of the Crow Reservation. See Section 2.4, Proposed Action Alternative. Appendix B, Alternatives Considered and Dismissed, discusses other major alternatives considered.	Alternatives analysis

Comment Number	Entity	Date of Comment	Comment	Response	Comment Topic
4-13	EPA	October 30, 2014	*We recommend that the alternatives summary and proposed action description…*look at different alternatives to more cost-effectively serve potential industrial users. Depending on the industrial use, expensive, high-quality potable water may not be needed. For example, if allowable under the Settlement Act, could the drilling of windmill driven wells be funded for livestock watering? This alternative would avoid water treatment and pumping costs, as well as reducing transmission line construction costs.	The Tribe has made it a priority to construct a system that will provide them the potential for the greatest economic impact. During preparation of the *Master Plan* proposed industrial services were contacted and scrutinized. The industrial connections included in the *Master Plan* have the potential or already provide a large economic impact on the Reservation. See Section 2.2, Alternatives Development and Screening, for a summary of the trade-offs between alternatives and specifically Section 2.2.2 for design criteria and Section 2.2.3 for water treatment requirements and goals. Windmill driven wells were not considered and are not the industry standard (nor preferred by ranchers) for regional water systems in rural agricultural areas. A targeted amount of 50% of the cattle on the reservation (48,000 head) was used in the development of the Master Plan. The final amount of cattle served will be based on actual water system connection sign-up campaigns. By designing the transmission and pumping costs based on actual system signups the costs will be minimized to provide the water need specifically determined for those areas.	Alternatives analysis; project cost, funding
4-14	EPA	October 30, 2014	We recommend that the EA be written in a manner that will accommodate changes in the treatment technologies and locations if needed as a result of comments or information from the pilot study.	Water treatment technologies were evaluated using pilot and bench studies and existing information as described in Section 2.2.3, Water Treatment Process Alternatives Screening Summary and associated reports. Appendix B, Alternatives Considered and Dismissed, describes water treatment process alternatives considered for the proposed action. Alternative locations of WTP and scope of preferred water treatment process and analysis of effects are described in *Water Treatment Plant*, Section 2.4.1, Project Components.	Alternative analysis; Water Treatment Plant Technologies & Distribution System

Comment Number	Entity	Date of Comment	Comment	Response	Comment Topic
4-15	EPA	October 30, 2014	We recommend that the EA disclose the impacts of disposal of the reject water from ultrafiltration and/or reverse osmosis reject water. • The EA could be used to evaluate different disposal locations and methods. Depending on the quality of the reject water there may be potential impacts to surface and groundwater quality, soil productivity and agricultural impacts. • The analysis should also address any control mechanisms that will limit impacts such as a surface water discharge permits (NPDES) or an injection well permit (UIC).	Section 2.4.1, Project Components, *Water Treatment Plant* discusses the preferred and alternative disposal of the waste stream. Waste stream impacts to surface and groundwater and associated mitigation measures are discussed in Section 3.4.4, Direct, Indirect, and Cumulative Effects on Water Resources and Section 3.5.3, Direct, Indirect, and Cumulative Effects on Fisheries and Aquatic Life. Effects of solid wastes and associated mitigation measures are discussed in Section 3.3.6, Direct, Indirect, and Cumulative Effects to Public Health and Safety.	Water Treatment Plant Technologies & Distribution System; Water Resources & Quality; Soil productivity/ Agricultural Impacts; Permits
4-16	EPA	October 30, 2014	We are also concerned that disinfection byproducts (DBPs) may form in the many miles of transmission pipelines, especially in areas of the water distribution system that have few users or low seasonal water demand. • We recommend that the EA discuss the actions that will be taken to reduce the development of disinfection byproducts.	Disinfection byproducts are discussed in Section 2.2.3, Water Treatment Process Alternatives Screening Summary.	Water Treatment Plant Technologies & Distribution System
4-17	EPA	October 30, 2014	*For the potential groundwater use sub-alternatives (see Comment 1-5), we recommend…*that the EA include existing information on the water quality of the wells (for example, TDS, sulfate, alkalinity, hardness, etc.).	Ground water quality is discussed in Section 3.3.2, Existing Drinking Water Quality, with reference to associated reports and surface and ground water sampling. Deficiencies in existing systems, including ground water quality, are summarized in Appendix A.	Alternatives analysis; Water Resources & Quality
4-18	EPA	October 30, 2014	*For the potential groundwater use sub-alternatives (see Comment 1-5), we recommend…*that the EA include if there is an adequate ground water supply, at what level in the aquifer is best quality water located and what limitations are there to drilling new wells (e.g., water rights).	Evaluation of groundwater capacity for use in regional system was evaluated in the *Engineering Report*, as summarized in Section 2.2.1, Needs Assessment and Engineering Report. Also discussed in Section 2.2.2, Master Plan Screening Summary. Further detail in Appendix B, Alternatives Considered and Dismissed. Existing ground water used as drinking water is discussed in Section 3.3.2, Existing Drinking Water Quality. Water rights discussed in Section 3.4.2, Existing Water Resources and Water Rights.	Alternatives analysis; Water Resources & Quality

Comment Number	Entity	Date of Comment	Comment	Response	Comment Topic
4-19	EPA	October 30, 2014	We recommend that the EA discuss how the remainder of OM&R costs will be funded.	Discussion provided in *Economic Effects to Individuals and Households* found in Section 3.2.5, Direct, Indirect, and Cumulative Effects to Socioeconomics. The Tribe plans to charge a monthly water bill. A preliminary rate study has determined affordable rates can be established for all water users that would generate the revenue necessary to cover the required share of annual OM&R costs.	Long-term Operations and Maintenance; Project cost, funding
4-20	EPA	October 30, 2014	What are the estimated user fees for a typical household?	Estimated user fees are discussed in Section 3.2.5 Direct, Indirect, and Cumulative Effects to Socioeconomics, *Effects to Reservation-wide Economy and Commercial Water Users* and *Economic Effects to Individuals and Households*. A detailed rate study will be completed later in the design phase after CTWRD Water Code and Rules and Regulations are complete.	Long-term Operations and Maintenance; Project cost, funding
4-21	EPA	October 30, 2014	Will the user fees be different for tribal members and other users?	A detailed rate study will be completed later in the design phase after CTWRD Water Code and Rules and Regulations are complete.	Long-term Operations and Maintenance; Project cost, funding
4-22	EPA	October 30, 2014	Will any tap fees be assessed?	Connection fees will be determined later in the design phase after CTWRD Water Code and Rules and Regulations are complete. Tap fees for household connections are not expected, however a fee is expected for livestock taps.	Long-term Operations and Maintenance; Project cost, funding
4-23	EPA	October 30, 2014	Who is responsible and/or pays for connecting individual households to the new water system, the individual homeowner or the Crow MR&I system?	Connection fees will be determined later in design phase after CTWRD Water Code and Rules and Regulations are complete. It is anticipated that the connection to a household will be included in system.	Long-term Operations and Maintenance; Project cost, funding
4-24	EPA	October 30, 2014	Have any municipal or industrial bulk water users been identified?	Municipal, commercial, and industrial users were identified in evaluation of water demands and determination of design criteria during preparation of the *Master Plan*, as summarized in Section 2.2.2, Master Plan Screening Summary and Table 2.1.	Water demands

Comment Number	Entity	Date of Comment	Comment	Response	Comment Topic
4-25	EPA	October 30, 2014	What are the anticipated future bulk water users? And are they any environmental impacts associated with reasonably foreseeable developments?	Municipal, commercial, and industrial users are discussed in Section 3.2.5, Direct, Indirect, and Cumulative Effects to Socioeconomics and Section 3.4.4, Direct, Indirect, and Cumulative Effects to Water Resources.	Water demands; Cumulative Effects
4-26	EPA	October 30, 2014	We recommend that the EA discuss how the new regional water system will address long-standing issues regarding collection of user fees.	Discussion provided in *Economic Effects to Individuals and Households* found in Section 3.2.5, Direct, Indirect, and Cumulative Effects to Socioeconomics. Water fee collection is issue on many reservations and is no different on the Crow Reservation. It is an issue that the Crow Tribe is discussing and consideration options to make the water affordable to all income levels. Current discussions included utilizing the $47 million O&M fund to subsidize low income household and lower water rates for them to payable levels; households with higher income levels would not be subsidized. A preliminary rate study has determined affordable rates can be established for all water users that would generate the revenue necessary to cover the required share of annual OM&R costs.	Long-term Operations and Maintenance; Project cost, funding
4-27	EPA	October 30, 2014	We recommend the EA evaluate existing water conservation strategies (e.g., existing building codes, ordinances) to determine whether additional mitigation measures should be incorporated into the project.	Existing water systems summarized in Section 3.3.3, Existing Water Supply Infrastructure and Fire Safety. Mitigation measures presented in Table 2.9, Required Mitigation Measures for the Proposed Action.	Water Conservation
4-28	EPA	October 30, 2014	Another effective conservation strategy is to require meters for all customers and develop a user fee system that increases water rates with increased water use. • At a minimum, the EA should disclose whether all water users will be metered on the new regional system.	The Tribe intends to meter and charge for all water use from the MR&I system, as described Section 3.2.5, Direct, Indirect, and Cumulative Effects to Socioeconomics. See also description of proposed action and meter installation in *Pipeline Appurtenances and Service Connections* in Section 2.4.1, Project Components.	Water Conservation; Project cost, funding

Comment Number	Entity	Date of Comment	Comment	Response	Comment Topic
4-29	EPA	October 30, 2014	We recommend that the EA discuss the impacts of increased water diversion from the Big Horn River on: • aquatic life, • geomorphology (if applicable), and • other water users.	Effects on aquatic life are discussed in Section 3.5.3, Direct, Indirect, and Cumulative Effects on Fisheries and Aquatic Life. Effects on geomorphology are discussed in Section 3.6.3, Direct, Indirect, and Cumulative Effects to Geology and Soils. Effects to other water users and water supply are discussed in Section 3.4.4, Direct, Indirect, and Cumulative Effects to Water Resources.	Water Quality; Aquatic Life; Geomorphology; Socioeconomics; Recreation
4-30	EPA	October 30, 2014	We recommend that the EA identify the number of crossings and potential acres of wetlands/waters of the U.S. that are likely to be affected by the project.	Surface waters and stream crossings are discussed in Section 3.4, Water Resources. Numbers and acres of wetlands affected are discussed in Section 3.9, Wetlands and Floodplains.	Wetlands and Waters of the U.S.
4-31	EPA	October 30, 2014	We recommend the EA address how the project will comply with Section 404 of the Clean Water Act (CWA).	The CWA Section 404 is discussed in Section 3.4.1, Water Regulations and Water Quality Standards; Section 3.9.1, Wetland and Floodplain Regulations; and Section 3.9.3, Direct, Indirect, and Cumulative Effects and Wetlands.	Wetlands and Waters of the U.S.
4-32	EPA	October 30, 2014	The EPA recommends consulting with the U.S. Army Corps of Engineers (Corps) regarding the project, as the Corps implements the CWA Section 404 permitting program. For example, will the project need an individual Section 404 permit or can a nationwide permit be used? If an individual CWA permit is needed, the Corps will need to ensure that the environmental review and alternatives analysis are sufficient to determine if the proposed project is the least environmentally damaging practicable alternative as required by the CWA Section 404 implementing regulations at 40 CFR Part 230.	The CWA Section 404 and consultation with the Corps is discussed in Section 3.9.1, Wetland and Floodplain Regulations; 3.9.3 Direct, Indirect, and Cumulative Effects and Wetlands; Section 5, Consultation and Coordination.	Wetlands and Waters of the U.S.; Permits
4-33	EPA	October 30, 2014	The construction of the water lines, water intake structures and water treatment plant are likely to need a stormwater construction permit.	Permits are discussed in Section 1.8. Stormwater Construction Permits are also discussed Section 3.4.1, Water Regulations and Water Quality Standards.	Sediment/ Erosion Control; Permits

Comment Number	Entity	Date of Comment	Comment	Response	Comment Topic
4-34	EPA	October 30, 2014	We recommend developing the SWPPP sufficiently in the EA to serve as the mitigation and control measures for construction sediment and erosion impacts.	The SWPPP is introduced in Section 3.4.1, Water Regulations and Water Quality Standards and described as mitigation in Section 3.4.4, Direct, Indirect, and Cumulative Effects to Water Resources; Section 3.6.3, Direct, Indirect, and Cumulative Effects to Geology & Soils; and Section 3.9.3, Direct, Indirect, and Cumulative Effects to Wetlands & Floodplains. Mitigation measures presented in Table 2.9, Required Mitigation Measures for the Proposed Action.	Sediment/ Erosion Control; Permits
5-1	Bernadette Smith	November 10, 2014	Verbal family history that St. Xavier water was “no good” and “rotten.” Family used to bring water from Pryor to St. Xavier for household use.	Current drinking water quality is discussed in Section 1.4, Purpose and Need and Section 3.3.2, Existing Drinking Water Quality.	Water Resources & Quality
5-2	Bernadette Smith	November 10, 2014	Water is coming from Wyoming through fields and pastures. How do we know what they use on the soils and the chemicals sprayed on the crops? Powell, Wyoming used to smell like sulfur. What happened to that? Was it buried to pollute future generations and feed products?	Water Quality of the proposed water source for the project, the Bighorn River, is discussed in *Bighorn River Water Quality* in Section 3.3.2, Existing Drinking Water Quality, with reference to associated reports on surface and ground water sampling. Treatment goals and pilot study results are discussed in Section 2.2.3, Water Treatment Process Alternatives Screening Summary.	Water Resources & Quality
5-3	Bernadette Smith	November 10, 2014	Fifteen years is a long time and commenter stated they’ll probably be dead if or when water line is completed to Pryor, MT.	*Phasing and Priorities* of proposed action is discussed in Section 2.4.4, Project Construction, with reference to detail in *Master Plan*.	Project scope, timeline
5-4	Bernadette Smith	November 10, 2014	Opposed to the water line, cost is too expensive. Water should be free. Why should commenter support water bills for family in the future?	Estimated costs are discussed in *Economic Effects to Individuals and Households* found in Section 3.2.5, Direct, Indirect, and Cumulative Effects to Socioeconomics. Section 1.5 discusses Benefits and Opportunities of the proposed action.	Project cost, funding
5-5	Bernadette Smith	November 10, 2014	Believe a better and cheaper use for water can be discovered. Residents along highway could use better water for household use and commenter never sees them at meetings.	Current drinking water quality and problems are discussed in Section 1.4, Purpose and Need and Section 3.3.2, Existing Drinking Water Quality. Estimated costs and affordability of alternatives are discussed in Section 2.2, Alternatives Development and Screening and associated reports.	Project cost, funding; Water Resources & Quality

Tally of Comment Topics

Aesthetics/Visual Resources: 1

Alternatives Analysis: 14

Aquatic Life: 1

Cultural Resources: 1

Cumulative effects: 1

Endangered Species: 1

Geomorphology: 2

Land ownership, Easement acquisition: 2

Long-term Operations and Maintenance: 14

Noise: 1

Permits: 4

Project construction coordination: 1

Project cost, funding: 20

Project scope, timeline: 3

Public meeting administration: 2

Sediment/Erosion Control: 3

Socioeconomics: 1

Soil Resources; Soil Productivity/Agricultural Impacts: 2

Traffic: 1

Water Conservation: 2

Water Demands: 4

Waste & Pollution Management: 2

Water Resources & Quality: 9

Water Treatment Plant Technologies & Distribution System: 4

Wildlife Resources: 1

Wetlands and Waters of the U.S.: 3

Appendix F

Distribution List for the Draft EA

Distribution List for the Draft EA

Interested or Affected State or Federal Agencies
Bighorn Canyon National Recreation Area, Fort Smith, MT
EPA Region 8 Office, Denver, CO
NRCS Crow Agency Field Office, Crow Agency, MT
NRCS Hardin Field Office, Hardin, MT
US Army Corps of Engineers, Billings Regulatory Office, Billings, MT
USFWS, Ecological Services Montana Field Office, Helena, MT
USFWS, Robbin Wagner, Lewistown, MT
Montana Department of Transportation, District 5 Office, Billings, MT
<Placeholder: Others as determined necessary.>

Individuals or Special Interest Organizations that Commented During Scoping
Bernadette Smith, Pryor, MT
<Placeholder: Others ?>

Public Spaces Where Hardcopy EA Will Be Available for Review by General Public
Crow Tribe Headquarters, Crow Agency, MT
Crow Nation Legislative Branch Office, Crow Agency, MT
Crow Tribe Water Resource Department, Crow Agency, MT
Crow Tribe Sub Office, Billings, MT
Little Big Horn College Library, Crow Agency, MT
Big Horn County Library, Hardin, MT
Bureau of Reclamation Regional Office, Billings, MT
Bureau of Indian Affairs Regional Office, Billings, MT
<Placeholder: Others as determined necessary.>