

Appendix C

Final Programmatic Agreement

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SURFACE TRANSPORTATION BOARD
Washington, DC 20423

OFFICE OF ECONOMICS, ENVIRONMENTAL ANALYSIS, AND ADMINISTRATION

December 20, 2005

Mr. Don Klima, Director
Office of Planning and Review
Advisory Council on Historic Preservation
The Old Post Office Building
1100 Pennsylvania Avenue, NW, #809
Washington, DC 20004

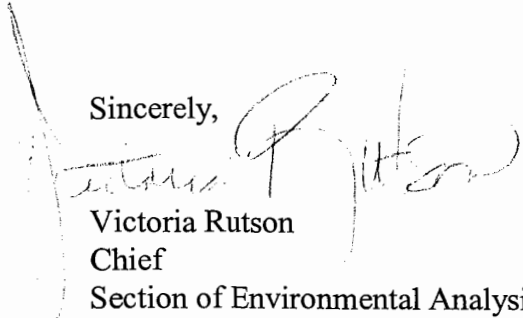
Re: Tongue River Railroad Company, Inc. - Finance Docket 30186 (Sub-No. 3) -
Construction and Operation of the Western Alignment - Programmatic
Agreement

Dear Mr. Klima:

The Surface Transportation Board's (Board) Section of Environmental Analysis (SEA) prepared the attached Programmatic Agreement (PA) for the Tongue River Railroad Company's application to construct and operate a rail line in southeastern Montana, known as Tongue River III. SEA is the office within the Board responsible for conducting the environmental review process pursuant to the National Environmental Policy Act, including the National Historic Preservation Act (NHPA). The PA was prepared in consultation with the signatory and concurring parties. The draft PA was made available for public review and comment on October 15, 2004, as part of the Draft Supplemental Environmental Impact Statement prepared in Tongue River III.

The attached fully executed PA (with original signatures) has already been executed by the Advisory Council on Historic Preservation (ACHP), which constitutes the comments of the ACHP as required by Section 106 of NHPA and the ACHP's regulations. Copies of the PA will be provided to the Montana State Historic Preservation Office and all other signatories and concurring parties to the PA.

Sincerely,



Victoria Rutson
Chief

Section of Environmental Analysis

cc: Montana State Historic Preservation Office
U.S. Army Corps of Engineers
U.S. Department of the Interior, Bureau of Land Management
U.S. Department of Agriculture Agricultural Research Service
Montana Department of Natural Resources and Conservation
Tongue River Railroad Company
Northern Cheyenne Tribe
Crow Tribe
Northern Plains Resource Council

**PROGRAMMATIC AGREEMENT AMONG
THE SURFACE TRANSPORTATION BOARD,
THE MONTANA STATE HISTORIC PRESERVATION OFFICER,
THE ADVISORY COUNCIL ON HISTORIC PRESERVATION, U.S. ARMY CORPS OF
ENGINEERS, THE U.S. DEPARTMENT OF THE INTERIOR BUREAU OF LAND
MANAGEMENT, THE U.S. DEPARTMENT OF AGRICULTURE AGRICULTURAL
RESEARCH SERVICE, THE MONTANA DEPARTMENT OF NATURAL RESOURCES
AND CONSERVATION, AND THE TONGUE RIVER RAILROAD COMPANY, INC.
REGARDING CONSTRUCTION AND OPERATION
BY THE TONGUE RIVER RAILROAD COMPANY, OF A RAIL LINE
FROM MILES CITY TO DECKER IN CUSTER,
ROSEBUD, POWDER RIVER AND BIGHORN COUNTIES, MONTANA**

WHEREAS, the Surface Transportation Board (Board),¹ the lead Federal agency, has determined that construction and operation of a rail line by the Tongue River Railroad Company, Inc. (TRRC, Inc.) from Miles City to Decker in Custer, Rosebud, Powder River and Bighorn Counties, Montana (Finance Docket No. 30186) may have an effect upon historic properties included on or eligible for inclusion on the National Register of Historic Places (National Register), and has consulted with the Montana State Historic Preservation Officer (SHPO), the Advisory Council on Historic Preservation (Council), the U.S. Army Corps of Engineers (COE), the U.S. Department of the Interior Bureau of Land Management (BLM), the U.S. Department of Agriculture Agricultural Research Service (ARS), the Montana Department of Natural Resources and Conservation (MT DNRC), and the TRRC, Inc. pursuant to Section 800.14 of the regulations (36 CFR Part 800) implementing Section 106 of the National Historic Preservation Act (NHPA), 16 U.S.C. 470f; and,

WHEREAS, the Northern Cheyenne and Crow tribes, and the Northern Plains Resource Council have been invited to participate in development of, and concur in, this Agreement; and,

WHEREAS, the Board has contacted the Arapaho Business Council, Oglala Sioux Tribal Council, Shoshone Business Council and Standing Rock Sioux Tribal Council and invited them to concur in this Agreement and each tribe has either not responded to Board's invitation or decided not to participate in the development of, or concur in, this Agreement; and,

WHEREAS, this Agreement embraces and replaces all earlier proposed agreements in this rail line construction and operation proceeding; and,

WHEREAS, the definitions of 36 CFR Part 800, and those attached in Appendix 1 are applicable through this Programmatic Agreement as well as any subsequent attachments to the PA; and

¹ The Surface Transportation Board (Board) was created with the passage of the Interstate Commerce Commission Termination Act of 1995 (Pub. L. No. 104-88). The Board, an independent body within the U.S. Department of Transportation, is responsible for administering rail, pipeline, and certain adjudicatory functions involving motor and water carriers. These responsibilities are similar to those duties formerly administered by the Interstate Commerce Commission. The Board is the lead agency under NEPA for the Tongue River Railroad Project.

WHEREAS, the consulting parties to this agreement have considered the applicable requirements of NHPA, the American Indian Religious Freedom Act, 42 U.S.C. 1996 et. seq. (AIRFA), the Native American Graves Protection and Repatriation Act, 25 U.S.C. 3001 et. seq. (NAGPRA), Executive Order 13007 – Indian Sacred Sites, and the Archaeological Resources Protection Act of 1979 (ARPA) in the course of consultation; and,

WHEREAS, a Class I Inventory² has been conducted for a 1500 foot area on either side of the proposed centerline and the reports on the results of the Class I Inventory have been provided to the Board through submission of various documents by TRRC, Inc., and,

WHEREAS, the Board has provided the relevant Class I Inventory documents to the signatory and concurring parties.

NOW, THEREFORE, the Board, SHPO, the Council, BLM, COE, ARS, MT DNRC, TRRC, Inc., Northern Cheyenne and Crow tribes agree that the undertaking shall be implemented in accordance with the following stipulations in order to take into account the effects of the undertaking on historic properties and to satisfy the Section 106 NHPA responsibilities for the project.

STIPULATIONS

The Board has a statutory obligation as the lead Federal agency to fulfill the requirements of Section 106, therefore the Board shall ensure that the measures in the following parts are carried out.

I. Identification Plan

a. The Identification Plan (ID Plan), Attachment A to this PA, describes the Area of Potential Effect (APE), the methodology for the location, inventory, identification, recording, and evaluation of all historic properties that have surface and exposed profile indications along the approved alignment for construction. The ID Plan involves two steps: 1) Updating the Class I Inventory and conducting a windshield survey of the approved rail alignment to identify

² The Class I inventory has been published by the Board in the following documents: The draft and final Environmental Impact Statements (EIS) for Tongue River I, (Tongue River Railroad Company Rail Construction and Operation In Custer, Powder River and Rosebud Counties, Montana, Finance Docket No. 30186 (Miles City to Ashland) (not printed) (served Sept.4, 1985), modified, (not printed) (served May 9, 1986)), the draft EIS for Tongue River II (Tongue River Railroad Company Rail Construction and Operation Of An Additional Line from Ashland to Decker, Montana, Finance Docket No. 30186 (Sub. No. 2) (not printed) (served Nov. 8, 1996)), the Environmental Report submitted with the application for the Western Alignment (Tongue River Railroad Company Rail Construction and Operation Western Alignment In Rosebud and Big Horn Counties, Montana, Finance Docket No. 30186 (Sub. No. 3)), Analysis of Potential Changed Circumstances Related to the Environment and Proposed Action Along Original 89 Miles of the Tongue River Railroad Approved in 1989: 1985 to 1998 and Analysis of Potential Changed Circumstances Related to the Environment and Proposed Action along the Northern 21 Miles of the Proposed Tongue River Railroad Extension: 1996 to 1998, Exhibits 2 and 1 respectively to the Reply of Tongue River Railroad Company to Comments on the Scope of the Supplement to the Final EIS, Finance Docket No. 30186 (Sub. No.3) (filed with the Board Sept. 8, 1998); and the draft Supplement to the Final EIS, (Tongue River Railroad Company Rail Construction and Operation Western Alignment In Rosebud and Big Horn Counties, Montana (Finance Docket No. 30186 (Sub. No. 3)).

previously recorded sites; and 2) a Class III Inventory for identification and evaluation of cultural resources. This second step will be performed for the entire rail alignment; however, it may be performed on portions of the rail line, such that once TRRC, Inc. has access to a portion of the rail line, the intensive survey for that portion can be completed.

b. The Signatories and Concurring Parties to this Agreement consent that historic properties will be identified in accordance with the ID Plan which was developed for this project in coordination with the Federal agencies, SHPO, and consulting tribes.

c. Prior to construction TRRC, Inc. will retain a Cultural Resource Use Permittee who has or will obtain a BLM-approved permit, or any other state or federal agency permits necessary to conduct the inventories required to prepare the Identification Plan, (hereafter Permittee) and who meets the professional qualifications standards provided in the Secretary of the Interiors Standards and Guidelines for Archaeology and Historic Preservation, 48 FR 44716-44742 and 48 CFR 44720-44723. Permittee will comply with the conditions of the Cultural Resource Use Permit. The Permittee will conduct surveys, identifications and evaluations and prepare Identification Reports in accordance with the attached ID Plan.

d. Representatives of the Northern Cheyenne and Crow tribes (The tribes) will be invited by the Board to participate in the inventories (Class I and Class III) to help identify, document, and evaluate properties to which they attach traditional religious and cultural significance within the APE. Traditional religious and cultural significance will include all aspects of significance as outlined in National Register Bulletin 38, Guidelines for Evaluating and Documenting Traditional Cultural Properties (National Park Service 1990) and those identified by the tribe or other groups. Each tribe will designate a representative(s), to accompany the cultural resources inventory crew. In addition, during the Class III Inventory, the Tribal representative(s) will be invited by the Board to work with the Permittee to identify and compile a list of traditionally-important plants that occur in the APE as well as the gathering sites and access points for these plants. The tribes may require the assistance of a Tribal cultural expert(s) to participate in the inventories and evaluations required under this PA. If so, the tribes shall identify to the Board the Tribal cultural expert(s) that will be assisting the tribes so that appropriate documents can be provided to the Tribal cultural expert(s). TRRC, Inc. shall provide reasonable financial reimbursement for professional services³ provided by the designated Tribal cultural expert(s).

e. The Board shall review each report prepared pursuant to the ID Plan and provide copies to the signatory and concurring parties to this Agreement for their review and comment within 15 calendar days of receipt from the Permittee.

1. The signatory and concurring parties will have 15 calendar days after receipt to notify the Board in writing if information is missing from the report and recommendations.

³ Reasonable financial reimbursement shall include payment for professional services (based on an agreed upon hourly rate), travel and miscellaneous expenses incurred by the Tribal cultural expert(s) during participate in the inventories and evaluations required under this PA.

2. The Board will then have five calendar days to supply the missing information or to determine that such information is not necessary to complete National Register evaluation and effect determinations
3. The Board shall require the return of comments within 45 calendar days of receipt of the additional information or the determination that additional information is not required.
4. If no additional information is requested, the parties have 60 calendar days from the receipt of the initial report to submit comments. A copy of the comments sent to the Board should be sent simultaneously to the SHPO.

In consultation with the SHPO and federally-designated tribes that attach traditional religious and cultural significance to identified historic properties, the Board shall seek to reach concurrence on the National Register eligibility of all historic properties identified in the project area within 45 calendar days of receipt of comments. The Board will finalize determinations of eligibility in a manner consistent with 36 CFR Part 800.4(c) and pertinent guidelines of the National Park Service, Council, and SHPO. Once the Board has finalized its determinations of eligibility, it shall then consult with SHPO regarding the effects of the undertaking on any properties determined eligible for listing in the National Register, pursuant to 36 CFR Part 800.5(a), within 40 calendar days of receipt of comments. The Board, in consultation with the SHPO, shall direct the Permittee to make any required revisions to the reports prepared pursuant to the ID Plan.

f. Within 15 calendar days of its receipt of a final report prepared pursuant to the ID Plan from the Permittee, the Board may approve the final report, send a copy of the final report to the signatory and concurring parties to this Agreement, or require additional changes as necessary to ensure acceptability of the report.

II. Consultation on Treatment (to prepare a Treatment Plan)

a. The Board, in consultation with the SHPO, shall consult with the signatory and concurring parties to this Agreement to develop measures that avoid minimize or mitigate adverse effects identified in Stipulation I.e, in a Treatment Plan. The Board shall invite representative(s) of the Arapaho and Sioux, as well as any other tribe that has expressed interest in participating in the inventory process, to meet with the Board, the Permittee, and Cheyenne and Crow tribal representative(s) who participated in the inventory to discuss the inventory results and define how properties of traditional religious and cultural significance can most respectfully be managed as part of the Treatment Plan. If requested by the SHPO, this consultation will include a meeting with SHPO representatives, the managing Federal agency (for sites on Federal land), and others the SHPO may deem appropriate, to further review the framework for how treatment plans will be developed, and to review opportunities and alternatives that could avoid or minimize adverse effects to a historic property, group of closely related historic properties, or category of historic properties. The Board shall notify parties of the proposed treatment options within 45 calendar days of the date of a final ID Report.

b. Nothing in this Agreement shall preclude any signatory or concurring party from consulting with any other signatory or concurring party, or with any other person or entity, during any period of consultation specified in this Agreement or at any other time.

c. Copies of all reports and notices distributed by the Board to signatory and concurring parties under the terms of this Agreement shall in all cases be transmitted by overnight courier, U.S. Express Mail or more expeditious means which provides for verification of delivery.

III. Treatment Plan (for Eligible Resources--Native American and Non-Native American)

a. The Board will ensure that the Permittee prepares, and TRRC, Inc. implements, a Treatment Plan(s) that will address the adverse effects of the proposed undertaking on historic properties. More than one Treatment Plan may be prepared for the railroad. A Treatment Plan may be prepared for a portion of the line provided that the ID Report for that portion has been completed and approved in accordance with Stipulation I. The Treatment Plan shall be amended, if necessary, after the finalization of any supplemental Identification Report(s) (hereafter "Treatment Plan Amendment"). The plan shall (1) identify all eligible historic properties in the APE or portion thereof, (2) identify the nature of the effects to which each property will be subjected, and (3) identify the treatment strategies proposed to avoid, minimize or mitigate the effects of the undertaking. To the extent practicable, the Treatment Plan(s) will incorporate measures identified by tribal representatives as necessary for mitigation of adverse effects to properties that are determined to be significant for their traditional cultural values and protection of and continuing access to the gathering sites and access points of traditionally-important plants. If appropriate, TRRC, Inc. may attempt to negotiate access to public or private lands that are not currently accessible. The Treatment Plan(s) will conform to the principles of the Council's Treatment of Archaeological Properties: A Handbook, Parts I and II, the "Secretary of the Interior's Standards and Guidelines for Archaeology and Historic Preservation" (Federal Register, Vol. 48 No. 190, September 29, 1983, pp. 44716-44742) and appropriate SHPO guidelines.

b. Whenever possible, in-place preservation shall be the preferred alternative. In consultation with the signatory and concurring parties to this Agreement, TRRC, Inc. shall develop specific procedures to preserve historic properties in-place. These procedures may include minor changes to the rail alignment or construction methods, to the extent feasible, to avoid or reduce impacts, and/or monitoring of historic properties by historians, archaeologists and tribal representatives during construction.

c. Where avoidance is not feasible and data recovery is determined by the Board in consultation with the signatories and concurring parties to this Agreement to be the most prudent and feasible treatment option, the research design proposed in the Treatment Plan(s) shall specify, at a minimum:

1. the historic properties to be affected and the nature of those effects;
2. the research questions to be addressed through data recovery, with an explanation of their relevance and importance;

3. The data needed to address specific research questions, the likelihood that this data can be recovered and how the data will be analyzed;
 4. the fieldwork and analytical strategies to be employed, with an explanation of their relevance to the research question;
 5. proposed methods of dealing with individual discovery situations;
 6. methods to be used in data management and dissemination of data, including a schedule;
 7. how findings will be presented to support the research design;
 8. the proposed repatriation of recovered materials and records including the disposition of Native American sacred items, human remains and funerary items;
 9. proposed methods for disseminating results of the work to the public;
 10. proposed methods by which tribal representatives will be kept informed of the work and afforded an opportunity to participate; and
 11. a proposed schedule for the submission of progress reports to the Board; and,
 12. proposed approach for the disposition and curation of data and materials (other than Native American items, human remains and funerary items as discussed under item 8 above) upon completion of data collection.
- d. The data recovery plan shall be incorporated as part of the Treatment Plan(s) and shall be consistent with the Secretary's Standards for Archaeological Documentation (48 FR 44734-37) and take into account the Council's publication, Treatment of Archaeological Properties: A Handbook (Advisory Council on Historic Preservation 1980), subject to any pertinent revisions the Council may make in the publication prior to completion of the data recovery plan, and SHPO guidance. Permittee shall obtain all necessary cultural resource permits for data recovery including an excavation permit from BLM for any data recovery on BLM land, appropriate ARS permits for any recovery on ARS lands and appropriate State permits for any recovery on State lands.

IV. Review of Treatment Plan

- a. Within 15 calendar days of receipt from the Permittee, the Board will submit the Treatment Plan(s) to the signatory and concurring parties to this Agreement for concurrent review. Within 15 calendar days of its receipt a signatory or concurring party must notify the Board in writing of any deficiencies in the Treatment Plan. The Board then has 10 calendar days to provide the additional information or to determine that such information is not required. The signatory or concurring parties then have 45 calendar days from the receipt of the complete information or the determination that additional information is not required to comment on the Treatment Plan. If no additional information is requested, the parties have 60 calendar days from receipt of the initial plan to submit comments. A

copy of any comments sent to the Board shall be sent simultaneously to the SHPO. If any party fails to submit their comments within 45 calendar days of the receipt of the complete information or 60 calendar days of receipt of the initial plan if it is complete, the Board shall assume that party's concurrence with the Treatment Plan. Based on the comments received during this review, the Board will direct Permittee to make any required revisions within 45 calendar days of the receipt of comments. The final decision on the acceptability of the Treatment Plan will be made by the Board, in consultation with the SHPO within 45 calendar days of receipt of the comments. A copy of the final Treatment Plan will be provided by the Board to the signatories and concurring parties to this Agreement within 15 calendar days of receipt from the Permittee.

V. Review of Data Recovery Reports

a. Reports resulting from the implementation of data recovery in accord with Stipulation III.c, will be submitted by the Permittee to the Board for review. Within 15 calendar days of receipt of the draft report(s), the Board shall provide a copy(s) to the signatory and concurring parties to this Agreement for their review and comment. Within 15 calendar days of its receipt a signatory or concurring party must notify the Board in writing of any deficiencies in the Data Recovery Report. The Board then has 10 calendar days to provide the additional information or to determine that such information is not required. The signatory or concurring parties then have 45 calendar days from the receipt of the complete information or the determination that additional information is not required to comment on the data recovery report. If no additional information is requested, the parties shall have 60 calendar days from receipt of the report to submit comments. A copy of any comments shall be sent simultaneously to the SHPO.

b. Comments will be incorporated, as appropriate into the final report(s) prepared by the Permittee at the direction of the Board in consultation with the SHPO. The final report(s) shall be prepared within 45 calendar days of receipt of comments. Permittee will ensure that reports are responsive to contemporary professional standards, and to the Secretary's Standards for Archaeological Documentation (48 FR 44734-37) as well as the requirements of Section 110(f) of the National Historic Preservation Act where appropriate. A copy of all final reports will be provided by the Board to the signatories and concurring parties to this Agreement within 15 calendar days of receipt from Permittee.

VI. Construction

a. Once the Board has agreed in consultation with the signatories and concurring parties to this agreement on the adequacy of the ID Report(s) as defined in the ID Plan, the Board will allow TRRC, Inc. to begin construction in those portions of the rail line which do not contain National Register eligible historic properties within the Class I and Class III Inventory survey areas provided that such construction will not preclude consideration of the full range of treatment options (including avoidance) of historic properties situated in any adjacent portion of the ROW. Where eligible historic properties are present within the Class I and Class III Inventory survey areas, the Board will allow construction to proceed once the agreed upon data recovery fieldwork/treatment as specified in the Treatment Plan is completed and approved by the Board with the concurrence of the SHPO for that area. Where eligible historic properties are present on BLM, ARS or State Lands, the

Board will allow construction to proceed in that area only after the agreed upon data recovery fieldwork/treatment is completed and approved by the BLM with respect to BLM-administered lands, by ARS with respect to ARS lands and by MT DNRC with respect to State lands, in addition to the Board approval with the concurrence of the SHPO.

b. TRRC, Inc. will notify the Board when data recovery fieldwork/treatment is completed for an area. Within 45 calendar days of notification, the Board, and the BLM if data recovery occurs on BLM-administered lands, ARS if data recovery occurs on ARS-administered land or the MT DNRC if data recovery occurs on State Lands, will inspect the site. Upon the Board and SHPO's concurrence and, if appropriate, BLM's, ARS's or MT DNRC's concurrence, that the data recovery fieldwork/treatment has been satisfactorily completed, the Board will allow construction to proceed in that area prior to the completion of the data recovery report. The data recovery report will be prepared in accordance with Stipulation V. Alternatively, issuance of a final data recovery report pursuant to Stipulation V will be considered approval of the data recovery fieldwork/treatment.

VII. Changes in the ROW/Other Ancillary Areas

a. If changes are made to the alignment after a ID Report(s) is completed that place the alignment, staging areas, work camps, unimproved construction access routes, or other ancillary areas related to the undertaking outside of the areas previously surveyed, then the Board shall direct the Permittee to conduct a Class III inventory of the area(s) not previously surveyed and prepare a supplemental ID Report prior to construction of the previously unsurveyed area. The Board will review the supplemental ID Report including the recommendations of eligibility and findings of effects and distribute it to the signatory and concurring parties to this Agreement within 10 calendar days of the receipt of the supplemental ID Report. The Board shall require the return of comments within 30 calendar days. A copy of any comments should be sent simultaneously to the SHPO. In consultation with the SHPO and any tribe that attaches traditional religious and cultural significance to the property, the Board shall seek to reach concurrence on all site eligibility recommendations in the supplemental ID Report within 30 calendar days of receipt of comments. The Board, in consultation with the SHPO, will finalize determinations of eligibility pursuant to the criteria in Stipulation I.e. within 45 calendar days of receipt of comments. In addition, the Board, in consultation with the SHPO, shall assess the effects of the undertaking as described in Stipulation I.e. within 45 calendar days of the receipt of comments. The Board, in consultation with the SHPO, shall direct the Permittee to make any required revisions to the supplemental ID Report.

b. A copy of the final supplemental ID Report will be provided by the Board to the signatory and concurring parties to this Agreement within 10 calendar days of receipt from the Permittee.

c. The Board, in consultation with SHPO, shall consult with the signatory and concurring parties to this Agreement to avoid, minimize, or mitigate any adverse effects identified in Stipulation VII.a. above in a Treatment Plan Amendment. The Board shall invite representatives of the Arapaho, Sioux, and any other tribes that have expressed an interest in the inventories, to meet with the Board, Permittee and the Northern Cheyenne and Crow tribal representative(s) who participated in the inventory, to discuss how any historic properties of traditional religious and cultural significance could most respectfully be managed as part of the undertaking. The Board shall notify parties of the

proposed treatment options within 45 calendar days of the final supplemental Class III Inventory Report.

d. The Board will ensure that Permittee prepares and TRRC, Inc. implements a Treatment Plan Amendment that will address the adverse effects of the proposed undertaking on historic properties and that balances the concerns of the parties to this Agreement. Such amendment shall (1) identify all eligible historic properties in the APE not previously identified, (2) identify the nature of the effects to which each property identified in the Treatment Plan Amendment will be subjected, and (3) identify the treatment strategies proposed to avoid, minimize or mitigate the effects of the undertaking. The Treatment Plan Amendment shall comply with the provisions in Stipulation III. To the extent practicable, the Treatment Plan Amendment will incorporate measures identified by Native American representatives as necessary for mitigation of adverse effects to properties that are determined to be significant for their traditional cultural values.

e. Within 10 calendar days of receipt of the Treatment Plan Amendment from Permittee, the Board will distribute copies of it to the signatory and concurring parties to this Agreement for a 30 calendar-day comment period. A copy of any comments sent to the Board should be sent simultaneously to SHPO. Within 10 calendar days of the conclusion of the comment period, the Board will direct the Permittee to make any required changes. The final decision on the acceptability of the Treatment Plan Amendment will be made by the Board in consultation with SHPO within 30 calendar days of receipt of comments. A copy of the final Treatment Plan Amendment will be provided by the Board to the signatory and concurring parties to this agreement within 10 calendar days of receipt from the Permittee.

f. The final amendment will be incorporated in the Treatment Plan.

g. Activities undertaken pursuant to this Stipulation VII shall not impact the ability of TRRC, Inc. to construct in any areas other than the areas not previously surveyed as described in Stipulation VII.a. Construction may not begin in the areas described in Stipulation VII.a. until the Board, in consultation with the signatory and concurring parties of this Agreement, determines that the supplemental ID Report described in Stipulation VII.a. is adequate, at which time construction may begin in those areas described in Stipulation VII.a. that have been subjected to a Class III Inventory and do not contain eligible historic properties. Where eligible historic properties are present in those areas described in Stipulation VII.a, TRRC, Inc. will notify the Board when data recovery fieldwork/treatment is completed for an area. Within 45 calendar days of notification, the Board, and the BLM if data recovery occurs on BLM-administered lands, ARS if data recovery occurs on ARS-administered land, or the MT DNRC if data recovery occurs on Montana lands, will inspect the site. Upon the Board and SHPO's concurrence and, if appropriate, the BLM's, ARS's or MT DNRC's concurrence, that the data recovery fieldwork/treatment has been satisfactorily completed, the Board will allow construction to proceed in that area prior to the completion of the data recovery report. The data recovery report will be prepared in accordance with Stipulation V. Alternatively, issuance of a final data recovery report pursuant to Stipulation V will be considered approval of the data recovery fieldwork/treatment.

VIII. Discovery

a. A Discovery Plan for previously unencountered sites will be appended to the Treatment Plan. If a previously undiscovered historic property is encountered during construction, or previously known properties will be affected in an unanticipated manner, all work will cease within 200 feet in all directions until the Board can evaluate and, if necessary, authorize steps to mitigate impacts to the new discovery. Evaluation and mitigation will be carried out in consultation with the signatory and concurring parties to this Agreement as expeditiously as possible in accordance with 36 CFR § 800.13(a)(1).

b. If historic properties are encountered on Federal or State lands, the BLM, ARS or MT DNRC, depending on the agency that controls the land, will be consulted to develop appropriate mitigation measures. TRRC, Inc. will provide the construction contractor with written notification of the proper protocol for discovery of previously unencountered sites.

IX. Human Remains

a. If human remains and funerary objects, sacred objects, or items of cultural patrimony associated with human remains are encountered on Federal lands, the Board or the appropriate Federal land management agency shall consult with the appropriate tribe(s), or other appropriate culturally affiliated groups to determine treatment and disposition measures consistent with applicable Federal laws (such as NAGPRA and NHPA). If human remains and funerary objects, sacred objects, or items of cultural patrimony associated with human remains are encountered on State lands, the Board will consult with tribes, the SHPO and MT DNRC as to appropriate treatment measures in accordance with Section 106 of NHPA and the Montana Human Skeletal Remains and Burial Site Protection Act (M.C.A.22-3-801 through 811. If human remains and funerary objects, sacred objects, or items of cultural patrimony associated with human remains are encountered on private lands, the Board will ensure that they are also treated in accordance with applicable State and Federal law and the provisions of M.C.A. 22-3-801 through 811.

b. TRRC, Inc. will make every effort to avoid disturbing known human burial sites. Where avoidance is not possible, burials will be removed prior to construction and treated in accordance with procedures established by applicable Federal and state law and, culturally affiliated tribes, and in accordance with procedures identified in the Treatment Plan.

c. In the case of inadvertent discovery of human remains during construction activities, the Board will attempt to identify the appropriate Native American tribe(s) or other ethnic group(s) affiliated with the burial, and consult with them over the treatment of remains in accordance with procedures identified in the ID Plan and the Treatment Plan. All work will cease within 200 feet in all directions of the human remains until the requirements of Federal and state laws are satisfied. TRRC, Inc. will provide the construction contractor with written notification of the proper protocol for discovery of human remains, funerary objects, sacred objects or objects of cultural patrimony.

X. Curation

a. The Board shall ensure curation of all records and other items resulting from identification and data recovery efforts is completed in accordance with 36 CFR Part 79, Curation of Federally Owned and Administered Archaeological Collections, and the provisions of NAGPRA. Documentation of the curation of these materials shall be prepared by Permittee and submitted to the Board. The Board shall provide copies of the documentation to the signatory and concurring parties to this Agreement within 15 calendar days of receipt from Permittee. All archaeological materials recovered from BLM lands shall be curated in accordance with BLM requirements at BLM's Billings Curation Center. All archeological materials recovered from ARS lands shall be curated in accordance with 36 CFR Part 79.

b. The Board will encourage private land owners to donate collections from their lands to an appropriate facility meeting the requirements of the Department of the Interior's Manual 411 on curation.⁴ Permittee will provide private landowners with a list of all collected artifact finds from their lands. Materials from private lands to be returned to the private land owners shall be maintained in accordance with 36 CFR Part 79 until any specified analysis is complete. Documentation of the return of these materials to the private land owner shall be prepared by Permittee and submitted to the Board. The Board shall provide copies of the documentation to the signatory and concurring parties of this agreement within 15 calendar days of receipt from Permittee.

c. The Board will ensure through consultation with the MT DNRC that all cultural and paleontologic materials discovered on State lands will be curated in accordance with the Montana State Antiquities Act, M.C.A. 22-3-432.

XI. Dispute Resolution

a. Should any party to this Agreement object within 30 calendar days to any actions pursuant to this Agreement, the Board shall consult with the objecting party to resolve the objection. If the Board determines that the objection(s) cannot be resolved, the Board shall forward all documentation relevant to the dispute to the Council, unless the dispute involves site eligibility. Any unresolved issue regarding site eligibility shall be sent by the Board to the Keeper of the National Register.

b. For disputes not involving site eligibility the Council will, within 30 calendar days of receipt of all pertinent documentation, either:

1. provide the Board with recommendations, which the Board will take into account in reaching a final decision regarding the dispute; or
2. notify the Board that it will comment pursuant to 36 CFR Part 800.7(c)(1) through 36 CFR Part 800.7(c)(4), and proceed to comment.

⁴ Stipulation X. b. addresses the curation of cultural resources encountered during construction of the Tongue River Railroad on land owned by private party(ies) other than the Tongue River Railroad Company. Materials found on land owned by the Tongue River Railroad Company will be donated to an appropriate facility meeting the requirements of the Department of the Interior's Manual 411 on curation.

Should the Council not exercise one of the above options within 30 calendar days after receipt of all pertinent documentation the Board may assume the Council's concurrence with the Board's proposed response to the dispute.

Any Council comment provided in response to such a request will be taken into account by the Board in accordance with 36 CFR Part 800.7(c)(4) with reference to the subject of dispute.

c. For disputes regarding site eligibility the Board will send all pertinent documentation to the Keeper of the National Register to make a determination on issues regarding site eligibility.

d. Any recommendation or comment provided by the Council or the Keeper of the National Register will be understood to pertain only to the subject of the dispute; and no additional work shall occur which could affect the historic property(s) under dispute until resolution of said dispute. The Board's responsibility to carry out all actions under this Agreement that are not the subject of the dispute will remain unchanged.

e. Should any member of the public with a demonstrated interest in the project or Federally recognized tribal member raise a timely and substantive objection pertaining to the manner in which the terms of this Agreement are carried out, at any time during its implementation, the Board shall take the objection into account by consulting with the objector to resolve the objection. When the Board responds to an objection, it shall notify the parties to this Agreement of the objection and the manner in which it was resolved. The Board may request assistance of the Council to resolve objections

XII. Public Participation

The Board will ensure that an active public participation program be carried out. Modified version of reports required under this Agreement (locational information removed), will be made available for review to the general public on the Boards website at www.stb.dot.gov. The views of the parties to this Agreement, interested parties, and the general public will be considered by the Board with respect to the terms of this Agreement.

Consistent with Section 304 of the National Historic Preservation Act of 1966, as amended, Executive Order 13007, and ARPA, the parties to this Agreement will withhold from disclosure to the public, information about the location, character, or ownership of a historic property or if it is determined that disclosure may (1) cause a significant invasion of privacy, (2) risk harm to a historic property, or (3) impede the use of a traditional religious site by practitioners.

XIII. Final Report

Within six(6) months of completing construction of the rail line a Final Report shall be prepared and submitted to the Board who will provide copies to the signatory and concurring parties to this Agreement. The Final Report shall include all Class I, windshield, and Class III inventory reports, treatment plans, and data recovery reports for the project. The report shall also include information

about treatment and disposition of any human remains and funerary objects, sacred objects, or items of cultural patrimony associated with human remains encountered during construction.

XIV. Effective Date

This Agreement shall become effective when executed by the authorized representatives of each party and implementation of the Agreement may begin.

XV. Amendments

Any party to this Agreement may request that it be amended, whereupon the parties will consult in accordance with 36 CFR Part 800 to consider such amendment.

XVI. Termination

Any signatory party to this Agreement may terminate it by providing thirty (30) calendar days notice, in writing, to the other parties, provided that the parties will consult during the period prior to termination to seek agreement or amendments or other action that would avoid termination. In the event of a termination, the Board will comply with 36 CFR Part 800.4 through 800.6 with regard to this undertaking.

XVII. Duration

This Agreement shall remain in effect for five (5) years after its execution by the signatories, at which time the Board will notify the parties within three months of its impending expiration and request to extend it for a specific time period. All signatories must respond affirmatively prior to the expiration date for the Agreement to remain in effect.

Execution and implementation of this Programmatic Agreement evidences that the Board has afforded the Council a reasonable opportunity to comment on the construction of the Tongue River Railroad.

SURFACE TRANSPORTATION BOARD

By: _____ Date: _____

MONTANA STATE HISTORIC PRESERVATION OFFICER

By: _____ Date: _____

ADVISORY COUNCIL ON HISTORIC PRESERVATION

By: _____ Date: _____

U.S. ARMY CORPS OF ENGINEERS

By: _____ Date: _____

U.S. DEPARTMENT OF THE INTERIOR BUREAU OF LAND MANAGEMENT

By: _____ Date: _____

U.S. DEPARTMENT OF AGRICULTURE AGRICULTURAL RESEARCH SERVICE

By: _____ Date: _____

MONTANA DEPARTMENT OF NATURAL RESOURCES AND CONSERVATION

By: _____ Date: _____

TONGUE RIVER RAILROAD COMPANY, INC.

By: _____ Date: _____

Concurrence:

NORTHERN CHEYENNE TRIBE

By: _____ Date: _____

CROW TRIBE

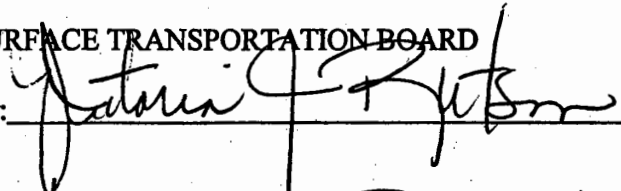
By: _____ Date: _____

NORTHERN PLAINS RESOURCE COUNCIL

By: _____ Date: _____

Execution and implementation of this Programmatic Agreement evidences that the Board has afforded the Council a reasonable opportunity to comment on the construction of the Tongue River Railroad.

SURFACE TRANSPORTATION BOARD

By: 

Date: Oct. 6, 2005

Victoria J. Rutson

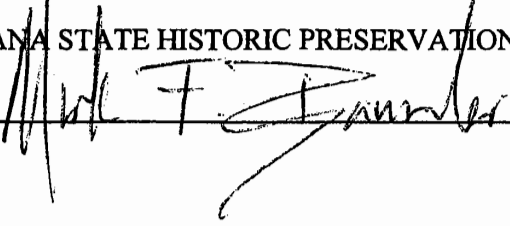
Chief

Section of Environmental Analysis

Execution and implementation of this Programmatic Agreement evidences that the Board has afforded the Council a reasonable opportunity to comment on the construction of the Tongue River Railroad.

MONTANA STATE HISTORIC PRESERVATION OFFICER

By: _____



Date: _____

8/31/2005

Execution and implementation of this Programmatic Agreement evidences that the Board has afforded the Council a reasonable opportunity to comment on the construction of the Tongue River Railroad.

SURFACE TRANSPORTATION BOARD

By: _____ Date: _____

MONTANA STATE HISTORIC PRESERVATION OFFICER

By: _____ Date: _____

ADVISORY COUNCIL ON HISTORIC PRESERVATION

By: _____ Date: 11/1/05

U.S. ARMY CORPS OF ENGINEERS

By: _____ Date: 29 Sep 05

U.S. DEPARTMENT OF THE INTERIOR BUREAU OF LAND MANAGEMENT

By: _____ Date: _____

U.S. DEPARTMENT OF AGRICULTURE AGRICULTURAL RESEARCH SERVICE

By: _____ Date: _____

MONTANA DEPARTMENT OF NATURAL RESOURCES AND CONSERVATION

By: _____ Date: _____

TONGUE RIVER RAILROAD COMPANY, INC.

By: _____ Date: _____

Concurrence:

NORTHERN CHEYENNE TRIBE

By: _____ Date: _____

CROW TRIBE

By: _____ Date: _____

NORTHERN PLAINS RESOURCE COUNCIL

By: _____ Date: _____

Execution and implementation of this Programmatic Agreement evidences that the Board has afforded the Council a reasonable opportunity to comment on the construction of the Tongue River Railroad.

SURFACE TRANSPORTATION BOARD

By: _____ Date: _____

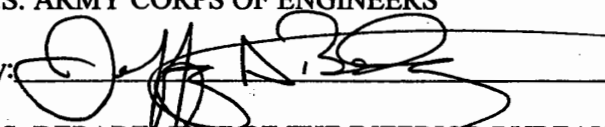
MONTANA STATE HISTORIC PRESERVATION OFFICER

By: _____ Date: _____

ADVISORY COUNCIL ON HISTORIC PRESERVATION

By: _____ Date: _____

U.S. ARMY CORPS OF ENGINEERS

By:  _____ Date: 29 Sep 05

U.S. DEPARTMENT OF THE INTERIOR BUREAU OF LAND MANAGEMENT

By: _____ Date: _____

U.S. DEPARTMENT OF AGRICULTURE AGRICULTURAL RESEARCH SERVICE

By: _____ Date: _____

MONTANA DEPARTMENT OF NATURAL RESOURCES AND CONSERVATION

By: _____ Date: _____

TONGUE RIVER RAILROAD COMPANY, INC.

By: _____ Date: _____

Concurrence:

NORTHERN CHEYENNE TRIBE

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CROW TRIBE

By: _____ Date: _____

NORTHERN PLAINS RESOURCE COUNCIL

By: _____ Date: _____

Execution and implementation of this Programmatic Agreement evidences that the Board has afforded the Council a reasonable opportunity to comment on the construction of the Tongue River Railroad.

SURFACE TRANSPORTATION BOARD

By: _____ Date: _____

MONTANA STATE HISTORIC PRESERVATION OFFICER

By: _____ Date: _____

ADVISORY COUNCIL ON HISTORIC PRESERVATION

By: _____ Date: _____

U.S. ARMY CORPS OF ENGINEERS

By: _____ Date: _____

U.S. DEPARTMENT OF THE INTERIOR BUREAU OF LAND MANAGEMENT

By: *David M. Schrey* Date: 10/13/05

U.S. DEPARTMENT OF AGRICULTURE AGRICULTURAL RESEARCH SERVICE

By: _____ Date: _____

MONTANA DEPARTMENT OF NATURAL RESOURCES AND CONSERVATION

By: _____ Date: _____

TONGUE RIVER RAILROAD COMPANY, INC.

By: _____ Date: _____

Concurrence:

NORTHERN CHEYENNE TRIBE

By: _____ Date: _____

CROW TRIBE

By: _____ Date: _____

NORTHERN PLAINS RESOURCE COUNCIL

By: _____ Date: _____

Execution and implementation of this Programmatic Agreement evidences that the Board has afforded the Council a reasonable opportunity to comment on the construction of the Tongue River Railroad.

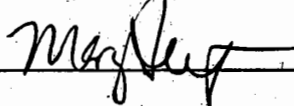
U.S. DEPARTMENT OF AGRICULTURE AGRICULTURAL RESEARCH SERVICE

By: W. H. Blahm Date: 19 Sept 2005

Execution and implementation of this Programmatic Agreement evidences that the Board has afforded the Council a reasonable opportunity to comment on the construction of the Tongue River Railroad.

MONTANA DEPARTMENT OF NATURAL RESOURCES AND CONSERVATION

By: _____

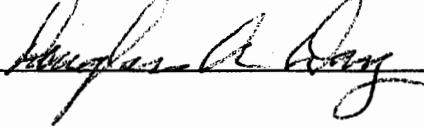
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Date: _____

9/15/05

Execution and implementation of this Programmatic Agreement evidences that the Board has afforded the Council a reasonable opportunity to comment on the construction of the Tongue River Railroad.

TONGUE RIVER RAILROAD COMPANY, INC.

By:  Date: 9-7-05

Appendix 1

Definitions

Class I Inventory

A Class I Inventory is a professionally prepared study of existing cultural resource data from published and unpublished documents, BLM cultural resource inventory records, institutional site files, State and National registers, informant interviews and other information sources. The purpose of the Class I Inventory is to obtain sufficient information about the prehistoric and historic properties, cultural landscapes, and properties of traditional cultural value to determine if these properties may be affected by the undertaking.

Windshield Survey

Windshield survey involves review of a project area by qualified cultural resource specialists from publicly accessible roads. The focus of the survey is to identify potential visual, audible, and atmospheric effects, as well as other indirect effects on standing structures, cultural landscapes and properties of traditional cultural value that may be affected by the undertaking outside the APE.

Class III Inventory

A Class III Inventory is a professionally conducted intensive survey of an entire target area (except for any subareas determined very unlikely to contain discoverable cultural properties such as developed and previously disturbed areas) aimed at locating and recording all cultural properties that have surface and exposed profile indications, through systematic inspection commonly carried out by a professional archaeologists walking a series of close-interval parallel transects until the area has been thoroughly examined. The Class III survey will be conducted using transects no more than 30 meters apart. If necessary, test excavations will be conducted to locate and record cultural resources.

The Class III Inventory also will be conducted on any staging areas, work camps, unimproved construction access routes, and other ancillary areas related to the undertaking. Ancillary areas include all contractor supplied construction materials (e.g. gravel, ballast, fill borrow, etc.) that would result in ground disturbance that have not otherwise been surveyed and permitted separately (e.g. commercial sources of ballast or gravel).

Reconnaissance Survey

A reconnaissance survey is an on the ground or pedestrian examination of all or part of an area accomplished in sufficient detail to make generalizations about the types and distributions of historic properties that may be present.

Attachment A

July, 2005 Identification Plan for the Tongue River Railroad Project

Surface Transportation Board Finance Docket No. 30186 (Sub-No. 3)

1. PURPOSE

This Identification Plan (ID Plan) has been developed by the Surface Transportation Board (Board) as part of the Section 106 Programmatic Agreement (PA) for the Tongue River Railroad Project, Finance Docket No. 30186 (Sub-No. 3). The ID Plan outlines the process for the identification and evaluation of historic properties for the project and describes: 1) the safety measures to be followed in compliance with the ID Plan; 2) the project's area(s) of potential effect (APE(s)); 3) the cultural resources studies required to identify, record, and evaluate historic properties located within the APE(s); 4) the minimum standards required for the cultural resource investigations; and 5) tribal and consulting party involvement.

The ID Plan has been developed in accordance with the stipulations outlined in the PA for this project, Section 106 of the National Historic Preservation Act (NHPA), Executive Order 13175, *Consultation and Coordination with Indian Tribal Governments*, other applicable Federal laws that consider impacts to historic properties for Federal undertakings, and the *Secretary of Interior's Standards and Guidelines for Archeology and Historic Preservation (Standards and Guidelines)* (48 FR 44716-44742).

2. SAFETY

All contractors and sub-contractors shall adhere to Occupational, Safety, and Health Administration (OSHA) standards while conducting related activities covered in the PA and ID Plan. Such personnel shall also follow the Bureau of Land Management (BLM) and Tongue River Railroad Company, Inc. (TRRC, Inc.) safety rules when conducting activities on lands under management or jurisdiction of these parties.

3. AREA OF POTENTIAL EFFECT (APE)

The APE for the project will include:

1. The construction right-of-way (ROW) to include a twenty-foot buffer on either side of the fenced construction ROW along the entire route (ground disturbance area).
2. All lateral areas, borrow areas, haul roads (new or upgraded), staging areas, and other ancillary areas related to the undertaking.

3. That area outside the construction or ground disturbance ROW where there is the potential for the undertaking to have an adverse effect on historic properties, as defined in 36 CFR 800.5. Identification of these areas will include consultation with the SHPO, THPO/cultural resource representatives designated by the tribes, TRRC, Inc., other identified consulting parties, and Federal agencies.

4.0 IDENTIFICATION AND EVALUATION

Class I and Windshield Survey

The Class I Inventory, previously conducted for this project and described in the PA, shall be updated for an area 1,500 feet on either side of the centerline of the approval rail alignment.¹ The Class I Inventory is a professionally prepared study of existing cultural resource data from published and unpublished documents, BLM cultural resource inventory records, archival records, geomorphological and soil studies, institutional site files, State and National registers, informant or ethnographic interviews and other information sources. The purpose of the Class I Inventory is to obtain sufficient information about the existing or known prehistoric and historic properties, cultural landscapes, and properties of religious and cultural significance located within the project area to determine if these properties are eligible for the National Register and may be affected by the undertaking. The Class I Inventory also assists in determining the potential for previously unidentified historic properties to be located within the project area. The update will include, as needed, a reevaluation of the National Register eligibility of previously identified historic properties.

In addition, a windshield survey shall be conducted from publicly accessible roads of a one-mile wide corridor centered on the approved railroad alignment. The windshield survey involves review of a project area by qualified cultural resource specialists from publicly accessible roads. The focus of the survey is to identify potential visual, audible, and atmospheric effects, as well as other indirect effects on National Register eligible or listed historic properties including standing structures, buildings, districts, sites, cultural landscapes and properties of religious and cultural significance that may be affected by the undertaking.

The results of the Class I Inventory and windshield survey are intended to help guide the more detailed Class III Inventory(s). The results of the Class I Inventory and windshield survey shall be and included in a combined report.

¹ The BLM Miles City Office will be conducting a Landscape Level Overview of the High Potential Coalbed Methane Area in the later part of 2005 which will serve as a historic context and research direction document. This overview will overlap with the Tongue River Railroad project area. Additionally the BLM Miles City Office in cooperation with the Ashland Ranger District, Custer National Forest, Gnomon Inc, and Western GeoArch Research have applied for a grant to conduct predictive modeling in the Tongue River and Powder River drainages. This will include a geo-archaeological study similar to the one required by this ID plan and should cover the Tongue River Railroad project area. If possible SEA/permittee will coordinate with the BLM to incorporate information from these studies into the ID plan to avoid duplication of effort.

Class III Inventory

The Class III Inventory will be performed for the entire alignment; however, the Class III Inventory may be performed for a portion of the alignment, such that once TRRC, Inc. has access to a portion of the alignment TRRC, Inc. may direct the Cultural Resource Use Permittee (Permittee)² to perform a Class III Inventory for that portion and prepare the Class III Inventory Report for that portion. TRRC, Inc. will provide the signatory and concurring parties to the PA with a map of the area to be inventoried prior to performing each Class III Inventory.

The Class III Inventory will include the following activities:

1. An intensive pedestrian survey of the construction ROW plus 20 feet on either side of the fenced construction ROW.
2. An intensive pedestrian survey of all the lateral areas, borrow areas, haul roads (new and upgraded), staging areas, and other ancillary areas related to the undertaking.
3. An intensive pedestrian survey of the construction ROW using transect no more than 30 meters apart. If necessary, test excavation will be conducted to locate, record and evaluate the National Register eligibility of any identified historic properties. Test excavation may include shovel testing, augering, 1 x 1m or 50 x 50 cm test units, and use of heavy equipment such as backhoes in certain cases. Tribal input will be sought when assessing the National Register eligibility of any properties of religious and cultural significance to tribes. If, in the opinion of the Permittee and the cultural resource representative designated by the tribes, an historic property is eligible for the National Register as a traditional cultural property³, sufficient information to formulate Treatment Plan(s) shall be obtained.
4. A geomorphological survey of the construction ROW will be conducted to identify areas where buried historic properties may exist and where deep testing, as identified by the geomorphologist, may be necessary to identify cultural resources. The geomorphologist will also recommend construction monitoring areas and assist in evaluating the National Register eligibility of any newly identified buried historic properties by providing identification of the soil(s), soil characteristics, soil dating, and analysis of the probability of the soils to contain cultural material.
5. A reconnaissance level survey of those areas outside the ground disturbance area where there is the potential for the undertaking to have an adverse effect, as defined in 36 CFR 800.5, on historic properties. A reconnaissance survey is an on the ground or pedestrian examination of all

² See PA Stipulation I.c. which describes the necessary qualification for the Cultural Resource Use Permittee.

³ See National Register Bulletin 38, Guidelines for Evaluating and Documenting Traditional Cultural Properties.

or part of an area accomplished in sufficient detail to make generalizations about the types and distributions of historic properties that may be present. Identification of these areas will include consultation with the SHPO, THPO/cultural resource representative designated by the tribes, TRRC, Inc. other identified consulting parties, and Federal agencies.

Any areas not originally identified within the APE, but potentially affected by the undertaking, must be identified by the Board in consultation with the SHPO, THPO/cultural resource representative designated by the tribes, TRRC, Inc. other identified consulting parties, and Federal agencies. The Board will consult with the SHPO, THPO/cultural resource representative designated by the tribes, TRRC, Inc. other identified consulting parties (as defined in 36 CFR 800.2(c)), and Federal agencies to address their concerns.

5. STANDARDS AND QUALIFICATIONS

The Class I and III Inventories shall be conducted consistent with the *Standards and Guidelines*, applicable Federal laws, and guidelines of the MT SHPO. In addition, the professionals that will conducting cultural resources studies described for the Tongue River Railroad Project shall meet the *Secretary of the Interior's Professional Qualifications and Standards (Professional Qualifications and Standards)* (48 FR 22716, September 1983). All National Register findings shall be made pursuant to 36 CFR 800, 36 CFR 60.4, National Park Service Bulletin 38.

If unanticipated discoveries of cultural resources are found during implementation of the undertaking, the Board shall satisfy the requirements of Section 106 in accordance with 36 CFR 800.13.

6. REPORTS

All reports prepared pursuant to this ID Plan should follow the outline below to address the specific requirements of the survey conducted. Class III Inventory Reports should provide information for future research and National Register recommendations for those historic properties identified as National Register eligible. Class III Inventory Reports must provide explanations of potential effects on historic properties and comply with 36 CFR 800.5.

The reporting of results and discussions of the cultural resources investigations shall be organized in a logical sequence. In tables, site numbers shall be organized in sequence. A detailed outline of the required elements for the reports is contained as follows:

PART 1

Cover

Must include report title, date of report, project number(s), authors, organizations or who prepared the report.

Cover Page

Must include authors, report title, date of report, lead agency, preparer's organization, type of report (Class I/Windshield Survey, Class III Inventory), survey methods (transects in meters), county(s), USGS quad(s), landowner(s), legal description (reference to project maps may be appropriate), acreage (Federal, non-federal, block and linear with total), file search date(s), field personnel, and a site summary table.

Abstract

Table of Contents

List of Figures

List of Tables

Appendix(s)

1. Introduction

Project Description (include appropriate permit and agency file numbers)
Personnel (their roles and duties on the project)
Report Format (what is in each chapter of the report and who wrote or contributed to each chapter)

2. Environmental Overview

Topography
Geology
Drainages
Flora
Fauna
Climate
Paleoenvironment

3. Culture History

Paleoindian (includes a discussion of pre-Clovis)
Archaic etc. (varies widely along the project)
Woodland and Plains (Plains Indian)
Village
Contact Period (Protohistoric)

Historic

4. Research Design and Materials

Archaeological Site Definition

Prehistoric Archaeological Research Orientation

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Methods

Chipped-stone Technological and Functional Analysis

Methods

Historic Artifact Collection and Analysis

Methods

Curation

Methods

Facilities/Disposition

References

Appendix(s)

(Geomorphological Report)

Detailed Project Location Maps

and

Ethnographic Reports for all Traditional Cultural Properties that may be eligible for the National Register (if required to justify recommendations)

5. Results of Investigation

(A detailed discussion of each site that will include, as a minimum, the following information)

Site type, component, USGS 7.5 minute quadrangle, site area, topography, elevation, soil type, nearest water, survey method, site condition, site description, artifact descriptions and disposition, interpretation, and recommendation.

Legal and UTM locations will be confidential and only included in a removable appendix.

6. Research Findings (answer research questions presented in Chapter 4)

Prehistoric Context

Site distribution relative to environmental variables potential for unanticipated discovery

Site density

Site function

Temporal and cultural affiliation

Historic Context

Site distribution relative to environmental variables potential for unanticipated discovery

Site density

Site function

Temporal and cultural affiliation

7. Conclusions and Recommendations (appropriate text but also include tables to explain the recommendations)

Conclusions

Prehistoric Sites

Historic Sites

Recommendation (eligibility recommendations)

Prehistoric Sites

Site Specific/Avoidance/Mitigation/Other Historic Sites

Site Specific/Avoidance/Mitigation/Other

8. References

9. Appendix(s)

(Geomorphology report)

(Ethnographic)

(Site forms)

(Maps)

(Correspondence)

(American Indian coordination and consultation documentation and description)

(American Indian monitor reports)

(Other ancillary studies for example: radiocarbon, AMS, faunal analysis, phytolith analysis, pollen analysis, etc)

7. FIELDWORK – Survey Methods for Subsurface Investigations

Subsurface testing should be conducted in accordance with the Guidelines and Procedures for Cultural Resource Review and Consultation under the National Historic Preservation Act and Montana State Antiquities Act, Montana State Historic Preservation Office, Planning Bulletin No. 21.

(<http://www.his.state.mt.us/shpo/archaeology/consultingwith.asp>)

- **Shovel Testing and Augering**

Shovel testing and augering will be required if the surface visibility is less than 50% in the opinion of the project archaeologist/principle investigator, or if the terrain warrants the shovel tests. Tests will be approximately 30x30 centimeters to minimum depth of 50 centimeters or until sterile subsoil, or bedrock, or water is encountered. Tests will be spaced no further than 30 meters apart or closer if required by the SHPO. Shovel tests or augering will not be done if, in the project archaeologist's justifiable judgment (such as steep terrain or rocky or other etc.) they are unnecessary.

Regardless of surface visibility, shovel test or augering will be conducted and documented on each identified site or isolated find site. If a shovel test or augering is not conducted, justification for not conducting the test will be noted in field notes, site form or report. Deviation from the above policies must be justified.

- **1 x 1 meter or 50 x 50 cm Test Units**

If in the opinion of the project archaeologist/principle investigator 1 x 1 meter test units are necessary, the test unit will be excavated in arbitrary 10 centimeter levels, unless cultural material is encountered, to a depth of 50 centimeter or 20 centimeters below the last level of cultural material. Augering shall be conducted in the center of the 1 x 1 meter unit to a depth of 1 meter.

- **Backhoe Excavation**

Heavy equipment such as a backhoe may be necessary for the identification of a buried historic resource. In this event, a backhoe equipped with a 3 foot bucket shall be used for excavation to 1.5 meters. Excavated materials shall be randomly screened using ¼ inch screen.

- **Collection**

All subsurface artifacts will be collected and properly labeled in the field. Surface collection of sites not within the ground disturbance area is not required. All obsidian artifacts shall be collected.

- Curation

The Board shall ensure curation of all records and other items resulting from identification and data recovery efforts is completed in accordance with 36 CFR Part 79, Curation of Federally Owned and Administered Archaeological Collections, and the provisions of NAGPRA. Documentation of the curation of these materials shall be prepared by Permittee and submitted to the Board. The Board shall provide copies of the documentation to the signatory and concurring parties to this Agreement within 15 calendar days of receipt from Permittee. All archaeological materials recovered from BLM lands shall be curated in accordance with BLM requirements at BLM's Billings Curation Center. All archeological materials recovered from ARS lands shall be curated in accordance with 36 CFR Part 79.

The Board will encourage private land owners to donate collections from their lands to an appropriate facility meeting the requirements of the Department of the Interior's Manual 411 on curation. Permittee will provide private landowners with a list of all collected artifact finds from their lands. Materials from private lands to be returned to the private land owners shall be maintained in accordance with 36 CFR Part 79 until any specified analysis is complete. Documentation of the return of these materials to the private land owner shall be prepared by Permittee and submitted to the Board. The Board shall provide copies of the documentation to the signatory and concurring parties of this agreement within 15 calendar days of receipt from Permittee.

The Board will ensure through consultation with the MT DNRC that all cultural and paleontologic materials discovered on State lands will be curated in accordance with the Montana State Antiquities Act, M.C.A. 22-3-432.

- Human Remains

If human remains and funerary objects, sacred objects, or items of cultural patrimony associated with human remains are encountered on Federal lands, the Board or the appropriate Federal land management agency shall consult with the appropriate Tribe(s), or other appropriate culturally affiliated groups to determine treatment and disposition measures consistent with applicable Federal laws (such as NAGPRA and NHPA). If human remains and funerary objects, sacred objects, or items of cultural

patrimony associated with human remains are encountered on State lands, the Board will consult with tribes, the SHPO and MT DNRC as to appropriate treatment measures in accordance with Section 106 of NHPA and the Montana Human Skeletal Remains and Burial Site Protection Act (M.C.A.22-3-801 through 811. If human remains and funerary objects, sacred objects, or items of cultural patrimony associated with human remains are encountered on private lands, the Board will ensure that they are also treated in accordance with applicable State and Federal law and the provisions of M.C.A. 22-3-801 through 811.

TRRC, Inc. will make every effort to avoid disturbing known human burial sites. Where avoidance is not possible, burials will be removed prior to construction and treated in accordance with procedures established by applicable Federal and state law and, culturally affiliated tribes, and in accordance with procedures identified in the Treatment Plan.

In the case of inadvertent discovery of human remains during construction activities, the Board will attempt to identify the appropriate Native American Tribe(s) or other ethnic group(s) affiliated with the burial, and consult with them over the treatment of remains in accordance with procedures identified in the ID Plan and the Treatment Plan. All work will cease within 200 feet in all directions of the human remains until the requirements of Federal and state laws are satisfied. TRRC, Inc. will provide the construction contractor with written notification of the proper protocol for discovery of human remains, funerary objects, sacred objects or objects of cultural patrimony.

- **Evaluation Testing**

Sufficient subsurface testing, as determined by the Board, the Permittee, the SHPO, the BLM if BLM administered lands, the ARS if ARS administered lands or MT DNRC if state lands, and the Native American monitor on those sites suspected to be NRHP eligible, will be conducted to allow the Permittee to develop Treatment Plans or other alternatives to address any adverse effects.

- **Minimum Field Recordation Standard**

1. **Prehistoric and Historic Sites**

The appropriate site forms will be completed while on site (if possible). A sketch map and field notes (field notes should be kept by each crew member), and photographs of the site will be required. A description of the artifacts and features observed on each site shall be included in the field notes. The site will be noted on a 7.5 minute USGS quad.

All photographs will be keyed in the corresponding roll and frame number and identified as such on a photo log. The photo log will also include the site number or temporary site number, time of day, weather conditions at the time of the photograph, what was photographed, and the direction the photographer was facing. The ASA setting and the type of film (color or B&W) shall also be noted (Once the film is developed this information will be on the individual photograph along with the state-assigned site number). Upon completion of the project and acceptance of the Final Cultural Resources Report all photographs and negatives shall be shipped to the appropriate curation facility.

2. Standing Structures (including buildings, bridges, and other structures)

The appropriate site forms will be completed while on site. The field notes will include the address or location, the present condition and integrity of the property; a description of the prominent architectural/engineering features with emphasis on the primary facade; a documented or estimated date of original construction; identification of obvious alterations/additions; and a designation of style or vernacular type, when applicable. A 3 ½-inch by 5-inch black and white photograph of each property will be taken using 35mm format. Each photograph will be keyed with the corresponding roll and frame number and identified as such on individual photographs (see photo log instructions above). Original negatives and contact sheets will be included with the final report (Structures should be evaluated in the field by a qualified architectural historian). Upon completion of the project and acceptance of the Final Cultural Resources report all photographs and negatives shall be shipped to the appropriate curation facility.

CONFIDENTIALITY

All Signatories and Invited Signatories shall ensure that shared data, including data concerning the precise location and nature of historic properties and properties of religious and cultural significance are protected from public disclosure to the greatest extent permitted by law, including conformance to Section 304 of the NHPA, as amended and Section 9 of the ARPA and Executive Order on Sacred Sites 13007 FR 61-104 dated May 24, 1996.

Appendix D

Biological Opinion
and
Biological Assessment for Endangered
or Threatened Species

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United States Department of the Interior



FISH AND WILDLIFE SERVICE

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M.24-STB (ICC) Tongue River Railroad
Formal Consultation - 6MT-06-F02B

July 12, 2006

Ms. Victoria Rutson, Chief
Section of Environmental Analysis
Surface Transportation Board
1925 K Street, NW
Washington, DC 20423-0001

Dear Ms. Rutson:

This letter transmits the U.S. Fish and Wildlife Service's (Service) biological opinion based on our review of the proposed Tongue River Railroad Company's (TRRC) rail construction and operation in Rosebud, Custer, and Big Horn Counties, Montana. This transmittal letter also conveys our concurrence on the effects of your proposed action on listed species, incorporating modifications of the proposed action and conservation measures. This consultation concerns the possible effects of the TRRC's proposed rail construction and operation of the Tongue River Railroad on the bald eagle (*Haliaeetus leucocephalus*), whooping crane (*Grus americana*), the black-footed ferret (*Mustela nigripes*), the pallid sturgeon (*Scaphirhynchus albus*), and the interior least tern (*Sterna antillarum athalassos*). Critical habitat has not been designated for this species; therefore, none will be affected. This biological opinion was prepared in response to the Service's September 26, 2005 receipt of your September 20, 2005 letter, and September 2005 Biological Assessment (BA) requesting concurrence and initiation of formal section 7 consultation under the Endangered Species Act. The Surface Transportation Board's (Board) Section of Environmental Analysis (SEA), in a letter received by the Billing's Sub Office on February 13, 2006, agreed to a 90-day extension for formal consultation. The extension was necessitated by the need for further information and discussion on the possible impacts of this action on the Miles City Fish Hatchery (MCFH) and the pallid sturgeon.

This document represents the Service's biological opinion on the effects of that action on the bald eagle in accordance with section 7 of the Endangered Species Act of 1973, as amended, (16 U.S.C. 1531 et seq.). The Service has examined the proposed project in accordance with the section 7 Interagency Cooperation Regulations (50 CFR 402, 51 FR 19957-19963). This biological opinion refers only to the potential effects on the bald eagle and not the overall environmental acceptability of the proposed project. A complete administrative record of this consultation is on file at the Service's Montana Field Office, Billings Sub Office, Billings, Montana.

Based on the review of the revised BA and accompanying material, we concur with your determination that the proposed action is likely to adversely affect the threatened bald eagle. The Service also concurs with your determination that the action is not likely to adversely affect the pallid sturgeon, whooping crane, and the interior least tern.

Black-footed Ferret

The Service concurs with your determination that the action is not likely to adversely affect the black-footed ferret. This concurrence is based upon the past efforts to locate black-footed ferrets in the area, completion of a new survey and a commitment to complete additional surveys.

The September 2005 BA identified four black-tailed prairie dog (*Cynomys ludovicianus*) colonies greater than 80 acres. A 168 acre colony was surveyed according to the Service's Black-footed Ferret Survey Guidelines (U.S. Fish and Wildlife Service 1989), in September 2005 and found no ferrets or their sign. The TRRC has agreed to a modification to mitigation measure 26 in SEA's October 2004 Draft Supplemental Environmental Impact Statement (DSEIS).

Mitigation Measure 26 (Data Reconnaissance). Prior to the beginning of construction of each segment and once full access to the site of the railroad right-of-way is obtained, TRRC shall conduct aerial and ground-level surveys, as appropriate. Black-tailed prairie dog surveys shall be conducted to determine if construction of the line will traverse any additional prairie dog colonies. The surveys shall also determine the existence of black-footed ferrets. If black-footed ferrets are discovered, the Service and Montana Department of Fish, Wildlife, and Parks (FWP) shall be notified, and section 7 consultation must be re-initiated with the Service. Based on the surveys, TRRC shall develop appropriate means to mitigate the effects of construction and operation of the line on the black-tailed prairie dog and the black-footed ferrets for approval by the Task Force in accordance with the process set forth in Mitigation Measure 14. Regardless of the timing of construction, once full access to the site of the railroad right-of-way is obtained, TRRC must survey the three black-tailed prairie dog colonies for black-footed ferret occupancy which will be traversed by the proposed railroad, but are located on private properties. These colonies were not accessible due to landowner issues at the time the BA was prepared.

Pallid Sturgeon

The pallid sturgeon was listed by the Service in 1990 as endangered throughout its range. Bailey and Cross (1954) described the range of the pallid sturgeon as encompassing the middle and lower Mississippi River, the Missouri River, and the lower reaches of the Platte, Kansas, and Yellowstone rivers. Today, the pallid sturgeon is one of the rarest fish in the Missouri and Mississippi river basins (U.S. Fish and Wildlife Service 1993). Since 1980, reports of most frequent occurrence have included the lower 70 miles of the Yellowstone River (U.S. Fish and Wildlife Service 1993). The Service approved a recovery plan for the pallid sturgeon in 1993 (U.S. Fish and Wildlife Service 1993) that identified six Recovery Priority Management Areas (RPMA) and called for a stocking plan of hatchery raised pallid sturgeons as part of the recovery process. Recovery Priority Management Area 2 (RPMA 2) includes the Missouri River below Fort Peck Dam to the headwaters of Lake Sacagawea and the lower Yellowstone River up to the

confluence of the Tongue River, Montana. Recovery Priority Management Area 1 (RPMA 1) is the reach of the Missouri River above Fort Peck Reservoir. This reach is also identified in the Pallid Sturgeon Recovery Plan (U.S. Fish and Wildlife Service 1993) as an important area for recovery.

Pallid sturgeon move up and down the lower 75 miles of the Yellowstone River both daily and seasonally. Bramblett (1996) found that pallid sturgeon can move as much as 13 miles a day at a rate as fast as six miles per hour. It has been suggested that discharge and photoperiod may be important environmental cues for timing of migration and other movements (Bramblett 1996). With increasing discharge, pallid sturgeon tend to be found further upstream in the Yellowstone River below Intake Dam (Bramblett 1996). Bramblett (1996) suggests that the majority of the remaining pallid sturgeon in the area of the Missouri-Yellowstone river confluence utilize the lower Missouri River (defined as the reach between the confluence with the Yellowstone River and the headwaters of Lake Sacagawea) during late summer, fall, and winter; and move into the lower Yellowstone River to spawn. Pallid sturgeons were found to aggregate in the lower Yellowstone River from river mile (RM) 0 to RM 8 during spring and summer (Bramblett 1996). It is suggested that this aggregation during spring and summer is strongly associated with spawning and that this reach of the lower Yellowstone River is significant to the survival of the pallid sturgeon.

The Yellowstone River has some of the best remaining known habitat necessary for successful spawning. The eggs hatch from three to eight days later and the sack fry are carried downstream by the current in search of suitable rearing habitat (U.S. Fish and Wildlife Service 2000). It is likely that the further upstream the pallid sturgeon spawn, the longer the drifting larval fish have to develop and select habitat before they drift into impounded reservoirs without riverine conditions (G. Jordan, U.S. Fish and Wildlife Service, pers. comm. 2006). This suggests that the ability to move upstream may be critical to the development and survival of larval and immature fish and the species. Recovery Priority Management Area 2 may be the only RPMA that has the potential to realize substantial natural spawning of genetically pure pallid sturgeon. The value of restoring the Yellowstone River as a natural migratory route for sturgeon, and restoring the Yellowstone River's function as the spawning and nursery grounds for pallid sturgeons cannot be overstated (U.S. Fish and Wildlife Service 2003). The recovery and survivorship of this species may lie within this segment of its historic range.

Importance of the Miles City Fish Hatchery to the Recovery of Pallid Sturgeon

Kapuscinski (2003) estimates that as few as 178 wild pallid sturgeon occupy RPMA 2. During the past 15 years of sampling, a total of 44 wild pallid sturgeon (individual fish) have been collected in RPMA 1 (Jordan, U.S. Fish and Wildlife Service 2006). Extirpation by 2017 is predicted (Kapuscinski 2003) if declines are not reversed. Jordan (U.S. Fish and Wildlife Service 2006) states that based on extensive sampling and knowledge of these populations, stocking and augmentation of hatchery-reared juvenile pallid sturgeon is required to prevent the extirpation of the pallid sturgeon from RPMA 1-3. There are no alternatives (Jordan, U.S. Fish and Wildlife Service 2006). Based on genetic analysis, brood source for RPMA 1 and 2 should be collected from RPMA 1 and/or RPMA 2.

Currently, only the Bozeman Fish Technology Center (BFTC), Garrison Dam National Fish Hatchery, and the MCFH raise pallid sturgeon for release in RPMA 2, and because of disease concerns, only MCFH and the BFTC have been able to provide hatchery-reared juvenile sturgeon for RPMA 1. The stocking for RPMA 1 has been sporadic over the past several years due to occurrences of pallid sturgeon iridovirus at various facilities. Each year class that is not represented (stocked) into RPMA 1 could substantially reduce the amount of genetic variability within this reach.

Current health protocols have limited stocking hatchery reared pallid sturgeon above Fort Peck dam as pallid sturgeon iridovirus has never been detected in this reach. Insuring disease free production of hatchery reared pallid sturgeon is critical to future supplementation efforts into RPMA 1, and as previously stated, only MCFH and the BFTC have met fish health criteria for stocking into RPMA 1. **Loss of production at either facility will substantially degrade recovery efforts for RPMA 1 and reduce supplementation efforts for RPMA 2.**

Recent Consultations

On November 16, 2005, we acknowledged the receipt of your September 20, 2005 letter, and September 2005 Biological Assessment requesting initiation of formal section 7 consultation under the Endangered Species Act. During the Upper Basin Pallid Sturgeon Working Group meetings in Miles City, Montana on December 1, 2005; discussions with FWP personnel revealed that there were significant issues to be resolved on the impacts of the Tongue River Railroad on pallid sturgeon production at the MCFH.

On December 7, 2005, Lou Hanebury of our Billings Sub Office, and Gary Bertellotti, FWP, discussed these and other issues with your consultant, Mary Bean of Circle Point. On January 4, 2006, we further discussed these issues with Mary Bean and Kenneth Blodgett of your staff. The SEA, in a letter received by our Billings Sub Office on February 9, 2006, agreed to a 90-day extension of formal consultation, to assist in the facilitation of discussions with the interested parties to develop recommended mitigation which SEA can incorporate in the revised BA to address impacts to the pallid sturgeon at the MCFH.

On February 1, 2006, our field office staff held a conference call with fish hatchery biologists and researchers. This resulted in a preliminary research proposal (Webb 2006), by scientists at the Service's BFTC. This study would provide data to evaluate the affects the proposed railroad may have on wild adult and hatchery-reared juvenile pallid sturgeon in terms of health and reproduction.

On April 5, 2006, the Service met with the TRRC representatives, their consultants (via teleconference) and staff at the BFTC. The meeting resulted in an April 13, 2006 revised monitoring and mitigation plan by the TRRC. Letters dated April 6 and April 28, 2006 from FWP summarized commitments by all parties. The Service and FWP believes that the proposed monitoring program and the follow up study by Dr. Molly Webb should address the vibration and noise concerns at the MCFH.

On May 22, 2006, the Montana Field Office received your addendum to the September 2005 BA. Your document details commitment by TRRC to reduce the likelihood of negative impacts on the pallid sturgeon at the MCFH. The Service concurs with your determination that your proposed action is not likely to adversely affect the pallid sturgeon. This concurrence is based upon the following modifications of your action and additional conservation measures:

- A revised monitoring and evaluation plan prepared by Womack & Associates, Inc. dated April 13, 2006, titled *Miles City State Warm -Water Fish Hatchery - Revised Work Plan for High Resolution Vibration Monitoring, Evaluation of Potential Effects of Tongue River Railroad Construction and Operation, and Potential Mitigation at Miles City Fish Hatchery* (Womack and Associates 2006). TRRC is committed to implementing this revised work plan.
- The TRRC and FWP had previously reached an agreement on mitigation measures to ensure protection of the water pipelines serving the MCFH and weed control in areas adjacent to the MCFH. The agreements are reflected as proposed mitigation measures 84 and 85 in SEA's DSEIS (Surface Transportation Board 2004). The TRRC has agreed to add additional language to mitigation measure 84 in the Final Supplemental Environmental Impact Statement, to protect outgoing water pipelines during construction and operation.
- Mitigation Measure 84 (Protection of MCFH Water Supply Pipelines). As agreed to by TRRC and the FWP, TRRC shall relocate, as necessary, portions of the water supply pipelines from the Yellowstone River and Tongue River so that each pipeline crosses the rail right-of-way at a right angle or perpendicular to the rail alignment. To ensure structural integrity of the water supply pipelines, the portion of each pipeline lying perpendicular beneath the rail alignment shall be encased in a reinforced concrete pipe (RCP). The RCP shall be of sufficient size to allow for inspection and maintenance of the water supply pipelines. Access to the pipelines beneath the rail alignment shall be provided by installation of reinforced concrete manholes, located on each side of the rail alignment. The RCP manholes shall meet or exceed the American Railway Engineering and Maintenance of Way Association's standard specifications for installation of utilities underneath railway embankments. The design plans for the relocated section of the water pipelines and all associated elements shall be prepared by TRRC and be provided to FWP for review and approval prior to being constructed. The TRRC shall locate and protect (and replace if harmed) outgoing water pipelines that would impact operations if affected by construction or operation.
- Mitigation Measure 85 (Weed Control on MCFH). As agreed to by TRRC and FWP, TRRC shall use only mechanical means of weed control in its right-of-way adjacent to the MCFH between the points where the rail line crosses Interstate 94 to the connection with the Burlington Northern-Santa Fe Railroad Company main line. If it becomes necessary to utilize herbicides to control noxious weeds along the right-of-way in this area, herbicides will only be used with prior approval from FWP, as to the type of herbicide, application rate, and means of application, wind speed and direction.

Mitigation measure 87 requires that TRRC shall adhere to the mitigation conditions agreed upon by FWP and TRRC in any easement granted by the State allowing TRRC to cross the MCFH. Mitigation measure 86 encourages the parties to continue their discussions on the remaining issues while this proceeding is moving forward, and requires that TRRC continue to make itself available to consult with FWP for a period of up to six months after the effective date of the Board's final decision on TRRC's application to reach consensus.

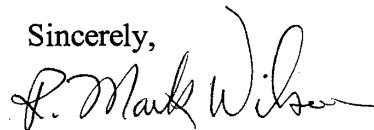
Re-initiation of consultation may be needed if: 1) new information reveals effects that may impact threatened, endangered, or proposed species or their critical habitat in a manner not considered in your biological assessment; 2) the proposed action is subsequently modified in a manner not considered in your biological assessment; or 3) a new species is listed or critical habitat identified that may be affected by the action.

In relation to the MCFH and pallid sturgeon, the Board must re-initiate consultation if:

- A. The research study at the Service's BFTC (Webb 2006) indicates that the vibration and noise equivalent to that of the Tongue River Railroad operations causes a stress response in adult pallid sturgeon, impedes reproduction by reducing gamete and/or progeny quality, and impedes the immunological response of adult pallid sturgeon, or impact embryo development or larval and juvenile growth.
- B. As outlined in the revised monitoring plan at the MCFH (Womack and Associates 2006), during construction and operation of the railroad, seismographs trigger an alarm when determined action levels are exceeded.
- C. There is a significant decrease in fertility, survivorship or health of eggs, larvae, juvenile or adult fish at the MCFH.

If you have any questions or concerns about this consultation or the consultation in general, please feel free to contact me or Lou Hanebury of our Billings Sub Office at 406-247-7366.

Sincerely,



R. Mark Wilson
Field Supervisor

cc: USFWS, Billings, MT (Attn: Lou Hanebury)
DOI, Office of the Secretary, Denver, CO (Attn: Robert Stewart)
EPA, Helena, MT (Attn: Steve Potts)
FWP, Helena, MT (Attn: Chris Hunter)
FWP, Billings, MT (Attn: Allison Putniak)
Tongue River Railroad Company, Billings, MT (Attn: Doug Day)
Circle Point, San Francisco, CA (Attn: Mary Bean)

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BIOLOGICAL OPINION
ON THE
CONSTRUCTION AND OPERATION
OF THE
TONGUE RIVER RAILROAD

U.S. FISH AND WILDLIFE SERVICE
MONTANA FIELD OFFICE
HELENA, MONTANA



July 12, 2006

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APPENDIX A - White papers from the Service's 1995 Biological Opinion (U.S. Fish and Wildlife Service 1995).

Maintain/Enhance Habitat Integrity 1

Maintain/Enhance Prey Base 4

Introduction

This biological opinion (opinion) is based on information provided in the revised biological assessment (BA), the *Draft Supplemental Environmental Impact Statement, Tongue River Railroad Company, Inc., Construction and Operation – Western Alignment, Tongue River III – Rosebud and Big Horn Counties, Montana* (DSEIS {Surface Transportation Board 2004}), information obtained from additional reports, plans, communications and meetings with the Surface Transportation Board (Board), their staff, consultants, Montana Fish, Wildlife and Parks (FWP), Bureau of Land Management (Bureau) staff, and members of the Montana Bald Eagle Working Group (BEWG).

Section 7 (b) (3) (A) of the Endangered Species Act (Act) requires that the Secretary of Interior issue biological opinions on federal agency actions that may affect listed species or critical habitat. Biological opinions determine if the action proposed by the action agency is likely to jeopardize the continued existence of listed species or destroy or adversely modify critical habitat. Section 7 (b) (3) (A) of the Act also requires the Secretary to suggest reasonable and prudent alternatives to any action that is found likely to result in jeopardy or adverse modification of critical habitat, if any has been designated.

CONSULTATION HISTORY

The U.S. Fish and Wildlife Service (Service) has provided significant recommendations to the Tongue River Railroad Company (TRRC) through consultation over the past twenty years. Detailed background history and record of consultation is provided in the 1995 biological opinion (U.S. Fish and Wildlife Service 1995), the DSEIS (Surface Transportation Board 2004) and revised BA. However, for purposes of clarity, some history is presented here, along with recent consultations.

The Tongue River Railroad was originally conceived in 1980 to transport coal from potential surface mines in the Ashland/Otter Creek area about 89 miles north to Miles City. The environmental analysis relating to this Miles City to Ashland rail line (Tongue River I), was addressed in the *Final Environmental Impact Statement, Tongue River Railroad Company, Construction and Operation of a Line of Railroad in Custer, Rosebud and Powder River Counties, Montana* (1985 FEIS {ICC 1985}), prepared by the Interstate Commerce Commission (ICC). Tongue River I was approved by the ICC in 1986.

On November 17, 1989, the ICC published in the Federal Register its intent to prepare an environmental impact statement for the TRRC's proposed construction and operation of a 41-mile rail line between Ashland and Decker, Montana. The TRRC extension would extend the already approved but not yet built 89-mile rail line from Miles City to Ashland, Montana. The primary purpose of the TRRC extension (Tongue River II) would enable shipment of coal from operating mines near Decker north to Miles City and provide an alternate route for coal now moving from Wyoming mines via the Burlington Northern and Santa Fe Railway (BNSF) line through Sheridan, Wyoming and Forsyth, Montana. The *Final Environmental Impact Statement, Tongue River Railroad Company, Construction and Operation of an Additional Rail Line from Ashland to Decker, Montana*, was prepared and finalized by the ICC and its successor, the Surface Transportation Board (1996 FEIS {Surface Transportation Board 1996a}). June 1995 the ICC submitted a BA to the Service. The BA discussed the potential effects of the Ashland to Decker extension along TRRC's refined original preferred alignment, and included measures to mitigate any adverse effects to listed species. In July 1995, the Service did not concur with the

conclusion that the project would not adversely affect the bald eagle (*Haliaeetus leucocephalus*). The Service contended that although the mitigation measures proposed by the BA were positive and should help reduce the potential impacts to bald eagles, the proximity of the railroad to one active bald eagle nest could result in abandonment of the nest or premature fledging of chicks.

Between April 18 and May 11, 1995 TRRC and its consultants asked several members of the BEWG to review the draft BA and to provide recommendations regarding the bald eagle. The BEWG was formed in January 1982, and is composed of eagle biologists and representatives from federal and state agencies, Native American Tribes, universities, conservation groups and private industry. The BEWG provides technical assistance to landowners and agencies concerning management of bald eagles in Montana.

The Service issued its final biological opinion on Tongue River II in November 1995 (U.S. Fish and Wildlife Service 1995). The 1995 Biological Opinion provided additional measures to mitigate the effects of Tongue River II on the bald eagle.

After review of comments received on the 1994 *Supplement to Draft Environmental Impact Statement, Tongue River Railroad Company, Construction and Operation of an Additional Rail Line from Ashland to Decker, Montana*, (ICC 1994), the Board concluded in its 1996 *Decision* (Surface Transportation Board 1996b) that the Four Mile Creek alternative would be environmentally preferable to the refined Original Preferred Alignment considered by the 1995 BA. In late 1996, the Board approved the Ashland to Decker extension utilizing the Four Mile Creek alternative.

In April 1998 TRRC filed an application (*Tongue River Railroad Company, Rail Construction and Operation, Western Alignment in Rosebud and Big Horn Counties, Montana*) with the Board seeking authority to construct and operate a 17.3 mile section (Western Alignment or Tongue River III), as an alternative to the southernmost portion of the previously approved Tongue River II. The application contained supporting evidence that the Western Alignment would present significant economic, operating, maintenance and environmental advantages over the Four Mile Creek alternative.

As part of its National Environmental Policy Act process, in July 1998 the Board issued a Notice of Intent (NOI) to prepare a Supplement to the Final Environmental Impact Statement (SEIS) for the Western Alignment. After review of comments that were submitted in response to the NOI, and after consultation with federal agencies, the Board served a Final Scope of the SEIS in early February 1999. In the Final Scope, the Board explained that the scope of the SEIS would involve a detailed environmental review of the Western Alignment and alternatives to it. The Board explained that the SEIS would include a BA for the entire Tongue River rail line from Miles City to Decker, updating information from the 1995 BA and 1995 Biological Opinion, as appropriate.

Through the consultation process of Tongue River I-III, the Service has provided a current species list for inclusion in (the Board's Section of Environmental Analysis {SEA}) the biological analyses. On December 28, 1989 the Service provided a species list to the ICC indicating that three species, all listed as endangered, could potentially occur in the area to be affected by the TRRC extension (Palawski 1989): 1) the bald eagle could nest along the Tongue River, and could occur as a migrant and winter resident; 2) the peregrine falcon (*Falco peregrinus*) could occur as a migrant; and 3) the black-footed ferret (*Mustela nigripes*) could occur in black-tailed prairie dog (*Cynomys ludovicianus*) colonies. On November 10, 1994 the

Service added the pallid sturgeon (*Scaphirhynchus albus*), which could occur in the lower Tongue River, to this list (McMaster 1994).

On January 19, 1999 the Service notified the Board that six listed or candidate threatened or endangered species could potentially occur in this area: 1) the black-footed ferret is listed as endangered, and could be a potential resident in black-tailed prairie dog colonies; 2) the bald eagle is listed as threatened, is known to nest along the Tongue River, and is present as both seasonal migrants and winter residents; 3) the peregrine falcon is listed as endangered, and may occur as a transient in the area; 4) the mountain plover (*Charadrius montanus*) is a candidate species that is a resident of short-grass prairie and prefers to nest in prairie dog colonies. On February 16, 1999 its status was changed to a proposed threatened species, and on September 9, 2003, the Service published a final rule which determined that the action of listing the mountain plover as threatened was not warranted, and the proposed rule was withdrawn; 5) the swift fox (*Vulpes velox*) is a candidate species that is a potential resident of the area, and prefers prairie grasslands. On January 8, 2001, the Service found that the petitioned action was not warranted and the swift fox was removed from the candidate list; and 6) the sturgeon chub (*Macrhybopsis gelida*) is a candidate species that has been recorded in the lower Tongue River (also removed from the candidate list on January 8, 2001). The pallid sturgeon was not included in the January 1999 U.S. Fish and Wildlife Service species list. New species lists, no longer including the mountain plover, swift fox and sturgeon chub, but additional species including the whooping crane (*Grus americana*) and Interior least tern (*Sterna antillarum athalassos*) were obtained by your consultants directly from the Service's web site.

In a memorandum dated November 24, 2004, the Montana Field Office provided comments on the DSEIS for the TRRC's proposed Western Alignment to the Service's Regional Headquarters in Denver, Colorado. Our Regional Office on November 29, 2004, sent our response to the State Director of the Bureau. The Service noted the need for a updated analysis of the impacts of the railroad on the bald eagle, and that the Tongue River Corridor is an important breeding and wintering area for bald eagles in Montana. These concerns were incorporated into the Department of Interior's comments sent to the SEA on December 2, 2004.

On December 7, 2005, the Service met with state, federal, and industry consultants in Sheridan, Wyoming to review current and future needs for monitoring bald eagle winter and breeding use of the Tongue River Corridor. While some sharing of data from the participants will be practiced, specific data needs will have to be born by the TRRC in order to assess the railroad's impacts to wintering and nesting bald eagles and bald eagle habitat. Due to funding and manpower limitations, FWP can only complete two of the four needed nesting flights to document bald eagle productivity. Before construction and during operations, TRRC will need to fly the bald eagle nest territory occupancy flight in March and the bald eagle nestling flight in May of each year. A minimum of three flights during the winter are needed to begin the process of identifying any important winter roosts within the corridor. This would probably entail a flight during the second half of December, a flight during the first half and second half of January. An additional flight during the first half of February would be useful.

The 1995 biological opinion (U.S. Fish and Wildlife Service 1995) discussed the role of the BEWG in formulating appropriate mitigation measures to compensate for the loss of bald eagle nesting and winter habitat from the construction and operation of the Tongue River Railroad. On December 15, 2005, eagle habitat compensatory mitigation measures were discussed at the annual meeting of the BEWG. General consensus established affected areas as suitable habitat within a buffer along the rail line right-of-way (ROW). Replacing lost cottonwood trees was

believed to be the most affective mitigation. This could be accomplished with land purchase, easements, fencing out cattle or subsidizing spring flows out of Tongue River Dam. Establishing a trust fund for mitigation where matching funds could increase the money available for mitigation was discussed.

On June 21, 2005, the Service acknowledged receipt of the Board's May 13, 2005 letter requesting initiation of formal Section 7 consultation under the Act. We also stated that we had not received all of the information necessary to initiated formal consultation and identified what additional information was needed to complete formal consultation. This included in detail, current information on wintering and breeding bald eagles within the Tongue River Corridor.

On July 27, 2005, we received your letter dated July 22, 2005 requesting initiating formal consultation and included a determination that construction and operation of the Tongue River Railroad is not likely to adversely affect the bald eagle. In an email dated August 2, 2005 from our Billings Sub Office to the consultants for TRRC, the Service did not agree with your determination and recommended additional information and changes needed in the revised BA.

A revised letter from the Board's SEA dated September 20, 2005 was received in our Billings Sub Office on September 26, 2005. Your letter again requested initiation of formal consultation and included a revised September 2005 BA. On November 16, 2005, the Service acknowledged the receipt of the September 20, 2005 letter, and September 2005 BA requesting initiation of formal consultation. The Service had planned to provide the Board with an opinion by February 8, 2006.

As stated in our transmittal letter to this opinion, the Service received a letter from the SEA on February 9, 2006 granting a 90-day extension for formal consultation. This was based on additional information needs concerning the pallid sturgeon. Additional information as an addendum to the BA, was received by the Service on May 22, 2006.

DESCRIPTION OF THE PROPOSED ACTION

The proposed action being considered in this formal consultation is the construction and operation of the entire Tongue River Railroad line from Miles City to Decker, Montana. The primary purpose of the Tongue River Railroad would be to transport coal from existing and future mines in southeastern Montana and to provide an alternative routing for coal from Wyoming mines. The Tongue River Railroad would connect at its northernmost point with the BNSF mainline at Miles City, and would again connect with BNSF at its southernmost point near Decker, Montana. Use of TRRC's line would reduce the present transportation distance of coal mined in the upper Powder River Basin (both in Montana and Wyoming).

The Tongue River Railroad would begin at the southwestern edge of Miles City, where it would tie into the existing BNSF mainline. From Miles City, the route would bear south along the west side of the Tongue River to a point approximately 10 miles north of Ashland. The route would then cross the Tongue River and continue south along the east side of the river. The route would divide near Ashland, with one branch following approximately eight miles southeast along the Otter Creek drainage to Terminus Point 2, while the main branch would continue south along the east side of the Tongue River Valley about nine miles south of Ashland to Terminus Point 1. Terminus Points 1 and 2 represent the southern end of the rail line previously approved by the ICC in Tongue River I. Since 1986, TRRC has refined portions of the alignment from Miles City to Terminus Point 1 so that the total length of this portion of the rail line would be about 78

miles. In addition to shortening the route about three miles, most of these refinements place the approved route further from the Tongue River than the alignment considered in Tongue River I.

From Terminus Point 1, the railroad would continue south along the east side of the Tongue River Valley for about 21 miles, following the route of the previously approved Tongue River II. The TRRC also has refined the alignment along some parts of this portion of this route, which generally serves to place the route further from the Tongue River. From a point about 21 miles south of Terminus Point 1, the TRRC line would follow the Western Alignment (instead of the approved Four Mile Creek alternative) to Decker. The Western Alignment would be about 17 miles long and would cross to the west side of the Tongue River, then gradually leave the Tongue River Valley as it would proceed south to the final terminus near Decker, Montana.

The Tongue River Railroad track would be comprised of 136-pound continuous welded rail on concrete ties, resting on 12 inches of ballast and 12 inches of sub-ballast. The ROW would range from 100 to over 300 feet in width, depending on cut and/or fill requirements, and would average approximately 200 feet. Cut and fill slopes would generally be constructed at angles between two horizontal to one vertical (2H:1V) and one and one-half horizontal to one vertical (1.5H:1V). Steeper slopes may be appropriate in some areas based on soil conditions and to reduce surface disturbance.

Facilities associated with the rail line would include sidings, possible terminal facilities, signal and communications systems, relocated roads, bridges and culverts.

Initial design specifications, include the construction of seven passing sidings. Each passing siding would be 8,500 feet long between clearance points, which would accommodate future increases in train size and would also allow for comfortable stopping margins. Locations of passing sidings would be based on minimizing train delays in both directions. In addition to the passing sidings, additional set-out tracks would be constructed for set-out and storage of maintenance-of-way (MOW) equipment, bad-order cars and other operational equipment. Each set-out track would be at least 550 feet in length, sufficient to accommodate permanently-coupled car sets that may operate on the Tongue River Railroad. Set-out tracks would be constructed at each passing siding location and at four additional locations along the route.

New terminal facilities may be constructed at Miles City, depending upon whether TRRC and BNSF reach an agreement that would allow BNSF to operate over TRRC tracks. A new terminal would not be required if such an agreement is reached, because BNSF would utilize its own existing facilities. If a new terminal is built, the facilities would consist of buildings for train and engine crews, dispatching, headquarters operation, limited servicing and maintenance, and MOW activities. Three additional sidings, 7,800 feet long, would be constructed to handle yard activities.

No power or communication lines are proposed to be constructed along the ROW of the Tongue River Railroad. Instead, signaling and communications systems would be operated by batteries, charged by solar power panels. Portions of public and private roads would be relocated along short sections of the railroad. Road relocations would be necessary to minimize curvature, minimize the number of road crossings and accommodate landowner access across the ROW.

Culverts would be placed according to final engineering design. They would be designed to both safely withstand a 25-year flood peak flow with one diameter of pipe headwater, and so that water from a 100-year flood event would not overtop the track.

The Tongue River Railroad would also require the construction of four bridges. There would be one bridge over Hanging Woman Creek, one bridge over Otter Creek and two bridges over the Tongue River (one about 10 miles north of Ashland and the other about 31 miles south of Ashland). All bridges would be designed to withstand and not be crested by a 100-year flood event. The preliminary design for these bridges does not require any piers or foundations to be placed in the river. Final engineering design would be determined by geotechnical investigations to be conducted prior to bridge construction.

Construction of the Tongue River Railroad would most likely occur from April through October over a 3-year period. During construction there would be a variety of heavy equipment operating within the ROW to clear existing vegetation, salvage topsoil, grade/cut/fill the ROW, prepare the rail bed, lay track and place ballast, and reclaim and revegetate disturbed areas. During construction a temporary road may be built within the ROW.

There may be two construction camps. The primary construction camp would be an approximately 10-acre site leased in or near Ashland. It would house about 400 people through a combination of trailer/RV hookups and bunkhouses. A smaller (five-acre) construction camp would be located at the south end of the railroad near the connection with the Spring Creek Mine Spur. It would consist of about 100 trailer hookups with support facilities. Following completion of railroad construction, both camps would be restored pursuant to agreements with landowners.

Three equipment laydown and construction centers would operate only during railroad construction. They would occupy a 15-acre site near Miles City, a five-acre site near Ashland, and a 10-acre site near the Spring Creek Mine Spur.

Once the Tongue River Railroad is in operation, it would operate 24 hours a day, 365 days a year. Trains would operate at speeds up to 55 miles per hour. By the fifth year of operation there would be an estimated 12 train movements per day, or six roundtrip coal trains, over the southern portion of the rail line and approximately 14 train movements per day, or seven roundtrip coal trains, over the Ashland to Miles City portion of the line (one unit train would be comprised of two locomotives and about 113 coal cars. By the 15th year of operation, it is anticipated that 18 train movements per day, or nine roundtrip coal trains, will move over the Miles City to Ashland portion of the rail line. Periodic maintenance of the rail line and ROW would be required, depending on the amount of train traffic.

Conservation Measures

As part of the TRRC's proposed action, TRRC has agreed to the following conservation measures:

I. Mitigation During Construction

The Montana Bald Eagle Management Plan (Montana Bald Eagle Working Group 1994) defined Nest Site Management Zones for human activity in the vicinity of bald eagle nests. Detailed descriptions of Management Zones, and guidelines for human activity within them, are presented in the Montana Bald Eagle Management Plan (Montana Bald Eagle Working Group 1994). Nest sites and area encompassed by Management Zones should be considered occupied in relation to formal consultation procedures for five years from last recorded activity of breeding bald eagles. For the purposes of this opinion, the Nest Site Area or Management Zone 1 includes the area

within 0.25 mile of all nest sites (active or inactive). According to the guidelines for human activity within Management Zone 1, once an active nest has been located within a breeding area, Management Zone 1 "applies only to the active nest.

For the purposes of this BA, Management Zone 2 is considered to be the primary use area for nesting bald eagles and comprises the area between Zone 1 (0.25 mile from the nest site) and 0.5 mile from the nest site (Montana Bald Eagle Working Group 1994). As with Management Zone 1, once an active nest has been located within a breeding territory, Management Zone 2 applies only to the active nest.

Management Zone 3 represents includes all suitable foraging habitat within most of a home range used by bald eagles during a nesting season, and extends to a radius of 2.5 miles from the nest site. Management Zone 3 only applies to nest sites that have been active within 5 years (Montana Bald Eagle Working Group 1994).

Construction and operation of the Tongue River Railroad, as described in the *Description of the Proposed Action*, would comply with the guidelines for human activities in Management Zone 3.

The bald eagle nesting period (encompassing courtship, nest building, egg laying, incubation, hatching and rearing young, and fledging) extends from February 1 - August 15 (Montana Bald Eagle Working Group 1994). The Tongue River Railroad construction period would overlap the bald eagle nesting period. To mitigate effects of construction on nesting bald eagles, the following measures would be instituted:

- A. The year prior to construction of the Tongue River Railroad, Tongue River Railroad will conduct an aerial survey the Tongue River Railroad from Miles City to the Tongue River Dam to determine the presence of nesting bald eagles. Any active or inactive bald eagle nests would be reported immediately to the Service and FWP.
- B. No construction activities would occur within Management Zones 1 and 2 for any active bald eagle nest during the nesting period (February 1 - August 15, or until five days after the first observation of independent flight). In this opinion, construction activities are defined to include both low intensity activities such as surveying, and high intensity activities such as heavy equipment operation, grading, etc. Construction activities do not include the collection of environmental, cultural resources or geotechnical data.
- C. Mobilization activities (in this opinion, mobilization activities include project-related truck traffic, transport of materials, equipment, etc. but do not include commuting workers) would not occur before 10 a.m. (assumed to be the end of primary bald eagle daily foraging period) on any public road within Management Zones 1 and 2 for any active bald eagle nest during the nesting period (February 1 - August 15, or until five days after the first observation of independent flight).
- D. Low intensity construction activities could occur within Management Zone 3 of any active nest from February 1 to May 1 (i.e., courtship through initiation of hatching). High intensity activities (heavy equipment operation, grading, etc.) would not occur in Management Zone 3 around any active nest during this period.
- E. From May 1 (assumed date of initiation of hatching) to August 15 (assumed date of fledging), high intensity activities in Management Zone 3 would not occur before 10 a.m.

(assumed to be the end of primary bald eagle daily foraging period). After August 15, low and high intensity construction activities could occur within Management Zone 3 at any time of the day.

- F. If aerial surveys for bald eagle nests in the spring prior to construction identify new nests in locations that would make compliance with the above measures impossible, TRRC would confer with the Service and BEWG to develop alternative mitigation measures. A possible alternative mitigation measure would be the development of a program to monitor the active nest of concern, to determine if approaching construction activities would have a negative effect on nesting bald eagles. Service and BEWG consultation would be expected to define the kind and amount of overt disturbance behavior exhibited by nesting bald eagles that would indicate that construction activities should be temporarily halted (henceforth called "threshold behavior"). It is expected that parameters influencing the determination of threshold behavior would include, but not be limited to, location of the nest in relation to the Tongue River Railroad route, distance from other human disturbances such as public roads, and known history of the nesting birds. It is expected that the threshold behavior value would vary, depending on the time of the nesting period (e.g., egg laying vs. rearing). Persons assigned to monitor active bald eagle nests (hereafter called "environmental inspectors") would have the authority to temporarily halt Tongue River Railroad construction activities in the vicinity of an active nest when the threshold behavior is exhibited by the nesting birds. This authority would be granted as part of contract specifications between Tongue River Railroad and the construction contractor. The environmental inspector would notify the on-site construction supervisor that construction activities must cease. The on-site construction supervisor would be responsible for notifying construction crews to cease activities in the vicinity of the nest. In the event of a construction halt, the environmental inspector would notify Service and FWP. The Service and FWP would evaluate the situation and make a recommendation to halt construction activities until a later date, proceed with certain kinds of activities, etc.

II. Mitigation During Operation

The following measures would be implemented during operation of the Tongue River Railroad:

- A. Rail line maintenance activities would fall into two general categories. The first would be comprised of non-emergency or planned activities (such as rail replacement) that would require considerable time or comparatively high intensity effort, and would not take place in Management Zones 1 or 2 from February 1 through May 15. This restriction would apply to any current or new nest discovered in the future. After May 15 until the first observations of independent flight of the fledglings (usually no later than August 15), these activities could occur in the afternoons. By afternoon, adult eagles have usually completed feeding the chicks and there would be minimal disruption of this activity. Certain short-term, low intensity planned maintenance activities, such as routine inspections of the rail line, would necessarily have to occur during the February 1 - May 15 period.
- The second category of maintenance activity is emergency maintenance or repairs. Such activities cannot be foreseen and therefore cannot be planned to occur in periods that would minimize the effect to nesting bald eagles. The degree of effect on nesting bald eagles would be influenced by the magnitude of the activity, the time of the nesting season at which the activity occurs, and the tolerance for disturbance displayed of the

affected bald eagles. The TRRC would notify the Service, as soon as possible, of an emergency maintenance activity within Management Zones 1 or 2 around an active bald eagle nest.

- B. The TRRC employees engaged in routine inspection of the rail line (a minimum of two times per week) would remove train-killed deer or other large animals from the right-of-way, in order to protect migrant, wintering or nesting bald eagles feeding on such carrion, from death by trains. Carrion would either be completely removed from the vicinity of the rail line, or would be placed at locations along or near the right-of-way where there would be no potential for deaths from trains, per objective 1.3123 of the Pacific Bald Eagle Recovery Plan (U.S. Fish and Wildlife Service 1986).
- C. The TRRC would prohibit trapping within its ROW. This measure would ensure that bald eagles are not accidentally caught in traps set for other animals.
- D. The year prior to construction of the Tongue River Railroad, Tongue River Railroad will conduct aerial surveys along the Tongue River Corridor from Miles City to the Tongue River Dam to determine the presence of wintering bald eagles and winter roosts. An additional survey for wintering bald eagles will be conducted in the year following completion of construction. The results of these surveys, including locations and numbers of bald eagles, would be reported to the Service and FWP.
- E. In the event that additional mitigation becomes necessary, TRRC would consult with the Service, FWP, and BEWG to identify one or more tracts of land along the Tongue River for purchase for management as potential bald eagle nesting habitat. Criteria that may be used to select such tracts would include but are not limited to: 1) location near irrigation dams, natural riffle/run sequences, etc. that concentrate prey (fish), particularly in reaches of the river where naturally occurring turbidity might otherwise limit visibility of fish; 2) location in areas that would be "cut off" by construction of the railroad. This would have two advantages: a) landowners who would otherwise have difficulty accessing these sites for agricultural management due to the railroad, might be receptive to selling such sites for wildlife management purposes; and b) isolating such sites with the railroad grade from other human disturbances may improve their attractiveness for less tolerant bald eagle pairs; and 3) presence of appropriately sized and aged stands of cottonwoods that would be available, or may eventually develop as nest sites for bald eagles. Montana Riparian-Wetland Association criteria (Hansen et al. 1995), or other appropriate methodology, would be used to inventory these sites.

Once a tract has been purchased, it could be managed as potential bald eagle nesting habitat by measures such as: 1) the site could be fenced to exclude livestock, which would aid regeneration of cottonwoods and understory species; and 2) through consultation with the BEWG and/or groups such as the Montana Riparian-Wetland Association, more intensive management steps such as planting cottonwoods, could be undertaken to enhance the site as future nesting habitat.

STATUS OF THE SPECIES

On February 14, 1978, the bald eagle was listed as endangered in all of the conterminous United States except Minnesota, Wisconsin, Michigan, Oregon, and Washington, where it was classified as threatened (43 F.R. 6233). The Service reclassified the bald eagle from endangered to threatened throughout its range in the lower 48 states on July, 12, 1995 (60 F.R. 36000). A proposal to delist the bald eagle was published on July 6, 1999 (64 F.R. 36454). A proposal to reopen the comment period to delist the bald eagle was published on February 16, 2006 (50 CFR. 8238). Concurrent to reopening the comment period, the Service has drafted National Bald Eagle Management Guidelines (U.S. Fish and Wildlife Service 2006a). The bald eagle population in the lower 48 states has increased from approximately 487 active nests in 1963, to an estimated minimum 7,066 breeding pairs today. The recovery of the bald eagle is due in part to habitat protection and management actions, and the reduction in levels of persistent organochlorine pesticides occurring in the environment.

Description

The bald eagle is a large, long-lived bird of prey. Adults have dark-brown bodies, white heads and white tails. This adult plumage is not acquired until age four at the earliest. Juveniles go through a series of plumages prior to achieving the adult coloration and in some plumages the young bear a superficial resemblance to golden eagles (*Aquila chrysaetos*).

Life History/Habitat Use

The eagle may live up to 45 years, achieve sexual maturity at four to five years, and produce one to three young per year. Publications by the U.S. Army Corps of Engineers (1979), Lincer et al. (1979), Brown and Amadon (1968), and U.S. Bureau of Land Management (1973) provide references on the biology of the species.

Bald eagles usually nest in trees near water, but are known to nest on cliffs and the ground. Nest sites are usually in large trees along shorelines in relatively remote areas that are free of disturbance (U.S. Fish and Wildlife Service 1999). The bald eagle typically lays a clutch ranging from one to three eggs which are incubated by both the male and female birds for approximately 35 days resulting in usually one or two eaglets produced by the pair (Stalmaster 1987). Typically, the recommended spatial buffers around nests for threatened and endangered raptors, including the bald eagle, are 1.0 miles (Romin and Muck 1999). The Montana Bald Eagle Management Plan (Montana Bald Eagle Working Group 1994) identifies three concentric nest management zones that surround most recently active and alternate nest sites, and vary by degree of allowable disturbance. Zone I includes the primary nest site area in which human activity or development may stimulate abandonment of the breeding area, affect successful completion of the nesting cycle or reduce productivity (Montana Bald Eagle Working Group 1994). It includes the area within a one-fourth mile radius of all nest sites in the breeding area that have been active within 5 years or is presently active. Zone II is the Primary Use Area that includes the area one-fourth mile to one-half mile from all nest sites that have been active within five years. Zone III represents most of the home range used by eagles during the nesting season and usually includes all suitable foraging habitat within 2.5 miles of all nest sites in the breeding area that have been active within five years (Montana Bald Eagle Working Group 1994).

For the purposes of this biological opinion, bald eagle habitat is defined as all suitable foraging habitat within 2.5 miles of all historic, abandoned and currently active bald eagle nests. Bald

eagle nesting habitat is also defined as any mature stand of conifer or cottonwood trees in association with rivers, streams, reservoirs, lakes or any significant body of water. Bald eagle roosting habitat is defined as any mature stands of conifer and cottonwood trees.

Research shows that bald eagles are sensitive to a variety of human activities. Responses to human disturbance vary from short term, temporal, and spatial avoidance of disturbance, to total reproductive failure and abandonment of breeding areas (Greater Yellowstone Ecosystem Bald Eagle Working Team 1996; Anthony et al. 1995; Stalmaster and Newman 1978). Responses of bald eagles to human disturbance vary depending on the eagle individual/pair, and the type, intensity, duration, time of year, predictability, and location of human activity (Knight and Cole 1995). Survival of individual eagles, particularly those in their first year of life, probably depends heavily on conditions they encounter during the wintering period. The physiological condition of adults at the beginning of each breeding season, an important factor influencing reproductive success, also is affected by how well their energy demands are met in wintering areas. Thus, the survival and recovery of nesting populations depends on the eagles having suitable locations to use throughout the wintering period each year (U.S. Fish and Wildlife Service 1983). Nesting chronology, although variable, is well documented for bald eagles in Montana (U.S. Fish and Wildlife Service 1986). Bald eagles are extremely sensitive to disturbance during nest building, egg laying, and incubation periods (February 1 through May 30). Bald eagles are most likely to desert nest sites during this period if disturbed (Montana Bald Eagle Working Group 1994), especially if the activity occurs within Nest Management Zones I and II.

During migration and at wintering sites, eagles that concentrate on locally abundant food tend to roost communally. Communal roosts usually are located in stands of mature old growth conifers or cottonwoods, and roosts may be several miles from feeding sites. Wintering bald eagles occur throughout the Nation but are most numerous in the West and Midwest (U.S. Fish and Wildlife Service 1983). An abundant, readily available food supply in conjunction with one or more suitable night roost sites is the primary feature of winter habitat. Also, eagles prefer to forage in areas with the least human disturbance (U.S. Fish and Wildlife Service 1978, McGarigal et al. 1991).

The majority of wintering eagles are found near open water where they feed on fish and waterfowl, usually taking those which are dead, crippled, or otherwise vulnerable (U.S. Fish and Wildlife Service 1983, Lingle and Krapu 1986). In addition, eagles are known to feed on carrion, small mammals, and game birds (Lish 1975, U.S. Bureau of Reclamation 1981, Lingle and Krapu 1986). Lingle and Krapu (1986) found eagles consumed at least 50 species of fish, birds, and mammals along the North Platte and Platte Rivers during the winters of 1978-1979 and 1979-1980.

Large, live trees in sheltered areas provide a more favorable thermal environment and help minimize the energy stress encountered by wintering eagles. Communal roosting also may facilitate food-finding (Steenhof 1976) and pair bonding. The proximity of adequate night roosts to the other habitats required by wintering eagles, such as hunting perches and feeding sites, is important (Steenhof et al. 1980). In some locations, the absence of a suitable night roost may limit the use of otherwise suitable habitat. Freedom from human disturbance also is important in communal roost site selection (Steenhof et al. 1980, U.S. Bureau of Reclamation 1981, U.S. Fish and Wildlife Service 1986, Buehler et al. 1991). Continued human disturbance of a night roost may cause eagles to abandon an area (Hansen et al. 1981, Keister 1981). Typically, buffers

around roost sites are one-half the size of buffers around nest sites, so a seasonal buffer zone for wintering bald eagles would be one-half mile (Romin and Muck 1999).

In Montana, roost sites are usually located in stands of mature or old growth conifers or cottonwoods. A communal roost is defined as an area usually less than 10 acres in size that contains greater or equal than six bald eagles on any given night. Critical roost sites are defined as exhibiting traditional use for equal or greater than five years, and contain equal or greater than 15 eagles per night for equal or greater than 14 nights per season (U.S. Fish and Wildlife Service 1983). A vital roost site is any communal roost that does not meet criteria for critical status but has local or regional significance in terms of unique features or importance to the local population of bald eagles (Montana Bald Eagle Working Group 1994). For instance, a communal roost located in an area with no other roosting opportunities and geographically isolated from other wintering aggregations may be vitally important to eagles using the site (mature timber stand on the eastern prairie) (Montana Bald Eagle Working Group 1994). No critical winter roost sites had been identified in Montana before the 1990s, although, by 1994, over 600 bald eagles winter in Montana (Flath et al. 1991). Winter bald eagle counts for 2005-2006, indicate that there are at least 419 bald eagles that winter in Montana (S. Lamarr, U.S. Bureau of Land Management, pers. comm. 2006). A vital winter roost site is located along the Yellowstone River near Pompey's Pillar in Yellowstone County. Between February and March each year, two to one hundred bald eagles roost within cottonwood trees up and downstream from Pompey's Pillar (J. Parks, U.S. Bureau of Land Management, pers. comm. 2002). Critical roost sites may exist within the planning area but, have not yet been located. For the purposes of this biological opinion, an occupied roost site or roost, is defined as a stand of mature or old growth conifer or cottonwood trees that contains greater or equal to six bald eagles on any given night.

Although eagle population studies have revealed that both reproduction and survival are important, changes in survival rates seem to have more effect on the population than similar changes in reproductive rates (Grier 1980). Hypothetical population modeling indicates it is possible for eagle populations with lower reproduction but adequate survival to do better than other populations with higher reproduction but poor survival. Adult eagles must prepare themselves for the next breeding season, and subadults and immature eagles must survive stressful environmental conditions. Therefore, maintaining and/or improving winter survival is crucial to eagle recovery (U.S. Fish and Wildlife Service 1978 and 1983).

Distribution

Historically, the bald eagle nested in at least 45 of the contiguous 48 states, with an estimated 250,000 - 500,000 bald eagles living on the North American continent before the first Europeans arrived. The breeding range of the bald eagle was greatly diminished during the 19th and 20th centuries. Present-day breeding occurs primarily in northern California, Alaska, Oregon, Washington, Minnesota, Wisconsin, Michigan, Maine, the Chesapeake Bay area, Florida, the tri-state corner of Idaho, Montana, and Wyoming, and in parts of Canada. The Service estimated the breeding population exceeded 5,748 occupied breeding areas in 1998 (U.S. Fish and Wildlife Service 1999), to an estimated minimum 7,066 breeding pairs today. Bald eagles winter throughout the country, but are most abundant in the West and Midwest.

Bald eagles occur year-round in Montana and occur in all 49 latilongs (Bergeron et al. 1992, Montana Bird Distribution Committee 1996). Currently, about 75 percent of nesting pairs in Montana can be found in the western third of the states west of the Rocky Mountain Front

(Montana Bald Eagle Working Group 1994). Most breeding areas are associated with large montane rivers, lakes, impoundments and coniferous and cottonwood (*Populus* spp.) forests. The remaining 25 percent of pairs are scattered throughout the eastern two thirds of the state along major prairie rivers. Most prairie breeding areas are associated with the Yellowstone River, but a number of bald eagles nest along the Bighorn, Tongue and lower Missouri Rivers (Montana Bald Eagle Working Group 1994). Wintering and migration habitat is distributed throughout Montana.

In 1978 there were only 12 breeding areas for bald eagles known in Montana (Servheen 1978). In the autumn 1995, 222 current or historical breeding areas were known in Montana (D. Flath, Montana Fish, Wildlife and Parks, pers. comm. 1995). By the end of 2001, of the 297 known bald eagle nesting territories in the state, 220 of the 261 territories surveyed were active (D. Flath, Montana Fish, Wildlife and Parks, pers. comm. 2001). Out of the 220 active nests, 188 were successful, producing 347 young. In 2005, there were 396 bald eagle territories in Montana (Montana Bald Eagle Working Group 2006). Four hundred and thirty-eight young fledged from 237 successful nests (Montana Bald Eagle Working Group 2006).

The Pacific Bald Eagle Recovery Plan (U.S. Fish and Wildlife Service 1986) uses the zone approach to differentiate subpopulations and habitat important to bald eagle recovery in the Pacific recovery area. The management zone approach is central to the recovery process because establishment of well-distributed bald eagle populations and habitats is essential for recovery of the species in the recovery area.

There are seven bald eagle management zones in Montana. The proposed action is located in six of the seven management zones (Zones 18, 39, 40, 41, and 47). The Tongue River Railroad will occur in Management Zone 41. Management Zone 41 includes lands drained by the Yellowstone River and its tributaries from the mouth of the Bighorn River to the North Dakota border. Floodplains of the Yellowstone, Powder, and Tongue Rivers support mature cottonwood forests. In 2001, there were 28 known bald eagle nesting territories in Zone 41, and 32 young were fledged from 14 successful nests (Montana Bald Eagle Working Group 2002). In 2005, there were 42 territories in Zone 41, in which 26 were successful, fledging 53 young (Montana Bald Eagle Working Group 2006).

Bald eagle seasonal habitat quality depends on the presence and abundance of food usually associated with open water, availability of secure night roost sites and freedom from human harassment and dictates the amount and extent of use of specific wintering grounds and areas used during migration (Montana Bald Eagle Working Group 1994). Bald eagles wintering in Montana tend to congregate near bodies of water and roost communally. Major rivers and large lakes constitute the majority of winter habitats used although temporary presence of high quality foods may entice eagles to areas far removed from aquatic zones. Wintering eagles are often observed in uplands, foraging on carcasses associated with late ungulate harvests and big game wintering grounds. Eagles may travel several miles to roost sites (Montana Bald Eagle Working Group 1994).

Records for wintering bald eagles in Montana exist for most of the latilongs included in the project area (Bergeron et al. 1992, Montana Bird Distribution Committee 1996). Counts of wintering eagles are very variable from year to year, and are not useful for trend analysis. Flath et al. (1991) estimated that over 600 bald eagles over winter in Montana. The annual bald eagle winter surveys sample 23 sites for wintering bald eagles in Montana. In January 2006, 419 bald eagles were observed just along these limited routes (S. Larmarr, U.S. Bureau of Land

Management, pers. comm. 2006). The value of the river immediately below the Tongue River Dam as an attractant for migrant and wintering eagles has been recognized (Lockhart and McEneaney 1978). It was estimated that an average 10-15 bald eagles winter along the river below the dam (U.S. Fish and Wildlife Service 1992).

During migration, bald eagles could be observed in any area or habitat with TRRC's planning area. Migration paths of adult bald eagles from the wintering grounds in the southern Rocky Mountain Region passed through eastern Montana in early April (Harmata 1984). A minimum of eight times as many bald eagles migrate through the lower Yellowstone River area of eastern Montana as winter there (Swenson et al. 1981, Swenson 1983).

Status and Threats

Montana is included in the seven-state Pacific Bald Eagle Recovery Area (U.S. Fish and Wildlife Service 1986). The primary recovery objective of this area is to provide secure habitat for bald eagles within the seven-state Pacific recovery area and to increase population levels in specific geographic areas to the extent that the species can be delisted. Another recovery criteria is to have stable or increasing wintering populations.

The Service originally proposed to delist the bald eagle on July 6, 1999 (U.S. Fish and Wildlife Service 64 FR 36453-36464). On February 16, 2006 (U.S. Fish and Wildlife Service, 50 CFR 8238-8251), the Service reopened the comment period for the proposed rule to remove the bald eagle in the lower 48 states from the list of endangered and threatened wildlife. The bald eagle population in the lower 48 states has increased from approximately 487 active nests in 1963, to an estimated minimum 7,066 breeding pairs today.

The decline in nesting populations during the 20th century has been attributed to habitat loss (identified as the most significant long-term threat to all bald eagle populations in the recovery area), environmental contamination, electrocution, shooting, vehicular collisions, poisoning, and trapping (U.S. Fish and Wildlife Service 1986).

Loss of eagle habitat continues to impact bald eagle populations within the seven-state Pacific recovery area. Development, both urban and recreational, as well as other forms of human activity such as logging, mineral exploration and extraction is adversely affecting suitable breeding, foraging and wintering habitats (U.S. Fish and Wildlife Service 1986). Disruption, destruction, or obstruction of roosting and foraging areas can negatively affect bald eagles. Bald eagles are extremely sensitive to disturbance during nest building, egg laying, and incubation periods (February 1 through April 30). Bald eagles are most likely to desert nest sites during this period if disturbed. Nesting bald eagles may inadequately feed their young if the adults are prevented or discouraged from feeding at preferred sites. Migrating and wintering bald eagles congregate at specific sites for purposes of feeding and sheltering. Bald eagles rely on established roost sites because of their proximity to sufficient food sources. Roost sites are usually in mature trees where eagles are somewhat sheltered from the wind and weather. Human activities near or within communal roost sites may prevent eagles from feeding or taking shelter, especially if there are not other undisturbed and productive feeding and roosting sites available. Disruptive activities in the flight path between nesting and roosting sites and important foraging areas can interfere with feeding. Activities that permanently alter eagle habitat can altogether eliminate the elements that are essential for feeding and sheltering eagles (U.S. Fish and Wildlife Service 2006a). The Pacific Bald Eagle Recovery Plan (U.S. Fish and Wildlife Service 1986) originally identified the cumulative long-term effects of small scale actions and individual

projects, while not jeopardizing the continued existence of the species, are the single most important threat to bald eagle recovery. Increased human activity and various land developments can adversely affect the suitability of breeding and wintering habitats (Juenemann and Frenzel 1972, Lish 1975, Grubb and King 1991).

Electrocution and collision with power lines has been a significant cause of mortality for golden and bald eagles. Before the 1970s, raptor electrocution had been noted by several researchers (Hallinan 1922, Marshall 1940, Edwards 1969, Coon et al. 1970). However, it was not until the 1970s, that its magnitude was known. Efforts to reduce power line mortalities by biologists, the utility industry, federal and state agencies, led to the publication of *Suggested Practices For Raptor Protection On Power Lines* (Miller et al. 1975) and *Mitigating Bird Collisions With Power Lines: The State of the Art in 1994* (Avian Power Line Interaction Committee (APLIC) 1994). Despite the publication of *Suggested Practices* in 1975, 1981, and 1996, and efforts on the part of the electric industry to correct many problem power lines, researchers have continued to report raptor use of power lines, and raptor electrocution deaths (APLIC 1996). Literature accounts from North America since 1981 indicate that the raptor electrocution problem is still widespread (APLIC 1996).

Electrocution deaths of bald eagles have been documented across the country, including Montana (APLIC 1996). Bald eagle losses to electrocution were probably underestimated in the 1970s and early 1980s because studies were not conducted in areas with bald eagle concentrations. Bald eagles frequently congregate in large numbers during the winter (Stalmaster 1987). In predominately treeless areas, common in southeastern Montana, power poles may be the only perches available to bald eagles. The National Wildlife Health Laboratory (1985) reported that 130 (9.1 percent) of 1,429 dead bald eagles examined from 1963 to 1984 were electrocuted, with 55 percent of those mortalities occurring between 1978 to 1984. Franson et al. (1995) summarized that 12 percent of the known bald eagle mortalities were the result of electrocution. Between 1986 and 1996 electric utility company records from across the western United States and Canada documented 118 bald eagles, 272 golden eagles, and an additional 358 unidentified eagles were electrocuted (Harness 1997).

ENVIRONMENTAL BASELINE

Under the provisions of section 7 (a)(2), when considering the "effects of the action" on listed species, the Service is required to consider the environmental baseline. The environmental baseline includes the past and present impacts of all federal, state, tribal, local, and private actions and other human activities in the action area (50 CFR 404.02). Unrelated federal actions affecting the same species or critical habitat that have completed formal or informal consultation are also part of the environmental baseline, as are federal and other actions within the action area that may benefit listed species or critical habitat. There is no critical habitat designated for the bald eagle, so none will be impacted.

Status of the Species within the Action Area

Since the late 1970s, the bald eagle has substantially increased its nesting distribution and numbers. Consequently the Service downlisted the bald eagle from endangered to threatened in 1995. This species can occur in the Tongue River Railroad project area in nesting, migrating, and wintering populations. The Tongue River Corridor is a significant nesting and wintering area, and migration corridor for bald eagles in Montana. Increased use of the corridor by bald eagles is part of the reason for, and reflective of, the trend towards recovery by this species.

Nesting Population

Montana is included in the seven-state Pacific Bald Eagle Recovery Area. In 1978 there were only 12 known breeding areas for bald eagles in Montana (U.S. Fish and Wildlife Service 1995). By 1998, there were more than 250 known breeding sites in Montana (K. Dubois, Montana Fish, Wildlife and Parks, pers. comm. 2006). By 2005, there were at least 396 nesting pairs in Montana, in which 237 nests were successful (Montana Bald Eagle Working Group 2006). Although, the majority of bald eagle nesting territories occur in western Montana, a significant number of bald eagles nest within or adjacent to the proposed activities.

At this time, there are at least seven bald eagle nest territories along the Tongue River, downstream of the Tongue River Dam (A. Putniak, Montana Fish Wildlife and Parks, pers. comm. 2006). The following discussion describes the current known and historical nests along the Tongue River.

Nest 01 (Tongue River, Nest Territory 041-005-1, not on map)

In the mid-1980s, a pair of bald eagles exhibited pair-bonding activity near a nest in a cottonwood tree along the Tongue River about 2.5 miles below the dam. In the BA, this nest was referred to as Nest 01. No egg-laying occurred and in subsequent years this nest was also used by golden eagles (U.S. Fish and Wildlife Service 1992). The nest was destroyed by a storm in 1994. Loss of bald eagle nests is not uncommon. In Montana, an average of seven percent (range 3-15 percent) of all bald eagle nests is lost each year. The continent-wide nest turnover rate is also seven percent (range 5-20 percent). Nests may fall out of trees or the tree may be lost (Montana Bald Eagle Working Group 1994). Thus, while certain nests may remain active for many years, it is not unusual for the location of a nest site within a bald eagle nesting territory to change (D. Flath, Montana Fish, Wildlife and Parks, pers. comm. 1995).

Nest 02 (Tongue River, Nest territory 041-005-2, not on map)

In spring 1992 a pair of bald eagles established a nest in a cottonwood tree about eight miles downstream from the dam (Harms 1992). This nest will be referred to as Nest 02. In 1992-1993, Nests 01 and 02 were apparently used interchangeably by the same pair of bald eagles (D. Flath, Montana Fish, Wildlife and Parks, pers. comm. 1994). In spring 1994, Nest 01 was occupied by bald eagles but was destroyed in a windstorm; Nest 02 was not occupied. It is believed that this pair of bald eagles constructed a new nest somewhere downstream from the Tongue River Dam, now known as Nest 03. Nest 02 was destroyed in 1995.

Nest 02 Alternate (Dutch Hollow, Nest Territory No. 041-042-1, Figure 1)

During the April 16, 1999 aerial survey, a large stick nest was observed in a cottonwood tree about 0.3 mile downstream from the previous location of Nest 02. Bald eagles may build alternate nests within a breeding area (Montana Bald Eagle Working Group 1994). This nest was referred to as Nest 02 Alternate (Tongue River, Nest Territory 041-005-2) in the BA. Nest 02 Alternate was occupied in 2005, and now considered its own territory and named Dutch Hollow (Nest Territory No. 041-042-2). It is about 4,300 feet (0.8 mile) from the Western Alignment portion of the Tongue River Railroad. The Dutch Hollow nest was active in April 2006 but appeared empty in June 2006.

Nest 03 (Tongue River, Nest Territory 041-005-3, Figure 1)

Nest 03 has been active every year since 1995. In 1998 it fledged two young eagles (Flath, personal comm. 1998). It was observed during an aerial survey of the Tongue River Valley and Tongue River Railroad route on April 16, 1999, and was again active and successful. This nest

was occupied in 2005. This nest is about 3,700 feet (0.7 mile) from the Western Alignment portion of the Tongue River Railroad. The Tongue River nest was active in June 2006 with three young.

Nest 04 / Nest 04 Alternate (H.S. School, Nest Territory 041-017-2, Figure 3).

An active bald eagle nest was found about 39 air miles up the valley (south) from Miles City in 1992. This nest, referred to as Nest 04 in the BA and 041-017-01 in the bald eagle data base, has been active every year since 1992. In 2000, a new alternate nest was built close to the first nest and is currently the active nest. This nest will be referred to as Nest 04 Alternate or 041-017-02. Since the alternate nest is very close to Nest 04, they are shown as a single location and active territory. Nest 04 Alternate was occupied in 2005. It is about 4,750 feet (0.9 mile) from the Tongue River Railroad. The HS School nest was active in June 2006 with two young.

Nest 05 (Brandenberg, Nest Territory 041-023-1, Figure 3)

In early 1999, TRRC and the Board were contacted by local residents regarding the possibility of a bald eagle nest several miles south of Nest 04. During the April 16, 1999 aerial survey, a nest (Nest 05 in the BA) was observed in a cottonwood tree about eight air miles upstream (south) of Nest 04. A dead adult bald eagle was in the nest. The status of this nest is inactive and is now off the nest territory list until active again. It is about 4,000 feet (0.75 mile) from the Tongue River Railroad. The Brandenburg nest was not located in April or June 2006.

Nest 06 (Inactive, Figure 2)

During the aerial survey on April 16, 1999 a large stick nest was found in a small, apparently inactive great blue heron rookery in large cottonwood trees along the Tongue River about 11 air miles up the valley (south) of Ashland. This nest was similar in size and shape to Nest 03, which was also originally a great blue heron nest that had been appropriated by bald eagles. On April 26, 1999 TRRC personnel observed a Canada goose on this nest, and about six great blue herons in the rookery around the nest (D. Day, Tongue River Railroad Company, pers. comm. 1999). This nest is not documented and is not considered active. It is about 6,200 feet (1.2 miles) from the Tongue River Railroad.

Nest 07 (Birney South, Nest Territory 041-038-1, Figure 1)

This nest was first identified during the April 2005 aerial survey. It was occupied in 2005. It is about 2,889 feet (0.55 miles) from the Tongue River Railroad. The Birney South nest was active in June 2006 with three young.

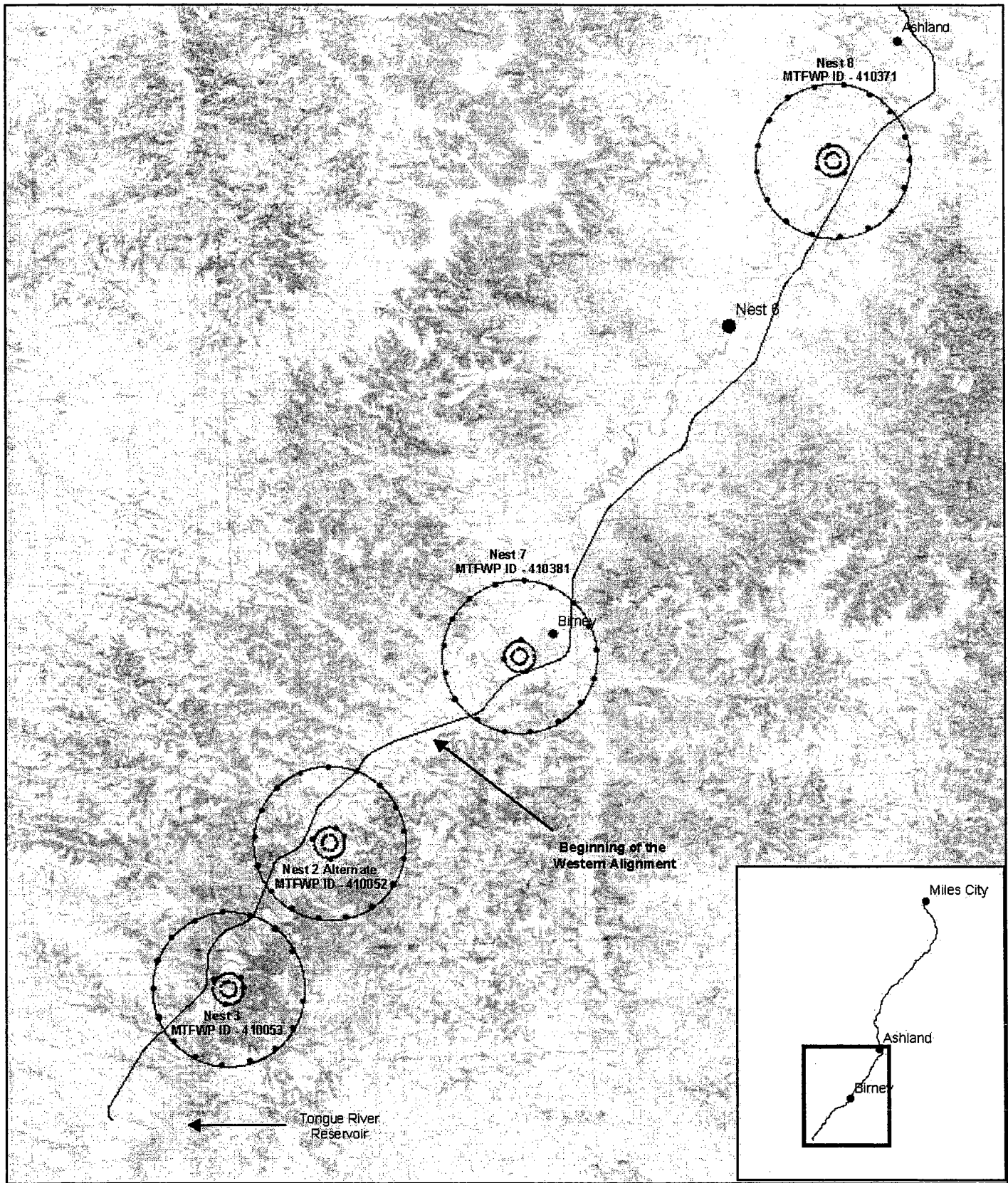


Figure 1: Bald eagle management zones in relation to the Tongue River Railroad route, Nest-03, 02 Alternate, 06, 07, and 08.

Nest 08 (Bowman Creek, Nest Territory 041-037-1, Figure 1)

This nest was first identified during a 2004 aerial survey and then again during the April 2005 aerial survey. It was occupied in 2005. It is about 3,661 feet (0.69 miles) from the Tongue River Railroad. The Bowman Creek nest was active in June 2006 with 2 young.

Nest 09 (Kennedy Creek, Nest Territory 041-036-1, Figure 3)

This nest was identified during a 2004 aerial survey and reported as active. It was occupied in 2005. It is about 5,282 feet (1.0 miles) from the Tongue River Railroad. Since a possible alternate nest to this territory, EMPTY2, is active as of April 2006, the Kennedy Creek 01 nest may remain unoccupied in 2006.

Nest 10 (EMPTY2, now Kennedy Creek Nest Territory 041-036-2, Figure 3)

This nest was identified during a 2004 aerial survey, although no bald eagle activity was observed at that time. At this time, this nest is considered inactive. In this BA, this nest is referred to as Nest 10. It is about 5,407 feet (1.02 miles) from the Tongue River Railroad. The EMPTY2 nest was active in June 2006 with two young.

Nest 11 (EMPTY1, Figure 3)

This nest was identified during a 2004 aerial survey, however no bald eagle activity was observed at this time. A subsequent survey in April 2005 documented this nest as empty. At this time this nest is considered inactive. It is about 2,441 feet (0.46 miles) from the Tongue River Railroad.

Nest 12 / Nest 12 Alternate (Cowles Creek, Nest Territory 041-031-1, Figure 4)

This nest was first identified during a 2004 aerial survey and then again during the April 2005 aerial survey. A bald eagle was observed in the nest during the 2005 survey. In this BA, this nest is referred to as Nest 12. Its location is shown in Figure 4. It is about 3,556 feet (0.67 miles) from the Tongue River Railroad. An empty nest in the vicinity of Nest 12 was identified during the April 2005 aerial survey. In the BA, this nest is referred to as Nest 12 Alternate. It is about 2,449 feet (0.46 miles) from the Tongue River Railroad. Due to their close proximity, Nest 12 Alternate will be considered as part of the same active territory as Nest 12. The Cowles Creek nest was active in June 2006 with two young.

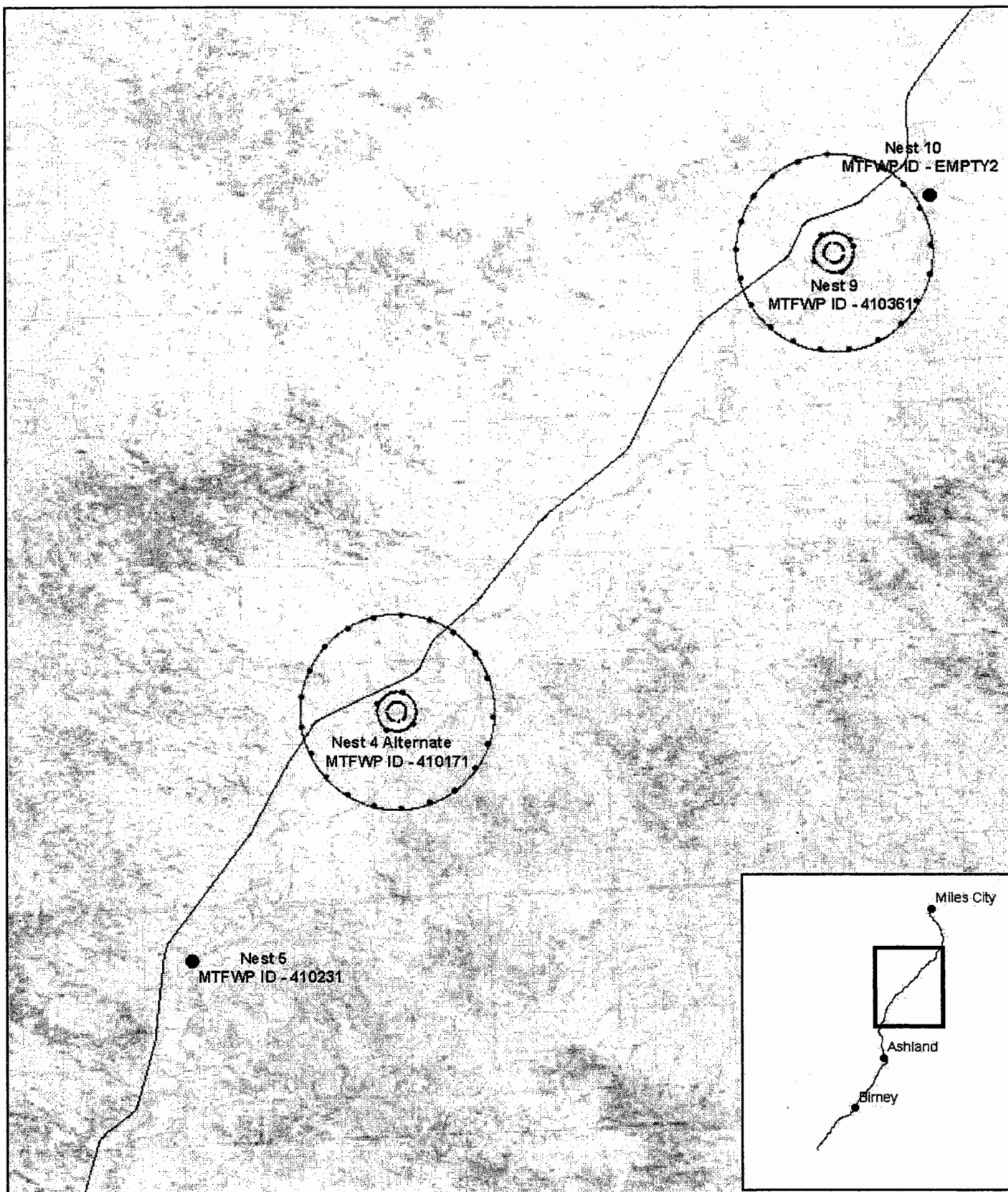


Figure 2: Bald eagle management zones in relation to the Tongue River Railroad route, Nests 04 Alternate, 05, 09, and 10.

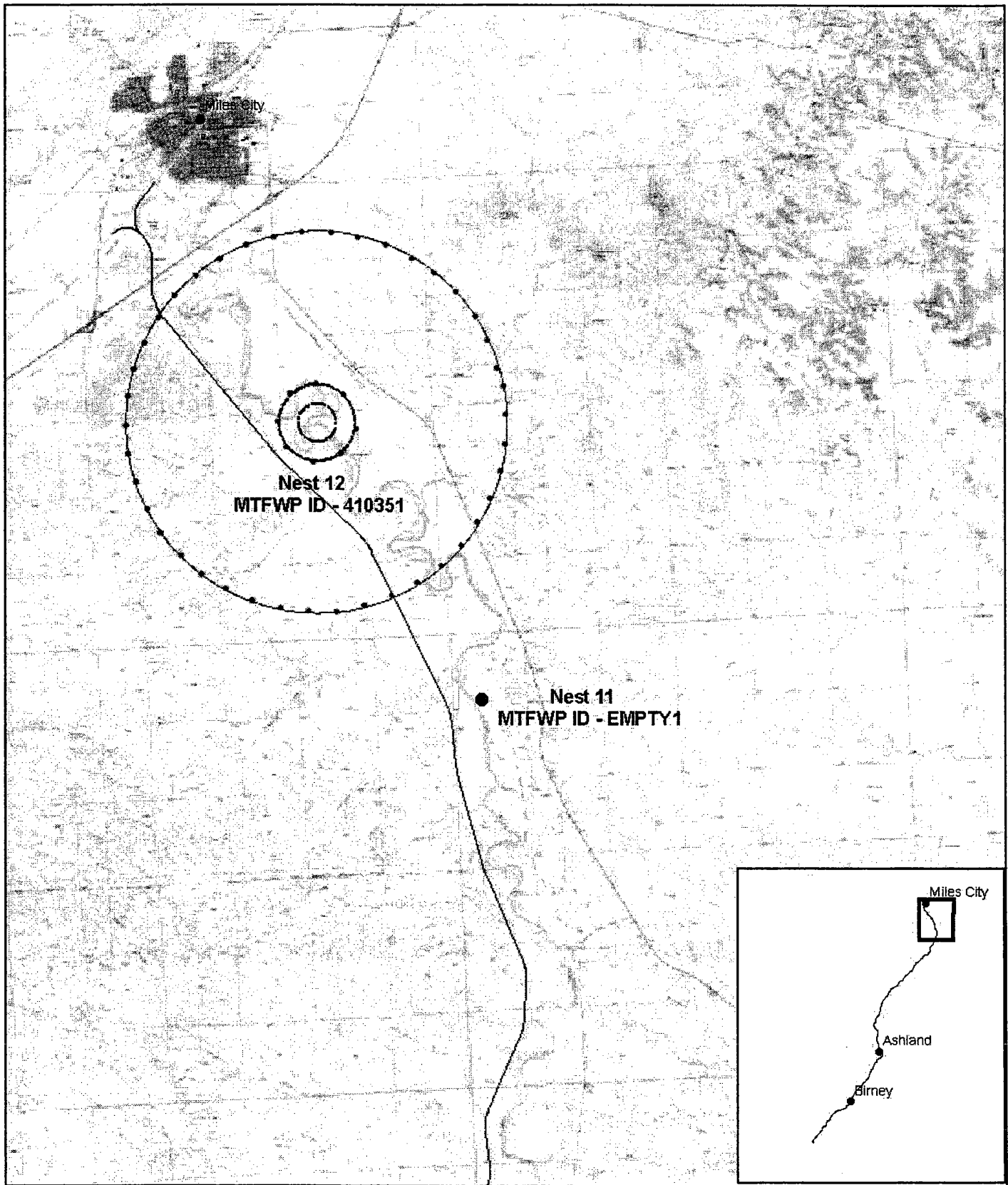


Figure 3: Bald eagle management zones in relation to the Tongue River Railroad route, Nests 11 and 12.

Wintering / Migrant Population

Bald eagle seasonal habitat quality depends on the presence and abundance of food usually associated with open water, availability of secure night roost sites and freedom from human harassment, and dictates the amount and extent of use of specific wintering grounds and areas used during migration (Montana Bald Eagle Working Group 1994). Bald eagles wintering in Montana tend to congregate near bodies of water and roost communally. Major rivers and large lakes constitute the majority of winter habitats used although temporary presence of high quality foods may entice eagles to areas far removed from aquatic zones. Wintering eagles are often observed in uplands, foraging on carcasses associated with late ungulate harvests and big game wintering grounds. Eagles may travel several miles to roost sites (Montana Bald Eagle Working Group 1994).

Records for wintering bald eagles in Montana exist for most of the latilongs included in the project area (Bergeron et al. 1992, Montana Bird Distribution Committee 1996). Migration paths of adult bald eagles from the wintering grounds in the southern Rocky Mountain Region passed through eastern Montana in early April (Harmata 1984). A minimum of eight times as many bald eagles migrate through the lower Yellowstone River area of eastern Montana as winter there (Swenson et al. 1981, Swenson 1983).

The value of the river immediately below the Tongue River Dam as an attractant for migrant and wintering eagles has been recognized (Lockhart and McEneaney 1978). Significant numbers of eagles pass through these areas as migrants. It is estimated that an average 10-15 bald eagles winter along the Tongue River below the Tongue River Dam (U.S. Fish and Wildlife Service 1992). It has been estimated that there are approximately 10 to 60 wintering bald eagles along the Tongue River (R. Hazelwood, U.S. Fish and Wildlife Service, pers. comm. 2003). This estimate does not include any migrants that may be passing through.

Counts of wintering eagles are very variable from year to year, and may not be useful for trend analysis. For several years, the Bureau has been conducting bald eagle midwinter surveys along the adjacent Powder River in both Custer and Powder River Counties. Observations of bald eagles since 1993 ranged from eight to fifty-seven bald eagles (B. Baker, U.S. Bureau of Land Management, pers. comm. 2002).

Bald eagle migrants and winter residents along the Tongue River forage on fish, waterfowl, carrion, etc. During migration, as many as 50 bald eagles have been counted along the Tongue River from Miles City to the upper end of the Tongue River Reservoir (Farmer 1992).

The BA cites surveys by consultants documenting winter use of the Tongue River Corridor. The Bureau has conducted eagle nesting and wintering surveys along the Tongue River the last few years and part of the monitoring requirements for coal bed methane (CBM) development (U.S. Bureau of Land Management 2005, 2006). Congregations of bald eagles noted in those surveys, suggest the presence of possible winter roosts. Two such locations close to the Tongue River Railroad ROW are at Section 6, T.7 S., R. 42 E. and Section 28, T. 6 S., R. 42 E.

Coal bed methane companies such as Fidelity Exploration and Production Company, have also conducted wintering and migrant bald eagle surveys in and adjacent to the action area. Bald eagle use of the river corridor is presented in reports for Fidelity Exploration and Production Company by Hayden Wing Associates Environmental Consultants (Hayden Wing Associates 2003, 2005, 2006).

In Wyoming, there are 10 historically active bald eagle nests within the Powder River Basin Oil and Gas project area. Forty-two bald eagle winter roosts have been documented within the project area. The eastern front of the Big Horn Mountains and the Powder River Basin is a known wintering area for bald eagles and observations of bald eagles are common during the winter months.

In summary, the environmental baseline currently includes seven active bald eagle nests, six inactive or unknown state nests and possible identifiable winter roost sites. Statewide, in 2005, the mean brood size for 237 successful nests was 1.8 young per successful nest (Montana Bald Eagle Working Group 2006). The nesting success for known fate active nests (317) was 84 percent. Over the past four years (2003-2006) the mean fledging rate for the seven lower Tongue River bald eagle territories was 1.44 young per successful nest. The nesting success for known fate active nests (18) was 94.4 percent.

Factors Affecting the Species Environment within the Action Area

Primary factors affecting the bald eagle in the action area are associated with human activity/disturbance, increased residential and commercial development, equipment noise, electrocution, collision with power lines and construction of new roads (collision with vehicles), loss of nesting and wintering habitat, effects of the Tongue River Dam, and CBM development.

In the Service's November 8, 1995, biological opinion addressing the proposed TRRC's additional rail line from Ashland to Decker, Montana, in the Powder River Basin (U.S. Fish and Wildlife Service 1995), the Service said that historically, the bald eagle nests and winter roosts have been affected by relatively few activities. Grazing had been the predominant land use in the area and has likely had only minimal effect on the eagles and their habitat. Since then, the baseline has changed due to the development of CBM.

In the Service's September, 2002 Final Biological and Conference Opinions for Coal Bed Methane Production in Blaine, Gallatin, Park, Carter, Powder River, Custer, Rosebud, Treasure, Wheatland, Sweet Grass, Stillwater, Carbon, Golden Valley, Musselshell, Yellowstone, and Big Horn Counties, Montana (U.S. Fish and Wildlife Service 2002a), we concurred that CBM development would likely adversely affect the threatened bald eagle. The Service anticipated that four bald eagles per year could be lethally taken as a result of CBM project activities. No known bald eagle mortalities have yet occurred. The reasonably foreseeable development estimated 18,300 wells (well bores), directly affecting 75,762 acres, with 9,018 miles of new CBM roads constructed with 27,917 miles of new utility line corridors (power lines). Current baseline figures for federal, state and private minerals within Federal Plans of Development include 704 wells, 167 miles of new roads, 87 miles of new power distribution lines. Some of this development is along the Tongue River Corridor, close to bald eagle nests and winter roosts. CBM development in the Powder River basin in Montana has resulted in impacts to 971 acres of nesting and wintering habitat for bald eagles.

Conventional oil and gas development continues to occur in the Powder River Basin in both Montana and Wyoming. Electrocution deaths of bald eagles due to CBM development and the construction on new powerlines are probable. Approximately 77 eagles have been electrocuted on power lines, including one bald eagle in 2002 in the Powder River Basin in Wyoming (Associated Press 2002). In south central Montana, eagle mortality from electrocution and collision from small distribution power lines common to oil and gas development was documented in 2000 and 2001 (Schomburg 2001). Although data was collected from 303

carcasses from 1996-2001, data from 273 carcasses were collected in 2000 and 2001. Cause of death of 23 raptor carcasses were attributed to mid-span collisions, with 21 identified as golden eagle (*Aquila chrysaetos*) and one as bald eagle (Schomburg 2001). Cause of death of 280 raptor carcasses were attributed to electrocution, with 219 identified as golden eagle, four were bald eagle and 11 were either golden or bald eagles (Schomburg 2002). Data were collected from 4,090 power poles in an area of ongoing efforts to modify power poles to reduce the probability of electrocutions. Northwestern Power, a major utility company in Montana, documents one to two bald eagle electrocutions each year in Montana (S. Milodragonovich, Northwestern Energy, pers. Comm. 2002). In 2002, the Service received information on 11 eagle mortalities in the Great Falls and surrounding area (K. Speckman, U.S. Fish and Wildlife Service, pers. comm. 2002). Three eagles were killed by vehicular collisions (two bald eagles) and eight eagles were electrocuted (four bald eagles). From May 2003, through March 24, 2006, Service Law Enforcement Salvage Records for northeast Wyoming identified that 102 raptors, including one bald eagle, 65 golden eagles, one unidentified eagle, 13 hawks, 22 owls and three unidentified raptors were electrocuted on power poles within the Powder River Basin Oil and Gas project area (U.S. Fish and Wildlife Service 2006c).

The Service also believes that as a direct result of the construction of significant number of miles of new roads and small distribution lines, there will be a loss of bald eagles. The Bureau's biological assessment states that increased traffic, road kills and carrion, resulting from CBM activities, potentially increases vehicle collision hazard to bald eagles. Data from Northeast Wyoming Bird Rescue and Rehabilitation (the only bird rehabilitation facility in the Powder River Basin) show that between 1995 and 2003, six bald eagles were injured as a result of collisions with motor vehicles in the Powder River Basin (U.S. Fish and Wildlife Service 2006b). Bald eagles often forage on carcasses of other animals, particularly in the winter when aquatic food resources are not as readily available. Foraging may also be intensified during the nesting period while adults are feeding nestlings. If there is an increase in carcass availability as a result of collisions with trains and vehicles in the project area or increased big game hunter harvest spoils, bald eagles may increase foraging activities in the project area.

Drilling for CBM in the Powder River Basin in Wyoming began in 1985. As of May 29, 2002, 13,306 CBM wells have been drilled with roughly 9,000 wells in production (U.S. Fish and Wildlife 2002b). As of January 2006, there were 6,556 conventional oil and gas wells in the Powder River Basin in Wyoming (B. Rogers, U.S. Fish and Wildlife Service, Pers. comm. 2006). As of April 27, 2006, 24,279 CBM wells have been drilled in the Powder River Basin in Wyoming (B. Rogers, U.S. Fish and Wildlife Service, Pers. Comm. 2006). Incidental take granted in the Wyoming programmatic biological opinion (U. S. Fish and Wildlife Service 2002b) and in other non-tiered opinions, totaled 12 bald eagles for the life of the project (B. Rogers, U.S. Fish and Wildlife Service, Pers. Comm. 2006).

The Tongue River Railroad's purpose is to transport coal. The primary hazardous materials carried on the Tongue River Railroad would be petrochemicals (diesel fuel and lubricants) used by the trains themselves. Transportation of other hazardous materials was not anticipated in 1995. However, the Tongue River Railroad is a common carrier. Because the Tongue River Railroad is a common carrier railroad, it would be possible that materials other than coal (including hazardous materials) could eventually be transported. A railroad that is a common carrier has a "common carrier obligation" to provide service to any and all shippers along the line that request service or may want service in the future. If the Tongue River Railroad is transporting hazardous materials and experiences a derailment that spills material into the Tongue River, wildlife within the corridor would be negatively affected. The bald eagles prey

base, waterfowl and fish, could be affected. Loss of prey fish could impact the endangered pallid sturgeon or least tern, both directly and indirectly. Montana Animal Species of Concern including the blue sucker (*Cycleptus elongates*), Paddlefish (*Polydon spathual*), Sauger (*Sander canadensis*), Sicklefin Chub (*Macrhybopsis meeki*), Sturgeon Chub (*Macrhybopsis gelida*), and Yellowstone cutthroat trout (*Oncorhynchus clarki bouvieri*) could also be significantly affected.

The train accident rate established by the Federal Railroad Administration for rail lines nationwide is 3.81 derailments per one million train miles (Surface Transportation Board 2004). The SEA's analysis of the number of accidents (derailments) projected to occur along the proposed Western Alignment only, assuming 14 one-way trips a day, 365 days a year, was estimated at 0.34 anticipated annual train accidents per year (Surface Transportation Board 2004). This was only for the 17.3 mile Western Alignment and could therefore be 10 times as much if extrapolated over the entire rail line. The Board should provide for appropriate responses to train derailments to minimize the potential effect of hazardous material spills on bald eagle habitat, particularly the potential for impact to the eagles aquatic-oriented prey base (fish and waterfowl).

Eagle habitat within the project area in the Powder River Basin is also influenced by hydrology changes caused by the Tongue River Dam on the Tongue River and Yellowtail Dam on the Big Horn River, which has limited the magnitude and frequency of flooding which results in less scouring of river banks necessary for cottonwood regeneration. Periodic channel migrations accompanied by erosion of streambanks and deposition of alluvial material to form sandbars is essential to the maintenance of riparian cottonwood communities (Elser et al. 1977). Cottonwoods require non-vegetated, recently deposited alluvium for successful seed germination and establishment. Seeds germinate within 48 hours and must have a continuous supply of moisture for several weeks. On-going ranching practices have also resulted in clearing of cottonwoods for alfalfa crops and in combination with grazing practices, keep most cottonwood seedlings from becoming established.

Increased residential and commercial development along the Tongue River Corridor will contribute to impacts on nesting, foraging, loafing, winter and migrant bald eagles; and their habitat. Recognition of the increased pressures of development and recreation within the corridor, have led to the development of a conservation proposal by FWP, Region 7, for the Tongue River Corridor in Montana (Montana Fish, Wildlife and Parks 1998). Full House Resorts Inc. and the Northern Cheyenne Nation of Montana have signed a development and management agreement that anticipates a Tongue River Reservoir Casino Complex for the northwest shore of the Tongue River Reservoir (J. Kaiser, U.S. Bureau of Indian Affairs, pers. comm. 2006). It will include an RV park, campground, and casino and motel complex on a 554 acre site. Additional developments are expected to follow.

Other projects in the immediate area (upstream of the Tongue River Dam) which have significantly altered the landscape include the Decker and Spring Creek coal mines.

EFFECTS OF THE PROPOSED ACTION

In the case of considering effects on a listed species, the future direct and indirect impacts of the operation are considered, including effects on any interrelated and interdependent activities and any reasonably certain future non-federal activities (cumulative effects). These are added together to determine the total effect on listed species and their habitat.

Primary factors affecting the bald eagle in the action area are associated with human activity/disturbance, equipment noise, train strikes, construction of new roads (collision with vehicles), loss of nesting and wintering habitat, possible area contamination due to derailment of railroad cars carrying hazardous materials, effects of the Tongue River Dam, and CBM development.

In the Service's November 8, 1995, biological opinion addressing the proposed TRRC's additional rail line from Ashland to Decker, Montana, in the Powder River Basin (U.S. Fish and Wildlife Service 1995), the Service anticipated one bald eagle could be lethally taken as a consequence of increased disturbance. The incidental take was expected to occur as a result of potential premature fledglings and/or nest abandonment during the construction phase and possible train strikes of adult birds during the operational phase.

Bald eagles are sensitive to a variety of recreational, research, resource and urban development activities. The Montana Bald Eagle Management Plan (Montana Bald Eagle Working Group 1994) defined disturbance, to be "any human elicited response that induces a behavioral or physiological change in a bald eagle contradictory to those that facilitate survival and reproduction. Disturbance may include elevated heart or respiratory rate, flushing from a perch or events that cause a bald eagle to avoid an area or nest site." The Service predicts that there will be some disturbance to nesting, wintering, and migrant bald eagles in the project area.

The Board in the revised biological assessment, stated that bald eagles are sensitive to human presence. Bald eagles may be affected by disturbance near winter roost sites and perch areas. Much of the project area is devoid of significant human disturbance, with grazing as the major land use. Many of the eagles may be unaccustomed to activities involving large equipment and significant human activity for even a short period of time, such as with drilling, construction of power lines and road building. Some eagles may lose foraging opportunities and could even choose to abandon the roost sites completely, depending on the level of activity.

The Montana Bald Eagle Management Plan (Montana Bald Eagle Working Group 1994) summarized the reaction of bald eagles to human activities as:

Bald eagles are sensitive to a variety of recreational, research, resource and urban development activities. Responses of eagles may vary from ephemeral, temporal and spatial avoidance of activity to total reproductive failure and abandonment of breeding areas. Less adequately documented is that bald eagles also tolerate apparently significant disturbances. Relationships of human activity and eagle responses are highly complex, difficult to quantify, and often site-specific. Responses vary depending on type, intensity, duration, timing, predictability, and location of human activity. The way in which these variables interact depends on age, gender, physiological condition, sensitivity, residency, and mated status of affected eagles. Prey base, season, weather, geographic area, topography and vegetation in the vicinity of activities and eagles (plus other variables probably unperceived by humans) also influence eagle responses. Cumulative effects of many seemingly insignificant or sequential activities may result in disruption of normal behavior. Lack of experimental data (due to endangered/threatened status) limits quantification of response to empirical evidence, but general trends in eagle responses (or lack thereof) to human activity are becoming evident to field researchers and managers, although somewhat subjectively. Clearly, some bald eagles are more tolerant of human activity than others. Tolerance threshold is

usually site, pair, and activity specific and a function of type, intensity, and proximity of disturbance over exposure time. However, it is becoming apparent that there are "urban" and "rural" eagles. Urban eagles may be more tolerant of certain human activities than their rural counterparts because they have been or are exposed to more human activity at gradually increasing levels while rural eagles' exposure is abrupt.

The Montana Bald Eagle Management Plan (Montana Bald Eagle Working Group 1994) defined disturbance, as used above, to be "any human elicited response that induces a behavioral or physiological change in a bald eagle contradictory to those that facilitate survival and reproduction. Disturbance may include elevated heart or respiratory rate, flushing from a perch or events that cause a bald eagle to avoid an area or nest site."

This definition of disturbance will be used for the purposes of this biological opinion, regardless of whether the bald eagle is delisted or a proposed definition is adopted for the Bald and Golden Eagle Protection Act (BGEPA). Until now, the meaning of "disturb" was never explicitly defined by the Service or by the courts. The Service is proposing a definition of "disturb" under the BGEPA as "To agitate or bother a bald or golden eagle to the degree that interferes with or interrupts normal breeding, feeding, or sheltering habits, causing injury, death, or nest abandonment" (50 CFR 8265, February 16, 2006).

Based on the above descriptions, it is reasonable to assume that bald eagles nesting along the Tongue River in the vicinity of the Tongue River Railroad would be accustomed to some level of disturbance related to use of the county road, residences, agricultural activities such as hay production and feeding livestock, and limited recreational use of the Tongue River. It is also reasonable to assume that the construction and operation of a railroad in the project area is going to cause considerably more disturbance particularly at the nest site than the birds in the vicinity are accustomed to. Responses of eagles may vary from ephemeral, temporal and spatial avoidance of activity to total reproductive failure and abandonment of breeding areas. Less adequately documented is that bald eagles also tolerate apparently significant disturbances. Relationships of human activity and eagle responses are highly complex, difficult to quantify, and often site-specific. Responses vary depending on type, intensity, duration, timing, predictability and location of human activity. The Service believes that the combination of construction and operational disturbances is likely to exceed the tolerance of the birds particularly since the railroad will be in such close proximity to some nests. The intensity and duration of disturbances will be much greater than the birds are accustomed to. Although birds are less likely to desert nest sites when disturbed during hatching, rearing and fledging periods (May 1 through August 15), care should be exercised to minimize disturbance (U.S. Fish and Wildlife Service 1986). The Service believes that the combination of construction and operational disturbances may cause the eagles to abandon its nest. Monitoring will help determine the short term affects of construction activities, but will not alleviate the potential long term operational impacts. Nesting habitat enhancement are appropriate measures to help off-set long term impacts to the population but do not remove or eliminate the potential to incidentally take bald eagles.

Direct Effects

The Service believes that the combination of potential construction and operation disturbances would likely have direct effects on the bald eagle and its habitat. The effects on the habitat would include removal of some of the riparian vegetation that serves as perch, screening,

foraging, and potential nesting vegetation from the riverbank in the project area. The most significant direct effects to the eagle include the potential pre-mature fledging and nest abandonment during the construction phase and possible train strikes of adult birds during the operational phase. Monitoring may help minimize short term affects during construction, but will not alleviate the potential long-term operational impacts. Nesting, foraging and wintering habitat enhancement is an appropriate measure to help off-set long term impacts.

Indirect or Interrelated and Interdependent Actions

Indirect effects of the proposed action include such things as temporary displacement of prey due to disturbance from passing trains or construction and maintenance activities. Such disturbance can potentially disrupt breeding and feeding activities.

Cumulative Effects

Cumulative effects are those effects of future non-federal (state, local government, or private) activities on endangered and threatened species or critical habitat that are reasonably certain to occur during the course of the federal activity subject to consultation. Future federal actions are subject to the consultation requirements established in section 7 of the Act and, therefore, are not considered cumulative to the proposed action.

The continued fragmentation of habitat and loss of riparian vegetation due to vegetation removal may eventually affect the eagle's ability to adequately use the prey base or other important habitat features. The Montana Bald Eagle Management Plan (Montana Bald Eagle Working Group 1994) emphasized that even though the bald eagle populations have increased in recent years, the continued alteration and removal of suitable habitat due to human activities may affect the long-term recovery of the bald eagle in Montana.

As stated in the BA, reasonably foreseeable related and unrelated actions, and cumulative effects would include: 1) CBM production may result in the loss of up to four bald eagles per year, 2) an increasing human population and infrastructure in the region could result in displacement, accidental death, or increased illegal killing of bald eagles, and 3) construction of the Tongue River Railroad could result in the development of two or three coal mines in the Ashland area.

The Final Biological and Conference Opinions for Coal Bed Methane Production in Blaine, Gallatin, Park, Carter, Powder River, Custer, Rosebud, Treasure, Wheatland, Sweet Grass, Stillwater, Carbon, Golden Valley, Musselshell, Yellowstone, and Big Horn Counties, Montana issued in September 2002 by the Service (U.S. Fish and Wildlife Service 2002a) anticipates that four bald eagles per year will be lethally taken as a result of CBM project activities. In nearby Wyoming, incidental take granted in the Wyoming programmatic biological opinion (U. S. Fish and Wildlife Service 2002b) and in other non-tiered opinions, totaled 12 bald eagles for the life of the project (B. Rogers, U.S. Fish and Wildlife Service, Pers. Comm. 2006). The Service based the anticipated take of bald eagles on similar concerns the Service had in the 1995 Tongue River Railroad Biological Opinion, as well as the extensive CBM project area in the Powder River and Billings Resource Management Planning areas. In comparison, the Service's 1995 biological opinion (U.S. Fish and Wildlife Service 1995) addressing the TRRC's rail line from Ashland to Decker, Montana concluded that one bald eagle could be lethally taken as a result of disturbance.

The Service does not believe that the direct, indirect and cumulative effects of the proposed project would reduce appreciably the likelihood of both survival and recovery, or alter appreciably the habitat of the Pacific Bald Eagle Population in the wild by reducing the reproduction, numbers, or distribution of the species.

BIOLOGICAL OPINION/CONCLUSION

After reviewing the current status of the bald eagle, the environmental baseline for the action area, the effects of the construction and operation of the Tongue River Railroad, and the cumulative effects, it is the Service's biological opinion that the direct and indirect effects of the construction and operation of the Tongue River Railroad, as proposed, are not likely to jeopardize the continued existence of the bald eagle. No critical habitat has been designated for this species, therefore, none will be affected.

The Service has reached this conclusion, based in part on, but not limited to, the following:

1. The bald eagle has experienced significant recovery across much of its range since listing. Today, the bald eagle population in the lower 48 states has increased from approximately 487 active nests in 1963, to an estimated minimum 7,066 breeding pairs. The Service has re-proposed to remove the bald eagle from the list of endangered and threatened wildlife (50 CFR 8238, February 16, 2006).
2. By 2005, Montana documented 396 bald eagle territories, in which 317 were active nests (Kristi Dubois, Montana Fish, Wildlife and Parks, pers. comm. 2006).
3. The project area encompasses a relatively small amount of the bald eagle's entire range.
4. Higher densities of bald eagles and their nesting territories occur in northwestern Montana.
5. A relatively small number of roosts sites may potentially be adversely affected by the project.
6. Even with anticipated losses from the direct and indirect effects of the Tongue River Railroad, recovery goals in Montana will be achieved.

INCIDENTAL TAKE STATEMENT

Section 9 of the Act and federal regulation pursuant to section 4(d) of the Act prohibit the take of endangered and threatened species, respectively, without special exemption. Take is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. Harm is further defined by the Service to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering. Harass is defined by the Service as intentional or negligent actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding or sheltering. Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity.

Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited taking under the Act provided that such taking is in compliance with the terms and conditions of this Incidental Take Statement.

The measures described below are non-discretionary, and must be undertaken by the Board so that they become binding conditions of any grant or permit issued, as appropriate, for the exemption in section 7(o)(2) to apply. The Board has a continuing duty to regulate the activity covered by this Incidental Take Statement. If the Board 1) fails to assume and implement the terms and conditions, or 2) fails to require the applicant to adhere to the terms and conditions of the Incidental Take Statement through enforceable terms that are added to the permit or grant document, the protective coverage of section 7(o)(2) may lapse. In order to monitor the impact of incidental take, the Board must report the progress of the action and its impact on the species to the Service as specified in the Incidental Take Statement [50 CFR 402.14(i)(3)].

AMOUNT OR EXTENT OF TAKE

It is our conclusion that the proposed project will likely result in the incidental "take" of bald eagles. We believe the most likely impact of the project would be the loss of nestlings as a result of nest abandonment during incubation or premature fledging. (Additionally, we believe mortalities will result from train strikes while birds are feeding on carrion. Discussions with Service law enforcement personnel also confirm that train strikes do kill eagles {C. Mann, U.S. Fish and Wildlife Service, pers. comm. 1995}). The rationale for establishing the incidental take at two eagles during the construction phase is based on the fact that the mean brood size for Montana is two and initially the most likely incidental "take" would involve the loss of one year's production from that nest through abandonment by the adults during incubation or premature fledging of young birds. After construction the most likely cause for incidental "take" will be a strike by a train. The measures to enhance nesting, and winter roost habitat and enhance the prey base are things that would benefit eagles in the long term and help offset potential negative impacts to the eagle population. It is also anticipated that the eagles may move the nest farther from the railroad tracks. Preliminary evaluation of existing eagle nests indicates that there are very few successful nests within one-fourth mile of existing railroad tracks. We believe that there will be no permanent loss of production and that the monitoring and timing constraints will be beneficial.

The following reasonable and prudent measures, with their implementing terms and conditions, are designed to minimize incidental take that might otherwise result from the proposed action. With implementation of these measures the Service believes that no more than two eagles during the construction phase and one eagle per year during operations will be incidentally taken. If, during the course of the action, this minimized level of incidental take is exceeded, such incidental take represents new information requiring review of reasonable and prudent measures provided. The federal agency must immediately provide an explanation of the causes of the taking and review with the Service the need for possible modification of the reasonable and prudent measures.

The Incidental Take Statement provided in this opinion satisfies the requirements of the Act, as amended. This statement does not constitute an authorization for take of listed migratory birds under the Migratory Bird Treaty Act, the Bald and Golden Eagle Protection Act, or any other federal statute.

In the accompanying biological opinion, the Service determined that this level of anticipated take of the bald eagle is not likely to result in jeopardy to the species or destruction or adverse modification of critical habitat.

REASONABLE AND PRUDENT MEASURES

The Service believes the following reasonable and prudent measures are necessary and appropriate to minimize impacts of incidental take of bald eagles. The Board, in the revised BA, has committed to many of the Terms and Conditions required by the Service in the 1995 biological opinion (U.S. Fish and Wildlife Service 1995) which implement the Service's reasonable and prudent measures (RPMs). Therefore, the following RPM's are to clarify, in part, those conservation measure commitments by the Board.

1. Report injured or dead bald eagles to authorities.
2. The Board will survey the Tongue River Corridor during the nesting and wintering season.
3. TRRC (in consultation with the Service, FWP and BEWG) would identify tracts of land along the Tongue River Railroad route for purchase or easement for management as potential bald eagle nesting habitat or important winter roost sites.

TERMS AND CONDITIONS

In order to be exempt from the prohibitions of section 9 of the Act, the Board must comply with the following terms and conditions, which implement the reasonable and prudent measures described above and outline required reporting/monitoring requirements. These terms and conditions are nondiscretionary.

To fulfill reasonable and prudent measure No. 1, the following terms and conditions shall be implemented:

1. In the event that a bald eagle (dead or injured) is located during construction and operation, the Service's Billings Sub Office of the Montana Field Office (406-247-7366) and the Service's Law Enforcement Office (406-247-7355) will be notified within 24 hours. The action agency must provide for monitoring the actual number of birds taken.
2. The Board will initiate informal consultation with the Service when 50 percent of the incidental take exempted in this take statement has occurred for the bald eagle. Additional measures may be implemented to further minimize the potential for take of listed species.

To fulfill reasonable and prudent measure No. 2, the following terms and conditions shall be implemented:

1. The year prior to construction of the Tongue River Railroad, Tongue River Railroad will conduct an aerial survey the Tongue River Railroad from Miles City to the Tongue River Dam to determine the presence of nesting bald eagles. Nesting surveys will occur annually until construction of the rail line is complete. Final nesting surveys will be run

the first nesting season after construction and during operation of the rail line. Any active or inactive bald eagle nests would be reported immediately to the Service and BEWG. Montana Fish, Wildlife and Parks will complete the bald eagle nest activity flight in April and the bald eagle fledging flight in late June to mid July. It is therefore required that the Board complete the bald eagle nest territory occupancy flight in March, and the bald eagle nestling flight in May of each required year.

2. The year prior to construction of the Tongue River Railroad, Tongue River Railroad will conduct an aerial survey of the Tongue River Railroad from Miles City to the Tongue River Dam to determine the presence of wintering bald eagles. Winter surveys will continue annually until construction of the rail line is complete. An additional survey for wintering bald eagles will be conducted in the year following completion of construction. The results of these surveys, including locations and numbers of bald eagles, would be reported to the Service, FWP, and BEWG. During the years the winter surveys are run, and after the requirement for winter surveys are fulfilled, the Board will work with the Service and BEWG to identify any significant winter roost sites along the railroad right-of-way.

To fulfill reasonable and prudent measure No. 3, the following terms and conditions shall be implemented:

1. One year before construction, the Board will meet with the Service and the BEWG to identify and delineate the type and amount of habitat mitigation needed to offset habitat loss.
2. Cottonwood regeneration should be encouraged within the project area through reduction, modification and/or removal of domestic grazing, recreational use, or mineral extraction, if those activities are identified as being a cause of lack of regeneration. The use of conservation easements or purchase should also be examined. A white paper on maintaining and enhancing habitat integrity from the Service's 1995 Biological Opinion (U.S. Fish and Wildlife Service 1995) has been retained in this document as additional guidance in Appendix A.

CONSERVATION RECOMMENDATIONS

Section 7(a)(1) of the Act directs federal agencies to utilize their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or to develop information.

The following Conservation Recommendations are taken directly from the white papers that the TRRC has agreed to and were submitted to the ICC on October 4, 1995, and subsequently included in the 1995 biological opinion (U.S. Fish and Wildlife Service 1995). The white papers contain additional discussion and strategy on how the recommendations will be accomplished (Appendix A).

1. TRRC (in consultation with the BEWG and the Service) would identify tracts of land along the Tongue River Railroad extension route and in neighboring tributaries for purchase or easement for management as nesting waterfowl habitat.

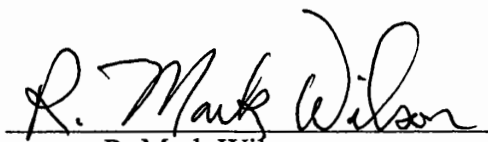
2. Because Tongue River Railroad would be a common carrier railroad, it would be possible that materials other than coal (including hazardous materials) could eventually be transported. The TRRC would be required to operate in full compliance with the Hazardous Materials Transportation Act (49 U.S.C. 1080 et seq.) and other applicable state and federal laws governing the safe handling and storage of hazardous materials (ICC 1992).

In order for the Service to be kept informed of actions minimizing or avoiding adverse effects or benefiting listed species or their habitats, the Service requests notification of the implementation of any conservation recommendations.

REINITIATION NOTICE

This concludes formal consultation on the actions outlined in the revised September 2005 BA on the construction and operation of the entire Tongue River Railroad from Miles City to Decker, Montana in Custer and Rosebud Counties, Montana. As provided in 50 CFR §402.16, reinitiation of formal consultation is required where discretionary federal agency involvement or control over the action has been retained (or is authorized by law) and if: 1) the amount or extent of incidental take is exceeded; 2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion; 3) the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat that was not considered in this opinion; or 4) a new species is listed or critical habitat designated that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, any operations causing such take must cease pending reinitiation.

Thank you for your assistance in the conservation of endangered, threatened, and proposed species. If you have any questions or comments regarding this biological opinion, please contact Lou Hanebury of my staff at 406-247-7367.


R. Mark Wilson
Field Supervisor

July 12, 2006
Date

cc:

USFWS, Billings, MT (Attn: Lou Hanebury)
DOI, Office of the Secretary, Denver, CO (Attn: Robert Stewart)
EPA, Helena, MT (Attn: Steve Potts)
FWP, Helena, MT (Attn: Chris Hunter)
FWP, Billings, MT (Attn: Allison Putniak)
Tongue River Railroad Company, Billings, MT (Attn: Doug Day)
Circle Point, San Francisco, CA (Attn: Mary Bean)

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APPENDIX A. WHITE PAPERS

MAINTAIN/ENHANCE HABITAT INTEGRITY

Assumptions

The following assumptions are made for the purposes of this discussion:

- "Habitat" refers to nesting, roosting and perching sites comprised of riparian forest (primarily cottonwood *Populus deltoides*) along the Tongue River Valley. This is a more limited definition than used in the *Montana Bald Eagle Management Plan* (Montana Bald Eagle Working Group 1994). Other components of habitat, such as prey base, will be addressed in separate discussions.

It is recognized that bald eagles may perch diurnally and may roost in trees (probably ponderosa pine, *Pinus ponderosa*) in upland areas away from the Tongue River (e.g., Anderson and Patterson 1988), but such sites should not be affected by a rail line placed in the river valley.

- "Perch" sites refer to trees or other structures (cliffs, rock outcrops, poles, etc.) used by bald eagles during the day (Montana Bald Eagle Working Group 1994), particularly when foraging along the Tongue River. It is expected that the most desirable perch sites will be close (<30 m) to the river bank (Steenhof et al. 1980). Perch trees may be larger and have greater 'Diameter at Breast Height' than neighboring trees (Bowerman et al. 1993) but, are often shorter and smaller than roost trees (Steenhof 1978). Proximity to food sources (in this case, areas along the Tongue River that may concentrate prey species including fish and waterfowl, such as below dams, above and below large riffles, at oxbows or adjacent wetlands, etc.) may also be a criterion in perch site selection (Steenhof 1978).
- "Roost" sites refer to trees used overnight, perhaps communally (Montana Bald Eagle Working Group 1994). Roost trees generally consist of large trees in dense stands with a more open understory than neighboring trees; well protected from the wind; located near the edge of the stand for ease of approach and entry, and perhaps as an aid in thermoregulation; yet well concealed from nearby areas of human activity (Chester et al. 1990; Harmata 1982; Steenhof 1978; Steenhof et al. 1980).
- "Nest" sites refer to trees, cliffs, artificial structures, etc. used for nesting (Montana Bald Eagle Working Group 1994). The most desirable nest trees along the Tongue River will generally be large cottonwoods.
- The target species of this discussion is cottonwood. Other, later successional species in the riparian forest (Hansen et al. 1995), such as green ash (*Fraxinus pennsylvanica*) and boxelder (*Acer negundo*), may be present in the forest and may be used, if appropriately placed, as perch sites by bald eagles but are less desirable for bald eagle roost and nest sites because of their shorter height and less substantial structure.

Objective

- Maintain or enhance cottonwood stands for bald eagle perch, roost and nest sites along the Tongue River.

Problems

- It is assumed that the Tongue River Basin Project would result in the continuing decline of mature cottonwood stands along the Tongue River (U.S. Bureau of Reclamation et al. 1995), due to regulated flows which will reduce or eliminate the alluvium deposition necessary to establish new stands (Hansen et al. 1995), as well as continue to limit the intensity of periodic high flows and flood events, which alter stream courses by creating meanders and oxbows and therefore change the successional stages of riverbank vegetation.
- Current land uses (primarily agricultural uses for hay production and livestock grazing) limit the amount of land available for riparian forest and may affect the vegetation succession within any given stand.

Strategy

As discussed in the BA, TRRC (in consultation with the Service, FWP, and BEWG) could identify tracts of land along the Tongue River Railroad route for purchase or easement for management as bald eagle habitat. Criteria to be used to select such tracts could include:

- location near irrigation dams, natural riffle/run sequences, oxbows, etc. that would concentrate prey (fish and waterfowl);
- location in areas that would be "severed" by construction of the railroad. This would have two advantages: a) landowners who would otherwise have difficulty accessing these sites for agricultural management due to the railroad, might be receptive to selling such sites for wildlife management purposes; and b) isolating such sites with the railroad grade from other human disturbances might improve their attractiveness for less tolerant bald eagles; and
- presence of appropriately sized and aged stands of cottonwoods that would be available, or would have the potential to eventually develop as perch, roost or nest sites for bald eagles. Cottonwood trees would not necessarily have to be present, if the site could potentially be vegetated through plantings or other efforts with cottonwoods.

Tracts would be selected by reviewing aerial photos of the Tongue River Railroad route along the Tongue River Valley. Potential sites would be identified and prioritized based on the above criteria. In some cases it may be desirable to visit a site (access permitting) to further analyze its suitability.

Once a tract has been purchased, it could be managed as potential bald eagle perching, roosting or nesting habitat by measures such as:

- the site could be fenced to exclude livestock, which would aid regeneration of cottonwoods. Once cottonwoods are re-established, livestock could resume grazing the area.
- through consultation with the BEWG and/or groups such as the Montana Riparian-Wetland Association, more intensive management steps such as prescribed fire or planting cottonwoods could be undertaken if necessary to enhance the site; and
- depending on site conditions, it may be possible to enhance perching or nesting opportunities through the use of artificial structures including posts, poles or nest tripods (Grubb 1980).

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MAINTAIN/ENHANCE PREY BASE

Assumptions

The following assumptions are made for the purposes of this discussion:

- "Prey base" refers to both the diversity and total biomass of forage items consumed by bald eagles in the Tongue River Valley along the entire length of TRRC's proposed rail line.
- The prey base for bald eagles in the Tongue River Valley is primarily comprised of fish, waterfowl and carrion. The availabilities (numbers, location and ease of capture) of these three prey items are largely unknown but probably differ seasonally and yearly, as well as by location along the route. It is recognized that other prey items (e.g., ground squirrels, prairie dogs, rabbits, etc.) may also be taken (Montana Bald Eagle Working Group 1994).
- The upland prey base away from the Tongue River Valley (e.g., carrion, rabbits, etc.) may be seasonally important for bald eagles nesting in the valley but will not be addressed in this discussion because this prey base should be unaffected by construction and operation of the Tongue River Railroad.
- The nesting waterfowl prey base along the Tongue River Valley appears to be habitat limited. For example, a review of USGS 7.5-minute topographic maps of the Tongue River Railroad route suggests that there are only 15-20 islands in the river, and three -four oxbows adjacent to the river, which might create backwaters suitable for nesting waterfowl.
- The nesting waterfowl prey base away from the Tongue River in the vicinity of the Tongue River Railroad is probably also limited by lack of habitat, since the only perennial tributary to the Tongue River along the Tongue River Railroad route is Hanging Woman Creek (ICC 1992). Small dams on ephemeral tributaries are probably too small to contribute significant numbers of nesting waterfowl. In addition, since most of these sites were constructed to livestock water supply, upland nesting habitat in the vicinity is usually limited.
- The migratory/wintering waterfowl prey base is partly a function of stream flows and weather. Flows in the Tongue River will be regulated by the Tongue River Basin Project to maintain certain minimums; additional instream flows may be purchased as a mitigation measure to this project (U.S. Bureau of Reclamation 1995). Winter severity (particularly freezing water and snow depth in fields) may also affect the numbers of waterfowl using the river, and the duration of their use.
- Mitigation of waterfowl habitat (wetlands) immediately below the Tongue River Dam, as well as along the Tongue River Reservoir shoreline, has been proposed in the Tongue River Basin Project Draft Environmental Impact Statement (U. S. Bureau of Reclamation 1995). Therefore this discussion does not address these sites further if proposed mitigation was accomplished..

- The primary source of carrion during operation of the Tongue River Railroad will be deer killed by trains. Carrion on lands not associated with the railroad, such as livestock on private lands, will remain an unpredictable source. While train/deer accidents are also unpredictable, it is assumed that they will occur, particularly during winter.
- Although the Tongue River Railroad will cross the Tongue River twice on bridges, the effects of bridge construction on the fisheries prey base are expected to be short-term, primarily as a result of displacement from the construction sites and sedimentation caused by instream activities.
- Maintaining and/or enhancing the fisheries prey base in the Tongue River has been addressed in the Tongue River Basin Project Draft Environmental Impact Statement (U. S. Bureau of Reclamation 1995). The FWP will be monitoring the effects of the Tongue River Basin Project on downstream fisheries. While this monitoring effort appears to be primarily oriented towards game fish species (U. S. Bureau of Reclamation 1995), it seems reasonable to assume that nongame fish could be included in this monitoring effort through coordination between the BEWG and FWP.

Objectives

- Maintain or enhance waterfowl habitat along the Tongue River Railroad route south of the Tongue River Dam, and/or in upland areas away from the rail line.
- Remove carrion from the rail line in such a manner as to eliminate or minimize the potential for mortalities of bald eagle from train strikes, while retaining this carrion as a potential food source.

Problems

- Foraging patterns of breeding, nonbreeding and migrant bald eagles along the Tongue River Valley in the vicinity of the Tongue River Railroad route are essentially unknown.
- Opportunities to enhance waterfowl habitat in the vicinity of the route are physically limited. To support sufficient numbers of nesting or migratory waterfowl to attract foraging bald eagles, such sites should be several acres in individual or combined size.

Strategy

The TRRC (in consultation with the Service, FWP, and BEWG) could identify tracts of land along the Tongue River Railroad route and in neighboring tributaries for purchase for management as nesting waterfowl habitat. Criteria that could be used to select such tracts in the river valley could include:

- location of existing oxbows or other wetlands near the rail line that has limited agricultural productivity (grazing or hay/crop production). Landowners may be receptive to selling or entering into conservation easements such areas for use as waterfowl management sites.

- location of areas that would be "severed" by construction of the railroad. Landowners who would otherwise have difficulty accessing these sites for agricultural management due to the railroad, might be receptive to selling such sites for wildlife management purposes. If such sites appear to have a comparatively high water table due to their location near the river, it may be possible to develop wetlands by dredging or blasting.
- ephemeral drainages crossed by the rail line where the placement of culverts through the railroad grade could be adjusted to create wetlands.

Criteria that could be used to select such tracts away from the river valley could include:

- size of the ephemeral drainage, as determined from topographic maps. It would be desirable to have a large enough drainage to provide sufficient runoff to fill a sizeable wetland.
- availability of water rights on drainages that might be selected for wetland creation or enhancement.

Tracts would be selected by reviewing aerial photos of the Tongue River Railroad route along the Tongue River Valley, and topographic maps of the tributary drainages. Engineers involved in the design of the railroad grade would be consulted during the examination of potential wetlands created along the railroad grade. Potential sites would be identified and prioritized based on the above criteria. In many cases it would be necessary to visit a site (access permitting) to further analyze its suitability.

Once a tract has been purchased, it could be managed as potential bald eagle perching, roosting or nesting habitat by measures such as:

- the site could be fenced to exclude livestock, which would aid regeneration of cottonwoods and understory species;
- it is assumed that natural revegetation of a created or enhanced wetland would occur quickly. In some cases it could be beneficial to plant appropriate wetland vegetation;
- small islands or other structures could be placed in certain wetlands to enhance waterfowl nesting; and
- depending on the site and neighboring habitat, it may be desirable to erect artificial perches for bald eagles at appropriate distances from the wetland.

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ADMINISTRATIVELY CONFIDENTIAL

**BIOLOGICAL ASSESSMENT
FOR ENDANGERED OR THREATENED SPECIES,
TONGUE RIVER RAILROAD**

September, 2005

ADMINISTRATIVELY CONFIDENTIAL
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BIOLOGICAL ASSESSMENT For Endangered Or Threatened Species, Tongue River Railroad

INTRODUCTION

Tongue River Railroad Company, Inc. (TRRC) proposes to construct approximately 116 miles of rail line from Miles City, Montana to near Decker, Montana. This project, called the Tongue River Railroad, would transport coal from existing and future mines in southeastern Montana and provide an alternative routing for coal from Wyoming mines. For the purposes of this Biological Analysis (BA), the route can be considered in three segments:

MILES CITY TO ASHLAND

The Tongue River Railroad was originally conceived in 1980 to transport coal from the Montco Mine and other potential surface mines in the Ashland/Otter Creek area about 89 miles north to Miles City. The environmental analysis relating to this Miles City to Ashland rail line, hereafter called **Tongue River I**, was addressed in the *Draft Environmental Impact Statement, Finance Docket No. 30186, Tongue River Railroad Company, Construction and Operation of a Line of Railroad in Custer, Rosebud and Powder River Counties, Montana* (hereafter called the 1983 DEIS), the *Supplement to Draft Environmental Impact Statement, Finance Docket No. 30186, Tongue River Railroad Company, Construction and Operation of a Line of Railroad in Custer, Rosebud and Powder River Counties, Montana* (hereafter called the 1984 SDEIS) and the *Final Environmental Impact Statement, Finance Docket No. 30186, Tongue River Railroad Company, Construction and Operation of a Line of Railroad in Custer, Rosebud and Powder River Counties, Montana* (hereafter called the 1985 FEIS), prepared by the Interstate Commerce Commission (ICC), which was the predecessor of the Surface Transportation Board (STB). Tongue River I was approved by the ICC in 1986; it has not yet been built.

In the early 1980s, there were no known endemic populations of federally listed or proposed endangered or threatened wildlife in the vicinity of the project. Four species (black-footed ferret [*Mustela nigripes*], whooping crane [*Grus americana*], peregrine falcon [*Falco peregrinus*] and bald eagle [*Haliaeetus leucocephalus*]) were considered by the 1983 DEIS and 1985 FEIS. Black-footed ferrets were not known to occur in the region encompassing the project; peregrine falcons and whooping cranes were considered possible migrants through the area, but nesting sites were identified in the region; and bald eagles were known to winter along the Tongue River but did not nest there. The 1983 DEIS and 1985 FEIS concluded that wintering bald eagles were not likely to be adversely affected by the Tongue River Railroad.

ASHLAND TO DECKER EXTENSION

In 1989 TRRC proposed to extend the rail line approximately 41 miles from Terminus Point 1 near Ashland south to the Decker area. This extension, hereafter called **Tongue River II**, would enable shipment of coal from operating mines near Decker north to Miles City and provide an alternate route for coal now moving from Wyoming mines via the Burlington Northern and Santa Fe Railway Company (BNSF) line through Sheridan, Wyoming and Forsyth, Montana. The environmental impact analysis for the Ashland to Decker extension was prepared by the ICC and its successor, the STB, in the *Draft Environmental Impact Statement, Finance Docket No. 30186 (Sub-No. 2), Tongue River Railroad Company, Construction and Operation of an Additional Rail Line from Ashland to Decker, Montana* (hereafter called the 1992 DEIS), the *Supplement to Draft Environmental Impact Statement, Finance Docket No. 30186 (Sub-No. 2), Tongue River Railroad Company, Construction and Operation of an Additional Rail Line from Ashland to Decker, Montana* (hereafter called the 1994 SDEIS), and the *Final Environmental Impact Statement, Finance Docket No. 30186 (Sub-No. 2), Tongue River Railroad Company, Construction and Operation of an Additional Rail Line from Ashland to Decker, Montana* (hereafter called the 1996 FEIS).

1995 Biological Assessment

In November 17, 1989 the ICC published in the Federal Register a Notice of Intent (NOI) to prepare an Environmental Impact Statement (EIS) in the Tongue River II proceeding and to hold public scoping meetings. On December 28, 1989 the U.S. Fish and Wildlife Service (USFWS), which administers the Endangered Species Act (ESA) of 1973, as amended, notified the ICC that three species (black-footed ferret, peregrine falcon and bald eagle), all listed as endangered, could potentially occur in the area to be affected by Tongue River II. Specifically, the USFWS explained that: 1) the bald eagle could nest along the Tongue River, and could occur as a migrant and winter resident; 2) the peregrine falcon could occur as a migrant; and 3) the black-footed ferret (*Mustela nigripes*) could occur in black-tailed prairie dog (*Cynomys ludovicianus*) colonies. On November 10, 1994 the USFWS added the pallid sturgeon (*Scaphirhynchus albus*), which could occur in the lower Tongue River, to the list as endangered.

Since the USFWS had determined that endangered species might be present in the project area and could be adversely affected by the Ashland to Decker extension, USFWS required the preparation of a Biological Assessment (BA) to address the potential effects of the rail line extension on the four species, and to propose (if necessary) measures to mitigate any significant negative effects. On January 23, 1990 the ICC designated Historical Research Associates, Inc. (HRA) to be the ICC's non-Federal representative to prepare the BA. In turn, HRA contracted with

Western Technology and Engineering, Inc. (now WESTECH Environmental Services, Inc. = WESTECH) to write the BA in October, 1994.

HRA began contacts with the USFWS, Montana Department of Fish, Wildlife and Parks (MTDFWP), area residents and other knowledgeable parties regarding the occurrence and habitat of these listed species along the proposed Ashland to Decker extension in 1990. This effort revealed that little was known about bald eagle nesting along the Tongue River. HRA conferred with the USFWS and it was agreed that surveys for wintering and nesting bald eagles along the Tongue River should be conducted. The USFWS formally agreed with this procedure in a letter dated December 24, 1991. These surveys were conducted in February and April, 1992.

In April 1992 the USFWS released its Fish and Wildlife Coordination Act report for the Tongue River Dam Rehabilitation Project (USFWS 1992), a project not related to the Ashland to Decker extension of the Tongue River Railroad. This report, and a subsequent update letter, summarized the known information on the occurrence of threatened or endangered species in an area that encompassed the Ashland to Decker extension.

The three species (black-footed ferret, peregrine falcon, and bald eagle) were considered in the 1992 DEIS. In compliance with the National Environmental Policy Act (NEPA), the 1992 DEIS also considered alternatives for the Ashland to Decker extension, and preliminarily concluded that one of these alternatives, called the Four Mile Creek alternative, would result in fewer environmental impacts than TRRC's proposed extension route (hereafter the Original Preferred Alignment).

After receipt of comments on the 1992 DEIS, however, the ICC reviewed its comparison of the Four Mile Creek alternative with the Original Preferred Alignment. In addition, after the 1992 DEIS was issued, TRRC refined the extension route in the vicinity of the Tongue River Dam and Tongue River Reservoir, to mitigate some of the potential impacts that were identified in the 1992 DEIS. In the 1994 SDEIS the ICC concluded that the Four Mile Creek alternative would result in significantly more adverse environmental effects than the Original Preferred Alignment, including greater land disturbance, increased soil erosion, greater deforestation, greater impacts to big game and breeding bird populations, increased air pollution and more impact to human residences.

In June 1995 the ICC submitted a BA to the USFWS. The BA discussed the potential effects of the Ashland to Decker extension along TRRC's refined Original Preferred Alignment, and included measures to mitigate any adverse effects to these four species.

1995 Biological Opinion

In July 1995, after reviewing the BA, the USFWS concluded that the BA accurately addressed the potential impacts to the listed species. The USFWS also concurred with the conclusions of the BA that the Ashland to Decker extension would not adversely affect the peregrine falcon, black-footed ferret or pallid sturgeon. However, USFWS did not concur with the conclusion that the project would not adversely affect the bald eagle. Specifically, USFWS explained that although the mitigation measures proposed by the BA were positive and should help reduce the potential impacts to bald eagles, USFWS was concerned that the proximity of the railroad to one active bald eagle nest could result in abandonment of the nest or premature fledging of chicks.

Therefore, following the process of formal consultation provided for in the ESA, the USFWS issued its final Biological Opinion on Tongue River II in November 1995; the Biological Opinion provided additional measures to mitigate the effects of Tongue River II on the bald eagle.

After review of comments received on the 1994 SDEIS, the STB concluded in the 1996 FEIS that the Four Mile Creek alternative would be environmentally preferable to the refined Original Preferred Alignment considered by the 1995 BA. The 1995 BA and 1995 Biological Opinion were included as Appendix C to the 1996 FEIS. In late 1996 STB approved the Ashland to Decker extension utilizing the Four Mile Creek alternative.

WESTERN ALIGNMENT

In April 1998 TRRC filed an application (*Finance Docket No. 30186 (Sub-No.3), Tongue River Railroad Company, Rail Construction and Operation, Western Alignment in Rosebud and Big Horn Counties, Montana*) with the STB seeking authority to construct and operate a 17.3 mile section, hereafter called the **Western Alignment**, as an alternative to the southernmost portion of the previously approved Tongue River II. The application, including the Environmental Report attached to it, contained supporting evidence that the Western Alignment would present significant economic, operating, maintenance and environmental advantages over the Four Mile Creek alternative.

As part of its NEPA process, in July 1998 the STB issued an NOI to prepare a Supplement to the Final Environmental Impact Statement (SEIS) for the Western Alignment. After review of comments that were submitted in response to the NOI and consultation with three cooperating agencies (U.S. Army Corps of Engineers (COE), U.S. Department of the Interior Bureau of Land Management (BLM), and the Montana Department of Natural Resources and Conservation (MDNRC) acting as lead agency for other Montana state agencies), the STB served a Final Scope of

the SEIS in early February 1999. In the Final Scope, the STB explained that the scope of the SEIS would involve a detailed environmental review of the Western Alignment and alternatives to it, as well as a limited review of the following portions of Tongue River I and Tongue River II: 1) where environmental circumstances or requirements have changed in a manner warranting the updating or augmenting of analyses for Tongue River I or Tongue River II; 2) where there have been refinements to the alignment previously considered in the Tongue River I and Tongue River II EISs requiring additional environmental analysis because they might result in significant environmental impacts not addressed in the previous EISs; and 3) where further environmental analysis was specifically requested.

In the Final Scope, the STB explained that the SEIS would include a BA for the entire Tongue River rail line from Miles City to Decker, updating information from the 1995 BA and 1995 Biological Opinion as appropriate. On November 24, 1998 the STB notified the USFWS that it proposed to designate WESTECH to be the STB's non-Federal representative to prepare the BA.

On January 19, 1999 the USFWS notified the STB that six listed or candidate threatened or endangered species could potentially occur in this area: 1) the black-footed ferret is listed as endangered, and could be a potential resident in black-tailed prairie dog colonies; 2) the bald eagle is listed as threatened, is known to nest along the Tongue River, and is present as both seasonal migrants and winter residents; 3) the peregrine falcon (*Falco peregrinus*) is listed as endangered, and may occur as a transient in the area; 4) the mountain plover (*Charadrius montanus*) was a candidate species (on February 16, 1999 its status was changed to a proposed threatened species) that is a resident of short-grass prairie and may nest in prairie dog colonies; 5) the swift fox (*Vulpes velox*) is a candidate species that is a potential resident of the area, and prefers prairie grasslands; and 6) the sturgeon chub (*Macrhybopsis gelida*) is a candidate species that has been recorded in the lower Tongue River. The pallid sturgeon was not included in the January 1999 USFWS species list.

On January 17, 2003, TRRC filed a request with the Board seeking to update its previously submitted evidence on the transportation merits. TRRC stated that its updated information would be minimal, and it identified five general areas to be addressed. On March 11, 2003, the Board served its decision allowing TRRC to file its supplemental evidence on the transportation merits. The Board will establish a procedural schedule for replies after TRRC has filed its evidence and the agency has had an opportunity to review it.

SEA is now resuming its environmental review of the application. SEA intends to use the final scope issued in February, 1999, because, based on currently available information, it appears to thoroughly cover environmental issues requiring analysis in the SEIS. However, because of the three-year lapse in action on the Tongue

River III application, it may be appropriate to update portions of the final scope, or the environmental record that serves as the basis of the SEIS to reflect new environmental circumstances that may differ significantly from when the final scoping notice was published in 1999. SEA is aware of issues related to coal bed methane development in the region, changes in listed Endangered and Threatened species, and that there may be U.S. Army Corps of Engineers jurisdictional changes as a result of the SWANCC case (Solid Waste Agency of Northern Cook County v. Corps of Engineers, 531 U.S. 159, 51 ERC 1833 (2001)). In addition, information that TRRC will provide on the transportation issues in response to the Board's decision of March 11, 2003, may require modifications to the final scoping notice for Tongue River III published on February 3, 1999 (Surface Transportation Board 2003).

DESCRIPTION OF THE PROJECT

PURPOSE

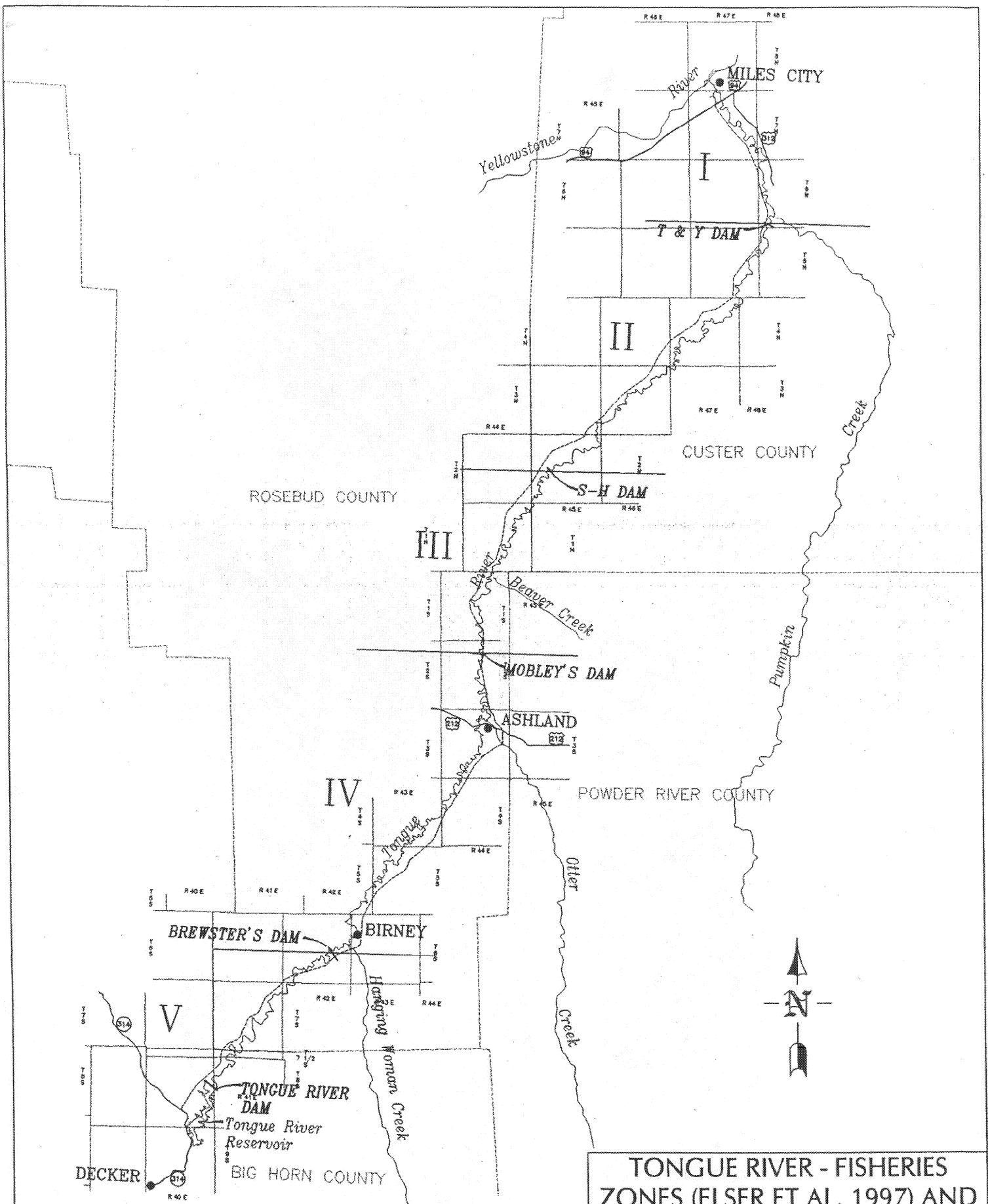
The primary purpose of the Tongue River Railroad would be to transport coal from existing and future mines in southeastern Montana and to provide an alternative routing for coal from Wyoming mines. The Tongue River Railroad would connect at its northernmost point with the Burlington Northern-Santa Fe (BNSF) mainline at Miles City, and would again connect with BNSF at its southernmost point near Decker. Use of TRRC's line would reduce the present transportation distance of coal mined in the upper Powder River Basin (both in Montana and Wyoming) by approximately 160 to 175 miles on 750 to 1000 mile one-way hauls to electric utilities in the upper Midwest and Great Lakes regions (or round-trip mileage savings of 320 to 350 miles). Significant savings in transportation, maintenance and equipment costs would result.

Construction of the Tongue River Railroad would also provide, for the first time, rail service to the largest remaining undeveloped reserves of low sulfur, high Btu sub-bituminous coal in the United States. This coal is needed to help utilities comply with the sulfur limitation in the U.S. Clean Air Act Amendments of 1990, which have created a strong market for low sulfur coal that can be burned in electric utility boilers without the need for costly flue gas desulfurization units.

In summary, the Tongue River Railroad would provide a more efficient means of transporting coal from existing mines in the region and would enable development of proposed low sulfur mines in the Ashland area. Without the Tongue River Railroad, there would be no economically viable transportation for the proposed mines.

DESCRIPTION

The Tongue River Railroad route from Miles City to Decker is shown in Figure 1. The railroad would begin at the southwestern edge of Miles City, where it would tie into the existing BNSF mainline. From Miles City, the route would bear south along the west side of the Tongue River to a point approximately 10 miles north of Ashland. The route would then cross the Tongue River and continue south along the east side of the river. The route would divide near Ashland, with one branch following approximately eight miles southeast along the Otter Creek drainage to Terminus Point 2, while the main branch would continue south along the east side of the Tongue River valley about nine miles south of Ashland to Terminus Point 1.



TONGUE RIVER - FISHERIES ZONES (ELSER ET AL. 1997) AND MAJOR DIVERSIONS

TONGUE RIVER RAILROAD

FIGURE 1



WESTECH
Environmental Services, Inc.
P.O. Box 6045
Helena, Montana 59604

SCALE: NTS
DATE: FEBRUARY 1999
DRAWN BY: DC
CHECKED BY:
FILE: TRRR99A08.DWG

Terminus Points 1 and 2 represent the southern end of the rail line previously approved by the ICC in Tongue River I. Since 1986, TRRC has refined portions of the alignment from Miles City to Terminus Point 1 so that the total length of this portion of the rail line would be about 78 miles. In addition to shortening the route about three miles, most of these refinements place the approved route further from the Tongue River than the alignment considered in Tongue River I.

From Terminus Point 1, the railroad would continue south along the east side of the Tongue River valley for about 21 miles, following the route of the previously approved Tongue River II. TRRC also has refined the alignment along some parts of this portion of this route, which generally serves to place the route further from the Tongue River. From a point about 21 miles south of Terminus Point 1, the TRRC line would follow the Western Alignment (instead of the approved Four Mile Creek alternative) to Decker. The Western Alignment would be about 17 miles long and would cross to the west side of the Tongue River, then gradually leave the Tongue River valley as it would proceed south to the final terminus near Decker, Montana.

In terms of construction, the Tongue River Railroad would be similar to other rail lines that serve coal mines in southeastern Montana. The track would be comprised of 136-pound continuous welded rail on concrete ties, resting on 12 inches of ballast and 12 inches of sub-ballast. The right-of-way (ROW) would range from 100 to over 300 feet in width, depending on cut and/or fill requirements, and would average approximately 200 feet. Cut and fill slopes would generally be constructed at angles between two horizontal to one vertical (2H:1V) and one and one-half horizontal to one vertical (1.5H:1V). Steeper slopes may be appropriate in some areas based on soil conditions and to reduce surface disturbance.

Facilities associated with the rail line would include sidings, possible terminal facilities, signal and communications systems, relocated roads, bridges and culverts.

Initial design specifications, which provide the capacity to meet TRRC 's needs for a number of years, include the construction of seven passing sidings. Each passing siding would be 8500 feet long between clearance points, which would accommodate future increases in train size and would also allow for comfortable stopping margins. Locations of passing sidings would be based on minimizing train delays in both directions. In addition to the passing sidings, additional set-out tracks would be constructed for set-out and storage of maintenance-of-way (MOW) equipment, bad-order cars and other operational equipment. Each set-out track would be at least 550 feet in length, sufficient to accommodate permanently-coupled car sets that may operate on the Tongue River Railroad. Set-out tracks would be constructed at each passing siding location and at four additional locations along the route.

New terminal facilities may be constructed at Miles City, depending upon whether TRRC and BNSF reach an agreement that would allow BNSF to operate over TRRC tracks. A new terminal would not be required if such an agreement is reached, because BNSF would utilize its own existing facilities. If a new terminal is built, the facilities would consist of buildings for train and engine crews, dispatching, headquarters operation, limited servicing and maintenance, and MOW activities. Three additional sidings, 7800 feet long, would be constructed to handle yard activities.

No power or communication lines are proposed to be constructed along the ROW of the Tongue River Railroad. Instead, batteries, charged by solar power panels would operate signaling and communications systems. Signals would conform to the best railroad industry practices to maximize safety to personnel and equipment. The communications system repeater stations would be located every 10 to 20 miles, as appropriate to ensure continuous communications with train crews with no signal loss under extremely adverse weather conditions.

Portions of public and private roads would be relocated along short sections of the railroad. Road relocations would be necessary to minimize curvature, minimize the number of road crossings and accommodate landowner access across the ROW.

Culverts would be placed according to final engineering design. They would be designed to both safely withstand a 25-year flood peak flow with one diameter of pipe headwater, and so that water from a 100-year flood event would not overtop the track.

The Tongue River Railroad would also require the construction of four bridges. There would be one bridge over Hanging Woman Creek, one bridge over Otter Creek and two bridges over the Tongue River (one about 10 miles north of Ashland and the other about 31 miles south of Ashland). All bridges would be designed to withstand and not be crested by a 100-year flood event. The preliminary design for these bridges does not require any piers or foundations to be placed in the river; final engineering design would be determined by geotechnical investigations to be conducted prior to bridge construction. Depending on final engineering, rip-rap may be needed at bridge crossings and at three locations (approximately seven miles south of Ashland, about one mile north of Ashland and about six miles north of Ashland) along the Tongue River.

CONSTRUCTION AND OPERATION

Depending on weather, construction of the Tongue River Railroad would most likely occur from April through October (but could begin earlier or end later) over a 3-year period. During construction there would be a variety of heavy equipment operating

within the ROW to clear existing vegetation, salvage topsoil, grade/cut/fill the ROW, prepare the rail bed, lay track and place ballast, and reclaim and revegetate disturbed areas, followed by final clean up. During construction a temporary road may be built within the ROW. Most heavy equipment would be confined to this road, but where the ROW is isolated due to the Tongue River, other stream crossings or large parcels of private land, temporary construction access roads, 20 feet in width, may be built subject to negotiation with affected landowners or land management agencies. After construction, these temporary roads would be reclaimed unless otherwise requested by landowners.

There may be two construction camps. The primary construction camp would be an approximately 10-acre site leased in or near Ashland. It would house about 400 people through a combination of trailer/RV hookups and bunkhouses, and would have support facilities such as a kitchen, dining room, restrooms and showers. No permanent foundations would be necessary because all structures would be temporary. Solid and sanitary wastes would be collected and transported to a licensed landfill or sewage treatment facility. No disposal would occur on site.

A smaller (five-acre) construction camp would be located at the south end of the railroad near the connection with the Spring Creek Mine Spur. It would consist of about 100 trailer hookups with support facilities. As with the Ashland camp, this complex would not involve permanent structures and would not entail on-site disposal of solid or sanitary wastes. Following completion of railroad construction, both camps would be restored pursuant to agreements with landowners.

Three equipment lay-down and construction centers would operate only during railroad construction. They would occupy a 15-acre site near Miles City, a five-acre site near Ashland, and a 10-acre site near the Spring Creek Mine Spur. Fuel storage and loading during construction would occur in bermed sites with an impervious barrier to avoid ground and surface water contamination.

Off-site borrow areas might not be necessary since the project design would maximize a cut/fill balance where fill material would be generated from cuts. However, if material suitability or volume, or haul distance precluded the use of on-site materials, off-site borrow areas would be developed. They would be located and permitted in accordance with applicable federal, state and local requirements. Sub-ballast would be obtained from suitable cut areas or would be imported from commercial suppliers. Ballast would be obtained from commercial sources.

Once the Tongue River Railroad is in operation, it would operate 24 hours a day, 365 days a year. Trains would operate at speeds up to 55 mph. By the fifth year of operation there would be an estimated 12 train movements per day, or six roundtrip coal trains, over the southern portion of the rail line and approximately 14 train movements per day, or seven roundtrip coal trains, over the Ashland to Miles City

portion of the line (one unit train would be comprised of two locomotives and about 113 coal cars). In subsequent years the number of trains per day would decline along that portion of the route south of Terminus Point 1, due to the anticipated decline in production from the Decker area mines. However, train traffic over the northern portion of the route is expected to increase over time. By the fifteenth year of operations, it is anticipated that 18 train movements per day, or nine roundtrip coal trains, will move over the Miles City to Ashland portion of the rail line.

Periodic maintenance of the rail line and ROW would be required, depending on the amount of train traffic. Access to the ROW would be limited to public grade crossings or to private grade crossings where access agreements would be made with the landowner. Maintenance, including mechanical or herbicidal vegetation control, would primarily be accomplished with equipment traveling along the rail itself.

DESCRIPTION OF THE AFFECTED AREA

For the purposes of this BA, the area that may be potentially affected by the Tongue River Railroad is generally defined as the Tongue River Railroad project area. This area includes the railroad ROW and adjacent uplands along the route described earlier from Miles City to the tie-in with the Spring Creek Mine Spur near Decker. Within the project area are suitable or potential habitats for five species listed under the ESA; each are considered within this BA. Any direct effects to these species from construction or operation of the railroad would be limited to the defined project area. Indirect effects may also occur outside of this area.

The Tongue River begins in the Big Horn Mountains in Wyoming and flows north to its confluence with the Yellowstone River at Miles City, Montana. It drains an area of about 5,379 square miles, of which 70 percent is in Montana (MDNRC et al. 1996). At its confluence with the Yellowstone River, the Tongue River has a 10 year average annual flow of about 422 cubic feet per second (cfs) just below the Tongue River dam, and 387 cfs at Miles City (USGS 2001). Most of the annual flow of the Tongue River comes from seasonal snow melt runoff in the Big Horn Mountains, with half the annual flow occurring from May to July (1992 DEIS).

Within the area potentially affected by the Tongue River Railroad, the Tongue River is greatly influenced by the Tongue River Dam and Reservoir, which regulate downstream flow. The dam was constructed in 1940 to store water for downstream irrigation; the impoundment originally covered about 3500 surface acres (Elser et al. 1977). Repairs to the Tongue River Dam were completed in 1999 (Undlin, personal comm. 2003). The dam/spillway system now has the capacity to pass a flow of 100,000 cfs. The height of the reservoir has risen by four feet, and its surface area has increased from about 3200 acres to about 3600 acres, and the capacity of the reservoir has increase from 67,000 acre-feet to 80,000 acre-feet. As

a result of dam/spillway reconstruction, downstream areas affected by a 100-year flood will increase slightly (MDNRC et al. 1996).

In the area potentially affected by the Tongue River Railroad downstream from the reservoir, most tributaries are ephemeral. The Tongue River Railroad will cross only two perennial tributaries, Hanging Woman Creek near Birney and Otter Creek near Ashland. In contrast to the Tongue River, tributaries below the reservoir derive their most significant flows during and after precipitation. In most years these tributaries do not have consistent flows associated with snowmelt runoff, and exhibit little base flow (1992 DEIS).

Elser et al. (1977) divided the Tongue River into five fisheries zones, defined primarily by the influence of the Tongue River Reservoir and a series of irrigation diversion dams (Figure 1). Immediately downstream from the dam (Zone 5), the Tongue River supports a cold-water fishery supporting trout, which are not native to the Tongue River. The fishery changes downstream to a more typical prairie river fishery comprised of native species such as sauger (*Stizostedion canadense*) and channel catfish (*Ictalurus punctatus*) supplemented with introduced species such as smallmouth bass (*Micropterus dolomieu*).

The Tongue River valley is bordered by hilly, sometimes rugged uplands that rise 200-500 feet above the valley floor. In the narrower upstream portion of the Tongue River Railroad area, these hills are close to the floodplain and are partially forested with ponderosa pine (*Pinus ponderosa*) and Rocky Mountain juniper (*Juniperus scopulorum*), particularly on north and east facing slopes. Downstream, steeper forested hills are interspersed with rolling grassland and shrubland benches.

The Tongue River meanders across the valley bottom. Its immediate banks are vegetated by deciduous forest in various stages of succession, from shrubs to mature eastern cottonwood (*Populus deltoides*) gallery forest. Portions of the adjoining valley bottom have been developed for irrigated and dryland hay and crop production.

The combination of upland, riparian, agricultural and aquatic habitats supports a good diversity of terrestrial and aquatic wildlife. A total of 245 species of birds, 63 mammals, 13 reptiles, six amphibians and 49 species of fish have been documented in the Tongue River Railroad (ENTRIX, Inc. 2004b).

The primary land use of the Tongue River project area along the Tongue River Railroad route is agriculture, particularly cattle grazing and hay production. There are operating coal mines near Decker (the south end of the Tongue River Railroad) and potential coal mines near Ashland. A portion of the Tongue River Railroad would cross land used by the Miles City Fish hatchery, and a portion of the railroad

would cross the U.S. Department of Agriculture Livestock and Range Research Station (LARRS) near Miles City.

Most residential areas along the route are associated with ranches. The railroad route begins at Miles City (population about 8500) and passes by small communities at Ashland, Birney and (on the Northern Cheyenne Reservation) Birney Day Village. The Reservation's east boundary is the Tongue River. The Tongue River Railroad will not cross Reservation lands (U.S. Census Bureau 2000).

CURRENT STATUS OF THREATENED OR ENDANGERED SPECIES ALONG THE TONGUE RIVER RAILROAD

As discussed earlier, in January 1999 the USFWS identified six special status species that might be affected by the Tongue River Railroad. Of those six species, the black-footed ferret and peregrine falcon were listed as endangered, the bald eagle was listed as threatened, the mountain plover was proposed for listing as threatened, and the swift fox and sturgeon chub were candidate species that could occur in the vicinity of the Tongue River Railroad (McMaster 1999).

As of September 2003, due to changes in species status designations, there were five threatened or endangered listed species, one candidate species, and one species of conservation concern that might be affected by the Tongue River Railroad. Of those seven species, the pallid sturgeon, black-footed ferret, whooping crane and interior least tern (*Sterna antillarum athalassos*) are listed as endangered, the bald eagle is listed as threatened, and the mountain plover is species of conservation concern that could occur in the three counties in which the Tongue River Railroad traverses (USFWS 2003a, Nordstrom, personal comm. 2003; Hanebury, personal comm. 2003b.) The seventh species, the black-tailed prairie dog, was removed from the candidate species list as of August 18, 2004 (Federal Register 2004). However, black-tailed prairie dog colonies are discussed below as potential habitat for the black-footed ferret and the mountain plover. The peregrine falcon was delisted from the ESA, and the sturgeon chub and swift fox are no longer candidate species. Therefore, the pallid sturgeon, whooping crane, interior least tern, bald eagle, and black-footed ferret are discussed below.

PALLID STURGEON

The pallid sturgeon was federally listed as endangered in 1990. Altered flow regimes caused by the damming of large rivers have resulted in the decline of pallid sturgeon populations in Montana from its historic range. This range included the Missouri River in Montana to its confluence and the Mississippi River from Illinois to its confluence. This species was also historically found in large tributaries of the Missouri and Mississippi Rivers including the Yellowstone. Presently, in Montana,

pallid sturgeon are found in the Missouri River from the Montana/North Dakota state line upstream to Fort Peck Dam and from upstream of Fort Peck Reservoir (Nichols Coulee) to Stafford Ferry. Pallid sturgeon is also found in the lower Yellowstone River from the state line upstream to near Fallon, MT (Gardner 2001).

Pallid sturgeon is a large river fish that resides in deep-water areas of the main channel. This species preferred habitat is comprised of sand flats and gravel bars in large, silty rivers with swift currents (Bramblett 1996).

Currently, there are no known occurrences of the pallid sturgeon in the Tongue River. However, the possibility exists that reintroduction of the pallid sturgeon in the Tongue River may occur in the future (Hanebury, personal comm. 2003a). The Miles City Fish Hatchery currently conducts a pallid sturgeon breeding program.

WHOOPING CRANE

The whooping crane was listed as endangered in 1970 and critical habitat was designated in 1978. Any whooping cranes found within the Tongue River Railroad area are migrants; this area is not among the principal and breeding areas identified in the Whooping Crane Recovery Plan. Marshes, lake, ponds, and rivers provide nesting and migration habitat for the main wild population, which nests in Wood Buffalo National Park (WBNP) and adjacent areas of Canada. Historic population declines resulted from habitat destruction, shooting, and displacement by human activities (USFWS 1994).

Today most whooping cranes migrate from Wood Buffalo National Park in Canada to Aransas NWR on the Texas coast. This route passes south southeastward through northeastern Alberta, south central Saskatchewan, northeastern Montana, western North Dakota, western South Dakota, central Nebraska and Kansas, west-central Oklahoma, and east-central Texas. Scattered occurrences have, however, been reported in adjacent states and provinces (USFWS 1994).

Whooping cranes are diurnal migrants, rarely continuing after dark, with regular stops to feed and rest. They travel as singles, pairs, family groups, or flocks of 4-5 adults. During migration, birds roost in shallow water in lakes, ponds, or riverine areas and then fly or walk to loafing or feeding areas. They sometimes join sandhill cranes for a portion of the migration (Lewis 1995). Tundra swan hunts recently initiated in the northern Great Plains (Montana, 1983; North Dakota, 1988; South Dakota, 1990), also present opportunities for misidentification of whooping cranes and accidental shooting (USFWS 1994).

Whooping cranes use a variety of habitats during migration (Howe 1989, Kuyt 1992). Twenty-seven cranes were monitored for one or more seasons, including nine radio-marked birds and others that associated with them (Howe 1989). They fed primarily in a variety of croplands and roosted in palustrine (marshy) wetlands.

A majority of the roosting wetlands were less than 10 acres (75 percent) and less than a mile a suitable feeding site. More than 40 percent of the roosting wetlands were smaller than one acre. Although heavily vegetated wetlands were generally not used, family groups appeared to select more heavily vegetated wetlands than non-families. Cropland was utilized for 70 percent of the feeding sites of non-families, but wetlands were utilized for 67 percent of the feeding sites of families (Howe 1989).

To date, there are no documented occurrences of the whooping crane within the Tongue River railroad route. If whooping crane do utilize the Tongue River, it is infrequently at most (Carlson 2003b).

INTERIOR LEAST TERN

The interior least tern is migratory and has historically bred along the Mississippi, Red and Rio Grande River systems and rivers of central Texas. The breeding range extended from Texas to Montana and from eastern Colorado and New Mexico to southern Indiana (USFWS 1990). It breeds on the Missouri River to eastern Montana (Thompson et. al 1997). In Montana, breeding interior least terns recently have been recorded both on the Yellowstone River, and on the Missouri River between Fort Peck Reservoir and North Dakota (USFWS 1990).

The riverine nesting areas of interior least terns are sparsely vegetated sand and gravel bars within a wide unobstructed river channel, or salt flats along lake shorelines. Nesting locations usually are at the higher elevations and away from the water's edge because nesting starts when the river flows are high and small amounts of sand are exposed. The size of nesting areas depends on water levels and the extent of associated sandbars (USFWS 1990).

Essential Habitat in Montana lies in segments of the Missouri River (USFWS 1990). The known breeding areas in Montana in the Missouri River System do not include the project area (USFWS 1990).

There are no documented occurrences of the interior least tern in the railroad project area. The closest documented occurrence to the railroad route of this species was approximately nine miles away on the Yellowstone River, downstream of the Tongue River confluence (Carlson 2003a, Montana Bird Distribution Database 2001, MTNHP 2003). In addition, MTNHP (2003) reported a composite occurrence that represents four observations of breeding attempts from 1994 to 1996 approximately 22 miles northeast of Miles City.

Hanebury (personal comm. 2003b) stated that a survey would be required if the route traversed or followed the Yellowstone River. The project route neither crosses nor follows the Yellowstone River, and the interior least tern does not inhabit the Tongue River.

BALD EAGLE

Since the late 1970's, the bald eagle has substantially increased its nesting distribution and numbers. Consequently the USFWS downlisted the bald eagle from endangered to threatened in 1995. This species can occur in the Tongue River Railroad project area in nesting, migrating, and wintering populations.

Nesting Population

Montana is included in the seven-state Pacific Bald Eagle Recovery Area. In 1978 there were only 12 known breeding areas for bald eagles in Montana (USFWS 1995). By 1998, there were more than 250 known breeding sites in Montana (Flath 1999a). By 2003, there were over 300 nesting pairs in Montana (DuBois, personal comm. 2003).

At this time, there are at least six major nesting territories along the Tongue River (Farmer, personal comm. 2003, DuBois, personal comm. 2003, Rau, personal comm. 2003). MTDFWP has recent data from infrequent nest checks; however, no complete surveys have been done on the Tongue River in several years (DuBois, personal comm. 2003). A bald eagle nest check survey was conducted by MTDFWP in April 2005. The following discussion describes the current known nests and historical nests along the Tongue River.

Nest 01

In the mid-1980's, a pair of bald eagles exhibited pair-bonding activity near a nest in a cottonwood tree along the Tongue River about 2.5 miles below the dam. In this BA, this nest will be referred to as Nest 01. No egg laying occurred and in subsequent years this nest was also used by golden eagles (USFWS 1992). MTDFWP (2003a) records also indicate that it was inactive in 1994 following loss of the nest in a windstorm.

Nest 02

In spring 1992 a pair of bald eagles established a nest in a cottonwood tree about eight miles downstream from the dam (Harms 1992). In this BA, this nest will be referred to as Nest 02. In 1992-1993, Nests 01 and 02 were apparently used interchangeably by the same pair of bald eagles (Flath, personal comm. 1994). In spring 1994, Nest 01 was occupied by bald eagles but was destroyed in a windstorm; Nest 02 was not occupied (MTDFWP 2003a). It was expected that that these bald eagles would construct a new nest somewhere downstream from the dam, or would reoccupy Nest 02 (Flath, personal comm. 1994). This assumption was correct, and a great blue heron nest about two miles downstream from the dam was occupied by bald eagles in March 1995. For the purposes of this BA, this nest will be referred to as Nest 03 (and discussed below).

Nest 02 may have also been destroyed, as it could not be located in March 1995 (Berry, personal comm. 1995 and 1999). WESTECH biologists could not find this

nest in February 1998, nor could other biologists find it on March 1, 1999 (Berry, personal comm. 1999).

Nest 02 Alternate (MTFWP ID = 410052)

During the April 16, 1999 aerial survey, a large stick nest was observed in a cottonwood tree about 0.3 mile downstream from the previous location of Nest 02. This nest was similar in size and shape to Nest 03, suggesting that it could have been constructed by bald eagles. No eagles were seen at or near the nest on April 16, 1999; instead, it was occupied by a red-tailed hawk. Bald eagles may build alternate nests within a breeding area (MBEWG 1994). In this BA, this nest will be referred to as Nest 02 Alternate. In 2005, a bald eagle was observed at this nest (Puchniak 2005). Its location is shown on Figure 2. It is about 4300 feet (0.8 mile) from the Western Alignment portion of the Tongue River Railroad.

Nest 03 (MTFWP ID = 410053)

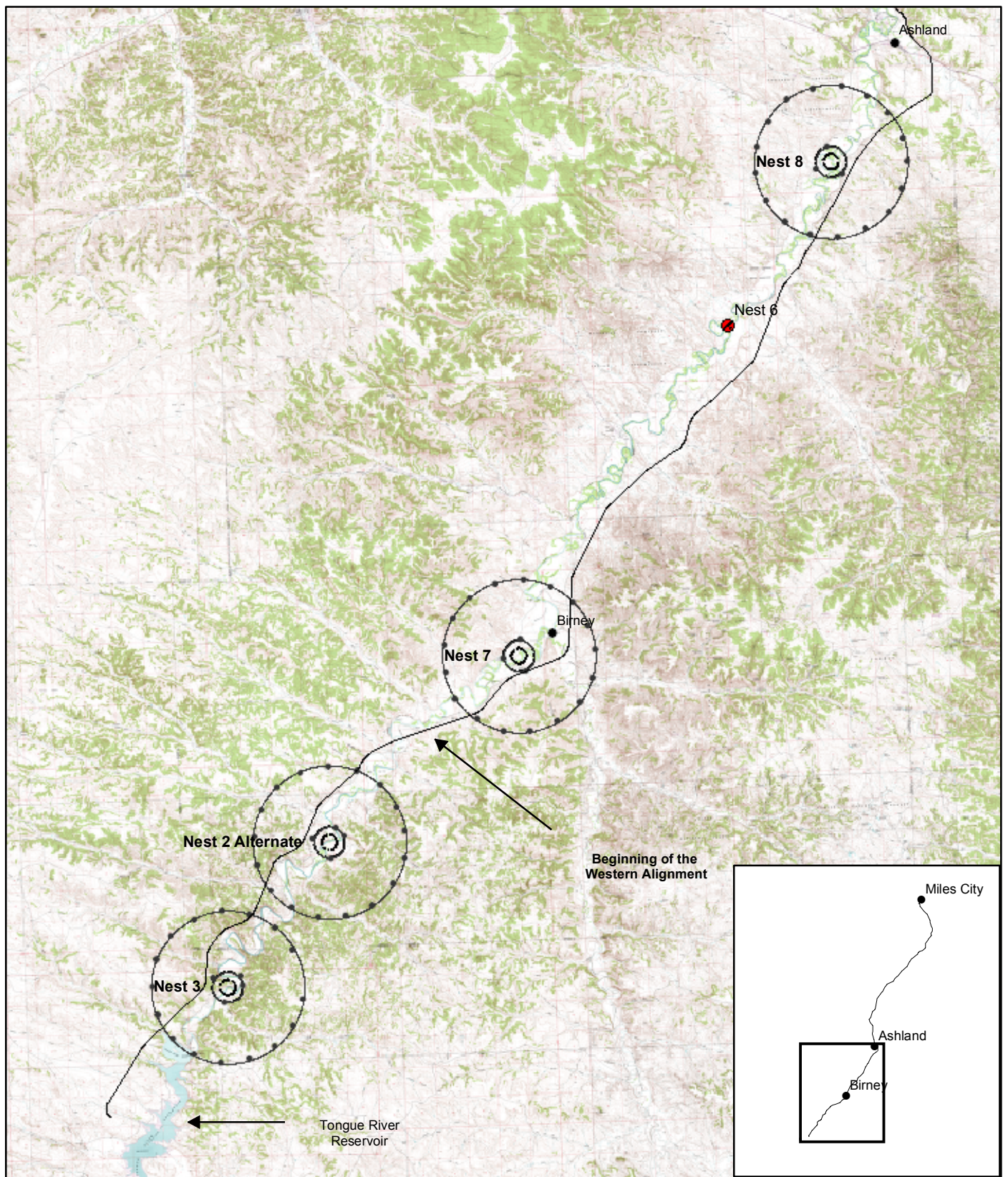
Nest 03 has been active every year since 1995. In 1998 it fledged two young eagles (Flath, personal comm. 1998). It was observed during an aerial survey of the Tongue River Valley and Tongue River Railroad route on April 16, 1999, and was again active and successful (MTDFWP 2003a). One adult was in the nest while the other was perched nearby. Since the April 1999 aerial survey, more recent data documents this nest as active and successful in 2001, 2002, and 2005. In 2002, there were two fledglings from this nest and in 2005, a bald eagle was observed on the nest (MTDFWP 2003a, Puchniak 2005). The location of Nest 03 is shown in Figure 2. It is about 3700 feet (0.7 mile) from the Western Alignment portion of the Tongue River Railroad.

Nest 04 / Nest 04 Alternate (MTFWP ID = 410171)

An active bald eagle nest was found about 39 air miles up the valley (south) from Miles City in 1992. This nest, referred to as Nest 04 in this BA, has been active every year since 1992. In 1998, two young eagles fledged from this nest (Flath, personal comm. 1998). It was again active on April 16, 1999, with one adult on the nest and the other perched nearby. This territory was active through 2002 (MTDFWP 2003a). In 2000, a neighboring nest was active. In this BA, this nest will be referred to as Nest 04 alternate (DuBois, personal comm. 2003). The location of Nest 04 Alternate was reported as very close to Nest 04. Therefore, for the purposes of this BA, the Nest 04 and Nest 04 Alternate are shown as a single location and active territory. Nest 04 Alternate was a successful nest in 2000 and 2002, but it was unsuccessful in 2001. Incubation was observed on Nest 04 Alternate in 2003. Therefore, it was considered active in 2003 (MTDFWP 2003a), although there are no production data for this year. In 2005, a bald eagle was observed at this nest (Puchniak 2005). The location of Nest 04 Alternate is shown in Figure 3. It is about 4750 feet (0.9 mile) from the Tongue River Railroad.

Nest 05 (MTFWP ID = 410231)

In early 1999, TRRC and STB were contacted by local residents regarding the possibility of a bald eagle nest several miles south of Nest 04. During the April 16, 1999 aerial survey, a nest (Nest 05 in the BA) was observed in a cottonwood about eight air miles upstream (south) of Nest 04. A dead adult bald eagle was lying in the nest. This bird appeared to have died recently, because the carcass had not been scavenged or otherwise deteriorated. No other eagles were nearby, although a single adult was seen about six miles further south. The area of this sighting was searched during the aerial survey, but no other nest was found. The status of this nest in 2000 is unknown, and in 2001 there was another species at this nest. In



Legend

Management Zone (Active Nest)

- Zone 1
- Zone 2
- Zone 3

- Inactive Bald Eagle Nest
- Proposed Route

0 2.5 5 Miles

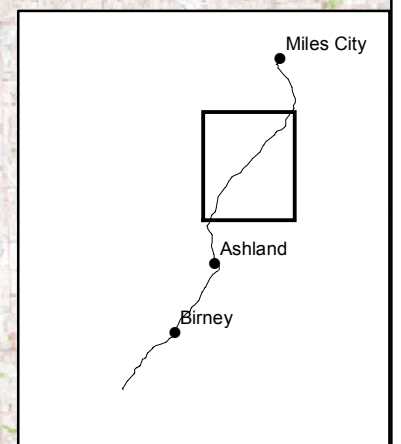
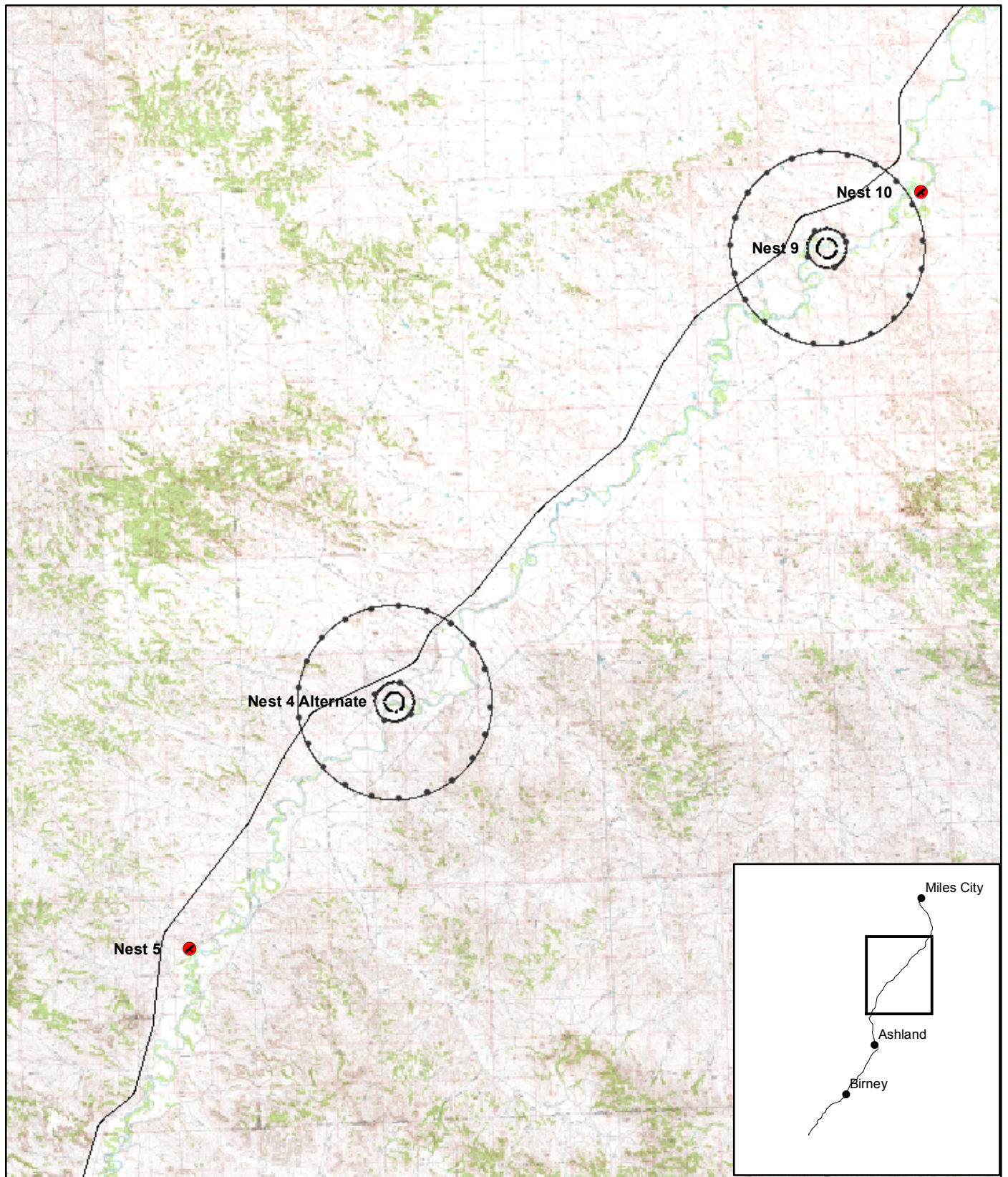


E N T R I X

Figure 2
Bald Eagle Management Zones
In Relation to the Tongue River
Railroad Route

Proj No. 3079712

Date: 4/2005



Legend

Management Zone (Active Nest)

- Zone 1
- Zone 2
- Zone 3

- Inactive Bald Eagle Nest
- Proposed Route

0 2.5 5 Miles



E N T R I X

Figure 3
Bald Eagle Management Zones
In Relation to the Tongue River
Railroad Route

Proj No. 3079712

Date: 4/2005

2002, this nest was inactive (MTDFWP 2003a). In 2005, this nest was not found and the status of the nest was unknown (Puchniak 2005). This nest is considered inactive. The location of Nest 05 is shown in Figure 3. It is about 4000 feet (0.75 mile) from the Tongue River Railroad.

Nest 06

During the aerial survey on April 16, 1999 a large stick nest was found in a small, apparently inactive great blue heron rookery in large cottonwood trees along the Tongue River about 11 air miles up the valley (south) of Ashland. This nest was similar in size and shape to Nest 03, which was also originally a great blue heron nest that had been appropriated by bald eagles. On April 16, 1999 there were two large white eggs in the nest, but no bald eagles, golden eagles or other raptors were seen in the general vicinity. Two Canada geese were seen along the river bank a short distance away. Canada geese sometimes appropriate great blue heron and raptor nests, and it is possible that the eggs that were observed in the nest were the first eggs of a clutch laid by Canada geese. The nest was checked again about 1 1/2 hours later, but there were still no birds at or near it. On April 26, however, TRRC personnel observed a Canada goose on this nest, and about six great blue herons in the rookery (Day, personal comm. 1999). In the MTDFWP (2003a) database, this nest is not documented and no other data are available (DuBois, personal comm. 2003). This nest is not considered active. In this BA, this nest is referred to as Nest 06. Its location is shown in Figure 2. It is about 6200 feet (1.2 miles) from the Tongue River Railroad.

Nest 07 (MTFWP ID = 410381)

This nest was first identified during the April 2005 aerial survey. A bald eagle was observed in the nest during this survey (Puchniak 2005). In this BA, this nest is referred to as Nest 07. Its location is shown in Figure 2. It is about 2,889 feet (0.55 miles) from the Tongue River Railroad.

Nest 08 (MTFWP ID = 410371)

This nest was first identified during a 2004 aerial survey and then again during the April 2005 aerial survey. A bald eagle was observed in the nest during the 2005 survey (Puchniak 2005). In this BA, this nest is referred to as Nest 08. Its location is shown in Figure 2. It is about 3,661 feet (0.69 miles) from the Tongue River Railroad.

Nest 09 (MTFWP ID = 410361)

This nest was identified during a 2004 aerial survey and reported as active. A subsequent survey in April 2005 was not able to locate this nest (Puchniak 2005). Because of the 2004 activity, this nest is considered active. In this BA, this nest is referred to as Nest 09. Its location is shown in Figure 3. It is about 5,282 feet (1.0 miles) from the Tongue River Railroad.

Nest 10 (MTFWP ID = EMPTY2)

This nest was identified during a 2004 aerial survey, although no bald eagle activity was observed at that time. A subsequent survey in April 2005 documented this nest as empty. At this time, this nest is considered inactive (Puchniak 2005). In this BA, this nest is referred to as Nest 10. Its location is shown in Figure 3. It is about 5,407 feet (1.02 miles) from the Tongue River Railroad.

Nest 11 (MTFWP ID = EMPTY1)

This nest was identified during a 2004 aerial survey, however no bald eagle activity was observed at this time. A subsequent survey in April 2005 documented this nest as empty. At this time this nest is considered inactive (Puchniak 2005). In this BA, this nest is referred to as Nest 11. Its location is shown in Figure 4. It is about 2,441 feet (0.46 miles) from the Tongue River Railroad.

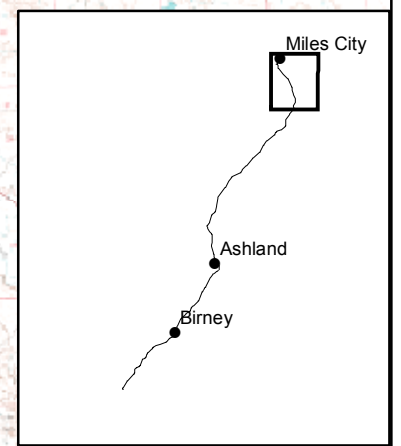
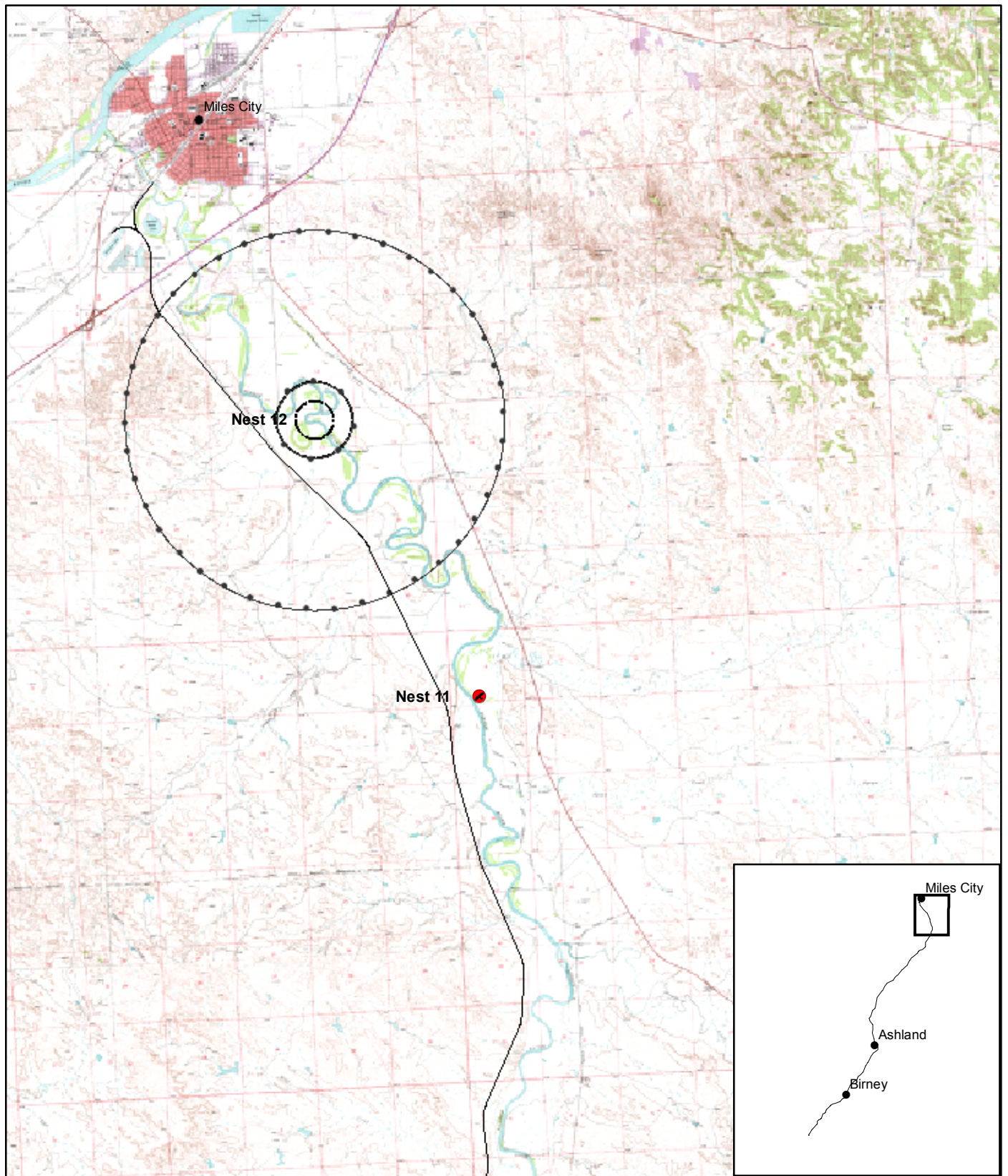
Nest 12 / Nest 12 Alternate (MTFWP ID = 410351)

This nest was first identified during a 2004 aerial survey and then again during the April 2005 aerial survey. A bald eagle was observed in the nest during the 2005 survey (Puchniak 2005). In this BA, this nest is referred to as Nest 12. Its location is shown in Figure 4. It is about 3,556 feet (0.67 miles) from the Tongue River Railroad. An empty nest in the vicinity of Nest 12 was identified during the April 2005 aerial survey. In this BA, this nest is referred to as Nest 12 Alternate. It is about 2,449 feet (0.46 miles) from the Tongue River Railroad. Due to their close proximity, Nest 12 Alternate will be considered as part of the same active territory as Nest 12 for the purposes of this BA.

Other Nests Outside of the Project Area

In addition to the nests in the vicinity of the Tongue River Railroad, bald eagles have also successfully nested along the Tongue River upstream from the Tongue River Reservoir (Phillips et al. 1990). This nest was also in a cottonwood tree. A new nesting territory was apparently being occupied in late winter/early spring 1999 above the Tongue River Reservoir (Berry, personal comm., 1999; Flath, personal comm. 1999b). During the aerial survey on April 16, 1999 an active bald eagle nest was found about 1.5 miles upstream from the upper end of the Tongue River Reservoir. Since the 1999 survey, more recent data (MTDFWP 2003a) document a nest in the same territory (in this BA, this nest is referred to as an alternate nest) that was active through 2001. In 2000, it was active and successful, and it was used again in 2001. In 2002, this nest was active and successful with one fledgling. Data for 2003 are not available. This nest is about 6.5 miles south of the Tongue River Railroad tie-in with the existing Spring Creek Rail Spur, so it will not be considered further in this BA. It is notable, however, that the nest is about 1200 feet (0.23 mile) from the existing BNSF rail line from Sheridan, Wyoming to the Decker coal mines.

This area was also surveyed by air in January 2003 and April 2005. Observations from these surveys include a nest approximately 6.5 miles south of the Tongue

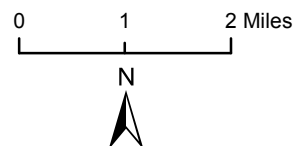


Legend

Mangement Zone (Active Nest)

- Zone 1
- Zone 2
- Zone 3

- Inactive Bald Eagle Nest
- Proposed Route



E N T R I X

Figure 4
Bald Eagle Management Zones
In Relation to the Tongue River
Railroad Route

Proj No. 3079712 Date: 4/2005

River Railroad tie-in with the existing Spring Creek Rail Spur (Hayden-Wing 2003, Hayden-Wing, personal comm. 2003, Puchniak 2005).

Wintering / Migrant Population

Bald eagles also occur along the Tongue River as migrants and winter residents. They forage on fish, waterfowl, carrion, etc. During migration, as many as 50 bald eagles have been counted along the Tongue River from Miles City to the upper end of the Tongue River Reservoir (Farmer 1992).

The value of the river immediately below the Tongue River Dam as an attractant for migrant and wintering bald eagles has been recognized (Lockhart and McEneaney 1978, Albers 1995). In 1992 it was estimated that an average 10-15 bald eagles winter along the river below the dam (USFWS 1992). Currently, there are approximately 10 to 60 wintering bald eagles along the Tongue River (Hazelwood, personal comm. 2003). This estimate does not include any migrants that may be passing through. Through a multiple agency effort of national winter bald eagle surveys, John Berry has done mid-winter surveys along the Tongue River (Hazelwood, personal comm. 2003).

A mid-winter survey was done by John Berry (Berry, personal comm. 2003, Hazelwood, personal comm. 2003) in January of 2001 and 2002 from Ashland to the Wyoming border. In January 2001, 13 bald eagles were recorded on an aerial survey along the Tongue River including 9 adults and 4 juveniles. In 2002, 15 bald eagles were found along the Tongue River in January. The survey started in the morning with mild conditions and 80% ice cover. Of the 15 bald eagles recorded, there were eight adults and seven juveniles.

During a January 2003 survey (Hayden-Wing 2003) along the Tongue River, primarily south of the Tongue River Reservoir, a perch site was noted approximately 4.5 miles south of the tie-in (Hayden-Wing, personal comm. 2003). The Tongue River Railroad does not fall within the 0.25-mile wintering diurnal perching area zone of this observation (MBEWG 1994).

In February 2004, an aerial survey was conducted for the Bald Eagles wintering individuals (BLM 2002b) along the proposed Tongue River Railroad (Farmer 2004). In February 2004, 13 bald eagles were recorded including 6 adults and 7 juveniles. The Tongue River Railroad does not fall within the 0.25-mile wintering diurnal perching area zone of these observations (MBEWG 1994).

BLACK-FOOTED FERRET

Historically, the black-footed ferret ranged from the Canadian plains to the intermountain west and perhaps as far south as Mexico. As early as 1967, populations had been reduced to the point where the species was officially

recognized as endangered. A major cause for the decline in the black-footed ferret is thought to be the 90-98 percent reduction of the range of prairie dogs (USFWS 1988).

No black-footed ferrets are known to occur in or near the vicinity of the Tongue River Railroad project area (MTNHP 2003). Ferrets were reintroduced into Montana in 1994 and in Wyoming in 1991. The Montana reintroduction site is more than 130 air miles northwest of the Tongue River Railroad route. The route is also more than 180 air miles from the Wyoming reintroduction site, and more than 120 air miles to the last known site of a naturally occurring ferret population near Meteetsee, Wyoming. Therefore, it is highly unlikely that black-footed ferrets from these three locations would disperse to the Tongue River Railroad vicinity.

In Montana, the goal is to reestablish two viable populations with a minimum of 50 breeding adults in each. Nationwide, the objective is to increase the captive population to 250 breeding adults and to establish a wild pre-breeding population of 1,500 adults in 10 or more locations by 2010. In 1994, ferrets were released into black-tailed prairie dog towns northeastern Montana's C.M. Russell National Wildlife Refuge. This reintroduced ferret population is not well established at this time.. There is another possible reintroduction site in Montana; however, it is located in Custer Creek between Terry and Miles City on the Yellowstone River (Dood, personal comm. 2003). There is ongoing concern about the genetic viability of the captive population (MTDFWP 2003b)

There is also a BLM designated wildlife area of critical environmental concern (ACEC) located in Custer and Prairie counties, Montana. It encompasses 11,166 acres and is considered a potential reintroduction area for the black-footed ferret because it has 1,151 public acres of active prairie dog towns. ACEC designations highlight areas where special management attention is needed to protect and prevent irreparable damage to important historic, cultural and scenic values; fish, wildlife resources or other natural systems or processes; or to protect human life and safety from natural hazards (BLM 2003). However, this ACEC is not in the project area, because it is east of Miles City (Rau, personal comm. 2003).

Critical habitat for the black-footed ferret is considered to be prairie dog colonies (Biggins et al. 1985, USFWS 1989). In the Tongue River area, black-tailed prairie dogs excavate colonies in grasslands on gentle to rolling slopes on benches adjacent to the river, as well as in upland habitats away from the valley bottom. The USFWS (USFWS 1989) determined that, in order to constitute acceptable black-footed ferret habitat, black-tailed prairie dog colonies or complexes of colonies (a prairie dog colony complex is defined as two or more neighboring colonies each less than four miles from the other) must be at least 80 acres in size. Further, colonies should contain 4.7 active burrows/acre (Biggins et al. 1993).

On Native American lands (i.e., the Northern Cheyenne Indian Reservation), prairie dog control has been much less consistent or systematic. In the early 1990's, investigators identified a large black-tailed prairie dog complex on the Reservation (GeoResearch, Inc. 1991). This complex encompassed about 11,000 acres of active prairie dog colonies. In the early 1990s many of these colonies were debilitated by sylvatic plague, reducing the size of the active complex to about 650 acres by 1995 (FaunaWest 1998).

However, prairie dogs may reoccupy affected colonies (Hanebury, personal comm. 1999). By 1998 there were approximately 1500 acres of active prairie dog colonies on the Northern Cheyenne Reservation (FaunaWest 1998).

In the early 1990s the USFWS expressed concern that prairie dog colonies on the east side of the Tongue River (non-Native American lands) might be part of the Northern Cheyenne complex (1992 DEIS). Rivers might be seasonal barriers to black-footed ferret movement (Biggins et al. 1993); however, considering the historical distribution of ferrets from Canada to Mexico (Hillman and Clark 1980), it is improbable that streams the size of the Tongue River represent impassable barriers to ferret dispersal. Even if the Northern Cheyenne black-tailed prairie dog complex is redefined to include some of the colonies east of the river, the percentage of the complex east of the river would undoubtedly be very small (1992 DEIS).

Black-tailed prairie dog colonies along the approximate ROW of the Tongue River Railroad were mapped during an aerial survey on April 16, 1999. Thirty-six colonies were mapped on or near (within 3-mile on either side) the ROW. Of the 36, 28 were located on the Miles City to Ashland rail line, eight were found on the first 21 miles of the Ashland to Decker extension, and none were observed on the Western Alignment. Of the 28 colonies mapped on the Mile City to Ashland route, 26 were found on that part of the route located on the west side of the Tongue River between Miles City and about 10 miles north of Ashland. FaunaWest (1998) had reported many colonies in this general vicinity, so the comparatively large number of colonies counted in this area was not surprising.

Many of these colonies appeared to have been affected by plague and/or control efforts, a circumstance that was expected because FaunaWest (1998) had reported similar observations. In some colonies, burrows appeared to be widely separated. In other colonies, there were many burrows but few prairie dogs were observed and there appeared to be little recent evidence (fresh digging) at burrow entrances. Consequently, it was not possible to differentiate the active portions of colonies during the aerial survey, and it was difficult to accurately map the outside boundaries of colonies. However, it was estimated that the 36 colonies observed near the Tongue River Railroad route ranged in size from about two acres to about 450 acres, and averaged about 45 acres; 17 of 36 (47 percent) were estimated to

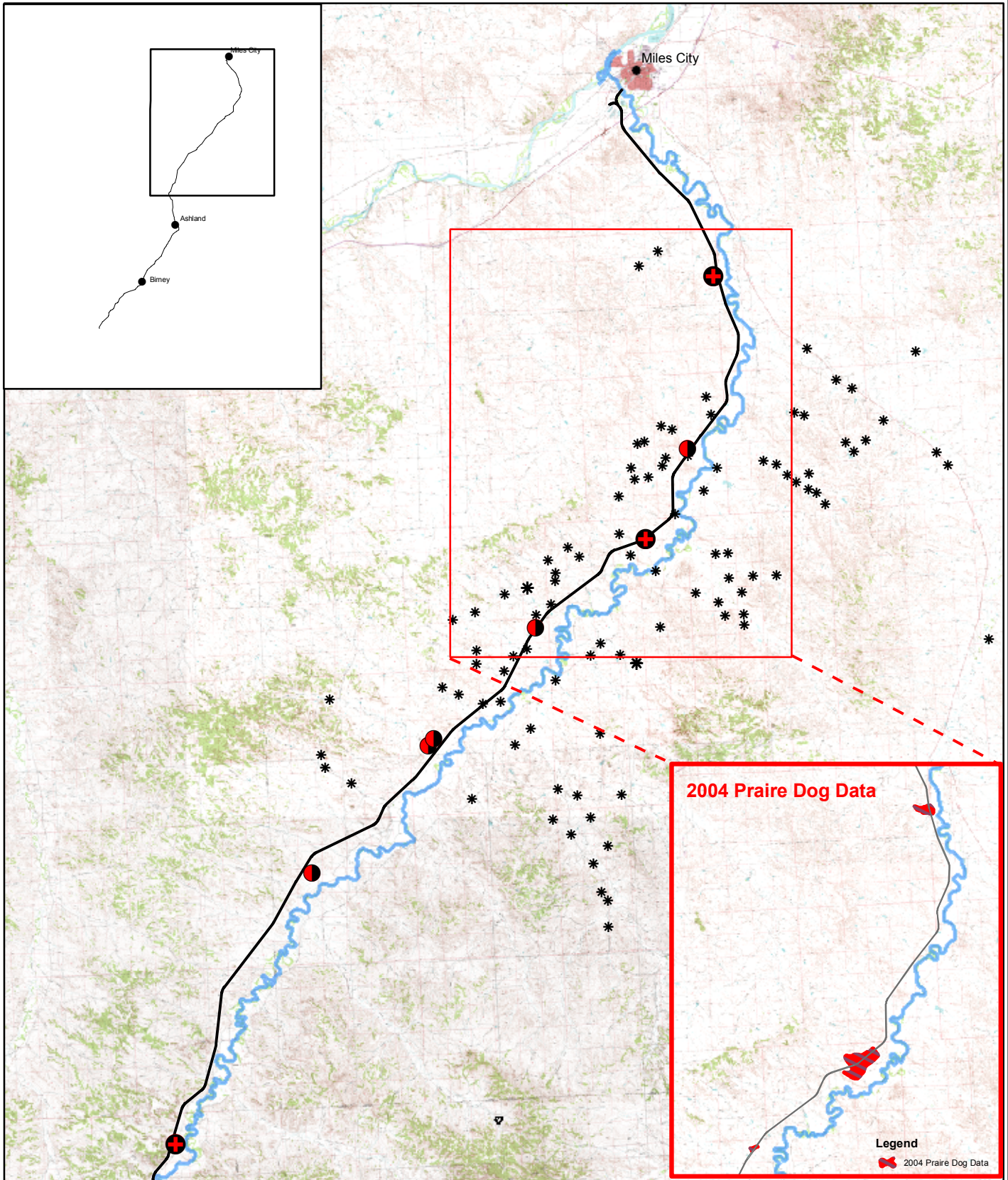
be less than 10 acres in size. In comparison, FaunaWest (1998) surveyed 118 colonies in Custer County (some of which were probably also counted during the Tongue River Railroad aerial survey) and reported that the largest was 491 acres, while the average was about 51 acres.

MTNHP (2003) also provided historical data; data included 1997 and 1998 point locations of prairie dog colonies. These point locations are shown on Figures 5 and 6. There are 83 point locations mapped from 1997; 48 point locations mapped from 1998; and 102 point locations mapped from Northern Cheyenne Reservation and collected in 1997, which were represented as polygons from the BIA (2003) data.

Other survey data from the Bureau of Indian Affairs (2003) also reports both historical data (1989-2000) and current (2001) prairie dog colonies along the Tongue River (Figure 6). These data include ground surveys of the Northern Cheyenne Tribal Lands along the Tongue River. These historical surveys reported 39 historical prairie dog colonies in 1989; 109 reported in 1990; 90 in 1994; 67 in 1995; 80 in 1996; 103 in 1997; 99 in 1998; 141 in 1999; and 110 in 2000 along the Tongue River (Figure 6). The average area of the historical colonies found from 1989-2001 was approximately 25 acres. In 2001, the most recent data from BIA (2003), 121 colonies were reported. The average size of the colonies in 2001 was approximately 28 acres. None of these colonies were within 0.5 miles of the project area (including route and 200-foot-wide construction buffer) (0.5-mile buffer from BLM 2002b). Of these colonies, nine were greater than 80 acres.

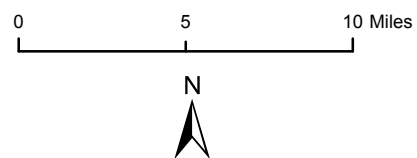
Of all of the black-tailed prairie dog colonies found during spring U.S. Forest Service surveys (2003), one colony (not including complexes of colonies) that was greater than 80 acres (approximately 129 acres) was found approximately 14 miles east of the Tongue River, southeast of Birney. Historical prairie dog data were also available from MTNHP (2003), but these were point locations. In Bureau of Indian Affairs (BIA) (2003) data, 121 prairie dog colonies were reported. The average size of the colonies in 2001 was approximately 28 acres, and nine were greater than 80 acres (not including complexes of colonies). However, none were within 0.5 miles of the project area (including route and 200-foot-wide construction buffer) (0.5-mile buffer from BLM 2002b).

In spring 2004, an aerial survey was conducted to delineate potential black-tailed prairie dog active colonies along the proposed Tongue River Railroad (Entrix, Inc. 2004a). The extent of the active black-tailed prairie dog colonies were also approximately delineated (for colonies large enough to circle with the aircraft) during the aerial survey utilizing a GPS on the small aircraft. Acreage is approximate due to the aircraft limitation in circling the boundary of the colonies. Some colonies may have actually been complexes, rather than individual colonies. Figures 5 and 6 exhibit all black-tailed prairie dog colonies found during this survey. Four colonies



Legend

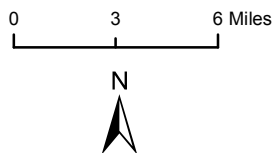
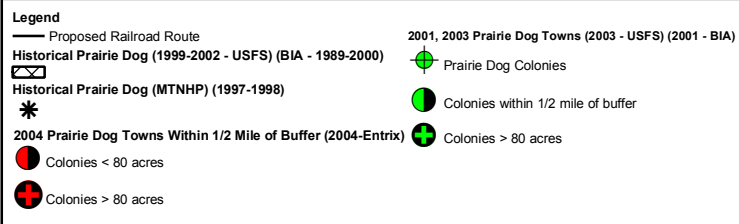
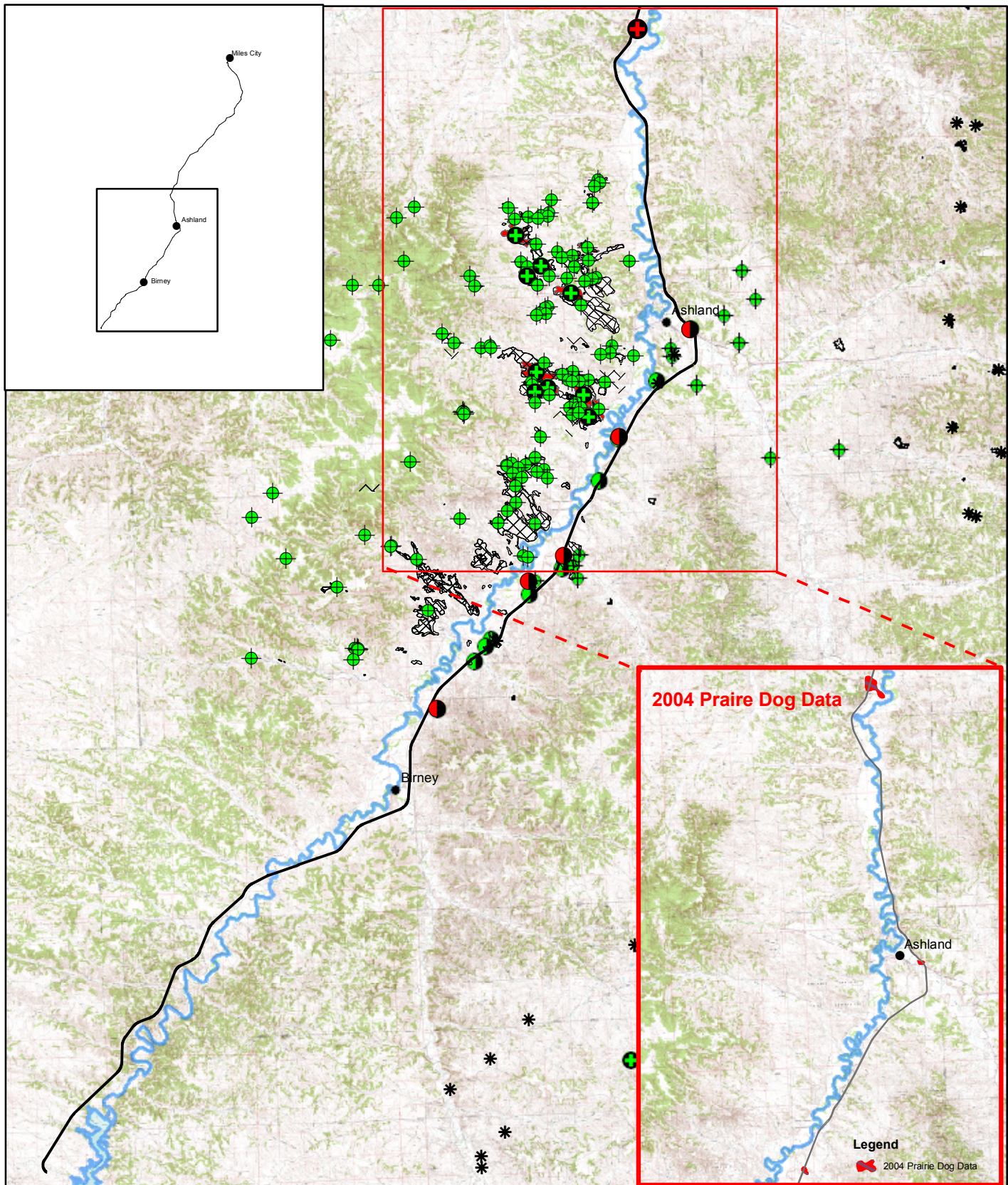
- Proposed Railroad Route
- * Historical Prairie Dog Points(1997-1998) (MTNHP)
- 2004 Prairie Dog Towns Within 1/2 Mile of Buffer (2004-Entrix)**
 - Colonies < 80 acres
 - ⊕ Colonies > 80 acres



ENTRIX

Figure 5
 Prairie Dog Colonies
 In Relation to the Tongue River
 Railroad Route

Prj No. 3079712 Date: 4/2004



ENTRIX

Figure 6
Prairie Dog Colonies
In Relation to the Tongue River
Railroad Route

Prj No. 3079712

Date: 4/2004

greater than 80 acres were delineated. A ground reconnaissance using USFWS (1989) black-footed ferret survey guidelines will subsequently be conducted prior to construction to determine the status of the above documented prairie dog colonies and any others found on aerial survey. Protocol surveys for black-footed ferrets were conducted in September 2005, and no individuals or their sign were recorded.

METHODS

The information for this Biological Assessment was collected from November 1998 through April 1999 and then updated from August through September 2003. Additional field data was collected in the spring of 2004, and September 2005. Data from MTDFWP studies in 2004 and 2005 has been included. Data collection methods included: 1) review of existing information; 2) contact with knowledgeable parties; and 3) appropriate surveys.

Literature reviewed for information regarding endangered or threatened species in the area potentially affected by the Tongue River Railroad included: administrative files provided by the USFWS; wildlife inventory reports from the Montco Mine from the late 1970s through the mid-1980s; the 1983 DEIS, 1984 SDEIS and 1985 FEIS for Tongue River I; the 1992 DEIS, 1994 SDEIS and 1996 FEIS for Tongue River II; the Fish and Wildlife Coordination Act Report for the Tongue River Dam Rehabilitation Project (USFWS 1992); the 1995 BA and 1995 Biological Opinion for Tongue River II; the 1995 DEIS (MDNRC 1995) and 1996 FEIS (MDNRC 1996) for the Tongue River Basin Project; the Final Biological and Conference Opinions for Coal Bed Methane Production in Blaine, Gallatin, Park, Carter, Powder River, Custer, Rosebud, Treasure, Wheatland, Sweet Grass, Stillwater, Carbon, Golden Valley, Musselshell, Yellowstone, and Big Horn Counties, Montana (USFWS 2002); Final Statewide Oil and Gas Environmental Impact Statement and Proposed Amendment of the Powder River and Billings Resource Management Plans (BLM, et al., 2003); theses, technical reports and journal papers; relevant information on natural resource agency WebPages; and various application materials for the Western Alignment submitted by TRRC to the STB. All citations used in this BA are included in LITERATURE CITED.

Contacts with knowledgeable parties ranged from informal discussions with landowners along the rail line, conducted by TRRC or WESTECH personnel; contacts with USFWS, MTDFWP, MBEWG, Montana Prairie Dog Working Group, mining company, Hayden-Wing Associates, and other biologists at various dates from 1990 to 1995 (cited in the 1995 BA for Tongue River II), late 1998-early 1999, and 2003 to 2005, as well as searches of biological resource data bases compiled by the MTNHP and MTDFWP.

Field inventories for wintering and nesting bald eagles along parts of the Tongue River Railroad route near operating or proposed coal mines have been conducted sporadically since the mid 1970s (e.g., Lockhart and McEneaney 1978; annual wildlife monitoring reports from the Montco Mine). Information from these surveys was summarized in the 1992 DEIS and USFWS 1992. Inventories specific to the Tongue River II route, including an aerial survey, were conducted in February and April 1992, prior to the preparation of the 1995 BA; the results of those surveys were included in the 1995 BA. A brief reconnaissance along public roads in the area potentially affected by the Tongue River Railroad was conducted during preparation of the Western Alignment application in February 1998.

As discussed previously, an aerial survey for bald eagle nests and prairie dog colonies was flown on April 16, 1999 after consultation in March 1999 with the USFWS. The survey went from Miles City to the Wyoming border, then returned to Miles City. The flight upstream followed the Tongue River from Miles City to the Wyoming border, concentrating on riparian habitat along the river which was considered the most likely habitat for bald eagle nesting activities. In the area below the Tongue River Dam from the dam to about the Nest 02 Alternate site, however, the survey was expanded to include the lower, ponderosa pine covered hills adjacent to the valley, which might also have been used for nesting or roosting. The flight downstream generally followed the ROW of the Tongue River Railroad from the tie-in with the Spring Creek Rail Spur to Miles City. Since the ROW has not been surveyed and flagged, an attempt was made to survey an area of about 3 miles on either side of the approximate ROW as mapped on USGS 1:24,000 scale topographic maps.

The aerial survey was flown at low altitude and low air speed in a Piper SuperCub, beginning at approximately 0615 and ending at about 1200. The survey was flown under clear skies (partly cloudy from Tongue River Dam to the Wyoming border) and cool temperatures (maximum approximately 45°F). All sightings of bald and golden eagles were mapped, and deciduous forest along the river was searched for nests that could be potentially used by bald eagles. Results were reported to MTDFWP and USFWS. Since 1992, monitoring of active bald eagle nests (identified as Nests 03 and 04 in this BA) along the Tongue River has been conducted by MTDFWP, BLM and coal mining companies (Flath, personal comm, 1994). In addition, TRRC personnel inspected Nest 06 on April 26, 1999 to determine whether or not this nest was active.

An early spring 2004 survey was conducted for prairie dog colonies and habitat along the ROW. Additionally, data from aerial bald eagle surveys conducted by MTDFWP in 2004 and 2005 has been incorporated.

ANALYSIS OF EFFECTS; PROPOSED MITIGATION MEASURES

PALLID STURGEON

Analysis of Effects

Pallid sturgeon is a large river fish that resides in deep-water areas of the main channel. This species preferred habitat is comprised of sand flats and gravel bars in large, silty rivers with swift currents (Bramblett 1996). Currently, there are no known occurrences of the pallid sturgeon in the Tongue River. The probable cause is likely due to changes in flow regime caused by damming of the Tongue River (Gardner 2001).

Pallid sturgeon is collected each year from the wild for spawning at the Miles City Fish Hatchery. The adults are released after spawning, and the young sturgeons are transported to other hatcheries for rearing and release.

As previously stated, reintroduction of the pallid sturgeon may occur in the Tongue River in the future. If this does occur, the operations of the Tongue River Railroad would not be expected to adversely affect this species in the river. The potential impact of vibrations caused by operation of the railroad to the sturgeon in an actively flowing stream is considered to be minimal. Additionally, vibration could potentially affect captive propagation and rearing of sturgeon held at the Miles City Fish Hatchery. Refer to the letter of agreement between the State, who operates the hatchery, and the applicant addressing vibration effects at the hatchery.

The proposed Tongue River Railroad may affect, but is not likely to adversely affect the pallid sturgeon.

Proposed Mitigation Measures

If pallid sturgeon were encountered during construction or operation of the Tongue River Railroad, TRRC would immediately reinitiate consultation with the USFWS based on this new information to determine appropriate means to mitigate the effects of construction and operation of the Tongue River Railroad on the pallid sturgeon.

WHOOPING CRANE

Analysis of Effects

There are currently no known occurrences of the whooping crane in the Tongue River Railroad project area. Birds potentially occur in the project vicinity only during migration. If whooping cranes would be observed, they would be transients through the area and would not be directly affected by the proposed project.

The proposed Tongue River Railroad may affect, but is not likely to adversely affect the whooping crane.

Proposed Mitigation Measures

If whooping cranes were encountered during construction or operation of the Tongue River Railroad, TRRC would immediately reinitiate consultation with the USFWS based on this new information to determine appropriate means to mitigate the effects of construction and operation of the Tongue River Railroad on the whooping crane.

INTERIOR LEAST TERN

Analysis of Effects

Suitable interior least tern habitat within the Tongue River Railroad project area includes sparsely vegetated sand and gravel bars within the Tongue River channel. Although this habitat is present, there have been no documented occurrences of this species in the project area. The closest known occurrences are nine miles away on the Yellowstone River.

Limited areas of potentially suitable habitat for the interior least tern are available along the Tongue River. However, it is possible that this species may be encountered in the project area. Potential impacts to the interior least tern, if present, due to the construction and operation of the Tongue River Railroad may include noise and disturbance from human activities associated with construction, and to a lesser degree with operations of the railroad.

The proposed Tongue River Railroad may affect, but is not likely to adversely affect the interior least tern.

Proposed Mitigation Measures

If the interior least tern were encountered during construction or operation of the Tongue River Railroad, TRRC would immediately reinitiate consultation with the USFWS based on this new information to determine appropriate means to mitigate the effects of construction and operation of the Tongue River Railroad on the interior least tern.

BALD EAGLE

Analysis of Effects

The proposed Tongue River Railroad project has the potential to cause disturbance to nesting, migratory and wintering bald eagles found in the vicinity of the Tongue River corridor. Disturbance can result from construction actions and associated

increases in human activity by construction personnel both on and off the job, and from operations of the railroad. The *Montana Bald Eagle Management Plan* (MBEWG 1994) summarized the reaction of bald eagles to human activities as follows:

Bald eagles are sensitive to a variety of recreational, research, resource and urban development activities. Responses of eagles may vary from ephemeral, temporal and spatial avoidance of activity to total reproductive failure and abandonment of breeding areas. Less adequately documented is that bald eagles also tolerate apparently significant disturbances. Relationships of human activity and eagle responses are highly complex, difficult to quantify, and often site-specific. Responses vary depending on type, intensity, duration, timing, predictability and location of human activity. The way in which these variables interact depends on age, gender, physiological condition, sensitivity, residence, and mated status of affected eagles. Prey base, season, weather, geographic area, topography and vegetation in the vicinity of activities and eagles (plus other variables probably unperceived by humans) also influence eagle responses. Cumulative effects of many seemingly insignificant or sequential activities may result in disruption of normal behavior. Lack of experimental data (due to endangered/threatened status) limits quantification of response to empirical evidence, but general trends in eagle responses (or lack thereof) to human activity are becoming evident to field researchers and managers, although somewhat subjectively. Clearly, some bald eagles are more tolerant of human activity than others. Tolerance threshold is usually site, pair, and activity specific and a function of type, intensity, and proximity of disturbance over exposure time. However, it is becoming apparent that there are "urban" and "rural" eagles. Urban eagles may be more tolerant of certain human activities than their rural counterparts because they have been or are exposed to more human activity at gradually increasing levels, while rural eagles' exposure is abrupt.

The *Montana Bald Eagle Management Plan* (MBEWG 1994) defined disturbance, as used above, to be "any human elicited response that induces a behavioral or physiological change in a bald eagle contradictory to those that facilitate survival and reproduction. Disturbance may include elevated heart or respiratory rate, flushing from a perch or events that cause a bald eagle to avoid an area or nest site."

Construction

NESTING POPULATION

The *Montana Bald Eagle Management Plan* (MBEWG 1994) defined Nest Site Management Zones for human activity in the vicinity of bald eagle nests during the

nesting period of February 1 through August 15. Appendix 1 provides detailed descriptions of Management Zones and guidelines for human activity within them. Management Zone 1 includes the area within 0.25 mile of all nest sites within a breeding territory until the active nest is located, at which time the Management Zone 1 guidelines apply only to the occupied nest. According to the guidelines for human activity within Management Zone 1, high intensity activities such as blasting and heavy equipment use are to be eliminated during the nesting period; low intensity activities are to be minimized but may be acceptable (see Appendix 1 for full description of human activities guidelines). Management Zone 2 is considered to be the primary use area for nesting bald eagles and comprises the area between Zone 1 (0.25 mile from the nest site) and 0.5 mile from the nest site. Potential disturbances within Zone 2 are to be minimized. As with Management Zone 1, once an active nest has been located within a breeding territory, Management Zone 2 applies only to the active nest (Appendix 1). Management Zone 3 represents most of a home range used by bald eagles during a nesting season, applies to nests that have been active at least once during the past five years, and extends to a radius of 2.5 miles from the nest site. Disturbances and hazards are to be minimized within Zone 3 (Appendix 1).

Of the eleven bald eagle nesting territories within the Tongue River Railroad project vicinity, the proposed railroad route does not cross within Nest Management Zone 1 (0.25 miles of the nest site) or Nest Management Zone 2 for any nest (see Table 1 and Figures 2-4). The *Montana Bald Eagle Management Plan* (MBEWG 1994) requires that unoccupied nest sites be considered occupied for five years after the last recorded activity of breeding bald eagles, because bald eagles may rebuild destroyed nests, often in the same or a nearby stand of trees. Nests 1 and 2 were apparently destroyed in 1994 and have not been rebuilt; these nests are not considered further in this BA. Nests 5, 6, 10, and 11 are not known to have been actively used by eagles during the past five years but data is not consistently available for each year. Therefore, seven of the eleven nests are considered active, and the Tongue Rive Railroad intrudes within Nest Management Zone 3 (between 0.5 and 2.5 miles) of each of these. Management Zone 3 (pending MTDFWP 2004 data) overlaps about 4.9 miles of the Western Alignment of the Tongue River Railroad near Nest 03 (Figure 2), about 4.9 miles of the rail line near Nest 02 Alternate (Figure 2), about 4.5 miles of the rail line near Nest 04 Alternate (Figure 3), about 5.6 miles of the rail line near Nest 07 (Figure 2), about 4.7 miles of rail line near Nest 08 (Figure 2), about 5 miles of rail line near Nest 09 (Figure 3) and about 4.8 miles of the rail line near Nest 12 (Figure 4).

Table 1. Bald eagle nesting status within the Tongue River Railroad project vicinity with distances of bald eagle nest sites to railroad corridor and public access roads.

Nest Site	Nesting Activity	Distance to Railway (miles)	Distance to Public Road (feet)
1	Destroyed		
2	Destroyed		
2 Alt	Breeding not confirmed	0.8	4,000
3	Active; Repeatedly successful	0.7	400
4/4 Alt	Active; Repeatedly successful	0.9	3,000
5	Inactive	0.75	3,400
6	Inactive; Unconfirmed past nesting	1.2	3,000
7	Active	0.55	390
8	Active	0.69	2,100
9	Active	1.0	3,638
10	Inactive	1.02	682
11	Inactive	0.46	1,627
12/12 Alt	Active	0.67/0.46	2,648

No known bald eagle nest sites would be destroyed by construction of the Tongue River Railroad. Construction of the ROW and operations of the railroad would disturb approximately 25 acres of riparian deciduous tree/shrub habitat (ENTRIX, INC. 2004b).

Nest Management Zones provide guidelines that can be applied to project related effect analysis to bald eagle nesting territories. Though no active nests fall within Management Zones 1 or 2, the seven active eagle nesting territory in the Tongue River Railroad project vicinity lie approximately between 0.5 and 1.0 miles from the railroad corridor. Local topography, line-of-sight between the nest and human activity areas, the stage of the nesting cycle, and the individual sensitivity of an eagle may each influence how a bird may react to various disturbance activities. The earlier in the nesting season the more sensitive a nesting pair appears to be to disturbances. Construction of the 116-mile railroad line will take 3 years, and require the use of heavy equipment and a resident work force of over 500 people. Within this time period eagles may shift their nesting sites and other eagles may establish new territories within the project vicinity. The presence of a large workforce will result in increased human activity throughout the area including increased traffic, noise, and recreational activities where eagles may occur in addition to the actual construction of the railway.

Construction of the Tongue River Railroad near an active bald eagle nest during the nesting season could result in increased stress (included within the definition of "disturbance") to the birds due to noise and the presence of people, induced

flushing from the nest of an incubating or brooding adult, delays in the return of adult birds to the nest to tend to chicks, and disruption of foraging activities. Construction activities might also displace certain kinds of prey, such as, waterfowl and other birds, but such displacement would be localized and short-term. Other types of prey, including fish, would not be substantially affected though the use of certain areas along the river corridor by eagles for foraging may be precluded due to construction activities. Since construction related disturbance would occur only along a relatively small portion of the river corridor at one time, construction activities would likely result in the displacement of foraging eagles to other areas of the river. However, depending on the frequency and timing of disturbances near nest sites, and the sensitivity of the nesting pair, these disturbances could result in nest abandonment or failure.

Within the project vicinity, there is already some level of disturbance to bald eagles due to human activity in the area potentially affected by the Tongue River Railroad. Nesting bald eagles along the Tongue River have been exposed to, and perhaps become accustomed to some level of disturbance related to human use of the public roads (Table 1), residences, agricultural activities such as hay production and feeding livestock, and limited recreational use of the Tongue River. Though the population of nesting bald eagles along the Tongue River continues to expand with many nests successfully fledging young, these ongoing activities may have resulted in disturbance to the eagles as defined within the *Montana Bald Eagle Management Plan* (MBEWG 1994). As discussed, individual birds vary in their sensitivity to disturbance, and so in the absence of detailed nest-site monitoring data it may be difficult to define the degree of effect that on-going activities may be having as well as determining when the accumulation of disturbance could result in more serious consequences to this eagle population (e.g., nest failure or abandonment).

WINTERING / MIGRANT POPULATION

Construction of the Tongue River Railroad could displace migrant or non-nesting bald eagles from portions of the Tongue River Railroad, and also displace certain types of prey. However, this effect would be short-term and would occur only during the construction season (generally April through October). Therefore, minimal direct project related effects are anticipated to the wintering bald eagle population due to construction activities for the Tongue River Railroad.

Indirect effects from construction would be related to the presence of the construction force, and would potentially include: 1) displacement as a result of increased recreation in the area; 2) mortality of bald eagles from vehicles along access roads to the Tongue River Railroad, particularly if bald eagles were attracted to these roads by the presence of carrion such as vehicle-killed deer (USFWS 1986); and 3) an increased potential for illegal killing of bald eagles as a result of increased numbers of people in the area. Once construction is complete and the construction work force departs, these potential impacts would be abated.

Recreational access to the Tongue River Valley is restricted by private landowners, and this situation is not expected to change as a result of the construction and operation of the Tongue River Railroad.

Operation

NESTING POPULATION

The Tongue River Railroad is expected to operate 365 days a year, 24 hours a day. The train would generally consist of two locomotives and 113 coal cars moving at approximately 55 miles-per-hour. Periodic railroad maintenance activities would be required. The current bald eagle nesting territories within the project vicinity include:

- Nest 02 Alternate (MTDFWP ID 410052), that appears to have been built or modified by eagles, apparently has not been actively used by bald eagles and was occupied by red-tailed hawks in April 1999. Current data are not available for this nest. It is about 0.75 mile from a public road, about 0.9 mile from a residence, and is adjacent to active ranching activities. It is about 0.8 mile from the Western Alignment of the Tongue River Railroad (Figure 2).
- Nest 03 (MTDFWP ID 410053), which has been an active bald eagle nest every year since 1995, is within 400 feet of a public road (Figure 2), about 0.5 mile from an occupied residence, and also adjacent to active ranching activities. Therefore the bald eagles that use this nest are habituated to some level of human activity near their nest, even during the peak of nesting season. The Tongue River Railroad would be about 0.7 mile from Nest 03, farther away than all these other existing human activities.
- Nest 04 Alternate (MTDFWP ID 410171) has been used by nesting bald eagles every year since 1992. This nest is about 0.6 mile from a public road, 0.8 mile from a human residence, and is adjacent to ranching activities including cattle grazing and hay production. The Tongue River Railroad would be about 0.9 mile from this nest (Figure 3).
- Nest 05 (MTDFWP ID 410231), which was discovered in April 1999, has either been inactive or used by another species in subsequent years. It is about 0.6 mile from a public road, 0.7 mile from a human residence, and is adjacent to ranching activities. The Tongue River Railroad would be about 0.75 mile from this nest (Figure 3).
- Nest 06 (no MTDFWP ID), which appears to have been modified by eagles or other raptors, was occupied by Canada geese on April 26, 1999. No recent data are available for this nest. It is about 0.6 mile from a public road, about 0.8 mile from a human residence, and is adjacent to areas grazed by livestock. The

Tongue River Railroad would be about 1.2 miles from this nest (Figure 2), farther away than these other human activities.

- Nest 07 (MTDFWP ID 410381), which was first identified during the April 2005 aerial survey, is about 400 feet from the nearest public road (Figure 2). The Tongue River Railroad would be about 2,889 feet (0.55 miles) from the nest.
- Nest 08 (MTDFWP ID 410371), which was first identified during a 2004 aerial survey and then again during the April 2005 aerial survey, is about 2,100 feet from the nearest public road (Figure 2). The Tongue River Railroad is about 3,661 feet (0.69 miles) from the nest.
- Nest 09 (MTDFWP ID 410361), which was identified as active during a 2004 aerial survey, is about 3,638 feet from the nearest public road (Figure 3). The Tongue River Railroad is about 5,282 feet (1.0 miles) from the nest.
- Nest 10 (MTDFWP ID EMPTY2), which was identified as empty during 2004 and 2005 aerial surveys, is located about 682 feet from the nearest public road (Figure 3). The Tongue River Railroad is about 5,407 feet (1.02 miles) from the nest.
- Nest 11 (MTDFWP ID EMPTY1), which was identified as empty during 2004 and 2005 aerial surveys, is located about 1,627 feet from the nearest public road (Figure 4). The Tongue River Railroad is about 2,441 feet (0.46 miles) from the nest.
- Nest 12 (MTDFWP ID 410351), which was first identified during a 2004 aerial survey and then again during the April 2005 aerial survey, is located about 2,648 feet from the nearest public road (Figure 4). The Tongue River Railroad is about 3,556 feet (0.67 miles) from the nest.

Each of the eleven nests considered in this BA have been built in locations that suggest that the birds that built and used the nests are habituated to some level of human activity. However, the patterns of current human use in the area is unknown, and seasonal difference in disturbance factors may result in eagles establishing a nest in late winter when human activity is reduced, and retaining their commitment to the nesting attempt into the spring and summer despite increased human disturbances. The operations of the train will remain fairly constant providing nesting birds similar disturbance factors throughout the year. There are many examples of bald eagles successfully nesting in close proximity to both highways and railways. In addition, the loss of bald eagle nests is not uncommon. In Montana, an average of seven percent (range 3-15 percent) of all bald eagle nests are lost each year; the continent-wide nest turnover rate is also seven percent (range 5-20 percent). Nests may fall out of trees or the tree may be lost (MBEWG 1994). Thus,

while certain nests may remain active for many years, it is not unusual for the location of a nest site within a bald eagle nesting territory to change (Flath, personal comm. 1995). However, adequate information is not available to determine when the threshold of disturbance factors acceptable to nesting eagles may be reached.

Rail line maintenance activities near active bald eagle nests could result in short-term displacement of eagles. The magnitude of this impact at any nest site cannot be predicted because: 1) whether or not a maintenance activity would be required near an active eagle nest during the nesting season is not predictable; and 2) the kind of maintenance activity could influence the magnitude of the effect. For example, extensive replacement of rails could have more effect than a normal rail inspection, because more workers and equipment would be needed for a longer time in the vicinity of the nest. However, given the distance of the Tongue River Railroad from the eleven nests, the impact of maintenance of the Tongue River Railroad to bald eagle nesting would be expected to range from minor for low-level maintenance activities, to moderate for extensive maintenance activities.

Potential effects of train noise/vibration on nesting bald eagles are expected to be insignificant because of the considerable distance from the railroad to any known nest and because the topography around each nest (Figures 2-4) that would buffer some of the noise/vibration associated with operating trains.

WINTERING / MIGRANT POPULATION

According to the *Montana Bald Eagle Management Plan* (MBEWG 1994), the presence and abundance of food usually associated with open water, availability and distribution of foraging perches, availability of secure night roost sites and freedom from human harassment dictate the extent of bald eagle use of specific wintering grounds. As discussed earlier, displacement of prey by train operation or rail line maintenance activities would be localized and short-term. According to the *Montana Bald Eagle Management Plan* (MBEWG 1994), "...roost sites are usually located in stands of mature or old growth conifers or cottonwoods. For purposes of management, a communal roost is defined as an area usually less than 10 acres in size that contains ≥ 6 bald eagles on any given night...." Active wintering roost sites within or adjacent to the railroad corridor are not currently known. The greatest potential impacts to wintering bald eagles would be disturbance and/or mortality by trains of eagles feeding on carcasses of train-killed deer or other animals (USFWS 1986).

According to the *Montana Bald Eagle Management Plan* (MBEWG 1994), risks to migrant bald eagles mostly involve: 1) exposure to lead poisoning; 2) secondary poisoning from insect and predator control programs; 3) collisions and electrocutions associated with power transmission; and 4) loss of perching, foraging

and roosting opportunities due to human disturbance. The first three impacts are not applicable to the Tongue River Railroad, and (as discussed earlier) the fourth would be limited and short-term.

Individual bald eagles exhibit different behavioral reactions to disturbances (MBEWG 1994). Some may be extremely tolerant, while others may be intolerant of disturbance. "Tolerant" migrant or wintering bald eagles would not be significantly affected by operation of the Tongue River Railroad. Maintenance activities during winter could result in short-term displacement of less tolerant individuals, but this effect would be localized and would not extend along the entire route.

Related and Unrelated Actions, and Cumulative Effects

Reasonably foreseeable related and unrelated actions, and cumulative effects would include: 1) coal bed methane production may result in the loss of up to four bald eagles per year, 2) an increasing human population in the region could result in displacement, accidental death, or increased illegal killing of bald eagles, and 3) construction of the Tongue River Railroad could result in the development of two or three coal mines in the Ashland area. It is assumed that any effects to the bald eagle at the existing mines near Decker which would be served by the Tongue River Railroad have already occurred as a result of the construction and operation of those mines. Effects as a result of development of mines in the Ashland area that would be served by the Tongue River Railroad can not be defined since the exact locations/boundaries of these mines and the timing of their development have not been established. However, even if additional coalmines are developed in the Ashland area, nesting bald eagles are not likely to be directly affected, because no nesting sites have been identified that would be disturbed.

The Final Biological and Conference Opinions for Coal Bed Methane Production in Blaine, Gallatin, Park, Carter, Powder River, Custer, Rosebud, Treasure, Wheatland, Sweet Grass, Stillwater, Carbon, Golden Valley, Musselshell, Yellowstone, and Big Horn Counties, Montana issued in September 2002 by the US Fish and Wildlife Service (USFWS 2002) anticipates that four bald eagles per year will be lethally taken as a result of CBM project activities. The USFWS based the anticipated take of bald eagles on the same concerns the USFWS had in the 1995 Tongue River Railroad Biological Opinion, as well as the extensive project area in the Powder River and Billings Resource Management Planning area. In comparison, the USFWS's Biological Opinion of November 1995 addressing the Tongue River Railroad Company's rail line from Ashland to Decker, Montana concluded that one bald eagle could be lethally taken as a result of disturbance. In the 2002 Biological Opinion, the USFWS concluded that the level of anticipated take of the bald eagle is not likely to result in jeopardy to the species. The additive disturbance factors to the bald eagles from the Coal Bed Methane Production and Tongue River Railroad operations is uncertain because take of bald eagles is

broadly permitted with 16 counties within Montana and it is unclear where impacts of both projects would actually overlap the same bald eagle nest sites.

The proposed Tongue River Railroad may adversely affect the bald eagle.

Proposed Mitigation Measures

To mitigate the various sources of adverse effects to the bald eagle from the construction and operation of the Tongue River Railroad, various measures are herein incorporated into the project description, consistent with the guidelines of the *Montana Bald Eagle Management Plan* (MBEWG 1994).

Mitigation During Construction

The bald eagle nesting period (encompassing courtship, nest building, egg laying, incubation, hatching and rearing young, and fledging) extends from February 1-August 15 (MBEWG 1994). The Tongue River Railroad construction period would overlap the bald eagle nesting period. To mitigate effects of construction on nesting bald eagles, the following measures would be instituted:

- The year prior to construction of the Tongue River Railroad, an aerial survey will be conducted of the Tongue River Railroad corridor from Miles City to the Tongue River Dam to determine the presence of nesting bald eagles. Any active or inactive bald eagle nests would be reported immediately to the USFWS and MBEWG. If construction is delayed or occurs over a longer period than planned, then additional pre-construction surveys may be needed. Relevant resource agencies will discuss any additional surveys, if needed.
- No construction activities would occur within Management Zones 1 and 2 for any active bald eagle nest during the nesting period (February 1 - August 15, or until five days after the first observation of independent flight). In this BA, construction activities are defined to include both low intensity activities such as surveying, and high intensity activities such as heavy equipment operation, grading, etc. Construction activities do not include the collection of environmental, cultural resources or geotechnical data.
- Mobilization activities (including project-related truck traffic, and transport of materials and equipment, but does not include commuting workers) would not occur before 10 a.m. (assumed to be the end of primary bald eagle daily foraging period) on any public road within Management Zones 1 and 2 for any active bald eagle nest during the nesting period (February 1 - August 15, or until five days after the first observation of independent flight).

- Low intensity construction activities could occur within Management Zone 3 of any active nest from February 1 to May 1 (i.e., courtship through initiation of hatching). High intensity activities (heavy equipment operation, grading, etc.) would not occur in Management Zone 3 around any active nest during this period.
- From May 1 (assumed date of initiation of hatching) to August 15 (assumed date of fledging), high intensity activities in Management Zone 3 would not occur before 10 a.m. (assumed to be the end of primary bald eagle daily foraging period). After August 15, low and high intensity construction activities could occur within Management Zone 3 at any time of the day.
- If aerial surveys for bald eagle nests in the spring prior to construction identify new nests in locations that would make compliance with the above measures impossible, TRRC would confer with the USFWS and/or MBEWG to develop alternative mitigation measures, if necessary. A possible alternative mitigation measure would be the development of a program to monitor the active nest of concern, to determine if approaching construction activities would have a negative effect on nesting bald eagles. USFWS and/or MBEWG consultation would be expected to define the kind and amount of overt disturbance behavior exhibited by nesting bald eagles that would indicate that construction activities should be temporarily halted (henceforth called "threshold behavior"). It is expected that parameters influencing the determination of threshold behavior would include, but not be limited to, location of the nest in relation to the Tongue River Railroad route, distance from other human disturbances such as public roads, and known history of the nesting birds. It is expected that the threshold behavior value would vary, depending on the time of the nesting period (e.g., egg laying vs. rearing). Persons assigned to monitor active bald eagle nests (hereafter called "environmental inspectors") would have the authority to temporarily halt Tongue River Railroad construction activities in the vicinity of an active nest when the threshold behavior is exhibited by the nesting birds. This authority would be granted as part of contract specifications between Tongue River Railroad and the construction contractor. The environmental inspector would notify the on-site construction supervisor that construction activities must cease. The on-site construction supervisor would be responsible for notifying construction crews to cease activities in the vicinity of the nest. In the event of a construction halt, the environmental inspector would notify USFWS and/or MBEWG. USFWS and/or MBEWG would evaluate the situation and make a recommendation to halt construction activities until a later date, proceed with certain kinds of activities, etc.

Mitigation During Operation

The following measures would be implemented during operation of the Tongue River Railroad:

- Rail line maintenance activities would fall into two general categories. The first would be comprised of non-emergency or planned activities (such as rail replacement) that would require considerable time or comparatively high intensity effort, and would not take place in Management Zones 1 or 2 from February 1 through May 15. Although the Tongue River Railroad would not intercept Management Zones 1 and 2 of any known bald eagle nest, pending MTDFWP 2004 data, this restriction would apply to any new nest discovered in the future. After May 15 until the first observations of independent flight of the fledglings (usually no later than August 15), these activities could occur in the afternoons. By afternoon, adult eagles have usually completed feeding the chicks and there would be minimal disruption of this activity.

Certain short-term, low intensity planned maintenance activities, such as routine inspections of the rail line, would necessarily have to occur during the February 1 - May 15 period. However, these activities would be expected to have minimal effects to bald eagles.

The second category of maintenance activity is emergency maintenance or repairs. Such activities cannot be foreseen and therefore cannot be planned to occur in periods that would minimize the effect to nesting bald eagles. The degree of effect on nesting bald eagles would be influenced by the magnitude of the activity, the time of the nesting season at which the activity occurs, and the tolerance for disturbance displayed of the affected bald eagles. TRRC would notify USFWS as soon as reasonably possible of an emergency maintenance activity within Management Zones 1 or 2 around an active bald eagle nest.

- TRRC employees engaged in routine inspection of the rail line (a minimum of two times per week) would remove train-killed deer or other large animals from the right-of-way, in order to protect migrant, wintering or nesting bald eagles feeding on such carrion, from death by trains. Carrion would either be completely removed from the vicinity of the rail line, or would be placed at locations along or near the right-of-way where there would be no potential for deaths from trains, per objective 1.3123 of the Pacific Bald Eagle Recovery Plan (USFWS 1986).
- TRRC would prohibit trapping within its ROW. This measure would ensure that bald eagles are not accidentally caught in traps set for other animals.

- The TRRC will compensatorily replace all bald eagle nesting and wintering habitat lost due to the construction of the Tongue River Railroad. TRRC would consult with the MBEWG and the Task Force to identify one or more tracts of land totaling approximately 25 acres along the Tongue River to purchase for enhancement and management as bald eagle habitat. Criteria that may be used to select such tracts would include but are not limited to: 1) location near irrigation dams, natural riffle/run sequences, etc. that concentrate prey (fish), particularly in reaches of the river where naturally occurring turbidity might otherwise limit visibility of fish; 2) location in areas that would be "cut off" by construction of the railroad. This would have two advantages: a) landowners who would otherwise have difficulty accessing these sites for agricultural management due to the railroad, might be receptive to selling such sites for wildlife management purposes; and b) isolating such sites with the railroad grade from other human disturbances may improve their attractiveness for less tolerant bald eagle pairs; and 3) presence of appropriately sized and aged stands of cottonwoods that would be available, or may eventually develop as nest sites for bald eagles. Montana Riparian-Wetland Association criteria (Hansen et al. 1995), or other appropriate methodology, would be used to inventory these sites.

Once a tract has been purchased, it could be managed as potential bald eagle nesting habitat by measures such as: 1) the site could be fenced to exclude livestock, which would aid regeneration of cottonwoods and understory species; and 2) through consultation with the MBEWG and/or groups such as the Montana Riparian-Wetland Association, more intensive management steps such as planting cottonwoods, could be undertaken to enhance the site as future nesting habitat.

BLACK-FOOTED FERRET

Analysis of Effects

The black-footed ferret is not known to occur in the area potentially affected by the Tongue River Railroad. If no ferrets are present, construction and operation of the Tongue River Railroad would not affect this species. If ferrets are present, impacts could include mortality (e.g., ferrets could be killed by equipment during construction or by trains during operation of the Tongue River Railroad) and displacement from disturbed habitat (due to fires, dust, noise, accidental fuel spills, etc.).

Since habitat for the black-footed ferret is prairie dog colonies, it is assumed that ferrets will occur in or near prairie dog colonies if they are within the area potentially affected by the Tongue River Railroad. Disturbance of prairie dog colonies could potentially disturb black-footed ferrets.

One colony from the Spring 2003 data was greater than 80 acres, but was found approximately 14 miles east of the Tongue River (USFS 2003). Nine colonies were greater than 80 acres from the 2001 data on Northern Cheyenne Tribal Lands (BIA 2003), yet were not within 0.5-mile buffer of the route. Four complexes from the 2004 aerial survey were greater than 80 acres; however, due to landowner issues, a ground survey determining the presence of black-footed ferrets was not conducted on these colonies. Three of these will be traversed by the Proposed Tongue River Railroad. One colony is approximately 271 acres - 16 acres would be traversed; another colony is approximately 854 acres - 35 acres would be traversed; the third colony is approximately 236 acres - 13 acres would be traversed. During September 2005, protocol surveys for the black-footed ferret were conducted within the large prairie dog colony on publicly accessible land.

The primary impact of the Tongue River Railroad to the black-tailed prairie dog would be the disturbance of colonies during construction of the rail line. Some prairie dogs could be killed by construction activities. Displacement of prairie dogs away from construction activity could also occur, but would be short-term because undisturbed burrows would likely be reoccupied shortly after human activity had ceased.

Other potential effects to prairie dogs include mortality from trains, and impacts from fires, dust, potential fuel spills, or other rail line accidents. Such impacts would be short-term and would be limited to comparatively small areas and numbers of prairie dogs. They would not affect local or regional populations of prairie dogs.

It is not expected that landowner attitudes towards prairie dogs would change as a result of the construction and operation of the Tongue River Railroad. Thus, ranchers would be expected to periodically continue to control prairie dogs on their property.

Reasonably foreseeable related and unrelated actions and cumulative effects on prairie dogs and therefore potentially to black-footed ferrets would include: 1) assuming construction of the Tongue River Railroad results in the development of 2-3 coal mines in the Ashland area, direct and indirect impacts associated with these mines could potentially affect other existing prairie dog colonies. These direct and indirect impacts would be similar to those for the Tongue River Railroad; 2) recreational hunting of prairie dogs might increase as an indirect effect of the increasing human population in the region. However, the intensity of recreational hunting would depend on private landowner permission and cooperation; and 3) the Tongue River Basin Project would directly affect one small, apparently isolated prairie dog colony (Albers 1995).

The proposed Tongue River Railroad may affect, but is not likely to adversely affect the black-footed ferret.

Proposed Mitigation Measures

Prior to construction, the portion of prairie dog colonies greater than 80 acres within the Tongue River Railroad ROW and not previously surveyed would be examined for the presence of black-footed ferrets following protocol survey procedures within the limitations imposed by land ownership issues and access restrictions.

Surveys for black-footed ferrets would involve searches for evidence characteristic of ferrets, particularly trenching/digging patterns at prairie dog burrows. If black-footed ferrets or evidence of them are found in the prairie dog colonies that would be directly affected by the Tongue River Railroad, TRRC would immediately reinitiate consultation with the USFWS based on this new information to determine appropriate means to mitigate the effects of construction and operation of the Tongue River Railroad on the black-footed ferret.

As discussed in the earlier black-footed ferret section, if a proposal is made by FWS and MTDFWP to reintroduce the black-footed ferret, further coordination may be required. However, neither the ACEC nor the proposed reintroduction sites are in the project area (Dood, personal comm. 2003).

DETERMINATION OF EFFECT

Based on the above information and data to date, and proposed mitigation measures, this Biological Assessment concludes that:

- Construction and operation of the Tongue River Railroad is not likely to adversely affect the pallid sturgeon. It does not occur in the Tongue River and its tributaries. TRRC and MTDFWP have developed an agreement on addressing potential impacts to fish at the Miles City Fish Hatchery from increased vibration due to passing trains, if such an increase does occur
- Construction and operation of the Tongue River Railroad is not likely to adversely affect the whooping crane. Occurrences of the species in the project area are highly unlikely and would be transients.
- Construction and operation of the Tongue River Railroad is not likely to adversely affect the interior least tern. It is not likely to breed in the area.
- Construction and operation of the Tongue River Railroad, including with the proposed mitigation measures, may adversely affect the bald eagle.

Construction and operation of the Tongue River Railroad could result in disturbance to nesting, wintering, and migrant bald eagles.

- Construction and operation of the Tongue River Railroad is not likely to adversely affect the black-footed ferret. The species is not expected to occur in the area.

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Appendix I. Description of bald eagle nest site management zones (MBEWG 1994).

Zone 1 - Nest Site Area

Zone 1 includes the area in which human activity or development may stimulate abandonment of the breeding area, affect successful completion of the nesting cycle or reduce productivity, either annually or long-term. It includes the area within a 1/4 mile (440 m) radius of all nest sites in the breeding area that have been active within 5 years or until an active nest is located. Then, Zone 1 applies only to the active nest.

Objectives:

1. Eliminate disturbance.
2. Maintain or enhance nest site habitat suitability.

Guidelines:

1. Existing levels of human activities can continue if the breeding area has at least a 60% nest success, has fledged at least 3 young during the preceding 5 years, and has a low potential hazard rating on the Bald Eagle Nest Survey Form. Low intensity activities such as dispersed recreation can occur, but high intensity activities such as heavy equipment use, blasting, logging, or concentrated recreation should not occur during the nesting season. High intensity activity can occur during the non-nesting season if designed to minimize potential disturbance and avoid conflicts with bald eagle key use areas.
2. Additional human activity should not occur within Zone 1 from initiation of nest site selection to one month after hatching, unless the activity is consistent with bald eagle conservation. A short duration (less than one hour), nonrecurring, nonmotorized activity may occur during the late nestling to 2 weeks post fledgling period if the activity is under direct supervision of eagle specialists. Low intensity human activities such as dispersed recreation can occur during the non-nesting period or when the breeding area is not occupied.
3. Permanent development should be prohibited within Zone 1 of all nests (including alternates). Habitat alteration which may negatively affect the suitability of the breeding area for bald eagles should also be avoided. Such activities include, but are not limited to, timber harvest, prescribed fire,

powerline construction, pesticide use, land clearing, stream channeling, levee or dam construction or wetland drainage.

4. If conflicts persist, subsequent levels of planning should ensue.

Zone 2 - Primary Use Area

Zone 2 includes the area 1/4 mile (400 m) to 1/2 mile (800 m) from all nest sites in the breeding area that have been active within 5 years or until an active nest is located. Then, Zone 2 applies only to the active nest. The Working Group assumes that 75% of activity (foraging, loafing, bathing, etc.) of a breeding pair occurs within the boundary of Zone 2 (including Zone 1).

Objectives:

1. Minimize disturbance.
2. Maintain the integrity of the breeding area.
3. Eliminate hazards.

Guidelines:

1. Low intensity activities such as dispersed recreation can occur, but high intensity activities such as heavy equipment use, blasting, or concentrated recreation use should not occur during the nesting season. Higher intensity activities can occur during the non-nesting season if designed to minimize potential disturbance and avoid conflicts with bald eagle high use areas.
2. Habitat alterations should be designed and regulated to ensure that preferred nesting and feeding habitat characteristics are maintained.
3. Permanent developments that may increase human activity levels during the nesting season should not be constructed within Zone 2 of all nests (including alternates). If conflicts persist, subsequent levels of planning should ensue.
4. Structures that pose a hazard such as overhead utility lines should not be constructed within Zone 2 of all nests (including alternates). Existing structures that pose risks of injury or death should be removed or modified.
5. Permanent developments should not be constructed.

6. If conflicts persist, subsequent levels of planning should ensue.

Zone 3 - Home Range

Zone 3 represents most of a home range used by eagles during the nesting season. It usually includes all suitable foraging habitat within 2.5 miles of all nest sites in the breeding area that have been active within 5 years. Then, Zone 3 applies only to the active nests.

Objectives:

1. Maintain suitability of foraging habitat.
2. Minimize disturbance within key areas.
3. Minimize hazards.
4. Maintain integrity of the breeding area.

Guidelines:

1. Human activities, including permanent developments, should be designed and regulated to minimize disturbance and avoid conflicts with bald eagle key use areas.
2. Human activity should not reach a level where cumulative effects decrease habitat suitability.
3. Habitat alteration should be designed to ensure that prey base and important habitat components, such as perch trees or screening vegetation, are maintained or enhanced.
4. Pesticides should not be used in a manner which pose a hazard to bald eagles.
5. Structures which pose a hazard should be located and designed to minimize or avoid risk to bald eagles or their prey.
6. If conflicts persist, subsequent levels of planning should ensue.

Appendix E

Soil Survey—Western Alignment, Tongue River Railroad

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Appendix E

Soil Survey – Western Alignment

Tongue River Railroad

Big Horn and Rosebud Counties, Montana

Introduction

This report summarizes information on soil units located within 300 meters of the centerline of the Western Alignment of the Tongue River Railroad, Big Horn and Rosebud Counties, Montana. The survey has a two-fold objective: (1) identify the soil units within the study corridor; and (2) present relevant engineering and construction properties of the soil to assist in the permitting and engineering design process for the proposed railway. This work product was scoped to satisfy that portion of Mitigation Measure 42 of the DSEIS pertaining to the Western Alignment. This is not intended to characterize soil conditions along the entire 80-mile alignment.

The data for the text and table presented in this report were obtained from U. S. Department of Agriculture (USDA) Soil Survey Reports for Big Horn (1977) and Rosebud (1996) Counties. The soil units are described in text to the Series level. Where relevant engineering or construction properties warrant further detail, the soils within a Series are subdivided in Table E1 into component soil units.

Distribution of the soil units was obtained by downloading and querying information from the National Resource Conservation Service (NRCS) web site (<http://www.nris.state.mt.us/nrcs/soils/datapage.html>). The distribution of soil units within the 600-meter study corridor is illustrated in Figures E1 and E2.

Soil Series Descriptions

BIG HORN COUNTY SOILS

Chugter Series (Soil Units Cf, and CG)

The Chugter series consists of deep, gently sloping to strongly sloping, well-drained soils on fans, foot slopes, and terraces. These soils form in loam and gravelly loam alluvium derived from mixed calcareous sedimentary rocks. The soils are present on 2 to 35 percent slopes at elevations ranging from 3,400 to 4,000 feet. The Chugter series soils

are typically loam to a depth of approximately 60 inches or more. The soils are classified by USCS as ML. The soils have low shrink-swell potential and pH ranges from 7.4 to 8.4. Permeability is 0.60 to 2.00 inches/hour for all soil horizons. Chugter series soils are classified as slightly to very sensitive to erosion by water and moderately sensitive to erosion by wind.

Hydro Series (Soil Unit Hna)

The Hydro series consists of deep, nearly level to gently sloping, well-drained soils on terraces, fans, and benches. These soils form in clay loam and silty clay loam alluvium that contains a moderate amount of sodium. The soils are present on 0 to 8 percent slopes at elevations ranging from 3,000 to 3,800 feet. The Hydro series soils are typically silty clay loam to silty clay to a depth of approximately 32 inches and are underlain by stratified silt loam and very fine sandy loam to approximately 65 inches. The soils are classified by USCS as CH, CL, or ML. The soils have low to high shrink-swell potential and pH ranges from 7.9 to 8.4. Permeability is 0.06 to 0.20 inches/hour for soil horizons to a depth of approximately 39 inches and increases to 0.60 to 2.00 inches/hour for soils below 39 inches. Hydro series soils are classified as slightly sensitive to erosion by water and moderately sensitive to erosion by wind.

Kim Series (Soil Unit Kg)

The Kim series consists of deep, gently sloping to strongly sloping, well-drained soils on terraces and fans. These soils form in calcareous, mixed loam, silt loam, and fine sandy loam alluvium. They occur on 4 to 15 percent slopes at elevations ranging from 2,900 to 3,500 feet. The Kim series soils are typically loam to a depth of approximately 35 inches and are underlain by silt loam to approximately 65 inches. The soils are classified by USCS as CL or ML. The soils have low shrink-swell potential and pH ranges from 7.4 to 8.4. Permeability is 0.60 to 2.00 inches/hour for all soil horizons. Kim series soils are classified as slightly sensitive to erosion by water and highly sensitive to erosion by wind.

Spearman Series (Soil Unit SU)

The Spearman series consists of moderately deep, undulating and rolling, well-drained soils on dissected sedimentary uplands. The soils form in material weathered from platy red, red, burned shale and sandstone. The soils occur on 4 to 15 percent slopes at elevations ranging from 3,500 to 4,000 feet. Spearman series soils are typically loam to clay loam to a depth of approximately 15 inches underlain by channery loam to approximately 23 inches. Shale is present below a depth of approximately 23 inches. The soils are classified by USCS as CL, ML, SC, SM, GC, GM, or GP. The soils have low to moderate shrink-swell potential and pH ranges from 6.6 to 8.4. Permeability is 0.60 to 2.00 inches/hour for soil horizons to a depth of approximately 23 inches and increases to 2.00 to 6.00 inches/hour below 23 inches. Spearman series soils are classified as moderately to highly sensitive to erosion by water and moderately sensitive to erosion by wind.

Thedalund Series (Soil Units THn and Tho)

The Thedalund series consists of moderately deep, undulating to very steep, well-drained soils in the sedimentary uplands. These soils form in material weathered in place from shale. The soils occur on 4 to 90 percent slopes at elevations ranging from 2,800 to 3,800 feet. Thedalund series soils are typically loam to approximately 28 inches underlain by platy loam shale. The soils are classified by USCS as CL, ML, SC, SM, GC, GM, or GP. The soils have low shrink-swell potential and pH ranges from 7.4 to 7.9. Permeability is 0.60 to 2.00 inches/hour for all soil horizons down to bedrock at approximately 28 inches. Thedalund series soils are classified as moderately to highly sensitive to erosion by water and moderately sensitive to erosion by wind.

Wibaux Series (Soil Units Wp and Wr)

Wibaux series consists of shallow, undulating to very steep, excessively drained soils on dissected sedimentary uplands. These soils formed from material weathered in place from red burned shale and porcelanite. The soils occur on 4 to 90 percent slopes at elevations ranging from 3,400 to 4,100 feet. Wibaux series soils are typically channery loam to very channery loam to a depth of approximately 9 inches. Shale and sandstone is present at a depth of approximately 9 inches. The soils are classified by USCS as CL, ML, SC, SM, GC, GM, or GP. The soils have low shrink-swell potential and pH ranges

from 7.4 to 7.8. Permeability is 0.60 to 2.00 inches/hour for all soil horizons down to bedrock at approximately 9 inches. Wibaux series soils are classified as moderately to highly sensitive to erosion by water and moderately sensitive to erosion by wind.

ROSEBUD COUNTY SOILS

Armells Series (Soil Units 8, 9, and 10)

The Armells series consists of very deep, well-drained soils on foot slopes and side slopes on relic stream terraces and hills. These soils form in alluvium and in colluvium derived from baked sandstone and shale. The soils occur on 25 to 70 percent slopes at elevations ranging from 2,500 to 4,100 feet. The Armells series soils are typically slightly plastic channery loam at the surface and extremely channery loam at depths greater than 4 inches. The soils are classified by USCS as CL, ML, SC, SM, GC, or GM. The soils have low to moderate shrink-swell potential and pH ranges from 6.6 to 9.0. Permeability is 0.60 to 2.00 inches/hour for shallow soil horizons and increases to 6.00 to 20.00 inches/hour at a depth greater than 4 inches. Armells series soils are classified as moderately to highly sensitive to erosion by both water and wind.

Birney Series (Soil Units 16, 17, 18, 19, 20, 21, and 22)

The Birney series consists of very deep, well-drained soils on sedimentary plains, alluvial fans, and hills. These soils form in colluvium derived from baked sandstone and shale. The soils occur on 2 to 70 percent slopes at elevations ranging from 2,500 to 4,100 feet. The Birney series soils are typically non-plastic to slightly plastic channery loam to a depth of approximately 11 inches and is underlain by extremely channery sandy loam to a depth of 60 inches. The soils are classified by USCS as ML, SM, GC, GM, or GP. The Birney series soils have low to moderate shrink-swell potential and pH ranges from 7.4 to 9.0. Permeability is 0.60 to 2.00 inches/hour for surface soil horizons and increases to 6.00 to 20.00 inches/hour for soil horizons below approximately 6 inches. Birney series soils are classified as moderately to highly sensitive to erosion by both water and wind.

Borrollic Camborthides (Soil Unit 36)

Borrollic Camborthids consist of very deep, well drained to excessively drained soils that form in alluvium. These soils are present on alluvial fans and stream terraces. The soils

occur on 0 to 8 percent slopes at elevations ranging from 2,500 to 3,400 feet. Borollic Camborthids typically consist of hard, plastic clay. These soils are classified as higher taxa names due to their high variability. Information on soil physical and chemical properties is not currently available.

Busby Series (Soil Unit 44)

The Busby series consists of very deep, well-drained soils on stream terraces, sedimentary plains, and alluvial fans. These soils form in alluvium or colluvium. The soils occur on 0 to 15 percent slopes at elevations ranging from 2,400 to 3,900 feet. The Busby series soils are typically slightly plastic fine sandy loam to approximately 47 inches and loamy fine sand below 47 inches. The soils are classified by USCS as ML or SM. The Busby series soils have low shrink-swell potential and pH ranges from 7.4 to 8.4. Permeability is 2.00 to 6.00 inches/hour for most shallow horizons and increases to 6.00 to 20.00 inches/hour for soil horizons at a depth greater than approximately 47 inches. Busby series soils are classified as slightly to moderately sensitive to erosion by water and highly sensitive to erosion by wind.

Cabbart Series (Soil Units 54 and 55)

The Cabbart series consists of shallow, well-drained soils on hills. These soils form in semi-consolidated, loamy sedimentary beds. The soils occur on 4 to 70 percent slopes at elevations ranging from 2,500 to 4,100 feet. The Cabbart series soils are typically slightly plastic loam to silt loam to approximately 12 inches and underlain by semi-consolidated sedimentary beds to 60 inches. The soils are classified by USCS as CH, CL, ML, SC, SM, GC, or GM. Cabbart series soils have low to high shrink-swell potential and pH ranges from 6.6 to 9.0. Permeability is 0.20 to 2.00 inches/hour for all soil horizons. Cabbart series soils are classified as moderately to highly sensitive to erosion by water and highly sensitive to erosion by wind.

Cooers Series (Soil Units 65 and 66)

Cooers series consists of very deep well-drained soils on sedimentary plains and alluvial fans. These soils form in alluvium derived from baked sandstone and shale. The soils occur on 2 to 8 percent slopes at elevations ranging from 3,100 to 4,100 feet. The Cooers series soils are typically slightly plastic loam to a depth approximately 38 inches

underlain by channery loam to 60 inches. The soils are classified by USCS as CL, ML, SC, SM, GM, or GP. Coopers series soils have low to moderate shrink-swell potential and pH ranges from 6.6 to 9.0. Permeability is 0.60 to 2.00 inches/hour for all soil horizons. Coopers series soils are classified as moderately sensitive to erosion by both water and wind.

Delpoint Series (Soil Units 73, 74, and 77)

The Delpoint series consists of moderately deep, well-drained soils on sedimentary plains and hills. These soils form in semi-consolidated, loamy sedimentary beds. The soils occur on 2 to 70 percent slopes at elevations ranging from 2,600 to 4,100 feet. The Delpoint series soils are typically slightly plastic loam to silty loam to a depth of approximately 32 inches. Semi-consolidated sedimentary beds are present at a depth of approximately 32 to 60 inches. The soils are classified by USCS as CH, CL, or ML. Delpoint series soils have low to high shrink-swell potential and pH ranges from 6.6 to 9.0. Permeability is 0.60 to 2.00 inches/hour for most soil horizons. Delpoint series soils are classified as moderately to highly sensitive to erosion by both water and wind.

Gerdrum Series (Soil Unit 89)

Gerdrum series consists of deep to very deep, well-drained soils on alluvial fans and stream terraces. These soils form in alluvium. The soils occur on 0 to 8 percent slopes at elevations ranging from 2,500 to 3,900 feet. Gerdrum series soils are typically plastic silty clay loam to approximately 60 inches. The soils are classified as CH, CL, or SC. Gerdrum series soils have moderate to high shrink-swell potential and pH ranges from 6.6 to 9.0. Permeability is 0.20 to 0.60 inches/hour for surface soil horizons and decreases to 0.00 to 0.20 inches/hour below approximately 7 inches. Gerdrum series soils are classified as moderately to highly sensitive to erosion by water and moderately sensitive to erosion by wind.

Havre Series (Soil Units 99 and 100).

The Havre series consists of very deep, well drained to poorly drained soils on flood plains. These soils form in alluvium. The soils occur on 0 to 2 percent slopes at elevations ranging from 2,400 to 3,400 feet in areas that are occasionally flooded. The Havre series soils are typically slightly plastic loam at the surface, fine sandy loam at

approximately 12 to 28 inches, and clay loams at depths below 28 inches. The soils are classified by USCS as CL or ML. Havre series soils have low to moderate shrink-swell potential and pH ranges from 7.4 to 9.0. Permeability is 0.20 to 2.00 inches/hour for most soil horizons. Havre series soils are classified as slightly sensitive to erosion by water and moderately sensitive to erosion by wind. Both soil units within the Havre Series are eligible for prime farmland designation if irrigated.

Kirby Series (Soil Unit 108).

Kirby series consists of very deep, excessively drained soils on hills. These soils form in residuum derived from fractured, baked shale and sandstone. The soils occur on 4 to 70 percent slopes at elevations ranging from 3,000 to 4,100 feet. The Kirby series soils are typically slightly plastic very channery loam underlain by hard, fractured, baked shale at a depth of approximately 12 to 60 inches. The soils are classified as CL, ML, GC, GM, or GP. Kirby series soils have low shrink-swell potential and pH ranges from 7.4 to 9.0. Permeability ranges from 0.60 to 2.00 inches/hour for most soil horizons and 6.00 to 20.00 inches/hour for horizons that include fractured bedrock or fragmental bedrock material. Kirby series soils are classified as highly sensitive to erosion by water and moderately to highly sensitive to erosion by wind.

Ringling Series (Soil Unit 155).

Ringling series consist of very deep, excessively drained soils on hills. These soils form in material weathered from baked sandstone and shale. The soils occur on 4 to 70 percent slopes at elevations ranging from 3,000 to 4,500 feet. Ringling series soils are typically nonplastic channery loam to very channery loam to a depth of approximately 17 inches and is underlain by fractured, baked sandstone and shale. There is no physical or chemical data currently available for Ringling series soils.

Spang Series (Soil Unit 169).

The Spang series consists of very deep, well-drained soils on alluvial fans and sedimentary plains. These soils form in alluvium or colluvium derived from baked sandstone. The soils occur on 2 to 15 percent slopes at elevations ranging from 3,100 to 4,100 feet. The Spang series soils are typically nonplastic sandy loams. The soils are

classified by USCS as ML, SM, GM, or GP. Spang series soils have low shrink-swell potential and pH ranges from 6.1 to 9.0. Permeability is 0.60 to 6.00 inches/hour for most soil horizons and may increase to 6.00 to 20.00 inches/hour at a depth of approximately 42 inches. Spang series soils are classified as slightly to moderately sensitive to erosion by water and moderately to highly sensitive to erosion by wind.

Ustic Torrifuvents (Soil Unit 182)

Ustic Torrifuvents consist of very deep, moderately to excessively drained soils on flood plains. These soils form in alluvium. The soils are present on 0 to 2 percent slopes at elevations ranging from 2,400 to 3,400 feet. Ustic Torrifuvents are typically plastic loam to fine silty or sandy loam at depths greater than approximately 26 inches. These soils are classified as higher taxa names due to their high variability. Information on soil physical and chemical properties is not currently available.

Yamac Series (Soil Units 197, 198, 199, 201, 202, 209)

The Yamac series consists of very deep, well-drained soils on alluvial fans, stream terraces, sedimentary plains, and hills. These soils form in alluvium. The soils occur on 0 to 25 percent slopes at elevations ranging from 2,500 to 4,100 feet. The Yamac series soils are typically slightly plastic loam and silt loam to a depth of approximately 45 inches with a fine sandy loam present below 45 inches. The soils are classified by USCS as CH, CL, ML, SM, GM, or GP. Yamac series soils have low to high shrink-swell potential with pH ranging from 6.6 to 9.0. Permeability is 0.60 to 2.00 inches/hour in most soil horizons and increases to 2.00 to 6.00 inches/hour in soil horizons at depths greater than approximately 42 inches. Yamac series soils are classified as slightly to moderately sensitive to erosion by water and moderately to highly sensitive to erosion by wind. The Yamac Loam (0 – 2 percent slope) soil unit is eligible for prime farmland designation if irrigated.

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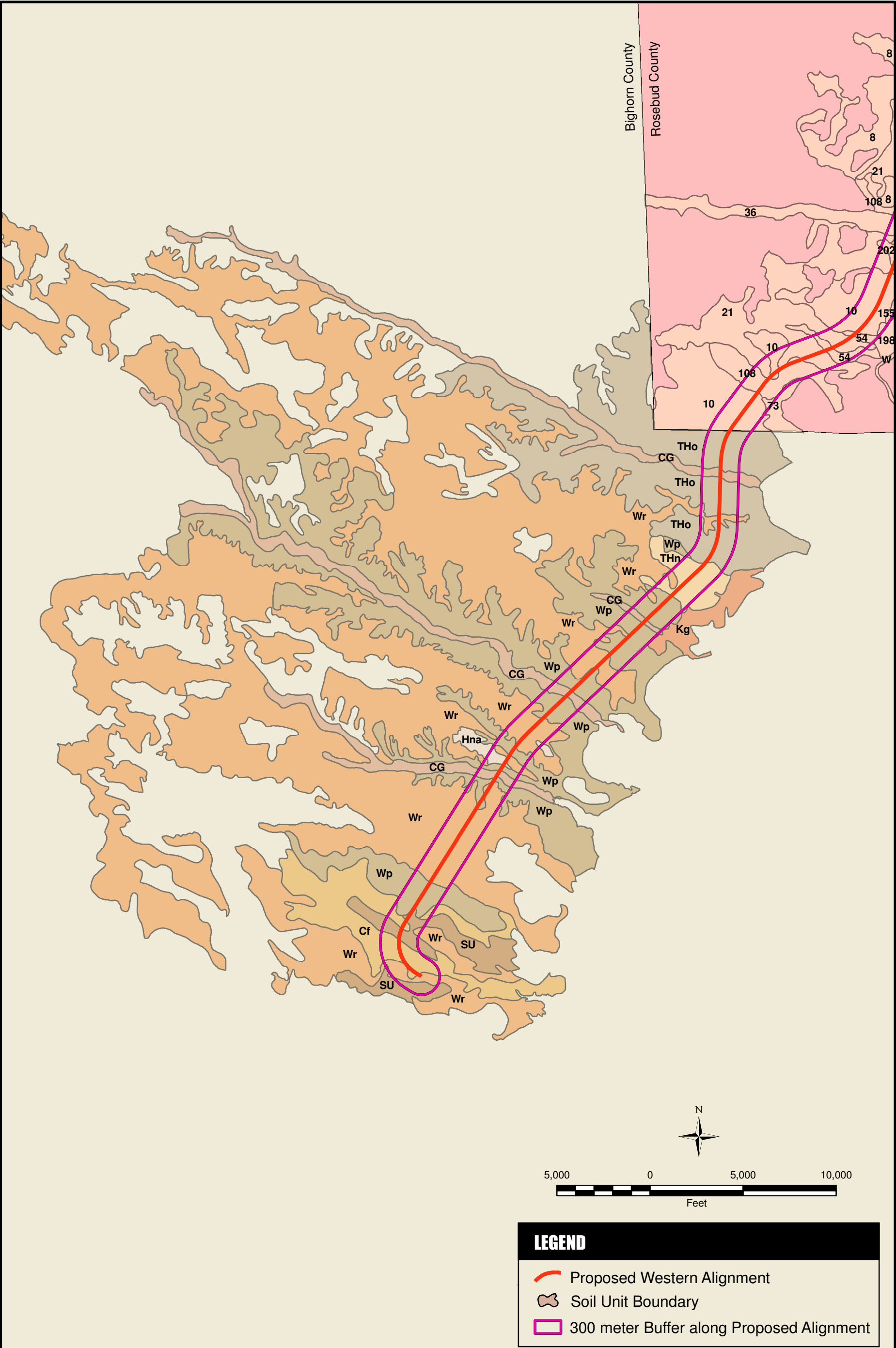


FIGURE E-1
SOIL SURVEY MAP - BIGHORN COUNTY
PROPOSED WESTERN ALIGNMENT

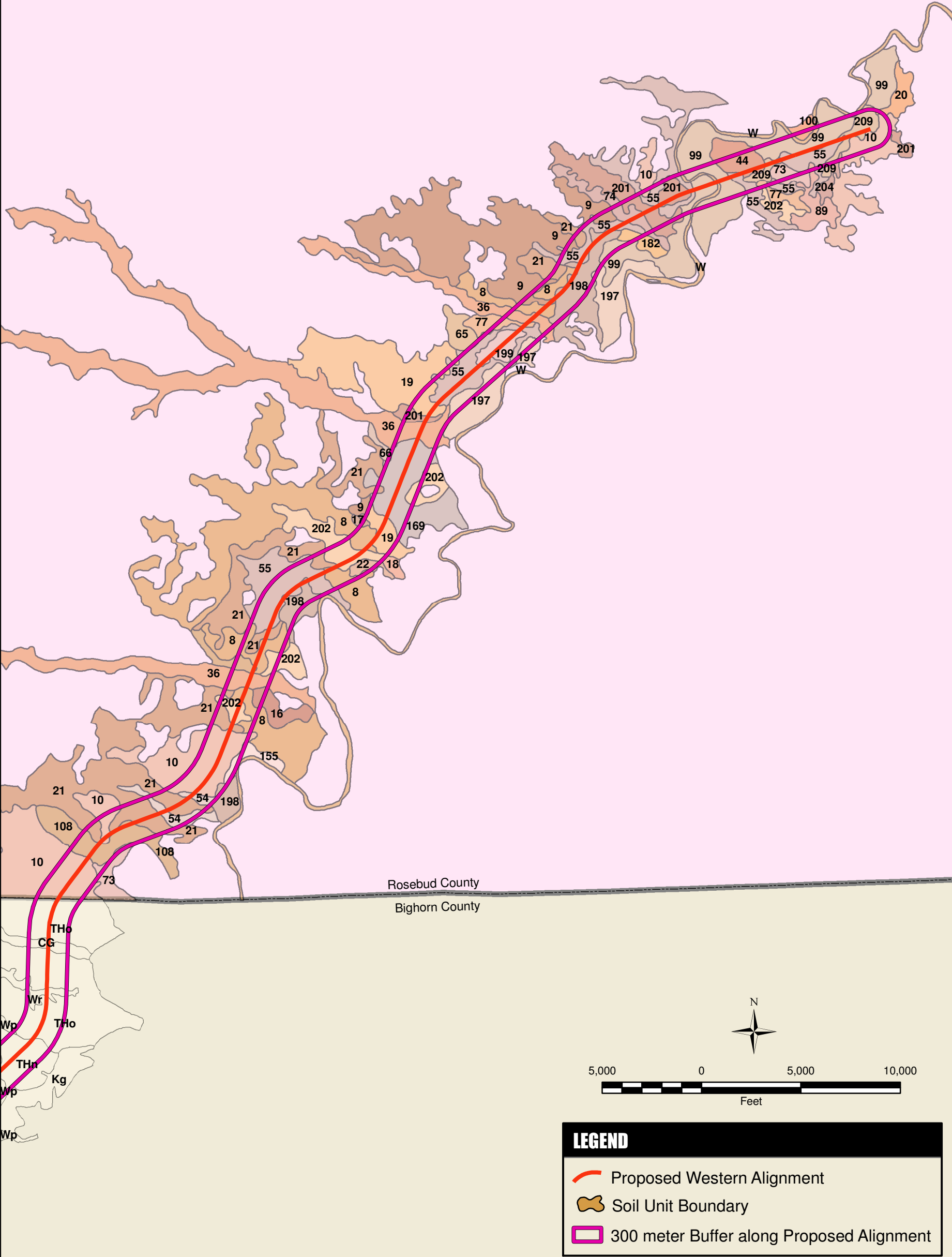


FIGURE E-2

SOIL SURVEY MAP - ROSEBUD COUNTY
PROPOSED WESTERN ALIGNMENT

TABLE E1
SOIL PROPERTIES
PROPOSED WESTERN ALIGNMENT
ROSEBUD AND BIG HORN COUNTIES, MONTANA

Soil Series Name and Units (Symbol)	Soil Depth (inches)	USDA Texture	Unified Classification	Permeability (inches/hour)	Shrink-Swell Potential	Erosion Factor (T) ¹	Wind Erodibility Index ²	Depth to Water Table (feet)	Potential Frost Action	Soil Reaction (pH)	Prime Farmland ³	Shallow Excavations (limitations and hazards)	Local Roads (limitations and hazards)
BIG HORN COUNTY SOILS													
CHUGTER SERIES													
Chugter loam, 2-8% slopes (Ct)	60	loam, clay loam	CL, ML	0.60 - 2.00	Low	5	48	NA	High	7.4 - 8.4	No	Slight to Moderate: slope	Severe: frost action
Chugter complex, 2-15% slopes (CG)	10 - 65	loam, clay loam, channery loam, very channery loam, very channery sandy loam, fragmental material	ML	0.60 - 2.00	Low	1 - 5	48	NA	High	7.4 - 8.4	No	Slight to Moderate: slope	Severe: frost action
HYDRO SERIES													
Hydro loam, 0-8% slopes (Hna)	65	loam, clay, silty clay, silty clay loam, silt loam, very fine sandy loam	CH, CL, ML	0.06 - 2.00	Low to High	5	48	NA	Moderate to High	7.9 - 8.4	No	Severe: silty clay texture	Severe: frost action, shrink-swell, low strength
KIM SERIES													
Kim loam, 4-15% slopes (Kg)	65	loam, sandy clay loam	CL, ML	0.60 - 2.00	Low	5	86	NA	High	7.4 - 8.4	No	Slight to Moderate: slope	Severe: frost action
SPEARMAN SERIES													
Spearman-Wibaux complex, rolling (SU)	12 - 60	loam, clay loam, channery loam, very channery loam, extremely channery loam, extremely channery sandy loam, fragmental material	CL, ML, SC, SM, GC, GM, GP	0.60 - 6.00	Low to Moderate	2 - 3	48 - 56	NA	High	6.6 - 8.4	No	Severe: depth to rock, slope	Severe: frost action, depth to rock
THEDALUND SERIES													
Thedalund-Wibaux stony loams, hilly (THn)	28 - 60	loam, stony loam, extremely channery loam, fragmental material, unweathered bedrock	CL, ML, SC, SM, GM, GP	0.60 - 2.00	Low	2 - 3	48 - 56	NA	High	7.4 - 7.8	No	Severe: depth to rock, slope	Severe: frost action, depth to rock
Thedalund-Wibaux complex, very steep (THo)	28 - 60	loam, very stony loam, extremely channery loam, fragmental material, unweathered bedrock	CL, ML, SC, SM, GC, GM, GP	0.60 - 2.00	Low	2 - 3	48 - 56	NA	High	7.4 - 7.9	No	Severe: depth to rock, slope	Severe: frost action, depth to rock
WIBAUX SERIES													
Wibaux loam, hilly (Wp)	10 - 60	loam, very channery loam, extremely channery loam, extremely channery sandy loam, fragmental material	CL, ML, GC, GM, GP	0.60 - 2.00	Low	2	48	NA	Low to Moderate	7.4 - 7.8	No	Severe: depth to rock, slope	Severe: depth to rock, slope
Wibaux-Spearman complex, rolling (Wr)	10 - 60	loam, clay loam, channery loam, very channery loam, extremely channery loam extremely channery sandy loam, fragmental material	CL, ML, SC, SM, GC, GM, GP	0.60 - 2.00	Low	2 - 3	48	NA	Low to Moderate	7.4 - 7.8	No	Severe: depth to rock, slope	Severe: depth to rock, slope
ROSEBUD COUNTY SOILS													
ARMELLS SERIES													
Armells-Delpoint-Cabbart complex, 25-70% slopes (8)	16 - 60	channery loam, very channery loam, extremely channery loam, very channery fine sandy loam, loam, clay loam silty clay loam, unweathered bedrock	CL, ML, SC, SM, GC, GM	0.60 - 2.00	Low to Moderate	2 - 5	48 - 86	> 6.0	Moderate	7.4 - 9.0	No	Severe: slope, depth to rock	Severe: slope
Armells-Kirby complex, 25-70% slopes (9)	14 - 60	channery loam, very channery loam, extremely channery loam, very channery fine sandy loam, extremely channery sandy loam, fragmental material	SC, SM, GC, GM, GP	0.60 - 20.00	Low	2 - 5	56 - 86	> 6.0	Low to Moderate	7.4 - 8.4	No	Severe: slope	Severe: slope
Armells-Kirby-Cabbart complex, 25-70% slopes (10)	10 - 60	channery loam, very channery loam, extremely channery loam, very channery fine sandy loam, extremely channery sandy loam, fragmental material	SC, SM, GC, GM, GP	0.60 - 20.00	Low to Moderate	2	56 - 86	> 6.0	Low to Moderate	7.4 - 9.0	No	Severe: slope, depth to rock	Severe: slope

TABLE E1
SOIL PROPERTIES
PROPOSED WESTERN ALIGNMENT
ROSEBUD AND BIG HORN COUNTIES, MONTANA

Soil Series Name and Units (Symbol)	Soil Depth (inches)	USDA Texture	Unified Classification	Permeability (inches/hour)	Shrink-Swell Potential	Erosion Factor (T) ¹	Wind Erodibility Index ²	Depth to Water Table (feet)	Potential Frost Action	Soil Reaction (pH)	Prime Farmland ³	Shallow Excavations (limitations and hazards)	Local Roads (limitations and hazards)
BIRNEY SERIES													
Birney channery loam, 15-25% slopes (16)	60	channery loam, very channery loam, very channery sandy loam, extremely channery fine sandy loam	ML, SM, GM, GP	0.60 - 2.00	Low	3	56	> 6.0	Moderate	7.4 - 9.0	No	Severe: slope	Severe: slope
Birney-Cabbart complex, moist, 25-70% slopes (17)	12 - 60	channery loam, very channery loam, very channery sandy loam, extremely channery fine sandy loam, loam, silt loam, clay loam, unweathered bedrock	CL, ML, SM, GM, GP	0.60 - 2.00	Low to Moderate	2 - 3	56 - 86	> 6.0	Moderate	7.4 - 9.0	No	Severe: slope, depth to rock	Severe: slope
Birney-Coopers-Kirby complex, 2-15% slopes (18)	18 - 60	channery loam, very channery loam, very channery sandy loam, extremely channery loam, extremely channery fine sandy loam, extremely channery sandy loam, loam, sandy loam, fragmental material	CL, ML, SC, SM, GC, GM, GP	0.60 - 20.00	Low	2 - 5	48 - 56	> 6.0	Low to Moderate	6.6 - 9.0	No	Slight to Moderate: slope, large stones	Moderate: slope, frost action, large stones
Birney-Kirby channery loams, 4-25% slopes (19)	18 - 60	channery loam, very channery loam, extremely channery loam, extremely channery sandy loam, fragmental material	CL, ML, SC, SC, SM, GC, GM	0.60 - 20.00	Low	2 - 3	56	> 6.0	Low to Moderate	7.4 - 9.0	No	Moderate: slope, large stones	Moderate: slope, large stones, frost action
Birney-Kirby-Cabbart complex, 15-25% slopes (20)	15 - 60	channery loam, very channery loam, very channery sandy loam, extremely channery fine sandy loam, extremely channery loam, extremely channery sandy loam, loam, clay loam, silty clay loam, fragmental material, unweathered bedrock	CL, ML, SM, SC, GM, GP	0.60 - 20.00	Low to Moderate	2 - 3	56 - 86	> 6.0	Low to Moderate	7.4 - 9.0	No	Severe: slope, depth to rock	Severe: slope
Birney, moist-Armells-Cabbart complex, 25-70% slopes (21)	12 - 60	channery loam, very channery loam, very channery fine sandy loam, very channery sandy loam, extremely channery fine sandy loam, loam, clay loam, silty clay loam, unweathered bedrock	CL, ML, SC, SC, SM, GC, GM, GP	0.60 - 2.00	Low to Moderate	2 - 5	56 - 86	> 6.0	Moderate	7.4 - 9.0	No	Severe: slope, depth to rock	Severe: slope
Birney, moist-Birney-Kirby channery loams, 15-25% slopes (22)	12 - 60	channery loam, very channery loam, very channery sandy loam, extremely channery fine sandy loam, extremely channery sandy loam, fragmental material	ML, SC, SM, GC, GM, GP	0.60 -20.00	Low	2 - 3	56	> 6.0	Low to Moderate	7.4 - 9.0	No	Severe: slope	Severe: slope
BOROLIC CAMBORTHIDS													
Borollic Camborthids-Ustic Torrifluvents complex, 0-8% slopes (36)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BUSBY SERIES													
Busby fine sandy loam, 2-8% slopes (44)	60	fine sandy loam, sandy loam, loam, loamy fine sand, loamy sand	ML, SM	2.00 - 20.00	Low	4	86	> 6.0	Moderate	7.4 - 8.4	No	severe: cutbanks cave	Moderate: frost action

TABLE E1
SOIL PROPERTIES
PROPOSED WESTERN ALIGNMENT
ROSEBUD AND BIG HORN COUNTIES, MONTANA

Soil Series Name and Units (Symbol)	Soil Depth (inches)	USDA Texture	Unified Classification	Permeability (inches/hour)	Shrink-Swell Potential	Erosion Factor (T) ¹	Wind Erodibility Index ²	Depth to Water Table (feet)	Potential Frost Action	Soil Reaction (pH)	Prime Farmland ³	Shallow Excavations (limitations and hazards)	Local Roads (limitations and hazards)
CABBART SERIES													
Cabbart-Armells-Rock outcrop complex, 25-70% slopes (54)	0 - 60	loam, clay loam, silty clay loam, channery loam, very channery loam, extremely channery loam, very channery fine sandy loam, unweathered bedrock	CL, ML, SC, SM, GC, GM	0.60 - 2.00	Low to Moderate	2 - 5	86	> 6.0	Moderate	7.4 - 9.0	No	Severe: depth to rock, slope	Severe: slope
Cabbart-Yawdim-Rock outcrop complex, 15-70% slopes (55)	0 - 60	clay loam, silt loam, silty clay loam, clay, weathered bedrock	CH, CL, ML	0.06 - 0.20	Low to High	2	86	> 6.0	Low to Moderate	6.6 - 9.0	No	Severe: depth to rock, slope	Severe: slope, shrink-swell, low strength
COOERS SERIES													
Coers-Birney complex, 2-8% slopes (65)	60	loam, channery loam, very channery loam, very channery sandy loam, extremely channery fine sandy loam	CL, ML, SC, SM, GM, GP	0.60 - 2.00	Low	3 - 5	48 - 56	> 6.0	Moderate	6.6 - 9.0	No	Slight	Moderate: frost action
Coers-Yamac loams, 2-8% slopes (66)	60	loam, channery loam, clay loam, silt loam	CL, ML, SC, SM	0.60 - 2.00	Low to Moderate	5	48	> 6.0	Moderate	6.6 - 9.0	No	Slight	Moderate: frost action, shrink-swell
DELPOINT SERIES													
Delpoint-Cabbart-Yamac loams, 8-25% slopes (73)	16 - 60	loam, clay loam, silty clay loam, silt loam, unweathered bedrock	CL, ML	0.60 - 2.00	Low to Moderate	2 - 5	48 - 86	> 6.0	Moderate	6.6 - 9.0	No	Moderate to Severe: depth to rock, slope	Moderate to Severe: slope, shrink-swell, frost action
Delpoint-Cabbart-Yawdim complex, 25-70% slopes (74)	11 - 60	loam, clay loam, silty clay loam, clay, unweathered bedrock	CH, CL, ML	0.20 - 2.00	Low to High	2 - 3	48 - 86	> 6.0	Low to Moderate	6.6 - 9.0	No	Severe: depth to rock, slope	Severe: slope, shrink-swell, low strength
Delpoint, moist-Delpoint-Cabbart loams, 25-70% slopes (77)	14 - 60	loam, clay loam, silty clay loam, sandy clay loam, unweathered bedrock	CL, ML	0.60 - 2.00	Low to Moderate	2 - 3	48 - 86	> 6.0	Moderate	6.6 - 9.0	No	Severe: depth to rock, slope	Severe: slope
GERDRUM SERIES													
Gerdrum clay loam, 2-8% slopes (89)	60	clay loam, clay, silty clay, silty clay loam, sandy clay loam	CH, CL, SC	0.00 - 0.60	Moderate to High	2	48	> 6.0	Low	6.6 - 9.0	No	Moderate: too clayey	Severe: shrink-swell, low strength
HAVRE SERIES													
Havre loam, 0-2% slopes (99)	60	loam, stratified fine sandy loam to clay loam	CL, ML	0.60 - 2.00	Low	5	56	> 6.0	Moderate	7.4 - 9.0	Eligible	Slight	Moderate: flooding, frost action
Havre loam, 0-2% slopes, occasionally flooded (100)	60	loam, stratified fine sandy loam to clay loam	CL, ML	0.60 - 2.00	Low	5	56	> 6.0	Moderate	7.4 - 8.4	Eligible	Moderate: flooding	Severe: flooding
KIRBY SERIES													
Kirby-Cabbart-Rock outcrop complex, 25-70% slopes (108)	11 - 60	very channery loam, extremely channery loam, extremely channery sandy loam, loam, clay loam, silty clay loam, fragmental material, unweathered bedrock	CL, ML, GC, GM, GP	0.60 - 20.00	Low to Moderate	2	56 - 86	> 6.0	Low to Moderate	7.4 - 9.0	No	Severe: large stones, slope, depth to rock	Severe: slope, large stones
RINGLING SERIES													
Rock outcrop (155)	0	DNA	DNA	DNA	DNA	DNA	DNA	DNA	DNA	DNA	DNA	DNA	DNA
SPANG SERIES													
Spang-Birney complex, 8-15% slopes (169)	60	sandy loam, fine sandy loam, channery loam, very channery sandy loam, extremely channery fine sandy loam, very channery loam	ML, SM, GM, GP	0.60 - 6.00	Low	3 - 5	56 - 86	> 6.0	Moderate	6.1 - 9.0	No	Moderate: slope	Moderate: slope, frost action

TABLE E1
SOIL PROPERTIES
PROPOSED WESTERN ALIGNMENT
ROSEBUD AND BIG HORN COUNTIES, MONTANA

Soil Series Name and Units (Symbol)	Soil Depth (inches)	USDA Texture	Unified Classification	Permeability (inches/hour)	Shrink-Swell Potential	Erosion Factor (T) ¹	Wind Erodibility Index ²	Depth to Water Table (feet)	Potential Frost Action	Soil Reaction (pH)	Prime Farmland ³	Shallow Excavations (limitations and hazards)	Local Roads (limitations and hazards)
USTIC TORRIFLUVENTS													
Ustic Torrifluvents, saline, 0-2% slopes, frequently flooded (182)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
YAMAC SERIES													
Yamac loam, 0-2% slopes (197)	60	loam, clay loam, silt loam, stratified gravelly loam to loamy sand	CL, ML, SM	0.60 - 6.00	Low to Moderate	5	48	> 6.0	Moderate	6.6 - 9.0	Eligible	severe: cutbanks cave	Moderate: shrink-swell, frost action
Yamac loam, 2-8% slopes (198)	60	loam, clay loam, silt loam	CL, ML	0.60 - 2.00	Low to Moderate	5	48	> 6.0	Moderate	6.6 - 9.0	No	Slight	Moderate: shrink-swell, frost action
Yamac loam, 8-15% slopes (199)	60	loam, clay loam, silt loam, stratified gravelly loam to loamy sand	CL, ML, SM	0.60 - 6.00	Low to Moderate	5	48	> 6.0	Moderate	6.6 - 9.0	No	Severe: cutbanks cave	Moderate: shrink-swell, frost action, slope
Yamac-Birney complex, 2-8% slopes (201)	60	loam, clay loam, silt loam, channery loam, very channery loam, very channery sandy loam, extremely channery fine sandy loam	CL, ML, SM, GM, GP	0.60 - 2.00	Low to Moderate	3 - 5	48 - 56	> 6.0	Moderate	6.6 - 9.0	No	Slight	Moderate: shrink-swell, frost action
Yamac-Birney complex, 8-15% slopes (202)	60	loam, clay loam, silt loam, channery loam, very channery loam, very channery sandy loam, extremely channery fine sandy loam	CL, ML, SM, GM, GP	0.60 - 2.00	Low to Moderate	3 - 5	48 - 56	> 6.0	Moderate	6.6 - 9.0	No	Moderate: slope	Moderate: shrink-swell, frost action, slope
Yamac-Redcreek loams, 2-15% slopes (209)	16 - 60	loam, clay loam, silt loam, channery loam, unweathered bedrock	CL, ML, SM	0.60 - 6.00	Low to Moderate	1 - 5	48 - 86	> 6.0	Moderate	6.6 - 9.0	No	Moderate to Severe: slope, depth to rock	Moderate to Severe: shrink-swell, slope, frost action, depth to rock

NOTES

NA - Data not currently available.

DNA - Does not apply

1 - Erosion Factor (T) - An estimate of the maximum average annual rate of soil erosion by wind and or water. Values range from 1 to 5 with a value of 1 being the most sensitive to erosion.

2 - Wind Erodibility Index - A numerical value indicating the susceptibility of soil to wind erosion. Typical values range from 0 to 100. Values of approximately 80 or higher are considered highly erodible.

3 - Soil Units designated "eligible" to be prime farmland if irrigated.

REFERENCES

Natural Resources Conservation Service web page: <http://soildatamart.nrsc.usda.gov/>

United States Department of Agriculture, 1977. Soil Survey of Big Horn County Area, Montana.

United States Department of Agriculture, 1996. Soil Survey of Rosebud County Area and Part of Big Horn County, Montana.

Appendix F

Revised Draft Section 404 (b)(1) Showing

This Appendix contains the body of the Revised Draft Section 404(b)(1) Showing, without appendices.

The document in its entirety (including appendices) can be viewed at www.stb.dot.gov
Click on “Environmental Matters”, then “Key Cases”, then “Tongue River”

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REVISED DRAFT
TONGUE RIVER RAILROAD SECTION 404(b)(1) SHOWING

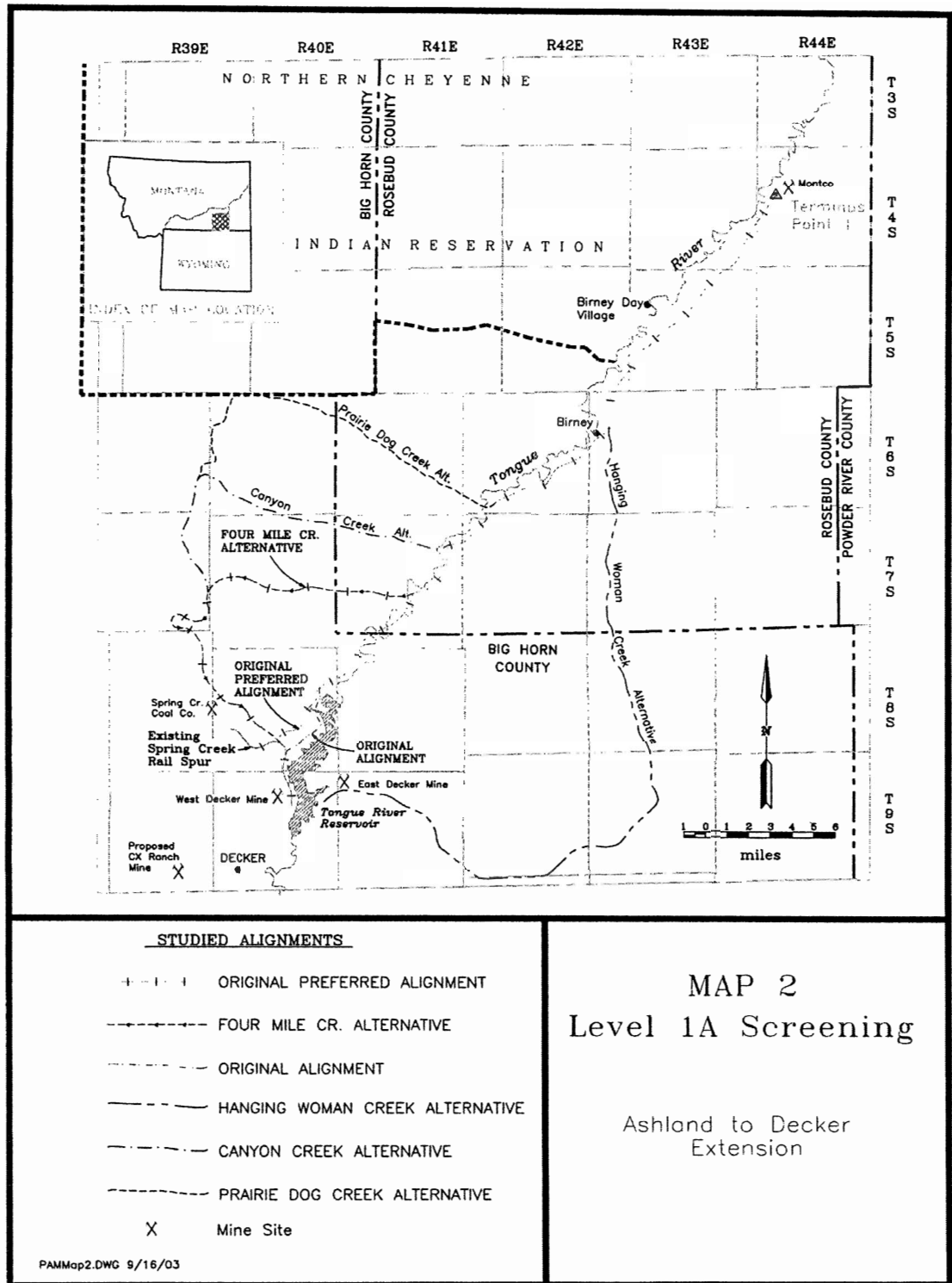
Prepared By:
The Tongue River Railroad Company, Inc.

Prepared For:
The United States Army Corps of Engineers
Omaha District-Regulatory Branch
Operations Division
North 17th Street
Omaha, Nebraska 68102-4978

May 2006

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EXECUTIVE SUMMARY

The Tongue River Railroad Company, Inc. (TRRC) is applying for a Section 404 permit for an approximate 120 mile rail line in Custer, Powder River, Rosebud and Big Horn Counties, Montana. In 1986 the Interstate Commerce Commission (ICC) approved an 89 mile routing from Miles City to Ashland (TRRI). In 1996 the Surface Transportation Board (STB), the successor to the Interstate Commerce Commission, approved a 41-mile extension of the rail line from Ashland to Decker (TRRII).

In 1998 TRRC filed an application with the STB to construct and operate the railroad utilizing a different alignment, know as the Western Alignment, for the southernmost 17.3-miles of the extension approved by the STB in 1996 (TRRIII). In the 1998 application, TRRC also proposed minor refinements to the alignment between Miles City and Ashland to improve operations and reduce construction costs. The Western Alignment and the alignment modifications were analyzed in detail by the STB in the 2004 Draft Supplemental Environmental Impact Statement (2004 DSEIS).

The purpose of the Tongue River Railroad is to provide for the transport of low-sulfur coal from existing and future coal mines in southeastern Montana and to provide an alternate routing for coal originating from Wyoming mines. The railroad would provide a more efficient means of transporting coal from existing mines and would enable the development of proposed mines in the Ashland and Otter Creek area to go forward.

The project must be evaluated by the US Army Corp of Engineers (USCOE) to determine its compliance with the 404 (b)(1) Guidelines for Specifications of Disposal Sites for Dredged or Fill Material (Guidelines). The purpose of this Showing Document is to demonstrate to the USCOE that the route approved by the ICC and the STB, modified as described in this Showing Document (the Proposed Action), fully complies with the Guidelines. TRRC believes that the Proposed Action is the least environmentally damaging practicable alternative and that this Showing Document and the material referenced herein provide sufficient information for such a determination. Therefore, the 404 permit should be granted.

This document presents the results of the evaluation conducted pursuant to USCOE's Practicable Alternatives Evaluation-Section 230.10A Guidelines. The alternatives evaluation includes the entire TRRC rail line from Miles City to Decker. Table 1 on page 3 summarizes the analyses conducted during the Level 1A, 1B and 2 Screening Analyses for the various alternatives considered in TRRI, TRRII and TRRIII.

The Proposed Action has the least impact on the total acreage of Waters of the U.S. The Environmental Impact Statement (EIS) in TRRI found that it was the only alternative that did not impact areas with significant aquatic habitat value and significant aquatic species value. While it has the potential to impact the Miles City Fish Hatchery, the identified impacts can be avoided or mitigated as discussed at pages 23 to 27 below. The Proposed Action also has the least impact on the Livestock and Range Research

Station (LARRS) as it follows the fence boundaries and would not cross research plots. Changes to the configuration of the LARRS research plots would impact the many years of baseline data making it difficult, if not impossible, to meaningfully relate the past data to future studies as discussed in more detail on pages 19 to 21. Map 1A on page 31 shows the impacts of the various alternatives on LARRS.

The Proposed Action meets the project's purpose and needs as well as the railroad's operational criteria. The Tongue River Road and Moon Creek Alternatives can be eliminated due to their substantial environmental impacts, including greater impacts to Waters of the U.S. Moreover, because of adverse grades, the Colstrip Alternative would have substantially higher long-term operational and maintenance costs, and result in greater fuel consumption and increased air emissions as compared to the Proposed Action. The Four Mile Creek Alternative has significant adverse grades resulting in operational and safety concerns that would severely impact the viability of the railroad. In addition, it would impact more acres of Waters of the US than the Proposed Action. Moreover, the Four Mile Creek Alternative is longer than the Proposed Action, has additional road crossings, requires reconstruction of State Highway 312 and is closer to more residences than the Proposed Action. The No Action Alternative using the existing BNSF lines provides no service to the proposed Ashland and Otter Creek area mines and no improvement in service to the Decker area mines.

Given all of the above factors, TRRC believes that the best practicable and least environmentally damaging alternative is the Proposed Action. The Proposed Action meets the design and the operational criteria for the railroad, provides for the economic transport of coal for the proposed Ashland/Otter Creek area mines and reduces the transportation distance for the Decker and some Wyoming area mines. The Proposed Action thus meets the purpose and need of the project. The Proposed Action also impacts the fewest acres of Waters of the US and has the least impacts to sensitive aquatic habitats.

Initial concerns were raised about the Proposed Action impacting the Miles City Fish Hatchery, including concerns about the impact of train vibrations. The Hatchery, which was constructed in the 1940's, is operated by the Montana Department of Fish, Wildlife & Parks ("FW&P"). Among other fish that are raised at the Hatchery, pallid sturgeon are raised there under a federally-funded program operated in coordination with the U.S. Army Corps of Engineers. The pallid sturgeon program is designed to restock the sturgeon population in the Yellowstone and Missouri Rivers. Various studies have shown, according to TRRC's consultants, that there is little to no likelihood of negative impacts to the Hatchery due to vibration and noise connected with the construction and operation of the line. Moreover, in April 2006, TRRC agreed to conduct a vibration monitoring study at the Hatchery and, if warranted by the outcome of that study, to conduct more detailed studies and assess if mitigation measures addressed to any possible vibration and noise impacts are needed. It is expected that the agreement between TRRC and FW&P on these matters will be incorporated by the STB as a condition to TRRC's right to construct and operate the line. TRRC has agreed to that condition. See Appendix 6. Other potential impacts regarding protection of the Hatchery's water supply lines, coal

dust, and weed control management would be mitigated through measures the Applicant has developed in consultation with the Montana Department of Fish, Wildlife & Parks. It is expected that the mitigation will be reflected in conditions imposed by the STB to its approval of TRRC's construction and operation of the rail line. TRRC has agreed to such conditions. Thus with mitigation, the Proposed Action would have no significant impacts on the Hatchery. The Proposed Action also limits impacts to the research on sustainable development of rangeland resources at USDA Ft. Keogh Livestock and Range Research Station.

Table 1
Summary of Screening Analyses

Alternative¹	Level 1A	Level 1B	Level 2
Miles City to Ashland			
Proposed Action	Pass	Pass	Pass/ Least Environmentally Damaging, Practicable Alternative
BN Option	Pass	Pass	Included in Proposed Action
Milwaukee Road	Fail	NA	NA
Custer County/LARRS Option	Fail	NA	NA
IntraSearch/LARRS Option	Fail	NA	NA
LARRS/Tongue River Option	Pass	Pass	Modified alignment consistent with ROW across LARRS; included in the Proposed Action.
Initial Option through LARRS	Fail	NA	NA
IntraSearch, East of Miles City	Fail	NA	NA
Option in T4N R47E	Fail	NA	NA
Ashland NW Alignment	Pass	Pass	Greater impacts on the Ashland community and the Tongue River than Ashland SE Alignment
Optional Route through Ashland	Fail	NA	NA
Ashland SE Alignment	Pass	Pass	Pass/ Least Environmentally Damaging, Practicable Alternative; included in Proposed Action
Decker Route	Fail	NA	NA
BLM Route	Fail	NA	NA
Tongue River Road Route	Pass	Pass	Fail
Moon Creek Route	Pass	Pass	Fail
Colstrip Route	Pass	Pass	Fail
Ashland to Decker Extension			
Four Mile Creek	Pass	Pass	Approved in TRR II
Original Preferred Alignment	Pass	Pass	Fail
Prairie Dog	Fail	NA	NA
Canyon Creek	Fail	NA	NA
Hanging Woman Creek	Fail	NA	NA
Western Alignment	Pass	Pass	Pass; Least Environmentally Damaging, Practicable Alternative; included in the Proposed Action

¹ These alternatives are shown on the map on page 30.

INTRODUCTION

The Tongue River Railroad Company, Inc.² (TRRC) has received approval from the Surface Transportation Board (STB) to construct approximately 120 miles of railroad in Custer, Powder River, Rosebud and Big Horn Counties, Montana. The STB's predecessor, the Interstate Commerce Commission (ICC), in 1986, approved an approximate 89-mile routing from Miles City to Ashland (TRRI).³ The northern terminus of the proposed rail line originally included a tie-in through the abandoned Milwaukee Road Rail Yards near the center of Miles City. Subsequently, a Burlington Northern (BN) Option was developed which includes a direct tie-in with the BNSF line south and west of Miles City. The BN Option was analyzed in detail in the 1984 Supplement to the Draft Environmental Impact Statement⁴ (1984 SDEIS) and became part of the Proposed Action approved by the ICC in 1986.

A 41-mile extension from Ashland to Decker was approved by the STB in 1996 (TRRII).⁵ In 1998 TRRC filed an application with the STB to construct the railroad utilizing a different alignment for the southernmost 17.3-miles of the extension than the alignment previously approved by the STB in 1996 (TRRIII).⁶ This new alignment is referred to as the Western Alignment. In addition to requiring STB authorization to construct and operate the Western Alignment, the project will require the issuance of a Section 404 Permit from the U.S. Army Corps of Engineers (USCOE) for actions along the entire route that involve the discharge of dredged and fill material into the waters of

² All of the assets of Tongue River Railroad Company, a limited partnership, were acquired by TRRC, Inc., a corporation, in 1998. See Tongue River Railroad Company, Inc. – Acquisition and Operation Exemption – Tongue River Railroad Company, Finance Docket No. 33644 (served November 13, 1998). The STB approved substitution of TRRC, Inc. for the limited partnership as the applicant. Tongue River Railroad Company – Construction and Operation – Western Alignment, Finance Docket No. 30186 (Sub. No. 3) (served Aug. 28, 2003).

³ See Tongue River Railroad Company – Rail Construction and Operation – In Custer, Powder River and Rosebud Counties, Montana, Finance Docket No. 30186 (Miles City to Ashland) (not printed) (served Sept. 4, 1985), modified, (not printed) (served May 91, 1986).

⁴ Supplement to Draft Environmental Impact Statement Finance Docket No. 30186 January 19, 1984.

⁵ Tongue River Railroad Company – Rail Construction and Operation Of An Additional Line from Ashland to Decker, Montana, Finance Docket No. 30186 (Sub. No. 2) (not printed) (served Nov. 8, 1996).

⁶ In March 2000, TRRC requested that the STB suspend further work on its application. In December 2002, TRRC advised the STB that it was in a position to move forward and asked the STB to resume its work. STB published an Amended Final Scope of the Supplemental Environmental Impact Statement on August 22, 2003. 68 Fed. Reg. 50,829 (2003).

the United States, including streams and wetlands.⁷ The project also will require the issuance of Right of Way (ROW) easements from the U.S. Bureau of Land Management (BLM) to cross certain BLM administered lands, ROW easements from the Montana Department of Natural Resources and Conservation (MDNRC) to cross certain state lands including certain state school trust lands, an easement from the Montana Department of Fish, Wildlife and Parks (FW&P) to cross the Fish Hatchery at Miles City, as well as various state permits related to construction of the railroad. The U.S. Department of Agriculture (USDA), Agricultural Research Service, granted an easement deed for crossing the Livestock and Range Research Station (LARRS) facility to the TRRC in May 1989.

The purpose of this document is to demonstrate, from the Applicant's perspective, that the construction of the rail line from Miles City to Decker via the Western Alignment ("the Proposed Action") complies with the 404(b)(1) Guidelines and to facilitate the issuance of the Section 404 Permit to the TRRC for the construction of the Tongue River Railroad. It does not necessarily represent the USCOE's conclusions with regard to the project and should not be construed as the USCOE's 404(b)(1) evaluation.

In connection with the application for the Western Alignment, the STB is preparing a Supplemental Environmental Impact Statement (SEIS) that will address the impacts concerning the construction of the Western Alignment and also address impacts related to changed circumstances along the remainder of the Miles City to Decker line. The STB is the "lead Federal Agency" for the SEIS. The USCOE, the BLM, and the MDNRC, on behalf of all interested Montana state agencies, including FW&P, have been designated as "Cooperating Agencies" for the SEIS and are participating throughout the SEIS process. The USCOE also participated as a Cooperating Agency in the preparation of the 1985 EIS for the Miles City to Ashland routing. USCOE was not a Cooperating Agency for the 1996 EIS for the extension from Ashland to Decker; however, the STB's Section of Environmental Analysis requested and received input from USCOE on the 1996 EIS.

The 2004 DSEIS, the 1985 EIS and the 1996 EIS are intended to serve as the NEPA compliance decision documents for the USCOE Section 404 Permit for the Proposed Action. In addition to addressing the requirements of NEPA, the USCOE must evaluate whether the Proposed Action meets the requirements of Section 404 of the Clean Water Act (33 U.S.C. 1344) and the EPA Guidelines for Specification of Disposal Sites for Dredged or Fill Material (40 C.F.R. Part 230)(hereinafter EPA Guidelines). This document will address the latter requirements.

⁷ USCOE previously issued a Section 404 permit for the rail line from Miles City to Ashland; however, that permit has expired.

PRACTICABLE ALTERNATIVES EVALUATION – SECTION 230.10A

The following section describes the steps taken to identify and evaluate alternatives to the Proposed Action for the Miles City to Ashland line and the Ashland to Decker extension and explains how the steps were used to consider and evaluate various alternatives.

PRACTICABILITY SCREENING METHODOLOGY

The following sequential steps have been taken to evaluate potential alternatives including the Proposed Action, and to identify the practicable alternative that would reasonably have the least amount of impact to the Waters of the U.S. and aquatic resources. The 1985 EIS considered alternatives for the Miles City to Ashland routing and the 1996 EIS considered alternatives for the Ashland to Decker extension. In both cases the EISs considered alternatives that are deemed to be reasonable as required under NEPA; however this document addresses alternatives strictly on the basis of practicability as defined in 40 C.F.R. § 230.3 (q)⁸.

- Step 1. Define the Project's Purpose and Need.
- Step 2. Identify a Range of Practicable Alternatives.
- Step 3. Level 1 Screening.

Level 1A Screening

Identify and determine the practicability of routes based on the project's purpose and evaluate the routes using specified criteria regarding impact to land and water resources, railroad design and operation standards and costs. For this step the Miles City to Ashland line, approved by the ICC in 1986, and the Ashland to Decker extension, approved by the STB in 1996, are considered separately. At the time TRRC filed its original application seeking authorization to construct the Miles City to Ashland rail line, the construction of the Ashland to Decker extension was not envisioned. The ICC granted TRRC's original application in 1986 -- five years before TRRC filed its application to construct the Ashland to Decker extension. Thus, it was after TRRC received authorization from the ICC to construct the Miles City to Ashland rail line that TRRC decided to extend that rail line to Decker, Montana and began to identify potential routes for an Ashland to Decker extension.

⁸ The regulations define "practicable" as "available and capable of being done after taking into consideration costs, existing technology, and logistics in lights of overall project purpose." 40 C.F.R. § 230.3(q).

Level 1B Screening.

Perform practicability analysis on those alternatives that were reviewed in detail in the environmental documents from the prior two Tongue River proceedings. Consistent with the Level 1A screening, the Miles City to Ashland line is considered separately from the Ashland to Decker extension, as the alternatives for each were considered separately in the two prior Tongue River Proceedings.

Step 4. Level 2 Screening.

Identify environmental impacts of the practicable alternatives, compare impacts to the Waters of the U.S. among the identified practicable alternatives and determine whether any of the alternatives would have other significant adverse environmental impacts.⁹ Identify those alternatives with very similar environmental consequences.

STEP 1 PROJECT PURPOSE AND NEED

The purpose of the Tongue River Railroad is to provide for the transport of coal from existing and future coal mines in southeastern Montana and to provide an alternate routing for coal originating from Wyoming mines. The Proposed Action would provide a more efficient means of transporting coal from existing mines in the region and would enable development of proposed mines in the Ashland area to go forward.

At its southernmost point, the TRRC will connect with the Burlington Northern Santa Fe Railway Company (BNSF) at Spring Creek/Decker. At the northernmost point, TRRC will connect with BNSF at Miles City. Use of TRRC's line will reduce the current transportation distance for coal mined in the upper Powder River Basin (both in Montana and Wyoming) by approximately 160 to 175 miles on 750 to 1,000 mile hauls to electric utilities in the upper Midwest and Great Lakes regions (or round-trip mileage savings of 320 to 350 miles). Significant savings in transportation, maintenance and equipment costs would result, as well as reductions in the use of diesel fuel.

Construction of the Tongue River Railroad also will provide, for the first time, rail service to the largest remaining undeveloped reserves of low sulfur, high Btu, sub-bituminous coal in the United States, which is located near Ashland, Montana. The U.S. Clean Air Act Amendments of 1990 have created a strong market for low-sulfur coal that can be burned in electric utility boilers without the need for costly flue gas desulphurization units. In addition, the increasing demand for electrical generating capacity in the U.S. continues to focus the utility generation industry on the availability of high quality, economic coal reserves. The Powder River Basin of Wyoming and

⁹ In determining if there is a practicable alternative which would have less of an impact on the aquatic ecosystem, USCOE must consider whether the alternative has other significant adverse environmental consequences. 40 C.F.R. §230.10(a).

Montana contains the great majority of the U.S. reserves of low-sulfur coal. Existing mines near Decker will yield less production as their resources dwindle, but this can be offset by new mine development in the Ashland area. The Tongue River Railroad is essential to the development of the Ashland area mines, which have no alternative means of economic transport without the railroad. The State of Montana has recently acquired an estimated 530 million tons of coal reserves from the federal government in the Otter Creek Tracts near Ashland and is actively pursuing the timely development of these coal assets.

Wyoming and Decker area mines also could use the Tongue River Railroad. The three existing low-sulfur coal mines in the Decker area (East and West Decker and Spring Creek) currently transport their production to Midwestern utilities by way of the BNSF line through Sheridan, Wyoming and Hardin, Forsyth and Miles City, Montana. The Tongue River Railroad would allow this coal to be shipped directly to Miles City saving up to 350 miles on each roundtrip coal train to the Midwest. In addition to Decker area coal, BNSF currently transports some Wyoming coal over the circuitous Sheridan-to-Miles City route to these upper Midwestern markets. At least some of this Wyoming coal is likely to move over the TRRC line.

Thus, the Tongue River Railroad is a critical element in the future of Montana coal production and will produce benefits that will accrue to the state and to local governments from the tax revenues associated with this production. The TRRC has attracted broad political support in Montana, as well as support from BNSF and from the utilities that would benefit from the coal transported by the Tongue River Railroad.

A more detailed discussion of the purpose and need for constructing the Tongue River Railroad is provided in Chapter 2 of the 2004 DSEIS.

STEP 2 IDENTIFY RANGE OF PRACTICABLE ALTERNATIVES

Potential routing alternatives were identified separately for the Miles City to Ashland line and for the Ashland to Decker extension. This occurred because, as stated above, at the time TRRC filed its original application seeking authorization to construct the Miles City to Ashland rail line it had not yet envisioned constructing the Ashland to Decker extension. Thus, it was after TRRC received authorization from the ICC to construct the Miles City to Ashland rail line that TRRC decided to extend that rail line to Decker, Montana and began to identify potential routes for an Ashland to Decker extension.

The initial TRRC line and the extension will therefore be addressed separately here and in the Level 1 screening discussions. The Level 2 screening analysis looks at the practicable alternatives for the Miles City to Ashland line and the Ashland to Decker extension and also considers the Western Alignment and proposed modifications to the Miles City to Ashland line.

Miles City to Ashland Line

The first step in the development of the Miles City to Ashland line was to identify routes to meet the project's objectives. Prior to the selection of any rail alignments certain design, operational and environmental criteria were developed. These criteria were:

- Identify and try to avoid to the extent practicable developed agricultural, residential and commercial properties;
- Minimize the encroachment of the railroad on the alluvial floor of the Tongue River Valley;
- Minimize the number of crossings of public and private roads, trails and other transportation features including water storage and transmission structures, such as irrigation reservoirs, canals and ditches;
- Avoid grades on main track in excess of 1.0 percent compensated for curve;
- Provide for maximum degree of curve for main tracks not in excess of 3 degrees;
- Allow for a rate of change for vertical curves of 0.05ft. /100 ft. in sags and 0.10ft/100ft. at summits;
- Minimize the distance of the coal haul;
- Maximize the operating characteristics of the rail line.

Ashland to Decker Extension

The Ashland to Decker Extension is an extension of the Miles City to Ashland alignment and the same criteria set forth above were used in developing and considering the alternatives for the extension.

STEP 3 LEVEL 1 SCREENING

Level 1A Screening

Miles City to Ashland Line

The topography of the region limits the number of feasible alignments meeting the criteria noted above. Initially TRRC attempted to develop and evaluate possible alignments into and out of both Miles City and Ashland as well as optional alignments to connect the approaches to the two cities considering various operational, construction and environmental factors. In addition, a no action alternative and alternative modes of transportation were considered.

The No Action Alternative would provide no rail service to the Ashland area, and, thus foreclose economic transport of new mine production of low-sulfur coal from the

Ashland area. The No Action Alternative is discussed in the 1985 EIS and in the Level 1B screening at page 37.¹⁰ The alternative modes of transportation, all of which were ultimately rejected due to feasibility and/or environmental concerns, are summarized in Table 2. Six alternatives were considered in the Level 1A screening and the 1985 EIS. In addition, several options that generally followed the proposed route but provided alternatives to it are discussed on pages 18 to 26. These routings, which were variations on the routings around Miles City and Ashland, were developed in response to public and agency comments. Moreover, the 1984 SDEIS looked at impacts of a modification of the proposed routing near Miles City, including impacts to the Miles City Fish Hatchery and the USDA Livestock and Range Research Station, and is discussed below.

Alternative Modes of Transportation

The ICC's Section of Energy and Environment (SEE), the predecessor to the STB Section of Environmental Analysis, looked at four alternative modes of transportation: (1) coal slurry pipeline; (2) conveyor belt system; (3) hauling by truck; and (4) mine-mouth generation of electricity. The discussion from Appendix B of the 1983 draft EIS¹¹ on each of these alternatives is summarized briefly below and in Table 2 on page 13. Each of the alternative methods of transportation poses a number of engineering, legal and environmental problems and is not feasible.

A Coal Slurry Pipeline would require several components including: (1) a coal slurry preparation facility; (2) a water supply system; (3) a 24-inch pipeline; (4) pump stations; and (5) a dewatering plant and loading facility. Such a system would require a minimum 30-foot ROW and could consume an estimated 7,200 acre-feet of water per year. Appendix B at B-4. Appendix B concluded that a slurry pipeline would not be economically competitive with a unit train over the distances to be considered for the Miles City to Ashland segment. Moreover, there are numerous legal and environmental constraints on the construction of a slurry pipeline in Montana, including water rights. Water availability also is an important environmental concern given the relatively arid nature of southeastern Montana. Appendix B at B-11 and B-12.

A Conveyor System also would require several components including: (1) storage and loading facilities; (2) a series of sections of conveyor belts; and (3) unloading, storage and loading facilities at the railhead. The conveyor system would be covered and would contain a belt, 48 inches wide, on which the coal would be transported. Appendix B at B-5. The conveyor system was eliminated as not economical given the 89-mile distance. The additional costs of this mode of transportation would have a negative impact on the ability to market the coal. While Appendix B concluded that construction of a conveyor system would pose environmental problems similar to the building of a

¹⁰ See Appendix B 1983 Draft Environmental Impact Statement, Finance Docket No. 30186 (hereinafter Appendix B.)

¹¹ A complete copy of the 1983 DEIS will be submitted to the USCOE with the final copy of the Showing. Copies of the pages referenced in this section are included in Appendix 1.

railroad, it also concluded that a conveyor belt would have significantly greater impacts on air quality. In addition, it would present a significant barrier to wildlife, and its operations would raise issues related to security of the system and maintenance of the system. Appendix B at B-12.

Hauling by Truck to an existing railhead would require approximately 300, 50-ton trucks and the construction of a separate, hard surface roadway and storage and loading facilities at the railhead and vehicle maintenance shops for the trucks. Appendix B at B-5. Hauling by truck was eliminated due to its higher costs and significant environmental impacts. Appendix B concluded that truck haulage of coal would impact air quality due to fugitive dust from the road and significant impacts from the trucks' diesel exhaust. In addition, Appendix B concluded that the large number of trucks that would be required could increase the number of vehicle accidents. Appendix B at B-12 through B-14.

Locating a Mine-Mouth Electrical-Generating Plant in the Ashland/Birney area would require the construction of the generating plant and high voltage transmission lines to a destination where they could join the existing transmission grids serving the same customers as would coal transported by the railroads. A large volume of water would be required for the operation of the power plant, typically 7 to 8 tons of water per ton of coal burned. Appendix B at B-5. This alternative was rejected due to the environmental difficulties with establishing a mine-mouth generating plant. The availability of the large amount of water needed for the plant would be questionable in the arid southeast Montana area, according to Appendix B at B-14.

Table 2
Level 1A Screening Analysis
Comparison of Alternative Modes of Transportation

Alternative	Engineering, Cost and Environmental Factors	Results
Railroad	More economical than other transportation methods; less impact to water resources than coal slurry or mine-mouth generation; less air impacts than conveyor system or truck haulage.	Feasible; ICC approved construction of a line from Miles City to Ashland in 1986.
Coal Slurry	Higher cost than rail transportation; use of water for transport of coal outside of Montana is contrary to Montana state law; impacts to water availability and quality	Not Feasible
Conveyor	Higher cost than rail would have a negative impact on ability to market coal; concerns regarding the security of the system; right-of-way acquisition would be difficult; greater air impacts than rail; presents a significant barrier to wildlife	Not Feasible
Truck Haulage	Higher cost than rail; additional acreage disturbed; impacts to air quality; noise and vibration concerns; energy consumption; increase in vehicle accidents due to large number of trucks required	Not Feasible
Mine-mouth Generation	Issues with the construction of transmission lines including ROW issues; water quality and socioeconomic impacts	Not Feasible

Alternative Rail Alignments

TRRC developed and evaluated possible alignments into and out of Miles City and Ashland that met the criteria outlined in Step 2 and which considered the following factors.

- Impact on agricultural, residential and commercial properties;
- Impact to the USDA Livestock and Range Research Station (LARRS) (also known as the Fort Keogh Range Experimental Station);
- Number of crossings or conflicts with the Tongue River;
- Number of county or state highway crossings;
- Number and length of bridges;
- Total curvature;
- Total cut;
- Total fill;
- Ruling grade¹²;
- Length of ruling grade;
- Total length;
- Total costs;
- Operating characteristics.

Taking into account the engineering constraints, environmental concerns and comments from private landowners, further refinements were developed.

Appendix B to the 1983 draft EIS discusses several alternatives that SEE identified. SEE solicited input and suggestions regarding possible alternatives from a number of sources including several federal, state and local agencies and groups which were designated as ("cooperating agencies"), and the public at large. The designated cooperating agencies were USCOE, the U.S. Department of Agriculture, the Federal Railroad Administration, the Montana Department of State Lands, the Custer County Planning Board, the Powder River County Commissioners and the Northern Cheyenne Indian Tribe.

In addition to the proposed alignment, five alternatives, summarized in Table 3, were considered. The five, which are identified on Map 1 on page 30, were:

- Decker Route
- Bureau of Land Management (BLM) Route

¹² "Ruling grade" is the maximum adverse grade that governs the amount of locomotive power required for a certain operating rail line. Some short-sections of grade may be steeper than the ruling grade, but because they are shorter than the length of the train (usually about 6,400 feet long for a unit coal train) they usually do not hinder the operational capacity of the locomotives. Ruling grades are usually the steepest grades that exceed the length of the loaded train.

- Tongue River Road Alternative
- Moon Creek Alternative
- Colstrip Alternative

Two of these alternatives, the Decker Route and the Bureau of Land Management Route, were eliminated as not meeting the operational and design criteria outlined above. Each is discussed briefly below. The three remaining alternatives: Tongue River Road, Moon Creek, and Colstrip, as well as the Preferred Alignment, are discussed in the Level 1B screening.

The Decker Route would originate at a point just west of the Tongue River Reservoir, where it would join the Burlington Northern Santa Fe (BNSF) spur now serving the Spring Creek Mine. The route heads north for approximately 10 miles from the BNSF line before turning due east for approximately 8 miles. At that point, the route would cross to the east side of the Tongue River and follow the river in a generally northeasterly direction to the site of the proposed Montco Mine, about 8.9 miles south of Ashland. From the Montco site, the route would continue north to an area near Ashland suitable to turn up the Otter Creek drainage and form a terminus some 7.7 miles southeast of Ashland. This route was rejected because it would result in increased operational costs, environmental concerns and potential negative impact to rail traffic in Sheridan, Wyoming. The number of locomotives needed to transport coal over the line due to the steep ruling grade raises the operational and maintenance costs significantly. Marketing problems for coal hauled over the Decker Route would be substantial. Coal traveling over this route would have an initial terminus in Sheridan, Wyoming. The coal would then have to be shipped via BNSF to Hardin, Montana, and then to Miles City for eventual transportation to markets in the Midwest. Finally, the direction of coal transport through the Sheridan, Wyoming, area could create a “bottleneck” at that point. Further concentration of coal shipment would not only affect the movement of coal and other commodities, but might have significant socioeconomic impacts on northern Wyoming communities. For these reasons SEE eliminated the Decker Route from further consideration as a reasonable alternative to the proposed rail line. Appendix B at B-16.

The Bureau of Land Management (BLM) Route is essentially a high ground route, starting at a juncture with the BNSF line west of Miles City and heading in a southwesterly direction across the hilly country west of the Tongue River valley. Generally, this route would parallel the Tongue River drainage for approximately 40 miles, at which point it would drop into the valley, cross the Tongue River, and continue south past Ashland via the route of the proposed rail line. This route would include a crossing of the Moon Creek drainage near the Tongue River/Yellowstone River divide. This route was rejected because of increased construction and operation costs and environmental problems. The suggested railroad route would have to climb approximately 400 feet from the valley before eventually dropping into the Moon Creek drainage. Extra locomotives would be required to pull a unit train up this grade, thereby adding to operating costs. Furthermore, this alignment would necessitate substantial amounts of cut and fill in order to cross the rougher terrain. The amount of cut and fill necessary to cope with the rough terrain would impact more acreage during the

construction phase. The U.S. Fish and Wildlife Service expressed concern over the possible effects of this alignment to wildlife populations in the area. For these reasons, the BLM Route was eliminated by the SEE from further consideration as a reasonable alternative to the proposed rail line. Appendix B at B-16.

Table 3
Level 1A Screening
Rail Alternatives: Miles City to Ashland

Alternatives	Operating Characteristics	Issues	Results
Proposed Action	0.2% ruling grade against loads, 30-ft total rise against load, 15,000 ft total length of ruling grade, requires 3 locomotives for operations. ¹³	Disturbance of research at LARRS	Included in Level 1B Screening and EIS.
Decker Alternative	1.0% ruling grade against loads, 1,000-ft total rise against load, 80,000 ft length of ruling grade against loads, requires 5 locomotives for operations.	Greatest rise against load of all the alternatives. Steep grades and additional locomotives substantially increase the long-term operating and maintenance costs of the alternative. Increased mileage and cost to markets in upper midwest	Eliminated from further consideration due to engineering, operating and environmental reasons.
BLM Alternative	1.0% ruling grade against loads, 450-ft total rise against load, 40,000 ft length of ruling grade against loads, requires 4 locomotives for operations.	Increased mileage, increased ROW acreage required, substantial cuts/fills, increased mileage to market place. Steep operating grades and additional locomotives result in high long-term operating and maintenance costs.	Eliminated from further consideration due to engineering and environmental reasons.

¹³ The models in 1985 called for two locomotives; however in 1991 the model was changes to require three locomotives due to longer trains. The 2005 train performance model runs confirm that 3 locomotives will be required. See discussion below on page 39.

Alternatives	Operating Characteristics	Issues	Results
Tongue River Road Alternative	0.85% ruling grade against loads, 380-ft total rise against load, 18,500 ft length of ruling grade against loads, requires 4 locomotives for operations.	Substantial cuts & fills, rebuild Tongue River road, require right of way from County. Steep grades and added locomotives result in high long-term operating and maintenance costs.	Included in Level 1B Screening and EIS, potential reasonable alternative, uses existing transportation right-of-way,
Moon Creek Alternative	1.0% ruling grade against loads, 400-ft total rise against load, 40,000 ft length of ruling grade against loads, requires 5 locomotives for operations.	Substantial cuts & fills, additional rail mileage, impact to wildlife resources. Steep grades and additional locomotives result in high long-term operating and maintenance costs.	Included in Level 1B Screening and EIS, potential reasonable alternative, avoids LARRS.
Colstrip Alternative	0.85% ruling grade against loads, 600-ft total rise against load, 31,000 ft length of ruling grade against loads, requires 4 locomotives for operations. ¹⁴	Substantial cuts & fills, additional rail mileage, significantly longer hauls to upper midwest market. Very high long term operating and maintenance costs. Also must factor in the additional mileage from Colstrip to Forsyth to Miles City.	Included in Level 1B Screening and EIS, potential reasonable alternative though longer hauls result.

¹⁴ Note that the 2005 train performance model runs indicate that 5 to 6 locomotives will be required due to heavier loads.

Additional Options For Routings Around Miles City and Ashland

In addition, SEE also considered several options which generally followed the proposed route, but presented various alternatives to it. The alternatives were considered to address potential impacts to LARRS, the Miles City Fish Hatchery and the City of Ashland. These routes are briefly described below and in Table 4 on pages 27 to 29. In addition, Map 1 on page 30 also shows nine of these options. Map 1A on page 31 shows a more detail view of the area around LARRS and the Fish Hatchery. The eleven alternatives considered were (1) Custer County/LARRS Option; (2) IntraSearch/LARRS Option; (3) LARRS Tongue River Option; (4) Proposed Rail Line through LARRS; (5) IntraSearch, East of Miles City; (6) Option in Township 4 North/Range 47 East; (7) Ashland N.W. Alignment; (8) Optional Route through Ashland; (9) Ashland SE Alignment; (10) BN Option; (11) Milwaukee Road Option. Options 3, 7, 9 and 10 were incorporated into the Preferred Alternative considered in the 1985 EIS and are discussed in the Level 1B screening. The reasons for rejecting the other options are described briefly below.

Options Related to Potential Impacts to LARRS

Early in the consideration of the Proposed Action USDA raised concerns about potential impacts to LARRS. LARRS was originally established as an army cavalry post, Ft. Keogh, in 1876 and in 1924 jurisdiction of the Ft. Keogh Military Reservation was transferred to the U.S. Department of Agriculture for experiments in stock raising and growing of forage crops. LARRS now occupies approximately 55,357 acres near the Miles City Fish Hatchery, which was built on land donated from LARRS. Approximately 1,800 acres at LARRS are under irrigation in the Yellowstone River Valley west of the laboratory headquarters while approximately 625 acres are in cultivated crops and 1,150 acres are in irrigated pastures. The remainder of the laboratory is rough, broken, lands typical of range cattle producing areas of the Northern Great Plains. The research program focuses on improving efficiency of beef cattle production for range land in the Northern Great Plains. These range lands, approximately 150 million acres stretching through Montana, North Dakota, South Dakota and Wyoming, are both ecologically fragile and vital to the economic well-being of the region. The work at LARRS involves studies in genetics, reproductive physiology, nutrition and growth of beef cattle and in range pasture development improvements and management. The research emphasizes the efficient and sustainable use of rangeland resources for livestock production with an emphasis on basic research to meet the immediate and future needs of farmers and ranchers in the region. For example, nutrition studies conducted at LARRS have demonstrated the importance of proper winter supplementation regimes for optimum rates of subsequent conception, calve survival and cow and calf weight gains. The cattle and farming operations at LARRS serve to support the research work including husbandry practices to meet the specific research protocols and maintaining farming operations to provide quality feedstuffs for research livestock using proper conservation and agronomic practices.

The USDA was concerned that alignments that divided research plots or resulted in the loss of lands to non-research use could severely damage, and in some instances destroy, the research at LARRS. For example, an alignment that followed the Tongue River flood plain could eliminate most rangeland research. In addition, concerns were raised that changing the size, shape and livestock use patterns of large research pastures would make it impossible to compare new results with those obtained previously. A number of research projects at LARRS rely on the data base that has been collected over a period of many years. This enables researchers to statistically account for experimental results attributable to variables such as seasonal precipitation and pasture-stocking rate. The long-term consistency in the research plots is important to the overall research and cannot be mitigated except by avoidance of the plots.

Based on these concerns and other issues raised by the public and agency officials the following options were considered to minimize impacts to the research at LARRS.

The Custer County/LARRS Option is an approximately 10-mile link between the BNSF rail line in the Yellowstone Valley and the proposed rail line. It connects to the BNSF line about 5 miles southwest of Miles City and reaches the Tongue River bottom just north of Pumpkin Creek. The route would require more cuts and fills than other options and probably would create more environmental impacts to the research facility. In addition, the Custer County route bisects the LARRS and has more impact on research at the facility than would a route nearer the station's extremities. For these reasons, the SEE eliminated this option from further consideration. Appendix B at B-18.

The IntraSearch/LARRS Option is an approximately 4-mile line connecting the BNSF line in the Yellowstone Valley with the proposed rail line. Connections would be made with the BNSF about 3 miles southwest of Miles City and with the proposed rail line about 4 miles south of Miles City. This option would have a more adverse grade than other routes through the LARRS. As with the other alignments through the range station, it could affect activities at the facility and bisect research plots. However, this option could have a more serious impact to the station than other alignments in that it would cross several irrigated fields north of Interstate Highway 94. Therefore, SEE eliminated the option from further consideration. Appendix B at B-18.

The LARRS/Tongue River Option is an approximately 6-mile divergence from the proposed rail line route just south of Miles City. It follows the Tongue River more closely than the proposed rail line, remaining on the west side of the valley. It leaves the proposed rail line 1 mile south of the BNSF line just outside Miles City, rejoining the proposed route about 7 miles out of town. Selection of this option would dictate raising the grade above the Tongue River flood plain. The route's proximity to the river could present aquatic and hydrological problems. This option was initially retained for further study. Appendix B at B-18-19. After negotiations with the USDA for ROW across LARRS, a slightly different alignment was developed consistent with the LARRS ROW requirements, which is incorporated in the Proposed Action.

The Proposed Rail Line Through LARRS follows the west side of the Tongue River, through the LARRS, about a mile from the nearest river meanders. This option represents the best route from an engineering perspective. It is further from the Tongue River than the LARRS/Tongue River option, yet it has the same engineering characteristics (0.2 ruling grade against load). The main constraint to selection of this option is its significant impact to range research plots at the LARRS. Due to this consideration, this option was eliminated from further consideration. Appendix B at B-19.

The IntraSearch, East of Miles City is an approximately 10-mile line which would have connected with the abandoned Milwaukee Railroad just northeast of Miles City and with the proposed rail line about 6 miles south of Miles City. This alignment would require an additional crossing of the Tongue River. This option has significant engineering and environmental consequences associated with it. This route would bisect agricultural, commercial, and residential properties on the south and east side of Miles City. The city's future residential expansion to the east would directly conflict with the option. In addition, selection of this option would necessitate a second crossing of the Tongue River and two additional highway crossings. Greater socioeconomic, aquatic, and hydrological impacts are associated with this option than with other options or alternatives, and therefore, it was not retained for further study. Appendix B at B-19.

The Option in Township 4 North/Range 47 East route is an approximately 2-mile divergence from the route proposed by TRRC. The proposed rail line route curves to the southeast in this area, generally following the river's curve; this option would curve to the northwest, away from the river. This option presents some additional engineering constraints when compared to the proposed rail line. It would require more cuts and fills and would result in additional adverse grade. The possible benefits that might result from this option were not significant enough to warrant its retention for further consideration. Appendix B at B-19.

Potential Impacts to Miles City Fish Hatchery

The 1984 SDEIS¹⁵ focused, among other things, on the impacts of the Proposed Action on the Miles City Fish Hatchery and looked at two options within the proposed action: the BN Option and the Milwaukee Road Option, which included a tie-in through the abandoned Milwaukee Road Rail Yards. The 1984 SDEIS concluded that the BN Option would (1) result in a reduction in overall traffic delays and the elimination of one at-grade crossing; (2) eliminate the need for a large cut through the "Camel's Back" and a large fill for a overpass of the Burlington Northern Line; (3) reduce air quality impacts to Miles City; (4) reduce noise impacts to Miles City; and, (5) reduce the numbers of acres of the hatchery impacted from approximately 15 to approximately 9. However, the 1984 SDEIS also recognized that vibrations from the operations of the trains as well as dust

¹⁵ A copy of the 1984 SDEIS will be submitted to the COE with the final copy of the Showing document.

during construction could impact the fish hatchery. The 1986 FEIS¹⁶ required mitigation measures to address these impacts. Rather than dictating specific measures, the ICC determined that the proper forum for detailed mitigation plans would be the process for acquiring the right of way across the Hatchery from the FW&P. The BN Option alternative was incorporated into the Proposed Action, recognizing that mitigation would be required. TRRC continued discussion with the FW&P regarding specific mitigation measures. As a result of those discussions several mitigation measures have been identified and are discussed below. These mitigation measures as well as the alignment modifications have been included in the 2004 Supplemental DEIS.

As a result of the discussions between TRRC and the FW&P, TRRC commissioned in 1999 a study by Womack & Associates¹⁷ based on a study plan that was developed in connection with and approved by FW&P. The study evaluated (1) the potential effects of vibration on the physical plant and the fish, (2) the potential for vibration to affect the stability of erosional remnant bedrock (hogback), which is between the east side of the Hatchery and the proposed alignment, (3) possible water pollution due to blowing coal dust and herbicides, (4) potential effects on fish reproduction from the construction and operation of the TRRC, and, (5) corrosive effects of soil chemistry on buried fish hatchery piping. An update to the report was prepared in May 2004 in response to additional questions from FW&P. The 2004 update also incorporated findings on the vibration analysis conducted for the proposed DM&E line in Minnesota, South Dakota and Wyoming.

Womack & Associates concluded in these reports concluded that there would be no structural damage to the Hatchery facilities from vibration resulting from the Proposed Action. Womack & Associates also concluded that the sounds produced by the vibrations would be heard by the fish but would be well below levels known to cause physiological damage to fish, eggs, and zooplankton and are also below the levels used to effect or influence fish. In its May 2004 Supplemental Report, Womack & Associates concluded that, "the predicted ground level vibrations at the Miles City Fish Hatchery from construction and operation of the TRR are extremely low and potential damage to the ponds and raceway from train vibration is not indicated by the models conducted for the TRR and analysis conducted for other rail projects, including the DM&E."

With regard to coal dust emissions, the 1999 report concluded that train speeds will be about 20 mph in the vicinity of the Hatchery, due to the connection with the BNSF, which is well-below the threshold velocity of 47 mph required to mobilize coal

¹⁶ A copy of the 1986 FEIS will be submitted to the COE with the final copy of the Showing document.

¹⁷ Womack & Associates received technical assistance from SK Geotechnical, Cooksley Geophysics, Radian International and James Anderson, Ph.D., Associate Professor, School of Fisheries, College of Ocean and Fisheries Sciences, University of Washington. A copy of the Womack Report and its 2004 Supplement will be submitted to the USCOE with the final Showing document. Selected pages referenced in this document are in Appendix 2.

dust from the unit coal trains. Moreover, several studies have indicated that coal dust settles to the bottom of the rail car during the first few miles of transport and the coal will have traveled at least 80 miles by the time it is near the Hatchery. The study concluded that coal dust emissions are not anticipated. The report concluded that the herbicides planned for use were not likely to harm the fish. Nevertheless, the report recommended that mechanical weed control methods should be used near the Hatchery. If mechanical means did not control the weeds, then any use of herbicides should be pursuant to a specific plan that addresses potential drift. Finally, the data collected showed that the soil is corrosive in areas and is likely to affect iron valves and concrete structures.

The 2004 DSEIS included additional analyses related to the potential impacts to the Hatchery of proposed changes in the alignment near the Hatchery and changes at the Hatchery since the initial approval for the rail line. Changes at the Hatchery include the construction of additional ponds, a second intake line and the new recovery program for the pallid sturgeon. The proposed alignment changes include moving the staging sidings to a location south of Interstate 94 and constructing a modified “Wye” connection with the existing BNSF line.

TRRC also proposed certain mitigation measures regarding protection of the Hatchery’s water supply lines and weed control, which were identified in the report as areas of potential adverse impacts. It is expected that these mitigation conditions will be imposed by the STB as conditions to TRRC’s ability to construct and operate its rail line.

The TRRC will be responsible for all costs associated with implementing the following mitigation measures to protect the water supply lines:

1. Relocating, as necessary, portions of the Yellowstone River and Tongue River Water Supply Pipelines so that each pipeline crosses the rail right of way at a right angle or perpendicular to the rail alignment, which is considered to be the most protective of the pipelines.
2. Each portion of the water supply line lying perpendicular beneath the rail alignment will be encased in a reinforced concrete pipe, to ensure the structural integrity of the water supply pipelines. The reinforced concrete pipe will be of sufficient size to allow for inspection and maintenance of the water supply pipelines.
3. Access to the pipelines beneath the rail alignment will be provided by installation of reinforced concrete manholes located on each side of the rail alignment. The reinforced concrete pipe and the manholes will meet or exceed the American Railway Engineering Association’s standard specification for installation of utilities underneath railway embankments.

4. In those locations where the water supply lines will be relocated to cross the rail alignment perpendicularly, new pipe and connectors will be installed that meet or exceed the diameter and pressure requirements of the existing water supply pipeline.
5. The final design plans for the relocation of sections of the water supply pipelines and the installation of the concrete pipe and manhole components will be prepared by the railroad during the final engineering and design and submitted to FW&P for approval prior to construction.
6. All features will be designed to meet or exceed the American Railway Engineering Association Standard Specifications and the Montana Public Works Standard Specifications.

More detailed information regarding the mitigation for the water supply lines is in Appendix 3.

In addition, TRRC has agreed to provide similar protection to outflow pipes at the Hatchery.

In response to concerns about impact from herbicides used for weed control management, Radian Corporation performed an evaluation on the use of herbicides along the railway as part of the Womack Report. The report found that while it was unlikely that herbicides could reach and impact the Hatchery that certain mitigation measures should be implemented. As a result of these recommendations, TRRC intends to use only mechanical means of weed control in the right-of-way adjacent to the Hatchery between the point the rail alignment crosses Interstate 94 North and the connection with the BNSF mainline. This area is shown on Map 1B on page 32. If it becomes necessary to utilize herbicide applications to control noxious weed infestation along the right-of-way between Interstate 94 North and the BNSF mainline, any herbicide application would be subject to prior approval from FW&P and the use of the herbicide would be under controlled means of applications such as by hand sprayer. FW&P's prior approval will include the type of herbicide to be applied, the application rate and means of application, and will take into consideration wind speed and wind direction at the time of herbicide application. More detailed information on the weed control plan is in Appendix 4. The specific conditions relating to TRRC's weed control program at the Hatchery are expected to be set forth by the STB as mitigation conditions on TRRC's ability to construct and operating the rail line, and TRRC has agreed to such mitigation.

As a result of discussions between the TRRC and FW&P in 2004-2005, agreement has been reached on several matters that had been raised by FW&P. FW&P has been supplied with all available information on alternative routes that were studied in the vicinity of the Hatchery and has not further raised the consideration of alternative routes as an issue. Other issues that have been addressed and resolved are as follows:

- Stability analysis of the hogback has determined that slope failure will not occur due to rail construction and operations
- Concerns for the Hatchery's water supply pipelines from the Yellowstone and Tongue Rivers have been resolved with an accepted mitigation plan
- The proposed weed control plan has been accepted to address concerns raised about the use of herbicides in the right-of-way proximate to the Hatchery
- Concerns over coal dust emissions from rail cars have been resolved in light of coal dust emission analyses which address the settling of dust in rail cars during transport and the low train speeds planned for the vicinity of the Hatchery

Further, TRRC has agreed to implement various measures to address concerns about the potential for a derailment to adversely impact the Hatchery. Specifically, trains will operate at a slow speed of 20 mph or less in the vicinity of the Hatchery. More detailed information on train speed and dust emissions is in Appendix 5. TRRC will implement an Emergency Response Plan as required by state law; TRRC will maintain a Spill Prevention Plan in cooperation with federal, state and local authorities, and TRRC will adhere to federal rail safety rules and the safety requirements concerning the transportation of hazardous materials, should any such materials be transported.

In April 2006 FW&P and TRRC reached an agreement with FW&P regarding a monitoring plan to assess the potential impacts on Hatchery fish, including the pallid sturgeon, of noise and vibration from the rail line. The noise and vibration program will include measurements and analysis to:

- Measure baseline conditions at the Hatchery including existing noise and vibrations from operation on a nearby BNSF line.
- Predict and assess future sound pressure levels from construction and operation of the TRR near the Hatchery and compare to baseline conditions.
- Measure actual noise and vibration during the construction and operation of the TRR to compare actual levels to predicted levels.
- If the predicted or measured levels of noise and vibration show an increase over baseline conditions, then determine acceptability criteria for increased noise and vibration associated with the TRR line in association with the US Fish and Wildlife Service (USFWS) and the FW&P.
- If necessary, recommend mitigation measures to be incorporated into the engineering design phase of TRR rail construction.

A copy of the vibration monitoring plan and letters from the Director of the FW&P and TRRC regarding the plan are in Appendix 6. It is anticipated that the monitoring plan will be included as a mitigation measure in the final Supplemental EIS and as a condition to the STB's approval of the construction and operation of the rail line. TRRC has agreed to such a condition.

FW&P also had initially raised concerns about impacts of the rail line on river access. However, there are relatively few points where the Proposed Alternative would be between the Tongue River and the roads that provide public access to the river and the land in those instances is privately owned. FW&P has agreed that this issue is best addressed during the right of way acquisition process with the individual private landowner.

Potential Impacts to Ashland

Based on issues raised by the public, three options were considered regarding the connections in Ashland.

The Optional Route Through Ashland is an approximately 3-mile divergence from the route around Ashland proposed by TRRC. The proposed rail line is west of Ashland; this option would swing east of Ashland about a mile north of town, cross Highway 212 about a mile east of town, then swing back near the river about 2 miles south of town. The principal difficulty in constructing a rail line along this optional route is the amount of earthwork that would be required. Conceivably, a substantial amount of fill would be needed through the Otter Creek drainage. This work might increase sedimentation to the creek and impact water quality and aquatic resources. This option was eliminated since it did not appreciably differ from the rail line proposed by TRRC. Appendix B at B-19.

The Ashland Northwest Alignment presents the best engineering route around Ashland. However, it might affect some residential areas of Ashland and could isolate the community from the fire station. However, it was retained for further consideration in the DEIS.

The Ashland Southeast Alignment provides a more direct access to the Otter Creek Terminus and minimizes direct flood plain encroachment near the Tongue River/Otter Creek confluence. However, a large quantity of fill would be needed to cross the Otter Creek drainage, which could impact to water quality and aquatic resources. The route was retained for further evaluation and ultimately became part of the Proposed Action.

Table 4
Level 1A Screening
Additional Options Miles City to Ashland¹⁸

Alternative	Operational and Construction	Environmental Factors	Result
Proposed Action (including BN Option)	Ruling grade against load is 0.2%; total length of ruling grade of 15,000 ft; total rise against load 30-ft; estimated construction cost \$129.2 mm* adjusted to 2004 dollars as \$226.8mm ¹⁹ .	Reduces impact on research at LARRS, impacts fewer acres of Hatchery	Included in EIS
Custer County/LARRS Option	Ruling grade against load is 1.0%; total rise against loads is 400 ft; length of ruling grade against loads is 40,000 ft; estimated construction cost \$132.5 mm* adjusted to 2004 dollars as \$232.6 mm.	requires more cuts/fills and right-of-way acreage; bisects LARRS impacting research at the facility	Eliminated from further consideration
IntraSearch/LARRS Option	Ruling grade against loads is 0.83%; total rise against loads is 78-ft; length of ruling grade against loads is 9,000 ft; higher adverse grade than other routes through LARRS; estimated construction cost \$132.3 mm* adjusted to 2004 dollars as \$232.3 mm.	Crosses several irrigated fields north of Interstate 94; severely impacting research at LARRS	Eliminated from further consideration
LARRS/Tongue River Option	Ruling grade against loads is 0.2%; total rise against loads is 30-ft; length of ruling grade against loads is 15,000 ft; option requires raising grade above Tongue River flood plain; estimated construction cost \$129.2 mm* adjusted to 2004 dollars as \$226.8 mm.	Proximity of river necessitates rip-rap; may avoid impact to research but proximity to river presents aquatic and hydrologic problems	Retained for further study because of limited impact on LARRS; route was modified to be consistent with USDA ROW requirements across LARRS and modified version is incorporated in Proposed Action

¹⁸ This table presents various options, which generally followed the proposed route and were developed in response to comments from the public and various agencies. Due to the relatively short length of the lines, the number of locomotives was not calculated. Ruling grade against load was used to compare the operational criteria for each alternative.

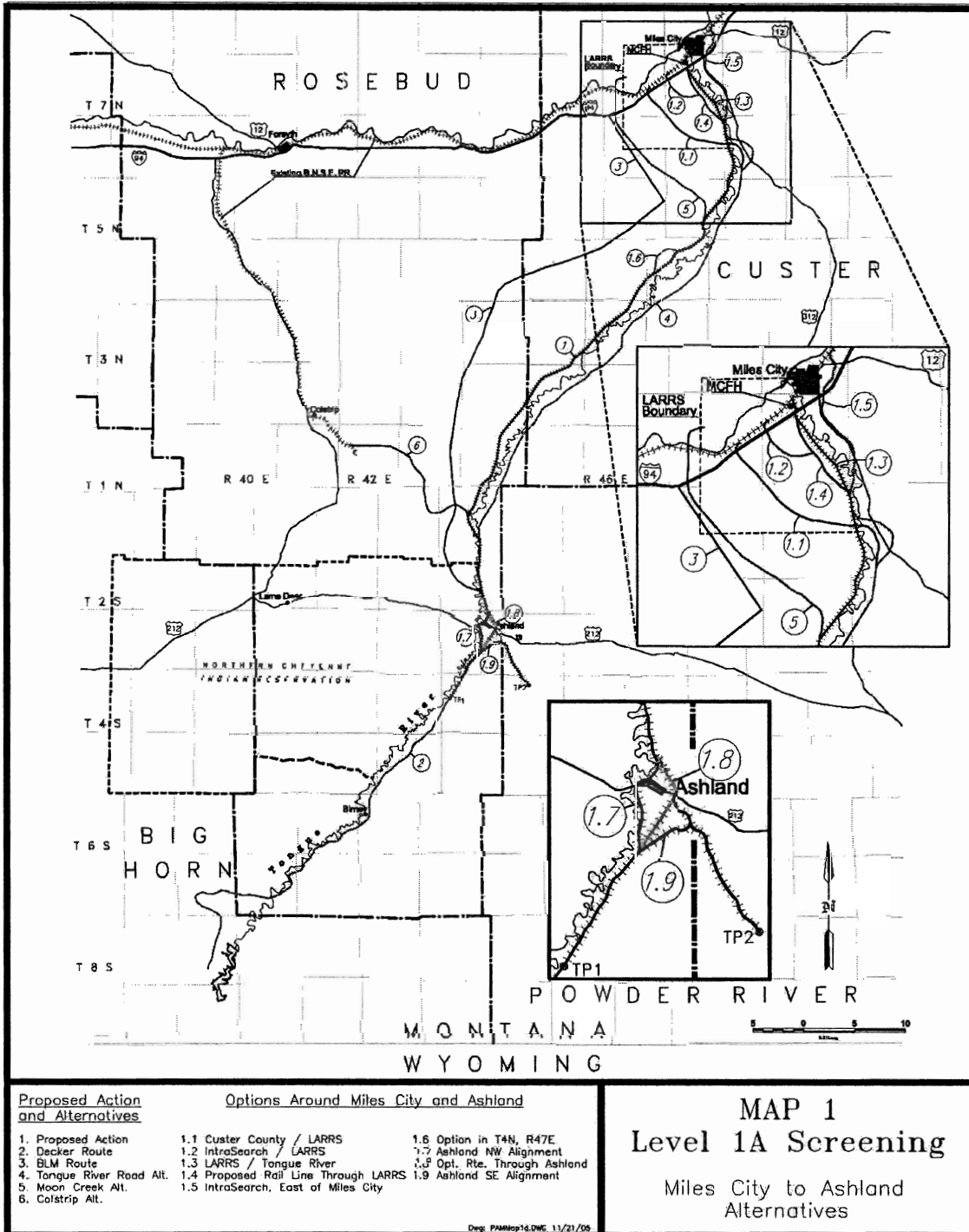
¹⁹ This figure has been adjusted to account for inflation using the Consumer Price Index published by the Department of Labor, Bureau of Labor Statistics. The calculation is as follows and is available at <http://minneapolisfed.org/Research/data/us/calc/index.cfm>.
 $Price_{2004} = Price_{1985} \times (CPI_{2004}/CPI_{1985})$, where $CPI_{2004} = 188.9$, and $CPI_{1985} = 107.6$
This formula will be used throughout the document.

Initial Option through LARRS	Ruling grade against loads is 0.2%; total rise against loads is 30-ft; length of ruling grade against loads is 15,000 ft; represents best route from engineering perspective, estimated construction cost \$129.2 mm* adjusted to 2004 dollars as \$226.8 mm.	Further from Tongue River; significant impacts to range research plots on LARRS	Eliminated from further consideration due to significant impacts to LARRS
IntraSearch, East of Miles City	Ruling grade against loads is 0.24%; total rise against loads is 36-ft; length of ruling grade against loads is 14,000 ft; significant engineering and environmental consequences; estimated construction cost \$133.7 mm* adjusted to 2004 dollars as \$234.7 mm.	Bisects agricultural, commercial and residential properties on east side of Miles City; requires additional crossing of Tongue River and two additional highway crossings; greater socioeconomic, aquatic, and hydrological impacts	Eliminated from further consideration
Option in T4N R47E	Ruling grade against loads is 0.4%; total rise against loads is 32-ft; length of ruling grade against loads is 8,000 ft; minor additional engineering constraints; results in additional adverse grade; possible benefits that might result from the option were not significant enough to warrant further consideration; construction cost estimate \$129.7 mm adjusted to 2004 dollars as \$227.7 mm.	Requires more cuts and fills than Proposed Action	Eliminated from further consideration
Milwaukee Road Option	Requires rehabilitation of the abandoned Milwaukee Rail Yard Interchange; requires an additional public grade crossing and high fills over BN Tracks, U.S. Highway 10 and I-94.	Requires large cut through Camel's Back; greater impact on Emergency Services in Miles City; impacts fewer acres of LARRS than BN options.	Eliminates from further consideration.
BN Option	Eliminates overpass of BN track and eliminates need to acquire property used by Miles City Livestock Yard, BLM and City of Miles City.	Eliminates one at grade crossing; eliminates need to cut through Camel's Back; reduce air quality and noise impacts to Miles City.	Included as part of Proposed Action.

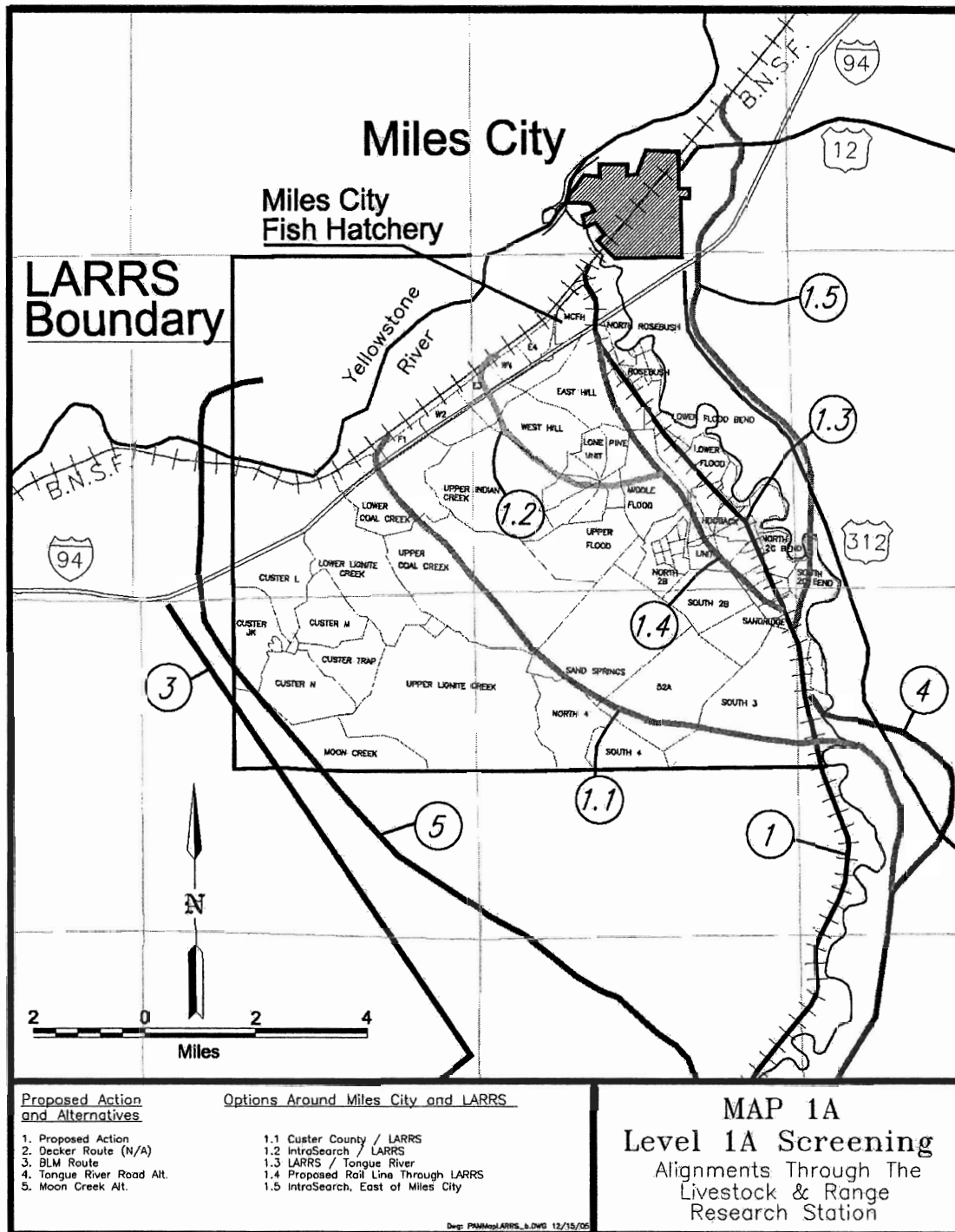
Ashland NW Alignment	Ruling grade against loads is 0.6%; total rise against loads is 36-ft; length of ruling grade against loads is 6,000 ft; best engineering route around Ashland; affects some residential areas and might isolate the community fire station; socioeconomic impacts associated with option are possible constraints to selection; construction cost estimate \$128.9 mm* adjusted to 2004 dollars as \$226.2 mm.	Proximity to Tongue River	Included in Level 1B Screening and EIS.
Optional Route through Ashland	Ruling grade against loads is 0.5%; total rise against loads is 50-ft; length of ruling grade against loads is 10,000 ft; requires additional earthwork (fill); construction cost estimate \$136.5 mm* adjusted to 2004 dollars as \$239.6 mm.	Could increase sedimentation and impact water quality and aquatic resources in Otter Creek Drainage	Eliminated from further consideration since it did not appreciably differ from proposed rail line.
Ashland SE Alignment	Ruling grade against loads is 0.2%; total rise against loads is 30-ft; length of ruling grade against loads is 15,000 ft; similar difficulties as Optional Route through Ashland; better direct access to Otter Creek coal reserves; construction cost estimate \$131.1 mm* adjusted to 2004 dollars as \$230.2 mm.	Potential impact to water quality and aquatic resources	Retained for further evaluation and became part of the Proposed Action.

*1985 dollars.

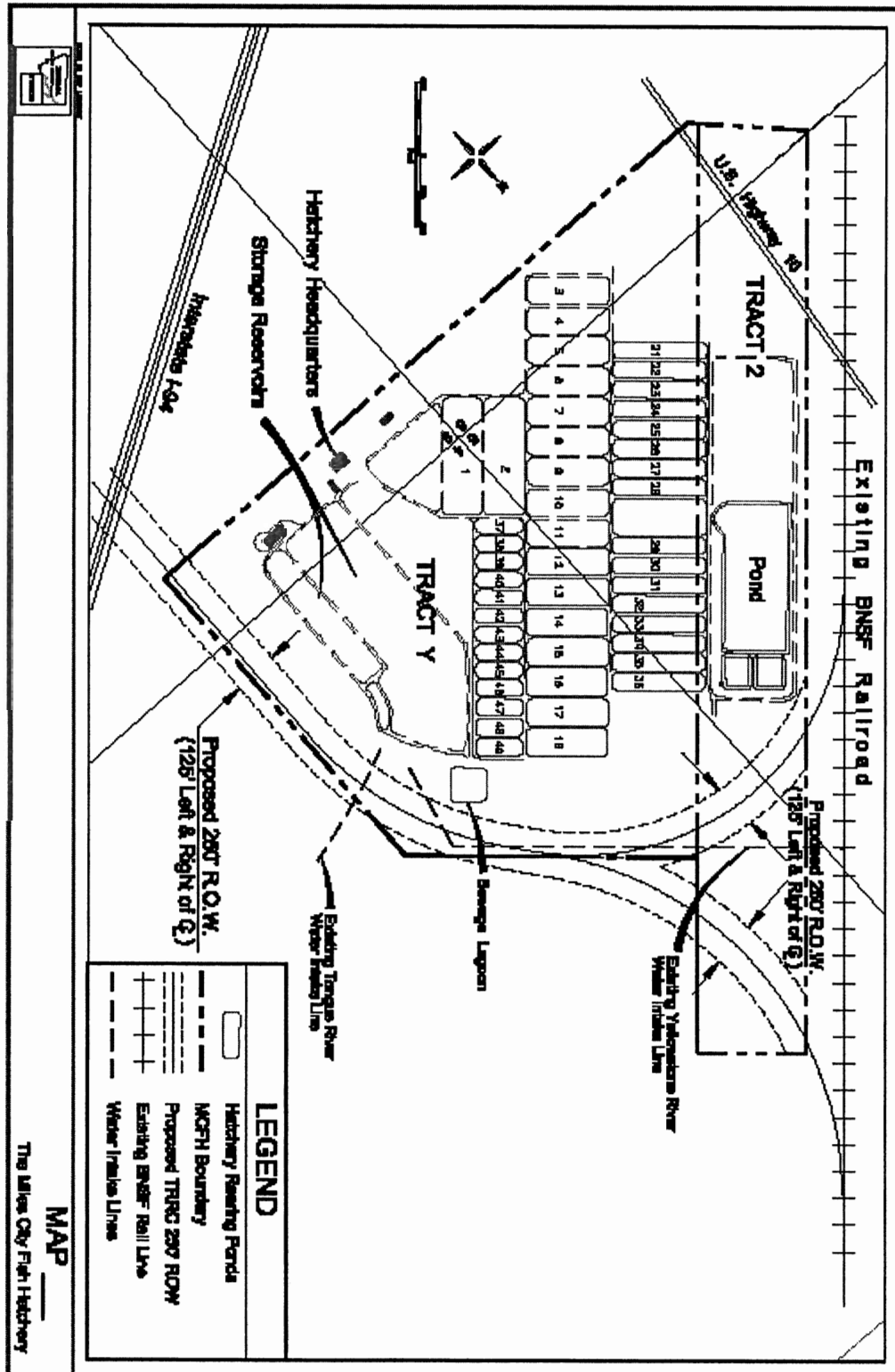
MAP 1 - Level 1A Screening Miles City to Ashland Alternatives



MAP 1A - Level 1A Screening Miles City to Ashland – Alternative Alignments Through LARRS



MAP 1B - The Miles City Fish Hatchery (North End Map)



As a result of the Level 1A screening process four alternatives were identified for further evaluation: (1) the Proposed Action, which included two alternative routes through Ashland -- Options 7 and 9 --discussed above and the BN Option at Miles City; (2) Tongue River Road Alternative; (3) Moon Creek Alternative; and (4) Colstrip Alternative. Each of these four alternatives is discussed in the Level 1B screening process below.

Ashland to Decker Extension

Given the existing end-points, (i.e., the end of the Miles City to Ashland segment on one end and the Spring Creek Mine Spur near Decker on the other end), desired operating characteristics and the topography of the region, there were a limited number of alternatives available for this extension. Criteria similar to those for the Miles City to Ashland line were considered for the Ashland to Decker extension including:

- Impact on agricultural, residential and commercial properties;
- Number of crossings or conflicts with the Tongue River;
- Number of county or state highway crossings;
- Number and length of bridges;
- Total curvature;
- Total cut;
- Total fill;
- Ruling grade;
- Length of ruling grade;
- Total length;
- Total costs;
- Operating and maintenance features and costs.

Initially five alternative routes were studied for the Ashland to Decker Extension, including:

- Four Mile Creek Alternative
- Original Preferred Alignment
- Prairie Dog Creek Alternative
- Canyon Creek Alternative
- Hanging Woman Creek Alternative.

A sixth alternative – the Western Alignment – was developed after the 1996 FEIS for the Ashland to Decker Extension proceeding was completed and is discussed in the 2004 DSEIS.

Three of these alternatives were screened out as not meeting the operational and design criteria outlined above. The three alternatives that were eliminated at this stage were the Prairie Dog Creek Alternative, the Canyon Creek Alternative and the Hanging Woman Creek Alternative. Each is discussed briefly below and in Table 5 on pages 36

and 37 and shown on Map 2 on page 38. The remaining routes are discussed in the Level 1B screening.

The Prairie Dog Creek Alternative is discussed at page 18 of the 1994 SEIS.²⁰ This alternative would leave the Tongue River Valley at milepost 22 and climb westerly approximately 960 feet in elevation toward the divide with Rosebud Creek. When it reached the divide, it would turn south and tie in with the north end of the Four Mile Creek Alternative. This alternative was rejected as not practicable because grades (ascending and descending) would exceed 2% creating safety concerns, and it would not meet engineering or operational criteria, due to undesirable curvature, length and safe speeds. This alternative also is significantly longer than the Original Preferred Alignment with a total length of 58 miles as opposed to 39.7 for the Original Preferred Alignment.

The Canyon Creek Alternative is discussed at pages 18-19 of the 1994 SDEIS. This alternative would leave the Tongue River Valley at milepost 25.4 and then climb westerly toward the divide with Rosebud Creek. When it reached 900 feet above the Tongue River Valley, it would turn south to tie in with the north end of the Four Mile Creek Alternative. This alternative also was rejected as not practicable because grades (ascending and descending) would exceed 2% and it would not meet design or operational criteria, such as curvature and safe speed. In addition, it would be significantly longer than the Original Preferred Alignment -- 54 miles v. 39.7 miles.

The Hanging Woman Creek Alternative is discussed at page 19 of the 1994 SDEIS. This alternative would separate from the Original Preferred Alignment at milepost 14.8 just north of Birney and proceed south following Hanging Woman Creek until a few miles north of the Montana/Wyoming border. At that point, the alternative would turn west and climb toward the divide between Hanging Woman Creek and the Tongue River. After crossing the divide, the alternative would turn northwest and descend toward the East Decker mine where it would join the East Decker rail spur. This alternative was rejected because it would have excessive grades against loads exceeding 2%, would fail to meet engineering or operational design criteria, such as curvature and safe speed and would be significantly longer than the Original Preferred Alignment -- 56 miles vs. 39.7 miles.

Based upon the rough topography of the area and evaluation of the engineering designs in consultation with engineering and operations experts, SEA concluded that these three alternatives would not be feasible. See 1994 SDEIS at 19-20.

Initially as a result of the Level 1A Screening Process for the Ashland to Decker Extension only two alternatives, the Original Preferred Alignment, as modified, and the Four Mile Creek Alternative were identified for further evaluation. These two alignments plus the No Action Alternative are discussed in the Level 1B screening process below as well as in the 1992 DEIS, 1994 SEIS, 1996 EIS. Subsequently in

²⁰ A complete copy of the 1994 SEIS will be submitted to the USCOE with the final Showing. Referenced pages from the 1994 SEIS are in Appendix 7.

1998, TRRC proposed an additional alternative for the Ashland to Decker Extension. This alternative routing, known as the Western Alignment, is discussed in the Level 2 Screening and in the 2004 DSEIS.

Table 5
Level 1A Screening
Ashland to Decker Extension

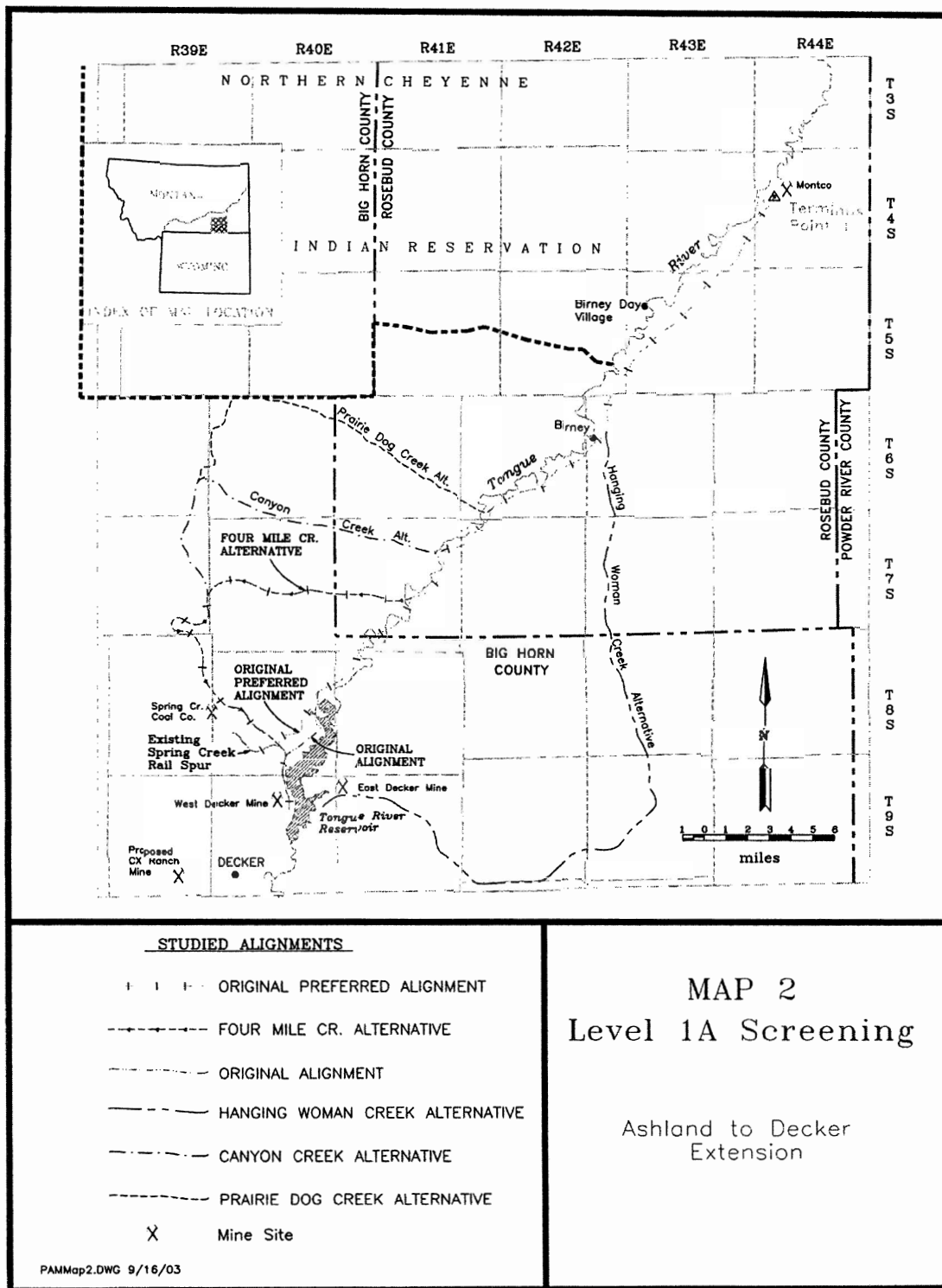
Alternative	Operating Characteristics	Issues	Results
Four Mile Creek	Maximum loaded ascending grade of 1.5% for approximately 13 miles and a maximum descending grade of 2.3%	51 miles in length; route traverses pronghorn habitat and ROW could inhibit pronghorn migration;	Included in Level 1B screening, 1996 EIS and 2004 DSEIS STB approved this alignment in 1996
Original Preferred Alignment ²¹	Maximum loaded ascending grade of 0.33 for approximately 2 miles and gradual descending grade to Miles City	41 miles in length. Would require the construction of five bridges and a tunnel in the Tongue River Canyon	Included in Level 1B and 1996 EIS; not included in 2004 DSEIS
Prairie Dog Creek ²²	Ascending and descending grades exceed 2% creating safety concerns	58 miles long (significantly longer than the Original Preferred Alignment); steeper topography requiring greater land disturbance than the Original Preferred or Four Mile Creek Alignments.	Eliminated from further consideration

²¹ Approximately 4 miles of this routing was modified as a result of comments from the Montana Department of Natural Resources and Conservation. This modification, which was considered in the 1994 SDEIS, changed the proposed route on the west side of the Tongue River Reservoir. At the northern end of the modification the alignment was moved approximately 300 feet west to avoid fishing access, private cabins and the recreational access road. At the southern end, the alignment was moved $\frac{3}{4}$ to $1\frac{1}{2}$ miles west to provide a larger buffer between the proposed railroad and the state recreational area.

²² The number of locomotives was not calculated for the Prairie Dog Creek, Canyon Creek and Hanging Woman Creek options; maximum loaded ascending grade was used to compare operational issues.

Canyon Creek	Ascending and descending grades would exceed 2%; curvature does not meet operational and design criteria	54 miles long (significantly longer than the Original Preferred Alignment); steeper topography requiring greater land disturbance than the Original Preferred or Four Mile Creek Alignments.	Eliminated from further consideration
Hanging Woman Creek	Grades against load would exceed 2%; fails to meet operational criteria for curvature	56 miles long (significantly longer than the Original Preferred Alignment). Steeper topography requiring greater land disturbance than the Original Preferred or Four Mile Creek Alignments.	Eliminated from further consideration

MAP 2 - Level 1A Screening Ashland to Decker Extension



Level 1B Screening

Miles City to Ashland Line

Four alternatives and the No-Action Alternative were discussed in the 1985 EIS for the Miles City to Ashland line. These four alternatives, the TRRC Preferred Alternative (the Proposed Action), the Tongue River Road Alternative, the Moon Creek Alternative and the Colstrip Alternative, are summarized in Table 6 on page 44. Each of these alternatives is discussed below. In addition, Map 3 on page 46 shows the four alternatives.

The No Action Alternative would provide no rail service to the Ashland area, and, thus, foreclose economic transport for the new mine production of low-sulfur coal from the Ashland area. The 1985 EIS concluded that due to "various environmental, economic, engineering and legal considerations" there was no alternative mode of transporting coal from the area. See 1985 EIS at iii.²³ The No Action Alternative would provide no service to the proposed Ashland mines and, therefore, does not meet the stated purpose and need for the Proposed Action and is not a practicable alternative.

The Proposed Action would provide a direct link with the existing BNSF mainline at Miles City. From Miles City the route would bear south along the west side of the Tongue River to a point approximately 10 miles north of Ashland. The route would cross the Tongue River and continue south along the east side of the Tongue River drainage. Near Ashland the route would divide with one branch following approximately eight miles southeast along the Otter Creek drainage to Terminus Point 2 and the main branch would continue along the east side of the valley about nine miles to Terminus Point 1.²⁴

From an engineering and operational standpoint, the Proposed Action is the most desirable route. The 0.33-percent ruling grade against loads is less than the ruling grade for any of the other alternatives. The 1985 EIS recognized that this would be the most desirable route from an engineering standpoint and stated that the environmental impacts associated with the Proposed Action would be comparable to those that are anticipated for the Tongue River Road Alternative and the Moon Creek Alternative, but would be

²³ See Appendix 8.

²⁴ Two alternative routes around Ashland were considered and both were approved by the ICC. The two routes are the Ashland Northwest Alignment (Option 7) and the Ashland Southeast Alignment (Option 9). The Ashland Northwest Alignment runs through the west side of Ashland, swinging southwest toward the river about a mile north of Ashland and closely following the east side of the Tongue River for about 2 miles. The Ashland Southeast Alignment swings east of Ashland about a mile north of the town, crosses Highway 212 east of town, then swings back to the west about 2 miles south of town. TRRC ultimately selected the Ashland Southeast Alignment as part of the Proposed Action because it had fewer impacts on the Ashland community and the Tongue River.

greater than those for the Colstrip Alternative. Taking into account the engineering and marketing considerations²⁵ in addition to the environmental impacts, the 1985 EIS concluded at page i that the Proposed Action and the Colstrip Alternative were the only feasible alternatives. However, as discussed in the Level 2 Screening, the Proposed Action has fewer impacts on aquatic resources than the Colstrip Alternative. Further, the 1985 EIS did not consider the environmental impacts associated with rebuilding the Colstrip to Forsyth spur which, as discussed below, would be required to meet current mainline railroad specifications.

In 2005 TRRC asked Robert Leilich, a railroad operations and economics consultant, to review the issues identified in the 1985 FEIS to see if any changes in railroad operations since the original analysis would change the comparisons. As part of that analysis Mr. Leilich conducted a simulation of the trains on the Proposed Action. He found that: "trains in the loaded direction would require three SD-40 type locomotives, take about one hour and twenty minutes and consume about 455 gallons of fuel. In the reverse direction, the empty returning train would take a few minutes less time and consume 492 gallons of fuel. (The loaded trains are running downgrade and the empty trains are running upgrade.)"²⁶ He concluded that "the superior operating, maintenance and economic advantages of the Proposed Action, which were discussed in the prior environmental documents, remain intact or even enhanced" due to increased fuel costs.

The Tongue River Road Alternative would follow the Proposed Action south from Miles City on the west side of the river for about eight miles and then cross to the east side of the river near the mouth of Pumpkin Creek. It would then parallel the Tongue River Road until it would rejoin the Proposed Action approximately 10 miles north of Ashland.

From an engineering standpoint, the route would not be as desirable as the Proposed Action. The 0.85-percent ruling grade against load would result in higher construction and ultimately higher operational and maintenance costs. Because this alignment attempts to parallel an existing road it has many changes in elevation, which would result in significant earthwork, and, thus, increased construction costs. The 1985 EIS found at page 42 that the Tongue River Road Alternative would require two additional locomotives per train over most of the line. The Tongue River Road Alternative follows the same alignment through the LARRS as the Proposed Action, and would pose the same potential for impact to ongoing research and research plots. While the 1985 FEIS concluded at page i that the environmental impacts of the Tongue River Road Alternative and the Proposed Action were comparable, it also concluded that the Tongue River Road Alternative was not feasible because of marketing and engineering factors.

²⁵ The main market for coal transported on the Tongue River Railroad would be the Upper Midwest. Factors such as the length of the line, construction costs and operation and maintenance costs all impact the transportation costs of the coal, and, thus, the competitive marketability of the coal.

²⁶ 2005 Statement of Robert Leilich at Appendix 9.

In 2005, Mr. Leilich also reviewed the issues identified in the 1985 FEIS to see if any changes in railroad operations could lessen the impacts of the engineering and economic concerns of the Tongue River Road Alternative. Mr. Leilich concluded that even though new locomotives are more powerful today, the length of adverse grade and reduced operating speeds for this alternative would prohibit reliance on momentum for climbing the adverse grades and therefore TRRC would still have to either add more power to trains for the entire trip or station a fleet of helper locomotives and crews to handle loaded trains over ruling grade portions of the run. Mr. Leilich stated that “[t]he higher construction capital costs, higher operating and maintenance costs, closer proximity to population, and several additional road crossings represent a significant economic liability for the TRRC to bear.” Leilich Statement, Appendix 9.

The Moon Creek Alternative would cross the Yellowstone River near Miles City and head west along an abandoned railroad right of way for approximately eight miles, then cross the Yellowstone River again and head southeast up the Moon Creek drainage, cross a ridge dividing the Yellowstone and Tongue Rivers and descend to join the Proposed Action approximately 14 miles south of Miles City.

This alternative was examined primarily as a means of limiting the potential impacts to the LARRS. It traverses only 2.5 miles of the southwest corner of that facility and would not be likely to significantly affect ongoing research activities. The 1985 EIS concluded at page xiii that a 1% ruling grade against load renders this route less favorable in terms of engineering constraints, energy efficiency and ultimate consumer costs. The 1985 EIS noted at page 43 that the Moon Creek Alternative would require three additional locomotives per train because of the rough topography encountered on this alignment. While the 1985 EIS concluded at page i that the environmental impacts of the Moon Creek Alternative and the Proposed Action were comparable, it also concluded that the Moon Creek alternative was not feasible because of marketing, engineering, and operational factors.

Mr. Leilich also looked at any changes in railroad operations that would impact the factors identified in 1985 regarding the feasibility of this alternative. Mr. Leilich found that this alternative would add significant time and mileage to the route. He concluded:

This alignment requires lifting loaded 17,000 ton coal trains 285 feet over a distance of 5.87 miles. Climbing this grade, alone, takes two additional SD-40 locomotive unit and 330 gallons in additional fuel. If 30 million tons of coal are handled per year, this translates to about 742,000 additional gallons of fuel. At \$2.40 per gallon, extra fuel costs for this grade translates to about \$1.8 million per year and this does not count additional locomotive capital and maintenance costs, additional labor costs, or additional fuel, labor, and locomotive costs associated with the longer route. This, along with significantly higher construction, maintenance and operating costs eliminates this route as a viable alternative.

Thus, the conclusion reached about the infeasibility of this route in the environmental documents prepared in the 1980's still stands.²⁷

Leilich Statement, Appendix 9.

The Colstrip Alternative would begin west of the town of Forsyth on the BNSF rail line at a point about 50 miles west of Miles City. It would use the existing Colstrip Spur running about 30 miles south to the town of Colstrip. However, much of this spur would have to be rebuilt to handle the tonnage projected for the Tongue River Railroad. From Colstrip the route would cross Cow and Rosebud Creeks, then head southeast up the Greenleaf Creek drainage. It would cross the divide between the Rosebud Creek and Tongue River drainages, then parallel Roe and Cooper Creeks as it descends into the Tongue River Valley, where it would join the TRRC Preferred Alignment north of Ashland.

The Colstrip Alternative has higher operation and maintenance costs than the Proposed Action. The 1985 EIS at page 44 found that the Colstrip Alternative would require two additional locomotives per train because topography for this alignment would be rougher than that for the Proposed Action. The 1985 EIS concluded that Colstrip and the Proposed Action were feasible alternatives. However, it also concluded that the Colstrip Alternative would have fewer environmental impacts than the Proposed Action. In reaching this conclusion, the 1985 FEIS did not consider the impacts of rebuilding the Colstrip to Forsyth spur, which would significantly increase the cost of the Colstrip Alternative.

Mr. Leilich also reviewed the operational and financial impacts of the Colstrip Alternative under 2005 operating conditions. He found that over half of the line would have to be re-laid with heavier rail to allow for the safe operation at the projects loads and speed for the TRRC. The part of the line without new and various improvements to the ties and subgrade will be needed. In addition, a signal system, grade crossing improvements and a new rail siding would be required at an estimated cost of 24.3 million.

Mr. Leilich also ran simulations comparing the Colstrip Alternative and the Proposed Alternative. He found that the Colstrip Alternative would require five or six locomotives as opposed to three locomotives for the Proposed Alternatives due to the adverse grades on the Colstrip Alternative. He quantified the impact of the longer route and adverse grade as follows.

For each round trip operated, the time penalty associated with the Colstrip Alternative would be roughly 2.5 hours for train labor and equipment (not counting the two or three extra locomotive units required). Locomotive capital and maintenance costs would be 65 – 100 percent higher.

²⁷ Leilich Statement, Appendix 9.

The fuel consumption penalty per round trip between the two points studied would be about 1,653 gallons. Translated to the movement of 30 million tons of coal per year, the fuel penalty alone translates to about 3.6 million gallons per year between the two study points and does not count additional fuel that might be used by the extra locomotives outside of these limits. At \$2.40 per gallon, this adds over \$8.6 million in additional operating expense – just for fuel – each and every year. Labor and additional locomotive requirements would add additional millions of dollars.²⁸

²⁸ Leilich Statement, Appendix 9.

Table 6
Level 1B Screening
Rail Alternatives Miles City to Ashland

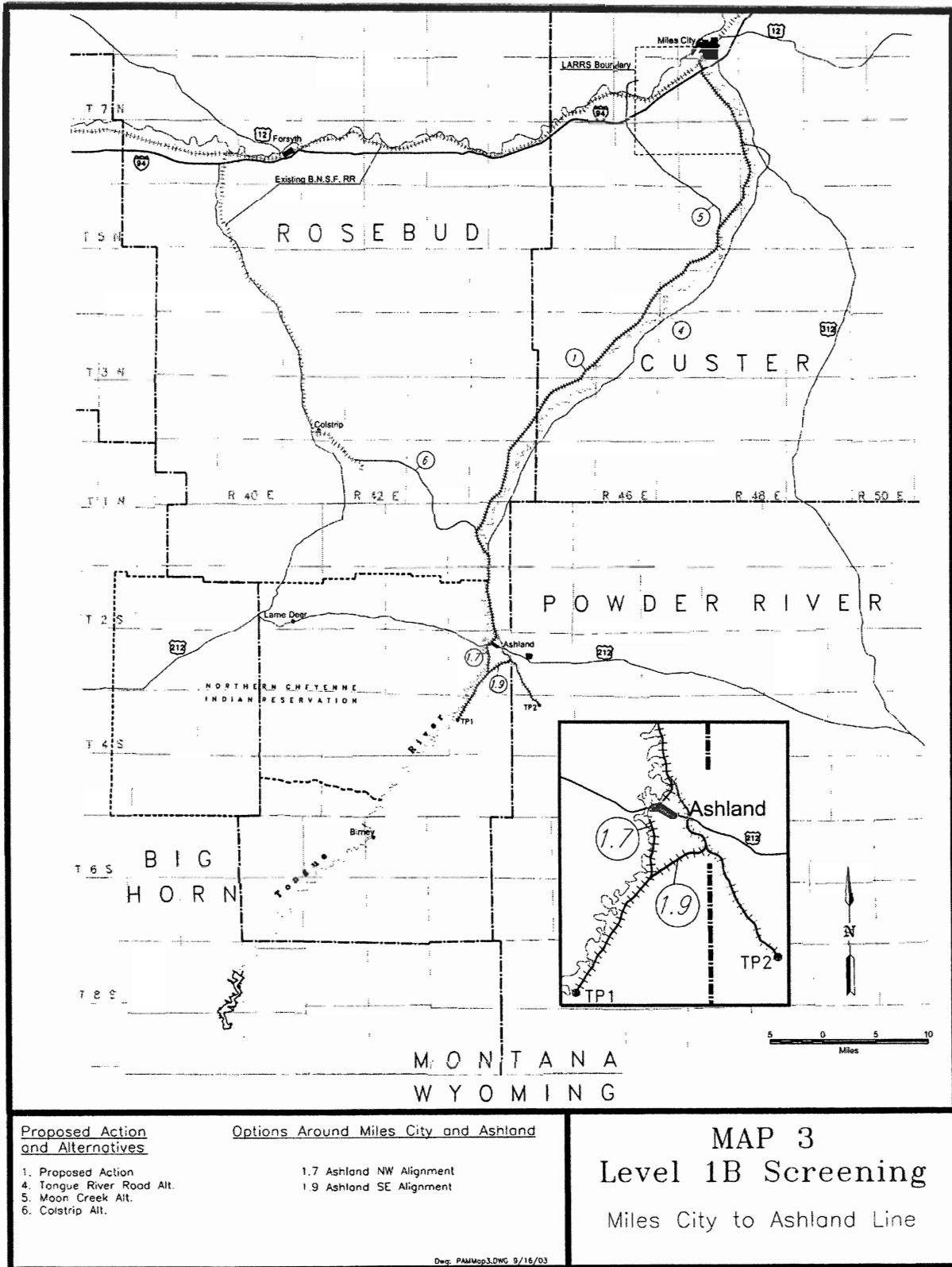
Alternatives	Marketing, Operational and Engineering Costs
No Action Alternative	Does not meet project objectives
Proposed Action	89 miles of new rail line. Requires 3 locomotives for operations. Vegetation and wildlife habitat lost due to ROW 1,278 acres. Construction cost estimate \$137.3 mm* adjusted to 2004 dollars as \$241.0 mm. ²⁹ Estimated 430 to 690 million tons of coal hauled from project area during analysis period. Round trip running time 2 hours 30 minutes; Fuel consumption to haul 30 million tons annually to Miles City is: 30 mmt @ 15,000 tons/train = 2,000 trains/year; Round-trip fuel use 947 gallons/rd. trip x 2,000 trains = 1.894 mm gallons/yr
Tongue River Road Alternative	88 miles of new rail line. Requires 4 locomotives for operations due to adverse grades. Greater grade and curvature specifications requires additional maintenance. Vegetation and wildlife habitat lost due to ROW, 1,413 acres. Construction cost estimate \$146.5 mm* adjusted to 2004 dollars as \$257.2 mm. Estimated 430 to 690 million tons of coal hauled from project area during analysis period. Fuel consumption to haul 30 million tons annually to Miles City :30 mmt @ 15,000 tons/train = 2,000 trains/year; Round-trip fuel use 1,845 gallons/rd trip x 2,000 trains = 3.69 mm gallons/yr
Moon Creek Alternative	89 miles of new rail from TP#1 & #2 to BNSF, 7 miles on BNSF to Miles City for a total miles 96. Requires 5 locomotives for operations due to adverse grades. Greater grade and curvature specifications necessitate more frequent maintenance. Vegetation and wildlife habitat lost due to ROW, 1,323 acres. Construction cost estimate \$140.8 mm* adjusted to 2004 dollars as \$247.2 mm. Estimated 430 to 690 million tons of coal hauled from project area during analysis period. Fuel consumption to haul 30 million tons annually to Miles City: 30 mmt @ 15,000 tons/train = 2,000 trains/year; Round-trip fuel use 1,337 gallons/rd. trip x 2,000 trains = 2.674 mm gallons/yr

²⁹ See footnote 18 on page 27 for adjustment calculations.

Colstrip Alternative	47 miles of new rail to Colstrip, 85 miles on BNSF (from Colstrip to Miles City), for a total of 132 miles; increased total hauling distance to Miles City and markets in the upper midwest. Requires 5 or 6 locomotives for operations, as per Statement of Robert Leilich set forth at Appendix 9. Greater grade and curvature specifications necessitate more frequent maintenance. Vegetation and wildlife habitat lost due to ROW, 838 acres, not including acres necessary to upgrade rail alignment north from Colstrip to the BNSF mainline. Construction cost estimate \$74.5 mm* adjusted to 2004 dollars as \$130.8mm, not including costs to upgrade rail spur from Colstrip north to the connection with the BN mainline. The estimate cost to re-lay heavier rail and make other improvements to make the line a Class III rail are estimated at 24 million, making the estimated construction costs in 2004 dollars as 154.8 million. Estimated 430 to 690 million tons of coal hauled from project area during analysis period. Fuel consumption to haul 30 million tons annually to Miles City: 30 mmt @ 15,000 tons/train = 2,000 trains/year; Round-trip fuel use 2,600 gallons/rd. trip x 2,000 trains/yr. = 5.2 mm gallons/year
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*1985 dollars.

MAP 3 - Level 1B Screening Alternatives Miles City to Ashland Line.



Ashland to Decker Extension

Two alternative routings for the Ashland to Decker extension and the No Action Alternative were considered in the 1996 EIS. The two alternatives are: the Original Preferred Alignment and the Four Mile Creek Alternative. Subsequently, the Western Alignment was developed in 1998 and is considered below and in the 2004 DSEIS. Each of these alternatives are discussed below and summarized in Table 7 on page 50.

The No Action Alternative would not offer the same transportation distance advantages to the Decker area mines. These mines would continue to use the existing BNSF route through Sheridan, Wyoming. This circuitous route is significantly longer than the Proposed Action. The Proposed Action would save approximately 320 to 350 miles on each round trip. The No Action Alternative provides no transportation savings to the Decker mines, and, therefore, does not meet the purpose and need for the Proposed Action and is not a practicable alternative.

Original Preferred Alignment. From Terminus Point 1 on the Miles City to Ashland segment, this alternative would follow the east side of the Tongue River Valley to the mouth of the Four Mile Creek drainage. The alignment then would cross the river five times and pass to the west of the Tongue River Reservoir before it joins the existing Spring Creek mine spur. The alternative was TRRC's preferred route in the Ashland to Decker extension proceeding. The Original Preferred Alignment and the environmental impacts associated with it are discussed in detail in the 1992 DEIS, 1994 SEIS and 1996 EIS. This alternative is shown on Map 4 on page 51. The 1996 EIS concluded at page iv that the Four Mile Creek Alternative would be environmentally preferable to this alternative because the Four Mile Creek Alternative would avoid the environmentally sensitive Tongue River Canyon.³⁰

The Original Preferred Alignment has certain engineering advantages over the Western Alignment (TRRC's current preferred route and part of the Proposed Action) and the Four Mile Creek Alternative. The Original Preferred Alignment would require fewer cuts and fills and would disturb less acreage overall than the Western Alignment or the Four Mile Creek Alternative. The Original Preferred Alignment has a maximum ascending grade for loaded trains of 0.5% for approximately 2 miles and then a gradual descending grade to Miles City. This is almost identical to the Western Alignment and is preferable to the more severe grades of the Four Mile Creek Alternative. Loaded trains on the Original Preferred Alignment would not require helper locomotives as would be required for the Four Mile Creek Alternative. However, the Original Preferred Alignment would cross the Tongue River five times as compared to only once for the other two alternatives. It is also 1.4 miles longer than the Western Alignment. The Original Preferred Alignment could result in greater impacts to the Tongue River due to the river crossings and would be closer to a bald eagle nest site than the other two

³⁰ A copy of the 1996 FEIS will be submitted to the USCOE with the final copy of the Showing document. Referenced pages are in Appendix 10.

alternatives. The STB decided not to approve the alignment. This alternative is not considered in the 2004 DSEIS.

Four Mile Creek Alternative. The Four Mile Creek Alternative would be identical to the Original Preferred Alignment from Terminus Point 1 on the Miles City to Ashland segment paralleling the east side of the Valley until the confluence of the Tongue River and Four Mile Creek. This alternative would then diverge from the Original Preferred Alignment and extend westerly along Four Mile Creek, climbing steeply away from the Tongue River. It would then turn southwestward approximately three miles from the divergence point and continue southwesterly. It would then turn south and east until it connects with the Spring Creek rail spur. This alternative is shown on Map45 on page 51. While recognizing that there are potentially significant environmental impacts associated with this alternative, the 1996 FEIS concluded at page iv that the Four Mile Creek Alternative would be environmentally preferable to the Original Preferred Alignment.

The Four Mile Creek Alternative poses significant operational problems due to the adverse grades and curves on the alignment. The Four Mile Creek Alternative has a maximum ascending grade for loaded trains of 1.5% for a distance of approximately 13 miles and a maximum descending grade of approximately 2.3% extending for 3.18 miles. In comparison, the Original Preferred Alignment and the Western Alignment both have a maximum ascending grade for loaded trains of 0.5% over 2.1 miles and then a gradual descending grade to Miles City. There would be significantly higher operating and maintenance costs associated with the Four Mile Creek Alternative that would impact the viability of the railroad. In addition, this alternative would require the use of three helper locomotives for over 16 miles, while the Western Alignment would require a helper locomotive only for that portion of the Spring Creek mine spur that would connect to the Tongue River Railroad from the West Decker mine. The extra locomotives required for the Four Mile Creek Alternative would result in increased fuel consumption and air emissions. The alignment is longer than the Western Alignment and is closer to residences. The Four Mile Creek Alternative would require more disturbance of earthwork than the Original Preferred Alignment, but less than the Western Alignment.

Western Alignment (Proposed Action). The Western Alignment is part of the Proposed Action. The Western Alignment separates from the Four Mile Creek Alternative and the Original Preferred Alignment approximately nine miles north of the mouth of the Four Mile Creek. At that point, the Western Alignment crosses to the west side of the Tongue River Valley approximately 3,000 feet downstream from the existing county road bridge over the Tongue River. The alignment then generally parallels the existing Tongue River county road for four miles, at which point it separates from the county road and continues to climb away from the Tongue River Valley. After approximately two miles, the Western Alignment crosses the Four Mile Creek drainage continuing south and away from the Tongue River Valley. After approximately six miles, the Western Alignment passes about one mile west of the Tongue River Dam and proceeds directly southwest to tie with the Spring Creek mine spur. The Western

Alignment and the environmental impacts associated with it are discussed in detail in the 2004 DSEIS. This alternative is shown on Map 4A on page 52.

The Western Alignment has significant engineering and operational advantages over the Four Mile Creek Alternative. The grades and curves are much less severe than the Four Mile Creek Alternative and are comparable to those in the Original Preferred Alignment. The Western Alignment has a maximum ascending grade for a loaded train of 0.5% for approximately 2 miles and then a gradual descending grade to Miles City. The maximum descending grade for loaded trains is 0.93%. Unlike the Four Mile Creek Alternative, helper locomotives would not be required for the Western Alignment. While the volume of earthwork for the Western Alignment is greater than for the Four Mile Creek Alternative or the Original Preferred Alignment, the total number of disturbed acres is less than for the Four Mile Creek Alternative.

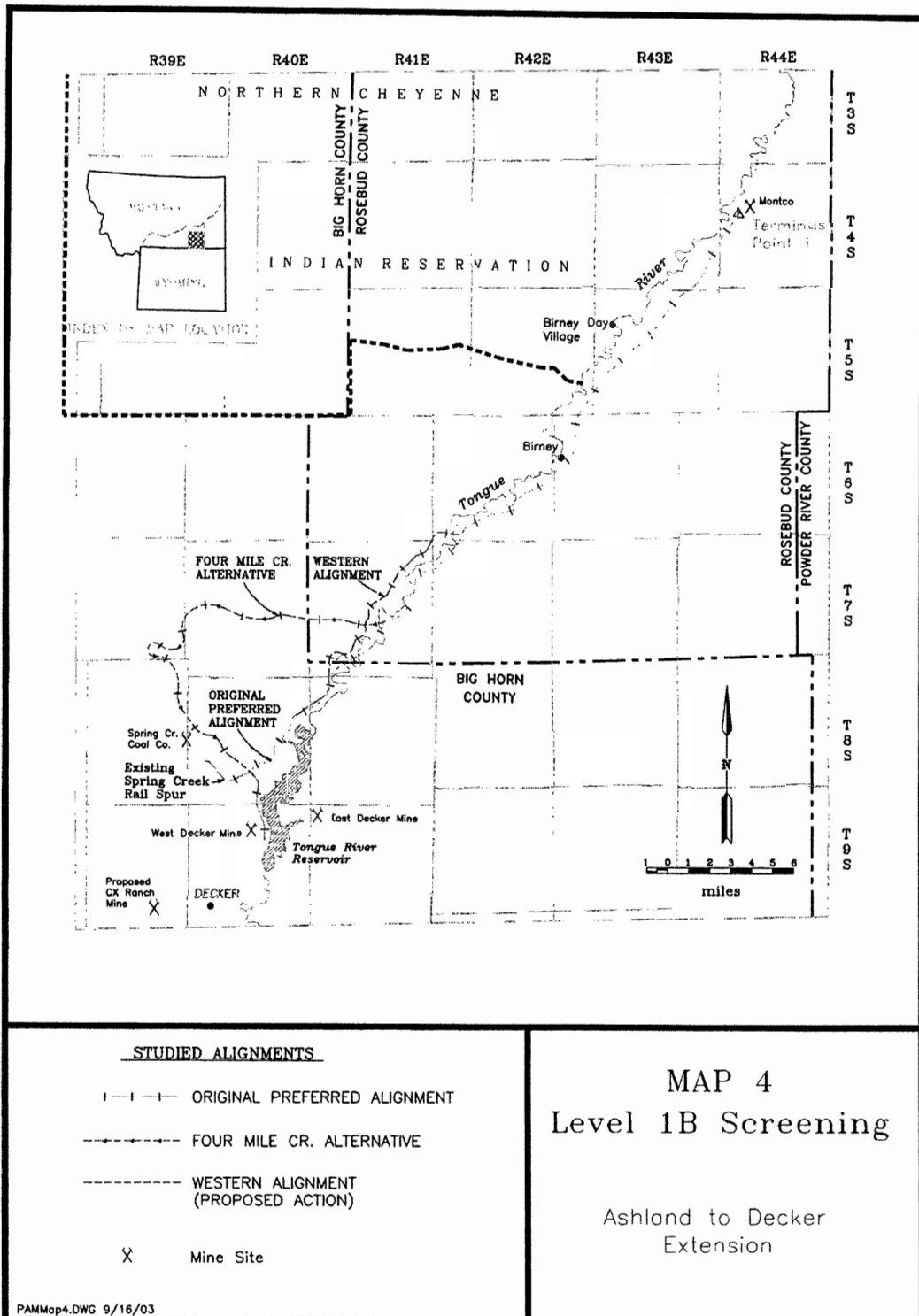
Table 7
Level 1B Screening Analysis
Ashland to Decker Extension

Alternative	Marketing, Operational and Engineering Costs
No Action Alternative	Does not meet project purpose and needs
Original Preferred Alignment	Approximately 41 mile rail line extension. Requires 3 locomotives for operations; maximum loaded ascending grade of 0.33 % and gradual descending grade for loaded coal trains. Vegetation and wildlife habitat lost to due to ROW 637 acres; would require the construction of five bridges and a tunnel in the Tongue River Canyon. Estimated construction costs \$76.8 mm.* adjusted to 2004 dollars as \$89.0 mm. ³¹
Four Mile Creek Alternative	Approximately 50 mile rail line extension. Requires 5 locomotives; maximum ascending grade of 1.5% and maximum descending grade of 2.3% for loaded coal trains raises safety, engineering and operational concerns; Vegetation and wildlife habitat lost to due to ROW 781 acres; Estimated construction costs \$84.3mm.* adjusted to 2004 dollars as \$97.7mm.
Western Alignment (Proposed Action)	An alternative alignment for the southernmost 17 miles of an approximately 40 mile extension of the rail line was proposed in 1998. Requires 3 locomotives; maximum ascending grade of 0.46% and maximum descending grade of 0.93% for loaded coal trains. Vegetation and wildlife habitat lost due to ROW 672 acres. Estimated construction costs \$92.6mm.* adjusted to 2004 dollars as \$107.3mm.

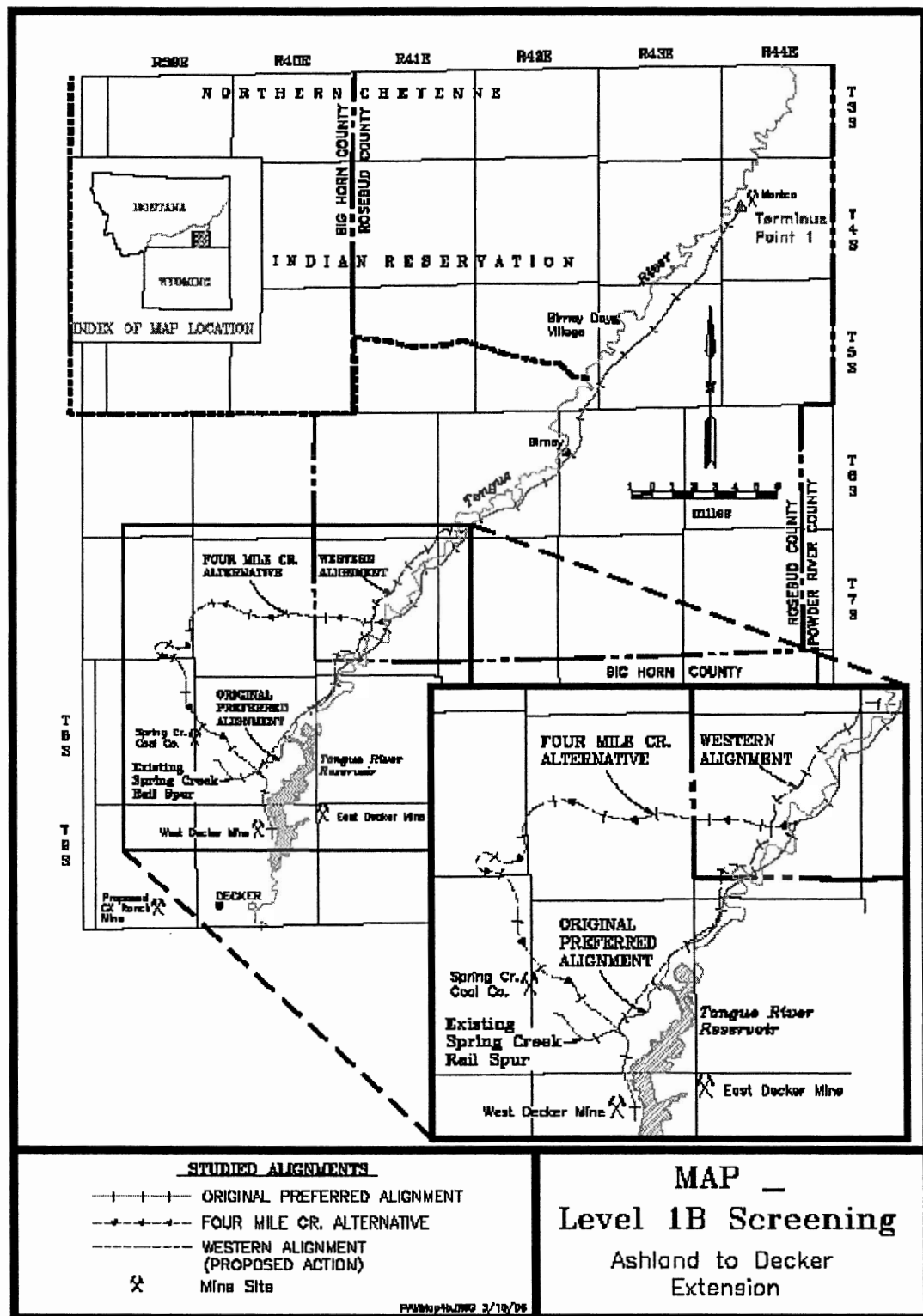
*1998 Escalated dollars.

³¹ This figure has been adjusted to account for inflation using the Consumer Price Index published by the Department of Labor, Bureau of Labor Statistics. The calculation is as follows and is available at <http://minneapolisfed.org/Research/data/us/calc/index.cfm>.
 $Price_{2004} = Price_{1985} \times (CPI_{2004}/CPI_{1998})$, where $CPI_{2004} = 188.9$, and $CPI_{1998} = 163.0$
This formula will be used throughout this chart.

MAP 4 - Level 1B Screening Ashland to Decker Extension



MAP 4A – Level 1B Screening Ashland to Decker Extension



STEP 4 LEVEL 2 SCREENING.

In the Level 2 Screening Process the practicable alternatives as identified from the Level 1A and Level 1B screenings are considered in three parts coinciding with the information considered in TRR I, TRR II, and TRR III.

Miles City to Ashland (TRRI)

The four alternatives considered from Miles City to Ashland in TRRI are:

- Proposed Action
- Tongue River Road Alternative
- Moon Creek Alternative
- Colstrip Alternative

These alignments are shown on Map 3 on page 46. Table 8 on page 56 provides a comparison of the alternative alignments evaluated by TRRC and ICC for the portion of the rail line between Miles City and Ashland. The ICC studied these alternatives in TRRI and approved the Proposed Action in 1986. Table 8 compares the length, total number and total acreage of Waters of the U.S. impacted, cultural resources potentially impacted, air emissions, public grade crossings, fuel consumption, required locomotives, number of potential accidents, potential number of threatened and endangered species, and aquatic impacts for each of these four alternatives.

In addition to the information in the 1985 EIS or 1996 EIS, information on the impact of each of these alternatives on the Waters of the U.S. was reviewed in 2003 and has been incorporated in the “Initial Analysis of Waters of the U.S., Tongue River Railroad Alternatives” (“Initial Analysis Report”), which is attached as Appendix D to the 2004 DSEIS. Each of these alternatives is discussed below. Two of these alternatives, Tongue River Road and Moon Creek, only questionably pass the Level 1B screening for practical alternatives due to engineering and operational concerns. Nevertheless, these two alternatives are included in the Level 2 screening as each was discussed in detail in the 1985 EIS.

The Proposed Action is the proposed Tongue River Railroad route approved by the STB and its predecessor, the ICC, in prior proceedings. The Proposed Action impacts less total acreage of Waters of the U.S. than any of the other alternatives. See Initial Analysis Report at Table 1. The Proposed Action impacts 33.54 total acres of Waters of the U.S. as compared to 49.42 acres for the Colstrip Alternative. Moreover, it is aligned away from the river to the extent practicable. In addition, because it would use the least number of locomotives, it would result in lower fuel consumption and air emissions than the other alternatives. Its impact on cultural resources is similar to those of the other alternatives. The proposed action would have the same impact on threatened and endangered terrestrial species as the other alternatives. It would have fewer impacts on aquatic resource due to the fewer stream crossing and according to the EIS in TRRI it is

the only alternative that does not impact areas with significant aquatic habitat values and significant aquatic species values. It would have some impacts on the Miles City Fish Hatchery, but these impacts could be addressed through mitigation, which the Applicant has proposed and the STB and its predecessor, the ICC, have required. The Proposed Action avoids dissection of major research plots at LARRS.

Tongue River Road Alternative would utilize portions of an existing transportation corridor, thereby limiting, to some extent, the necessity to sever agricultural parcels and disturb irrigation systems. The alignment would potentially disrupt access to residences and agricultural fields along the Tongue River Road. The 1985 EIS at page xiii found that the potential for grade-crossing accidents along the Tongue River Road Alternative would be higher than for any of the other alternatives. The Tongue River Road Alternative also impacts the largest acreage of Waters of the U.S. Moreover, the acres especially affected are classed as river with wetland fringe and abandoned meanders. See Initial Analysis Report at Table 1. The large acreage in these two categories is due to the fact that the centerline for this alternative passes within 200 feet of the Tongue River or its abandoned meanders at several locations. Upon final design the number of the sites might be reduced, but this alternative would still have a more significant adverse impact on Waters of the US than the Proposed Action. This alternative would have the same potential impacts on the Hatchery as the Proposed Action and would also impact Pumpkin Creek, which carries a high aquatic species habitat value. The alignment would have a similar impact to LARRS as the Proposed Action.

Moon Creek Alternative would require the construction of a railroad bridge across the Yellowstone River and the rehabilitation of an existing bridge across the Yellowstone River. The bridge construction is on an area of the Yellowstone River that the DEIS has categorized as a "high priority fishery resource." None of the other routes under consideration include a Yellowstone River crossing. The Initial Analysis Report found that this alternative would impact 42.40 acres of Waters of the U.S. This alternative has the highest number of potential cultural resources within the right of way. It would take some research land from LARRS, but it would be less than the Proposed Action or the Tongue River Road Alternative.

Colstrip Alternative would be comprised of about 30 miles of reconstructed route from the BNSF line approximately 6 miles west of Forsyth to Colstrip and about 22 miles of new route from Colstrip southeast to the Tongue River Valley where it would connect with the Proposed Action. The greater length of this alternative would result in longer haul distances, higher rail rates, greater fuel consumption and higher air emissions than the Proposed Action. This alternative would avoid impacts to the LARRS entirely. However, the 1985 EIS concluded at page xiii that increased rail traffic in the Colstrip and Forsyth areas would result in more vehicular delays. In addition, the adverse grades associated with this alternative would require two additional helper locomotives resulting in higher fuel consumption and air emissions than for the Proposed Action. The 1985 EIS concluded at page xiii that by virtue of the considerably shorter distance involved, Colstrip would result in proportionally fewer environmental impacts than the Proposed

Action. However, the 1985 EIS did not consider the environmental impacts of rebuilding the existing spur north of Colstrip. The spur would have to be rebuilt to meet the specifications for the projected tonnage for the Tongue River Railroad. The Initial Analysis Report showed that the Colstrip Alternative, although representing the shortest newly constructed route, impacts more acreage of Waters of the US than the Proposed Action because it follows the existing railroad from Forsyth to Colstrip along or in the floodplain of Armells Creek, a perennial stream. It also would require the crossing of Rosebud Creek, which the DEIS found is a significant aquatic species habitat. It would avoid impacts to the Hatchery. In addition, the 2005 train performance model runs show that the Colstrip Alternative will require approximately double the number of locomotives and will have longer running time. This results in significantly increased fuel consumption, and, thus, related emissions. It also results in substantial cost increases for fuel and equipment as well as increased labor costs as the longer running times impact crew service times. The Colstrip Alternative is not feasible from an engineering and operational standpoint due to the increased operational costs.

Table 8
Level 2 Screening
Miles City to Ashland (Alternatives Considered in TRRI)

Alternative	Approx. Length (Miles)	Total Number Waters of the US	Total Acreage WUS	Cultural Resources Impacted Within the ROW	Potential Cultural Resource Sites within 1,500 Feet of the Centerline	Air Emissions Operation	Number of Public At Grade Crossings*	Fuel Consumption per round trip Miles City to Ashland	Required Locomotives	Number of Potential Accidents	Number of T&E Species Potentially Impacted Terrestrial	Aquatic Impacts
TRRC Proposed Action (approved 1986)	89	195	33.54	4	34	TSP 2.4 ug/m ³ SO ₂ 0.002 ppm NO ₂ 0.016 ppm CO 0.08 ppm HC 0.024 ppm	2	989 gals.	3	7.6	1 (Bald Eagle)	Potential impacts to Hatchery required additional study; subsequent study showed vibration and coal dust impacts not likely; other impacts addressed in mitigation; two bridge crossings of Tongue River could have short-term impacts but are not in high sport fishery value areas
Tongue River Road Alternative	88	207	89.84	4	48	TSP 3.3 ug/m ³ SO ₂ 0.003 ppm NO ₂ 0.023 ppm CO 0.112 ppm HC 0.034 ppm	4	1456 gals.	4	8.2	1 (Bald Eagle)	Same potential impacts to Hatchery as Proposed Action; plus requires a bridge across Pumpkin Creek, which carries a high species/habitat value
Moon Creek Alternative BN to Miles City	89 +7 96	192	42.40	7	32	TSP 3.6 ug/m ³ SO ₂ 0.003 ppm NO ₂ 0.025 ppm CO 0.124 ppm HC 0.037 ppm	3 +0 3	1573 gals +90 gals 1663 gals	5	7.9	1 (Bald Eagle)	Similar to proposed action in impacts to the Tongue River plus requires bridge crossing of the Yellowstone River in section of the river which is "high priority fishery resource."
Colstrip Alternative Colstrip to Miles City	46 +80 126	206	49.42	2	20	TSP 5.4 ug/m ³ SO ₂ 0.005 ppm ^c NO ₂ 0.038 ppm CO 0.18 ppm ^d HC 0.055 ppm	2 +6 8	1118 gals +1385 gals 2503 gals	4	5.7	1 (Bald Eagle)	Requires crossing of Rosebud Creek, which holds a significant species/habitat area

*Using the Ashland SE Alignment

Ashland to Decker (TRRII)

The alternatives considered in the extension from Ashland to Decker in the 1996 FEIS include the route originally proposed by the TRRC and the Four Mile Creek alternative. Table 9 on page 58 provides a comparison of the alternate alignments studied by TRRC and STB in TRRII. The alignments are shown on Maps 4 and 4A on pages 51 and 52. The STB approved the Four Mile Creek alternative in 1996.

Original Preferred Alignment. This alternative would follow the east side of the Tongue River Valley from the terminus point of the Miles City to Ashland segment to the mouth of the Four Mile Creek drainage where it would then cross the Tongue River five times and pass to the west of the Tongue River Reservoir before joining the existing Spring Creek Mine Spur. The Original Preferred alignment would require fewer cuts and fills and disturb less acreage overall than the Four Mile Creek Alternative. It has a maximum ascending grade for loaded trains of 0.33%. However the alignment would cross the Tongue River five times and could result in greater impacts to the Tongue River Canyon. In 1996 the STB's Section of Environmental Analysis determined that the environmental impacts of this alternative were greater than those of the Four Mile Creek Alternative and the STB decided not to approve this alignment. This alignment is discussed in detail in the 1996 EIS. It is not included in the 2004 DSEIS.

Four Mile Creek Alternative. This alternative would follow the east side of the Tongue River Valley from the terminus of the Miles City to Ashland segment until the confluence of the Tongue River and Four Mile Creek, extending westerly along Four Mile Creek and climbing steeply away from the Tongue River. It would then turn southwesterly approximately three miles from the divergence point and continue southwesterly until turning south and east to connect with the Spring Creek rail spur. The Four Mile Creek Alternative and the environmental impacts associated with it are discussed in detail in the 1996 EIS and the 2004 DSEIS.

The 1996 EIS noted at pages 4 to 6 that while the Four Mile Creek Alternative segment would avoid ranching and farming operations and impacts to nesting and wintering bald eagles and wintering waterfowl immediately below the Tongue River Dam, it would cross more residential access roads, and would be as close as 100 feet to two residences. In addition, it would require more locomotives during operations, resulting in more fuel consumption and air emissions. It also would require reconstruction of a portion of State Highway 312. The Four Mile Creek would impact more acres of Waters of the U.S. than the other alternatives. In addition, the Initial Analysis Report found that this alternative encounters the greatest number of potential Waters of the U.S. as it follows the drainage of Four Mile Creek.

Table 9
Level 2 Screening
Ashland to Decker Extension (Alternatives Considered in TRRII)

Alternative	Approx. Length (Miles)	Total Numbers Waters of the US	Total Acreage Waters of the US	Cultural Resources Impacted Within the ROW	Potential Cultural Resource Sites within 1,500 Feet of the Centerline	Air Emissions Operation	Number of Public At Grade Crossings	Fuel Consumption per round trip Decker to Ashland	Required Locomotives	Number of Potential Accidents	Number of T&E Species Potentially Impacted Terrestrial	Aquatic Impacts
Original Preferred Alignment (TRRC's Preferred Alignment in 1996)	40.3	102	4.51	8	44	PM-10 0.58 SO ₂ - 0.61 NO ₂ 7.09 CO - 2.96 HC 0.65	5	890 gals.	3	<1	1 (Bald Eagle)	Bridge construction results in temporary impact to invertebrates in fishery zone V; construction impacts to bass and pike spawning area near Hanging Woman Creek
Four Mile Creek (Approved 1996)	50.3	130	31.97	6	40	PM-10 0.69 SO ₂ 0.61 NO ₂ 8.44 CO 3.52 HC 0.77	5	1951 gals.	5	<1	1 (Bald Eagle)	Primary impacts are at stream crossings and reduced number of crossings resulted in reduced impacts

Ashland to Decker Alternate Route (TRR III including the Western Alignment)

In 1998 TRRC sought STB approval of an alternate route for the southernmost 17 miles of the Ashland to Decker Extension to address many of the concerns with the Four Mile Creek Alternative. This alternative, known as the Western Alignment, was reviewed in the 2004 DSEIS and is included in the Proposed Action summarized on Table 10 on page 60.

The Western Alignment separates from the Four Mile Creek alignment approximately nine miles north of the mouth of Four Mile Creek and crosses to the west side of the Tongue River Valley where it parallels the existing Tongue River County Road for four miles before climbing away from the valley. This alignment would avoid the environmentally sensitive Tongue River Canyon. The grades and curves are significantly less severe than the Four Mile Creek Alternative with a maximum ascending grade of 0.5% per day. Moreover the Western Alignment impacts a lower number of disturbed acres and potential Waters of the US than the Four Mile Creek Alternative. The Alignment is discussed in greater detail in the 2004 DSEIS.

TRRC also proposed minor modifications to the alignment between Miles City and Ashland to improve operations and reduce construction costs. These alignment modifications were studied by the STB and are discussed in detail in the 2004 DSEIS. Table 10 on page 60 provides a comparison of the Miles City to Decker alternatives considered in TRRIII.

The alternatives compared in Table 10 on page 60 include the following: the Approved Route without modifications (via the Four Mile Creek alternative); the Approved Route without modifications via the Western Alignment; the Modified Route via the Four Mile Creek alternative; and, the Modified Route via the Western Alignment (Proposed Action).

In addition to the mitigation measure specific to the Hatchery, there are numerous other mitigation measures identified in the Draft Supplemental EIS such as re-vegetation requirements, culvert design and bridge construction that will further reduce the impacts of the Proposed Action. In total, there are 89 mitigation measures which are outlined on pages 7-10 to 7-24 of the draft EIS. A complete listing of the proposed mitigation measures from the draft Supplemental EIS is set forth in Appendix 11.

Table 10
Level 2 Screening
Miles City to Decker (Alternatives Considered in TRRII)

Alternative	Approx. Length (Miles)	Total Number Waters of the US ³²	Total Acreage WUS	Cultural Resources Impacted Within the ROW	Potential Cultural Resource Sites within 1,500 Feet of the Centerline	Air Emissions	Number of Public At Grade Crossings *	Fuel Consumption per round trip Miles City to Decker	Required Locomotives	Number of Potential Accidents	Number of T&E Species Potentially Impacted	Aquatic Impacts
Approved Route w/out modification (via Four Mile Creek)	131.4	338	67.16	20	105	**	7	3354 gals.	5	8.17	1 (Bald Eagle)	Potential impacts to Hatchery required additional study; which showed vibration and coal dust impacts not likely; other impacts addressed in mitigation; bridge crossings of Tongue River may have short-term impacts but are not in high sport fishery value area; potential impact due to construction sediments, but could be mitigated; may be restricted access to fishing near the bridge at Four Mile Creek
Approved Route w/out modification via Western Alignment	119.4	310	39.70	18	69	**	5	1707 gals.	3	7.94	1 (Bald Eagle)	Same as above except that Western Alignment would not impede access to fishing.
Modified Route via Four Mile Creek	127.6	325	65.51	16	98	**	7	2877 gals.	5	8.17	1 (Bald Eagle)	Potential impacts to Hatchery required additional study, which showed vibration and coal dust impacts not likely; other impacts addressed in mitigation; bridge crossings of Tongue River may have short-term impacts but are not in high sport fishery value area; potential impact due to construction sediments, but could be mitigated; may be restricted access to fishing near the bridge at Four Mile Creek

³² A breakdown on Water of the US and a draft mitigation plan is found in Appendix 12. The mitigation plan will be revised to include more specific information once the final alignment is selected and TRRC gains access to the entire right of way. This more detailed plan will be submitted to the USCOE.

Modified Route via Western Alignment (Proposed Action)	115.6	297	38.05	16	62	**	5	1546 gals.	3	7.94	1 (Bald Eagle	Same as above except that Western Alignment would not impede access to fishing.
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*Using the Ashland SE Alignment

** To be completed when the information from the 2006 SEIS is available for review.

Least Environmentally Damaging Practicable Alternative

Based on a side-by-side comparison, the Proposed Action is the only practicable alternative in terms of costs, existing technology and logistics as shown on Table 11. Although the Proposed Action does not have the lowest construction costs, it has the most efficient operating costs.

Table 11 Practicability Matrix

Miles City to Ashland

Category	Modified Route (Proposed Action)	Approved Route w/out modification	Tongue River Road Alternative to Miles City	Moon Creek Alternative BN to Miles City	Colstrip Alternative Colstrip to Miles City
Costs					
Minimize construction costs	NO \$241.0m	NO \$241.0	NO \$257.2m	NO \$247.2m	YES \$154.8m
Minimize operating costs	YES makes use of momentum grade ³³ to reduce operating costs	YES makes use of momentum grade to reduce operating costs	NO length of adverse grade and reduced speed would require more power or use of helper locomotives and crews	NO Adds significant miles and time to each train; requires additional labor costs	NO longer running times; higher locomotive maintenance costs; more labor costs
Existing Technology (Engineering)					
Avoid adverse ruling grades	YES 0.2%	YES 0.2%	NO 0.85%	NO 1.0%	NO 0.85%
Maximize the Operating Characteristics	YES momentum grades as opposed to adverse ruling grades means more efficient operations	YES momentum grades as opposed to adverse ruling grades means more efficient operations	NO Adverse grades require more crews	NO Severe ruling grade impacts operations	NO Longer route with adverse grades means longer running times and costs

³³ Momentum grade exists where the speed and/or inertia of the train provides much of the energy needed to lift the train over the hill.

Minimize Number of Locomotives and Fuel Consumption	YES 3 locom. 937 gal. roundtrip	YES 3 locom. 938 gal. roundtrip	NO 4 locom. 1456 gal roundtrip	NO 5 locom. 1663 gal. roundtrip	NO 5-6 locom. 2600 gal. roundtrip
Logistics					
Minimize Distance of Coal Haul	YES 89 miles	YES 89 miles	YES 88 miles	NO 96 miles	NO 126 miles
Minimize crossings of transportation features	YES 2 public road crossings	YES 2 public road crossings	NO 4 public road crossings; potential for grade crossing accidents	NO 3 public road crossings; requires new bridge and rehabilitation of an old bridge	NO 8 public road crossings; Reconstructed BNSF line

Table 11A Practicability Matrix**Ashland to Decker**

Category	Via Western Alignment	Via Four Mile Creek
Costs		
Minimize construction costs	NO \$108.9 m	YES \$97.7m
Minimize operating costs	YES Shorter distance and ability to take advantage of momentum grades	NO Steep grades require high operating and maintenance costs and more complicated operations to comply with safety requirements
Existing Technology (Engineering)		
Avoid loaded ruling grades	YES 0.4%	NO 1.5%
Maximize the Operating Characteristics	Flatter grade reduces the power needed and enhances safety	Ascending loaded train grades nearly four times as steep as Western Alignment requires more complicated operation to comply with safety requirements.
Minimize Number of Locomotives and Fuel Consumption	3 locoms. no helper locomos needed 1,826 gal. roundtrip	5 locoms. (including helpers for 16 miles) 2,798 gal. roundtrip
Logistics		
Minimize Distance of Coal Haul	Yes 17.3 miles	No 29.4 miles
Minimize crossings of transportation features	Yes 4 public road crossings	No 7 public road crossings

The Proposed Action also is the least environmentally damaging alternative as shown in Table 12.

Table 12 Resource Matrix

Miles City to Ashland

Category	Modified Route (Proposed Action)	Approved Route w/out modification	Tongue River Road Alternative	Moon Creek Alternative BN to Miles City	Colstrip Alternative Colstrip to Miles City
Minimizes Impacts to Waters of US	YES 33.54 acres	YES 33.54 acres	NO 89.84 acres	NO 42.40 acres	NO 49.42 acres
Avoids Impacts to Areas with Significant Aquatic Habitat Values	YES one bridge crossings of Tongue River could have short-term impacts but are not in areas of high sport fishery value areas	YES one bridge crossings of Tongue River could have short-term impacts but are not in areas of high sport fishery value areas	NO requires bridge across Pumpkin Creek which requires carries a high species/habitat value	NO requires bridge crossing of Yellowstone River in section which is high priority fishery resource	NO Requires crossing of Rosebud Creek which holds a significant specifiers/habitat area
Minimizes land needed for ROW	YES 1,278 acres	YES 1,278 acres	NO 1,413 acres	NO 1,323 acres	YES 838 acres
Minimizes impacts to terrestrial wildlife	YES 1-Bald Eagle	YES 1-Bald Eagle	YES 1-Bald Eagle	YES 1-Bald Eagle	YES 1-Bald Eagle

Table 12A Resource Matrix**Ashland to Decker**

Category	Western Alignment (Proposed Action)	Four Mile Creek
Minimizes Impacts to Waters of US	Yes 4.51 acres	No 31.97 acres
Avoids Impacts to Areas with Significant Aquatic Habitat Values	Disturbs approximately 1.69 acres of wetlands; 42 non-perennial stream crossings; 1 bridge crossing over Tongue River, which could have short term impacts to the invertebrates in the fishery zone	Disturbs approximately 6.09 acres of wetlands; 40 non-perennial stream crossings; 1 bridge crossing over Tongue River, which could have short term impacts to the invertebrates in the fishery zone
Minimizes land needed for ROW	Yes 672 acres	No 765 acres
Minimizes impacts to terrestrial wildlife	Yes Less pronghorn antelope habitat potentially impacted (approx. 76 acres); would not result in significant isolation of pronghorn habitat area; overall less terrestrial habitat lost	No Approx. 358 acres of pronghorn antelope habitat potentially impacted; more terrestrial habit lost overall

COMPLIANCE STATEMENT

As shown on Tables 8 through 12, the Proposed Action (which includes the Western Alignment) complies with the requirements in Section 230.12 of the Guidelines as it is the least environmentally damaging practicable alternative. None of the other practicable alternatives would have less adverse environmental effects and others would have more. For example, the Tongue River Road, Moon Creek and Colstrip Alternatives would have substantially greater environmental impacts, including greater impacts to Waters of the U.S.

The Proposed Action would impact 33.54 acres of waters of the US. By comparison the Moon Creek Alternative and the Colstrip Alternative would impact 42.40 and 49.42 acres respectively and the Tongue River Road Alternative would impact 89.84 acres. The Tongue River Road Alternative would have the same impacts to the Hatchery as the Proposed Alternative and would also require a bridge crossing of a creek designated as high species/high habitat value. The Colstrip Alternative would require crossing of a creek in a significant species/habitat area. The Moon Creek Alternative would require a crossing of the Yellowstone River in a section of the river which is a high priority fishery resource.

Moreover, because of adverse grades, the Colstrip Alternative would have substantially higher long-term operational and maintenance costs, and result in greater fuel consumption and increased air emissions as compared to the Proposed Action. The Proposed Action would consume approximately 1.9 million gallons of fuel per year to haul 30 million tons of coal annually to Miles City. By comparison the Colstrip Alternative would consume approximately 5.2 million gallons of fuel per year to haul the same tonnage of coal. The Tongue River Road and Moon Creek Alternatives would consume approximately 3.7 and 2.6 million gallons respectively to haul the same tonnage of coal.

While the Proposed Action would impact the Miles City Fish Hatchery the TRRC has agreed to various mitigation measures such as protection of the Hatchery water supply lines, reduced train speeds and mechanical weed control that will mitigate these impacts. The mitigation measures will become part of the STB's order, and, thus will be required. The Proposed Action also follows the fencelines at the LARRS research station, thus avoiding impacts to historical research plots. Changes to the configuration of historical research plots would make it difficult, if not impossible, to meaningfully relate past and future study results. The long-term consistency in the research plots is important to the overall research and cannot be mitigated except by avoidance of the plots.

The Four Mile Creek Alternative has significant adverse grades resulting in operational and safety concerns that would severely impact the viability of the railroad. In addition, it would impact more acres of Waters of the US (67.16) than the Proposed Action (38.05). Moreover, the proposed Four Mile Creek Alternative is 15.8 miles longer than the Proposed Action, has additional road crossings, requires reconstruction of

State Highway 312 and is closer to more residences than the Proposed Action. The No Action Alternative using the existing BNSF lines provides no service to the proposed Ashland and Otter Creek area mines and no improvement in service to the Decker area mines. It also is important to note that 89 mitigation measures ranging from culvert design to re-vegetation has been identified by the SEA that would further mitigate the impact of the Proposed Action. Sufficient information exists in the 1984 SDEIS, the 1986 FEIS, the 1994 SDEIS, the 1996 FEIS and the 2004 DSEIS and has been relied upon in this Showing Document to determine compliance with the requirements of Section 230.12.

Given all of the above factors, TRRC believes that the least environmentally damaging and best practicable alternative is the Proposed Action. The Proposed Action meets the design and the operational criteria for the railroad, provides for the economic transport of coal for the Ashland/Otter Creek area mines and reduces the transportation distance for the Decker mines, and some Wyoming area mines. The Proposed Action thus meets the purpose and need of the project. The Proposed Action also impacts the fewest acres of Waters of the US and encounters the lowest acreage of probable wetlands. The Proposed Action also has the least impact on aquatic resources. While there are some impacts to the Fish Hatchery, these can be mitigated.

TRRC strongly requests that the USCOE consider all of the above in evaluating the issuance of the 404 Permit for the Tongue River Railroad. TRRC believes that the Proposed Action will bring needed economic and efficient rail transportation to the Ashland/Otter Creek area with the least damaging environmental impacts.

Appendix G

Revised Work Plan for High Resolution Vibration Monitoring and Potential Mitigation at Miles City Fish Hatchery

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Womack & Associates, Inc.
Geology and Geotechnical Engineering

April 13, 2006

Doug Day
Tongue River Railroad Company
P.O. Box 1181
Billings, MT 59103-1181

RE: REVISED WORK PLAN FOR HIGH RESOLUTION VIBRATION MONITORING,
EVALUATION OF POTENTIAL EFFECTS OF TONGUE RIVER RAILROAD
CONSTRUCTION AND OPERATION, AND POTENTIAL MITIGATION AT MILES CITY
FISH HATCHERY

Dear Doug:

I have attached a revised work plan for evaluation of potential effects of vibrations and noise from TRR construction and operation at the Miles City Fish Hatchery (MCFH). Existing very low level vibrations will be measured at the hatchery by Wilson Ihrig Associates (WI) using high resolution equipment. Propagation of vibrations from TRR will be predicted by WI from in situ acoustic data. The vibration data will be evaluated by WI and Shannon & Wilson, Inc. (SW), to determine whether there may be potential effects to hatchery operation. If the hatchery is likely to be affected, acceptability criteria will be determined in cooperation with research personnel from the US Fish and Wildlife Service.

Respectfully submitted,

Womack & Associates, Inc.,

Ray Womack, P.E., P.G.

MILES CITY FISH HATCHERY ACOUSTICAL STUDY

The potential impacts of the Tongue River Railroad (TRR) on the Miles City Fish Hatchery (MCFH) have been studied extensively. Vibration levels have been measured along the existing BNSF rail and at the hatchery. Potential effects on fish of vibrations, windblown coal dust, and weed control have been assessed by experts. Geological conditions have been thoroughly researched and slope stability concerns have been addressed. However, in response to an issue raised by the Montana Department of Fish, Wildlife, and Parks, the work plan described herein has been developed. The work plan represents a refinement of the previous work specifically targeting very low level acoustics and vibration.

The noise and vibration program will include measurements and analysis to:

- Measure baseline conditions at the MCFH
- Predict and assess future sound pressure levels from construction and operation of the TRR near the MCFH and compare to baseline conditions.
- Measure actual noise and vibration during the construction and operation of the TRR to compare actual levels to predicted levels.
- If the predicted or measured levels of noise and vibration show an increase over baseline conditions, then determine acceptability criteria for increased noise and vibration associated with the TRR line in association with the US Fish and Wildlife Service (USFWS) and the Montana Fish, Wildlife & Parks (MTFWP).
- If necessary, recommend mitigation measures to be incorporated into the engineering design phase of TRR rail construction.

This study will focus primarily on the MCFH Headquarters building, although potential effects to other structures in which fish are located will be considered. Access to the hatchery facility will be coordinated with MTFWP. Womack & Associates (WA) will coordinate the work, provide geological and geotechnical consulting, and report to Tongue River Railroad Company (TRR). WA has teamed with Wilson Ihrig and Shannon & Wilson on the design of the monitoring study. Wilson Ihrig (WI) will conduct the noise and vibration work, Shannon & Wilson (SW) will assess effects to fish and appropriate action levels, and the team will evaluate mitigation measures. The work will be performed in cooperation with the US Fish and Wildlife Service (USFWS).

This team brings extraordinary qualifications and experience to the project. Detailed qualifications and resumes are appended and are summarized below.

Wilson, Ihrig & Associates, Inc. is a world renowned consulting firm that provides a complete range of professional services associated with acoustics and the assessment and control of noise and vibration. WI specializes in transit system and railroad noise and vibration control and

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draws from 40 years of experience with modern rail systems. WI projects include the DM&E Powder River Basin expansion, Bay Area Rapid Transit (BART), the Puget Sound Light Rail system, the Superconducting Supercollider, and research on construction vibration for the US Department of Transportation. WI wrote the Handbook of Urban Rail Noise and Vibration Control under contract to US DOT. Dr. James Nelson and Dr. George Wilson, who will provide senior review, each are graduates of the University of California at Berkeley, and have more than 30 years experience. Derek Watry, WI's lead consultant for the project, has a M.S. from UC Berkeley and 13 years experience with WI.

Shannon & Wilson has provided engineering and environmental consulting on more than 20,000 projects worldwide in the past 50 years. SW's natural resources services include regulatory compliance, wetlands, plant and animal surveys, fisheries, habitat remediation, water quality, biological assessments, and evaluation of impacts to threatened and endangered species. Murray Meierhoff, principal in SW's St. Louis office, has a M.A in Aquatic Biology from the University of Missouri and 20 years experience in aquatic biology, ecology, and limnology. He has worked extensively with the warm water fisheries of Illinois, Missouri, Pennsylvania, Kansas, and Mississippi.

Womack & Associates has provided geotechnical and geological consulting services in Montana since 1978. Ray Womack, P.E., P.G., has a M.S. in Earth Resources from Colorado State University and more than 30 years experience in the western US, as well as sub-Saharan Africa, Asia, and Central America. Mr. Womack assembled and led the geotechnical team for the TRR project beginning in 1997 and has been responsible for assessment of site conditions and vibration monitoring at the Miles City Hatchery since 1998.

SCOPE OF WORK

1.0 MEASURE BASELINE LEVELS

The existing ambient noise and vibration levels at the MCFH in Miles City, Montana, will be measured. Sources of existing noise and vibration at Miles City include pumps and other mechanical equipment in the Hatchery Headquarters, existing rail operations on the BNSF line (which are expected to be reduced once the TRR line becomes operational), and highway traffic on Interstate-94. Using these measurements, the environmental conditions which are currently prevalent at the hatchery will be established. USFWS and MTFWP will be consulted regarding the design of the study.

High-sensitivity, low noise floor transducers, low noise floor amplifiers, and digital-audio signal recorders will be used to quantify both noise and/or vibration over a frequency range of 1 Hz to 10,000 Hz. The transducers will include a hydrophone (for underwater measurements), seismic accelerometers, and precision microphones. All signal data will be recorded for later laboratory

data analysis. Special, large diameter wind screens will be used to reduce wind-generated noise interference for outdoor noise measurements, if necessary.

It is anticipated that the data will be resolved into standardized 1/3-octave band levels. If issues arise regarding specific frequencies, additional data analyses could include narrowband resolution of the data.

2.0 PREDICT FUTURE NOISE AND VIBRATION LEVELS

2.1 Construction Operations

Construction activities are likely to include, but not necessarily be limited to, excavation, compaction, and bulldozing. Of these, compaction typically generates the most vibration and noise. Transfer functions between the construction site and sensitive facilities at the MCFH will be predicted from results of in situ testing, probably using a heavy vibrating roller as the energy source. Continuous vibration monitoring will be performed during critical construction periods.

2.2 Rail Operations

To predict future vibration and underwater sound pressure levels from rail operations, the methodology first developed by the staff of WI in the 1970s, now adopted as the industry standard, will be employed. Briefly, the methodology breaks train vibration into two pieces: the dynamic forces inherently generated by the train at the wheel/rail interface and the transmission of those dynamic forces as ground vibration. The former is the train *force density level* (FDL) and the latter the ground *line source response* (LSR). The FDL of the existing BNSF trains at one location near the MCFH will be measured, and the LSR from the proposed right-of-way into the hatchery will be measured at two or three locations. These data, along with any minor adjustments necessary to correct for anticipated speed or other differences, will be used to predict future vibration in the hatchery. The methodology produces results in the 6.3 Hz to 160 Hz 1/3-octave bands which encompasses all significant railroad vibration frequencies. The predicted vibration will be used to predict underwater acoustic levels inside the hatchery tanks.

To predict future noise from railroad operations, recorded noise levels from existing BNSF trains and reasonable estimates of the sound transmission loss afforded by the MCFH Headquarters building will be used after its construction and condition have been examined.

2.3 Measurement Equipment and Data Analysis

The FDL and LSR testing will use specialized equipment designed by and built by or for WI, in addition to commercially purchased geophones and data recorders. Noise and vibration from construction activities will use the same equipment used to measure the existing conditions. Data will be resolved on a 1/3-octave band basis for direct comparison with the established action levels.

2.4 Assessment

The work plan assumes that assessment of predicted noise and vibration levels will involve comparison with existing levels. If the future vibration and noise are expected to exceed existing levels, the team will develop a research plan in cooperation with USFWS and MTFWP. Wilson Ihrig will be responsible for measurement of baseline levels and prediction of future levels. Shannon & Wilson and USFWS will be responsible for evaluation of appropriate acceptability criteria based on potential impacts to fish.

3.0 DEFINE ACCEPTABILITY CRITERIA

At a meeting between representatives of MTFWP, USFWS, and representatives of TRR held April 5, 2006, it was agreed that existing noise and vibration levels would be measured at the MCFH and compared to levels predicted during construction and operation of the rail. Although it is clear that fish hatcheries have been in successful operation for decades in locations with perceptible levels of both noise and vibration, actual effects of noise and vibration on fish are not completely understood. If it is concluded that construction and operation of the rail are likely to cause higher noise and vibration levels than currently exist in critical facilities at the MCFH, potential impacts and mitigation measures will be assessed. Specifically, bioassays will be performed that evaluate stress response due to increased vibration and noise by measuring levels of substances that indicate stress response in blood samples of shovelnose sturgeon (as a proxy for pallids) at various stages of development. The study will be performed by USFWS, with assistance from WI and SW, at the Fish Technology Center in Bozeman, or at other sites determined by the team. Dr. Molly Webb, research biologist for USFWS, has prepared a preliminary research proposal (attached in Appendix 2) and will work with WI and SW to develop testing protocols, if noise and vibration are expected to increase because of the TRR. Bob Snyder and Mike Rhodes of MTFWP will also be involved in preparation of the testing program.

SW will evaluate, in both natural settings and at the MCFH, potential stressors to pallid sturgeon and other species. Other species include walleye, sauger, largemouth bass, smallmouth bass, northern pike, and tiger muskellunge. Ecological characteristics of these fish, in terms of feeding preferences, habitat preferences, growth rates, predators, and distribution will be documented. The majority of this work will be completed from information gathered from technical literature or interviews. In addition, Murray Meierhoff of SW, an aquatic biologist, will visit the MCFH to observe conditions, interact with other team members, and develop information regarding the soils and geology in the vicinity of the proposed rail line. This task will include a review of vibration and noise data from published sources and/or developed by others.

4.0 COMPARE BASELINE AND PREDICTED LEVELS WITH ACCEPTABILITY CRITERIA THRESHOLDS

Based on the baseline, predicted levels, and acceptability criteria, the team will determine whether mitigation measures should be considered during the final engineering design phase. The work plan assumes that assessment of predicted noise and vibration levels will involve comparison with the acceptability criteria established under Task 3.0. If the future vibration and noise levels are expected to exceed acceptability criteria, the team will develop mitigation procedures.

5.0 DEVELOP MITIGATION MEASURES (IF NECESSARY)

If required by the assessment conducted above, the team will develop remedial measures to be incorporated in the final design engineering phase that maintain vibration levels at the MCFH at or below no-impact levels. This work will utilize the team's knowledge of railroad and construction operations in general, site-specific information on the geology of the area, ecological information regarding the pallid sturgeon and other species reared at MCFH, and vibration/noise data.

WI has been designing systems to reduce rail vibration since the 1970s, and is confident that successful mitigation measures can be designed for this application, if necessary. SW is also highly experienced in design and implementation of mitigation measures. Potential mitigation measures at the rail include resilient rail fasteners and rubber ballast mats, among others. At the hatchery, tanks may be isolated from vibration. Noise, if found to be an issue, could be mitigated by modifying the MCFH Headquarters building to increase the shell sound transmission loss. This can be done, if necessary, while retaining airflow through the building.

6.0 MONITOR NOISE AND VIBRATION FROM CONSTRUCTION AND INITIAL RAIL OPERATIONS

Once the previous tasks have been completed, the team will have a better understanding of the existing noise and vibration environment and expected future levels as a function of distance from the TRR right-of-way. At that point, the team will be able to design a responsible monitoring program to verify the predicted levels and/or monitor any mitigation measures that may have been implemented as a result of the efforts described above.

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For planning purposes it is assumed the team will follow WI's normal procedure for monitoring vibration at critical sites, which consists of live (attended) monitoring and continuous unattended monitoring. The live monitoring would occur for the first few days of any new major construction activity (e.g., grading, compacting) and operations. WI will use the same high-sensitivity instruments used during the engineering site-work and, prior to construction, the team will have established a protocol with the contractor or operator to cease operations if the levels exceed the action levels. For long-term construction activities, after the first few days, monitoring would be done using portable seismographs that will be strategically placed based on the results of the vibration study. These seismographs can be used to trigger an alarm to alert the construction crew if action levels are exceeded, and can also be programmed to call up to four people with alerts.

7.0 REPORT

All measurements, analysis, findings, and conclusions generated by Womack & Associates, Wilson Ihrig, and Shannon & Wilson will be presented in a single technical report.

8.0 PERSONNEL

Qualifications and resumes of individuals involved in the project from Womack & Associates, Wilson Ihrig & Associates, and Shannon & Wilson are attached in Appendix 1.

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APPENDIX 1
STATEMENTS OF QUALIFICATIONS AND
RESUMES OF KEY PERSONNEL



WILSON, IHRIG & ASSOCIATES, INC.
ACOUSTICAL AND VIBRATION CONSULTANTS

5776 BROADWAY
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Wilson, Ihrig & Associates, Inc. is a world renowned acoustical and vibration consulting firm offering a complete range of professional services associated with acoustics and the control of noise and vibration. As an acoustical consulting firm specializing in transit system and railroad noise and vibration control, Wilson Ihrig draws from 40 years of experience with modern rail systems.

Wilson Ihrig was established in 1966 and currently employs a staff of 21, comprising 13 well-trained and experienced professional specialists in acoustics and vibration, two technicians, a field assistant, and five support personnel. Wilson Ihrig has full capability to provide all aspects of noise and vibration studies and design work for rail and other transportation projects.

Rail Transportation

Wilson Ihrig is a leader in rail transportation noise and vibration control, having worked on over 30 different railroad and transit systems in the USA, Canada, United Kingdom, Australia, Hong Kong, Taiwan, Brazil and Greece. For many of the U.S. transit systems, Wilson Ihrig has served as system wide acoustical consultant from the initial environmental impact phase through the preliminary and final engineering design phases. Wilson Ihrig has consulted on all aspects of noise and vibration studies and design work for rail and other transportation mode projects, including environmental assessments, equipment and facilities specifications, facility planning, station acoustics, vehicle noise and vibration control, and analysis and testing of track support systems. In addition to work directly for rail systems, Wilson Ihrig prepared the "Handbook of Urban Rail Noise and Vibration Control" for the Transportation Systems Center of UMTA (now FTA); and the "Wheel/Rail Noise Control Manual" under TCRP Project C3. Wilson Ihrig developed the prediction methodology currently prescribed for rail transit impact assessment in the Federal Transit Administration guidance manual, "Transit Noise and Vibration Impact Assessment." Today, Wilson Ihrig remains a leader in the rail vibration control field through its work incorporating Tire-Derived Aggregate (tire shreds) into track design for vibration control.

A specialty of Wilson Ihrig is the measurement and evaluation of groundborne vibration and noise from rail transit operations and other sources, including the projection of the expected level of audibility of noise radiated in buildings and the possibility of perception of the vibration by occupants. Wilson Ihrig has the background and experience for effective review of new project situations, both to determine expected groundborne noise and vibration and to determine the expected effectiveness of practical mitigation measures

Environmental Noise and Vibration Impacts Assessment

Wilson Ihrig's experience involving assessment of environmental noise and vibration impacts for transportation systems includes: Alternatives Analyses (AA); Draft Environmental Impact Statements and Reports (DEIS/DEIR); Final Environmental Impacts Statements and Reports (FEIS/FEIR); and Environmental Assessments (EA). Wilson Ihrig has gained considerable experience with the requirements of the California Environmental Quality Act (CEQA), the U. S. National Environmental Protection Act (NEPA) and with noise and vibration criteria established by other governmental and transit agencies. Wilson Ihrig's services include: environmental noise and vibration measurement programs; evaluation of noise and vibration impacts; preparation of technical reports for inclusion in environmental documents; and writing the noise and vibration section of Environmental Impact Reports and Statements.

Measurement and Analysis Capabilities

Wilson Ihrig has decades of experience in measurement, analysis, community impact assessment and design of mitigation for rail system noise and vibration. Wilson Ihrig is fully equipped to do all types of acoustical and vibration measurements, including real time analysis, digital processing of noise and vibration data, statistical analysis and extended surveys, and has available the means to completely evaluate transportation systems, industrial, community and building noise and vibration problems or acoustical characteristics. In addition, Wilson Ihrig's measurement and laboratory analysis equipment has been designed specifically for performing accurate and efficient measurements of rail system noise and vibration. Our many completed measurement programs provide an extensive data base for use in projections associated with environmental impact studies.

PROJECT EXPERIENCE

DM&E Railroad Powder River Expansion Project, Kansas City, MO

Burns & McDonnell

Wilson Ihrig performed a study analyzing the potential ground vibration impacts associated with the future operation of unit coal trains on the Dakota, Minnesota & Eastern (DM&E) Railroad as part of the Powder River Expansion Project. This study included a thorough review of applicable criteria for potential building damage, human response and vibration sensitive industrial, research and medical facilities. The study presented examples of existing ground vibration from train operations at locations in British Columbia, Nevada and California. Also presented were methods used to predict the groundborne vibration from trains and a review of mitigation methods that could be used to reduce the production of wayside ground vibration where necessary. The study concludes with an indication of possible distances of ground vibration impact from train operations with respect to human response and potential building damage, as well as recommendations for additional study to further define the potential impact from the DM&E Powder River Expansion Project.

Union Pacific/Southern Pacific Merger, Fairfax, VA

De Leuw, Cather & Company

Wilson Ihrig performed the environmental noise impact analysis for the proposed UPSP railroad merger in support of the project's DEIS prepared by the STB in accordance with NEPA requirements. The project involved determining the environmental impact associated with merging the activities of these two national railroads covering the western half of the United States. Wilson Ihrig's work involved extensive field reconnaissance to determine the location and quantity of noise sensitive receptors (residences, schools, hospitals) along the mainline routes of the two railroads and adjacent to their rail yards which include intermodal facilities. Field measurements were made by Wilson Ihrig to characterize train and yard noise and improve the noise model used to project off-site noise levels. Noise level predictions were made for potentially affected areas along the railroads' mainlines and adjacent to the rail yards. Noise mitigation was investigated for those areas where noise impacts were indicated by the STB noise criteria. Wilson Ihrig prepared the DEIS text and supporting documentation for the noise impact section and assisted in response to public and agency comments on the DEIS noise section.

CN Rail Environmental Assessments, Ontario, Canada

CN Rail

Development/Review of Provincial (Ontario) "Land Use Policy on Noise and Vibration Levels in New Residential Developments Adjacent to Railways". Wilson Ihrig conducted environmental noise and vibration assessments at over 20 residential areas in Toronto.

Central Puget Sound Light Rail Transit System North Link Preliminary Engineering, Seattle, WA

Puget Sound Transit Consultants

Wilson Ihrig prepared an impact assessment of groundborne vibration from the proposed Sound Transit Light Rail Transit on the University of Washington campus as part of the preliminary engineering phase of the North Link project. Work has involved predicting and mitigating low level, low frequency vibration from a planned subway route under the University of Washington campus, where there is concern that even low levels of vibration will interfere with cutting-edge, optical-based research apparatus. Wilson Ihrig has made vibration propagation and extensive ambient

vibration measurements on the campus, as well as predicted statistical train vibration levels in many laboratories.

Tektronix Campus Vibration Assessment, Portland, OR

Tri-Met Engineers

Wilson Ihrig performed an analysis of ground vibration impacts by the Tri-Met Westside Light Rail Transit on future semiconductor manufacturing and research activities at the Tektronix campus. The analysis included field measurement of trackbed vibration force density levels for the Tri-Met vehicle, and impulse response measurements to determine ground vibration propagation conditions at the Tektronix campus. The results were combined to predict ground vibration at distances up to 600 ft from the track alignment. The work included attendance of meetings between the Tri-Met Engineers and Tektronix.

New York Metropolitan Transportation Authority/Long Island Railroad - East Side Access

Parsons

Wilson Ihrig was the noise and vibration consultant on the Systems Engineering design team for the East Side Access (ESA) project which will bring the LIRR commuter trains into NYC via the Upper East Side of Manhattan and connect under Park Avenue from the north to Grand Central Terminal (GCT). Wilson Ihrig evaluated the groundborne noise and vibration impacts associated with operating commuter trains in new subway tunnels underneath the streets of Manhattan and Queens. The planned subway tunnel will pass underneath numerous residences and other noise and vibration sensitive receptors. As part of this process, Wilson Ihrig made extensive measurements of the vibration propagation characteristics of the geologic strata in Manhattan and vibration measurements to determine the response of buildings potentially affected by the project. Wilson Ihrig was responsible for developing the requirements for groundborne noise and vibration mitigation to be used on the project. Wilson Ihrig was also responsible for acoustic design issues in the LIRR facilities to be built in GCT, with station platforms to be located 140 ft below street level.

Kamloops Railroad Vibration, Canada

Canadian National Railways

Wilson Ihrig analyzed vibration data to determine the cause of excessive ground vibration adjacent to the CNR in Kamloops, Canada. Undulation in the rail due to roller straightener wheel runout was identified as the principal cause of high vibration, and replacement of the rail with lower rail height profile perturbation reduced ground vibration velocity levels about 10 to 15 dB. The problem was identified by narrow band analyses which revealed spectral peaks in wayside vibration coincident with profile wavelengths equivalent to roller wheel diameters.

California High Speed Rail Statewide Program EIR

IBI Group; P&D Consultants, Inc.; EIP Associates, CH2M Hill

Wilson Ihrig conducted the analysis for the regional, environmental noise and vibration impact studies for the California High Speed Rail Statewide Program EIR. The project consisted of five regional corridors:

Sacramento - Bakersfield (Central Valley)

Los Angeles - Bakersfield

Los Angeles - San Diego (Coastal Route)

Los Angeles - San Diego (Inland Empire) Bay Area - Merced

Wilson Ihrig conducted environmental studies based on GIS screening analyses of noise and vibration impacts in accordance with the FRA "High Speed Ground Transportation Noise and

Vibration Impact Assessment” guidelines. The analyses for the five rail corridors determined impacts to sensitive land along 700 miles of proposed High Speed Rail corridor. Specific representative cases were also analyzed in detail for all five corridors for evaluation of noise and vibration impacts to specific types of land use.

Bay Area Rapid Transit District (BART), San Francisco International Airport Extension Preliminary Engineering

Bay Area Transit Consultants

During the environmental and design phases, Wilson Ihrig made projections of the groundborne noise and vibration at residences and buildings adjacent to the BART SFO at-grade, tunnel and aerial alignment. Field measurements were conducted to measure the vibration propagation along the alignment and building vibration responses, using an instrumented hammer attached to the drilling string and inserted into a borehole. Wilson Ihrig also conducted measurements of the building vibration responses at a nearby mobile home park and at single family residences. This test entailed using a vacuum-powered hammer to impact the sidewalk or street in front of the building and measuring the vibration at the ground in front of the building and the floor within the building. The vibration measurements were compared to obtain a measure of the vibration response of the building relative to the ground vibration. During the construction phase, Wilson Ihrig assisted with vibration and noise monitoring at the historic cemetery buildings and structures, and medical and office buildings adjacent to the cut and cover tunnel. Wilson Ihrig made presentations to BART and the Construction Management team to discuss noise and vibration measurements, project limits, etc., and developed construction noise and vibration guidelines for the project, including the monitoring approach used to determine compliance with the allowable limits. Wilson Ihrig also trained personnel in the environmental compliance management team to conduct noise and vibration monitoring and then coordinated daily monitoring location assignments with the team.

Bay Area Rapid Transit District (BART), Warm Springs Extension

Parsons Brinckerhoff Quade & Douglas

As part of the Preliminary Engineering team, Wilson Ihrig was responsible for evaluation of noise and vibration impacts associated with the new 7.8 mile BART extension to Warm Springs (WSX). Projected BART train, operational noise impacts for the adjacent residential areas along the planned alignment and determined appropriate noise mitigation to achieve the project criteria. Wayside noise control included sound walls and sound absorptive treatment. Evaluated noise impacts from ancillary facilities and determined noise control for emergency ventilation fans. Based on extensive vibration measurements within the WSX corridor, projected groundborne vibration impacts to adjacent residences. Evaluated several alternative track-side vibration control measures for their effectiveness in controlling groundborne vibration and their feasibility. Recommended specific measures that could be used to achieve project vibration criteria. Evaluated cumulative noise impact associated with relocation of the freight railroad tracks within the corridor.

Silicon Valley Rapid Transit (SVRT) Line Segment, Preliminary Engineering

HNTB

Preliminary engineering design for the Line Segment of the 16.3 mile Silicon Valley Rapid Transit (SVRT) extension of the Bay Area Rapid Transit (BART) system to San Jose. This is a 9.8 mile segment of the planned extension of the SVRT Project starting at the end of the planned Warm Springs BART Extension Project. The Line Segment alignment includes portions at grade, within retained cut, and on embankment and aerial structure. Work involved prediction of ground vibration from operations using the FTA-approved model, measurement of the vibration propagation

characteristics from the proposed alignment to adjacent properties, including measurements inside existing residential buildings to determine building response, and determining the need for and type of vibration mitigation to achieve criteria. Work also included prediction of airborne noise impacts from BART train operations, and the determination of wayside noise control measures such as noise walls necessary to achieve the project noise criteria. The project also involved evaluating the potential impacts from construction noise and vibration and specifying areas where control measures may be needed.

Silicon Valley Rapid Transit (SVRT) Tunnel Segment Preliminary Engineering

Hatch Mott MacDonald/Bechtel JV

Preliminary engineering design for the Line Segment of the 16.3 mile Silicon Valley Rapid Transit (SVRT) extension of the Bay Area Rapid Transit (BART) system to San Jose. This is a 5.1 mile subway segment of the SVRT Project starting at a portal at the end of the Line Segment and extending through downtown San Jose to a portal before the yard leads and tail track. The project involved determination and evaluation of groundborne noise and vibration impacts. The work included vibration testing, modeling, and analysis. During the project, field measurements were conducted along the planned alignment to determine site-specific vibration propagation characteristics. Predictions of groundborne noise and vibration were obtained using the FTA-approved model. The model included the effects of the tunnel structure on the vibration emission characteristics from the tunnel to the surrounding soil strata. Also included in the model were the effects of different types of building structures encountered close to the alignment. Based on the model predictions, Wilson Ihrig provided recommendations for mitigation measures to achieve the project groundborne noise and vibration criteria. The project also involved evaluating the potential impacts from construction noise and vibration and specifying areas where control measures may be needed.

Los Angeles County Metropolitan Transportation Authority - Metro Red Line Project

Southern California Rapid Transit District; Engineering Management Consultant (PB/DMJM)

Wilson Ihrig has served as the acoustical consultant for both the preliminary and final design phases of this project. Wilson Ihrig tasks have included: survey of existing levels of noise and vibration; projection of noise and vibration levels at nearby buildings; preparation of systemwide criteria and specifications for the control of wayside noise and vibration from construction of the system, operation of the trains and ancillary equipment; preparation of criteria and guidelines for achieving a comfortable acoustical environment in the stations and vehicles.

Metropolitan Atlanta Rapid Transit System

Parsons Brinckerhoff-Tudor; Metropolitan Atlanta Rapid Transit Authority

Wilson Ihrig has served as the systemwide acoustical consultant for the MARTA system from the preliminary environmental review, through the system design and the initial operation of the system. Initially Wilson Ihrig was a subconsultant to PBTB (later PBT), the general engineering consultant and since 1979, the Wilson Ihrig contract has been directly with MARTA. The tasks have ranged from developing projected noise contours from the environmental review of the proposed system to performing vibration propagation measurements at locations along the proposed North Line. Work has included projection of noise and vibration levels at nearby buildings; preparation of systemwide noise and vibration criteria; measurement and analysis of operational noise and vibration; and line structure and station design reviews.

Washington Metropolitan Area Transit Authority - Metro System

De Leuw, Cather & Company

Wilson Ihrig has been providing acoustical consulting services on the design and evaluation of the WMATA Metro system since 1970. Some of the significant tasks that Wilson Ihrig has performed for WMATA include: environmental measurements of existing noise and vibration levels; development of noise and vibration criteria for community noise, vehicles, stations, and ancillary equipment; design of floating slabs; design of way-structures, aerial and subway, for control of wayside community impact; development of rail fixation performance specifications; development and revision of floating slab track support system design; car noise and sound insulation testing and design.

Mission Valley East LRT Project, San Diego*BRW, Inc.*

The project involved measurement and analysis of soil vibration propagation characteristics, empirically deriving LRV source characteristics, and formulating special trackwork recommendations to control groundborne noise and vibration. Wilson Ihrig provided extensive support regarding construction noise and vibration impacts for San Diego State University buildings. This included identification of sensitive buildings, projection of construction noise and vibration at buildings, developed measures to achieve acceptable noise and vibration levels during construction, confirming performance of construction noise barriers, and demonstrated resulting noise levels to University and MTDB officials.

San Francisco Muni Third Street Light Rail Project*WPK Third Street Consultants*

Wilson Ihrig conducted construction vibration and noise monitoring to determine compliance with construction specifications and city noise ordinance. Extensive measurements and analyses were conducted to determine the effects of soil, track structure, rail conditions, wheel conditions, dynamic building response and other factors on vibration levels from San Francisco Muni Light Rail Vehicle. Wilson Ihrig also made design recommendations for mitigating the impact of groundborne vibration to residences along the planned Third Street light rail alignment.

Valley Metro Rail Central Phoenix/East Valley Light Rail*PBS&J/WE Joint Venture*

Wilson Ihrig work has involved Construction Administration, observations, criteria formulation, meetings, and noise and vibration analysis for construction phase. Wilson Ihrig is also conducting remote monitoring of vibration during construction.

Superconducting Super Collider Railroad Vibration Exposure*Lawrence Berkeley National Laboratory*

Wilson Ihrig work involved measuring ground vibration produced by railroad trains passing over the proposed alignment of the Superconducting Super Collider in the State of Arizona. This work involved identification of low frequency ground motion caused by the moving static load of the train.

Palo Alto Medical Foundation Railroad Ground Vibration*Taylor Engineering*

Acoustical and vibration consultation for expansion of Palo Alto Medical Foundation's proposed building along a railroad track. Wilson Ihrig measured and evaluated ground vibration from trains at

proposed site for the research facility and analyzed the design to minimize structural vibration transmission into medical building.

Ashley Creek US93 Widening, Kalispell, MT

Montana Department of Transportation / Big Sky Acoustics

Evaluation of potential adverse impact at the site of KGEZ radio station due to vibration generated by construction activities during the widening of US93 near Kalispell, Montana. Measurement of vibration-generating characteristics of most construction equipment to be used and of transfer functions between the road and spaces housing sensitive equipment at the radio station. Continuous vibration monitoring during key construction periods.

Transit Projects Involving Environmental Impact Analysis

Santa Clara County Transit District - Tasman Corridor Light Rail Transit FEIR/FEIS

Michael Brandman Associates

Wilson Ihrig services on the Tasman Corridor Light Rail Project have included measurement and analysis of environmental noise and vibration impacts, characterization of noise and vibration from the existing light rail system in San Jose, determining vibration propagation characteristics of the soil, and developing noise and vibration control measures. The work was incorporated into the FEIR/FEIS.

Portland Tri-met Hillsboro Extensions EIS

Parametrix Inc.

Wilson Ihrig performed environmental noise and vibration impact analyses for the Hillsboro extension between S.W. 185th Ave and Hillsboro. This work involved a complete alternatives analysis with respect to noise and vibration impact, site noise and vibration surveys, reviews, and recommendations for noise and vibration control. The work was incorporated into the DEIS and FEIS for the project.

Bay Area Rapid Transit District (BART), Pittsburg/Antioch Corridor DEIR, FEIR

Bechtel Civil, Inc.

Evaluation of the potential impact from noise and vibration for 12 alternatives proposed for the 18 mile BART Pittsburg/Antioch Corridor. The following issues were addressed: noise and vibration impact of system operations and project construction, BART and LRT ancillary equipment, and highway and road traffic associated with the project.

Bay Area Rapid Transit District (BART), Dublin/Pleasanton Extension DEIR, FEIR

Woodward-Clyde Consultants (now URS)

Evaluation of the impact due to noise and vibration for various alternatives for the proposed 13.7 mile BART Dublin/Pleasanton Extension, including noise and vibration impacts of project construction, BART vehicle operation, BART ancillary equipment and highway relocation associated with the project.

Bay Area Rapid Transit District (BART), Warm Springs Extension DEIR, FEIR*DKS Associates*

Evaluation of the environmental impacts due to noise and vibration for the 7.8 mile Warm Springs Extension of the BART Fremont line. Eight alternatives and several design options for a BART line and three non-BART alternatives were analyzed.

Research Projects**Development of Procedures for the Prediction and Control of Groundborne Noise and Vibration from Rail Transit Systems***U.S. Department of Transportation*

For this project, Wilson Ihrig studied methods for the prediction and control of groundborne noise and vibration. Groundborne noise and vibration can be a major source of environmental impact from rail transit systems in both commercial and residential areas. The goals of this project were to: (1) develop procedures to more accurately predict groundborne vibration; and (2) develop optimized methods for controlling groundborne noise and vibration. The study has involved a detailed review of the state-of-the-art, both in the U.S. and abroad; development of mathematical models characterizing transit car trucks, vibration propagation in soil, and soil/structure interaction; development of field procedures for characterizing the dynamic properties of transit car trucks; measurements of groundborne vibration at three transit systems and at the Transportation Test Center in Pueblo, Colorado; and the development of a new prediction procedure for groundborne vibration.

Using the prediction procedure for future transit projects will allow much more accurate pinpointing of the areas where vibration control measures are required. In many cases, it should be possible to reduce the lengths of special vibration control measures such as floating slabs by a significant amount, simply because of more accurate predictions. As part of this project, the prediction procedure was applied to the BRRT B-Route section extending from Reistertown Plaza to the Beltway. The prediction procedure has since been applied to several new transit systems.

Handbook of Urban Rail Noise and Vibration Control*U.S. Department of Transportation*

The Handbook of Urban Rail Noise and Vibration Control is an 800-page document covering all aspects of the prediction and control of urban rail noise and vibration. The entire handbook was researched and authored by Wilson Ihrig, drawing on the unparalleled experience of Wilson Ihrig in rail transit noise and vibration control. Much of the material included in the handbook was developed through Wilson Ihrig's numerous transit projects and had not been previously published. The document has been widely distributed since its publication in February 1982. It is generally acknowledged as the most authoritative and comprehensive source available on the topic of rail transit noise and vibration control and has been used by many different transit systems and consultants.

Topics covered in the handbook include: Criteria for acceptable levels of noise and vibration exposure of patrons, the community, and transit employees; Overview of the characteristics of urban rail noise and vibration; Detailed information on the procedures and equipment that should be used to measure rail transit noise and vibration; Control of airborne noise from different types of surface track; Prediction and control of groundborne noise and vibration; Acoustical design of transit

stations; Control of fan and vent shaft and other ancillary equipment noise; Control of pressure transients.

Research Study for TCRP Project C-3 - Wheel/Rail Noise Mitigation

Transit Cooperative Research Program, Transportation Research Board, Washington, D.C.

Wilson Ihrig performed a research study for the Transit Cooperative Research Program (TCRP) investigating wheel/rail noise generation and control for rail transit systems. The goal of the study was to identify practical and cost effective noise control measures that can be applied systemwide by a wide spectrum of transit authorities, and develop procedures for selecting and implementing these technologies. To accomplish this goal, Wilson Ihrig determined, by compilation, analysis and evaluation of the available information, the state-of-the-art regarding practical procedures for reducing wheel/rail noise.

The project involved two phases: (1) determination of the practical state-of-the-art in wheel/rail noise control by an extensive literature review and contact with cognizant individuals in the North American and international transit industry who have conducted research in the field and who have direct experience with tests of methods and procedures, and (2) development of a wheel/rail noise control manual with an effective set of noise control procedures that can be used by the transit industry. The "Wheel/Rail Noise Control Manual", TCRP Report 23, and accompanying software were published in June 1997. The work for C3A involved testing and demonstration of wheel and rail vibration absorbers at participating transit systems. This involved coordination with the transit agencies to install and measure the effect of mitigation measures.



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JAMES T. NELSON, Ph.D., P.E.

Principal / Vice President

Education: Ph.D. (1988) in Engineering Science, Mechanical Engineering,
M.S. (1982), B.A. (1972) in Physics and Mathematics,
University of California, Berkeley
Professional Mechanical Engineer, California, License No. 19425

Affiliations: Member, Transportation Research Board,
Committee A1F04 on Transportation Related Noise and Vibration
Committee A2M04 on Rail Transit Design
Chairman of TRB Subcommittee on Rail Transportation Noise and Vibration
Member, National Council of Acoustical Consultants
Member, Acoustical Society of America
Member, American Society of Mechanical Engineers
Member, American Institute of Physics
Member, Institute of Noise Control Engineering

Awards: Pike Johnson Award for Best Paper, Transportation Research Board
Best Paper, Transportation Research Board Committee A1F04

Employment History: Wilson, Ihrig & Associates, Inc. (1973 to Present)

Qualifications: Dr. Nelson has been involved in every aspect of rail transportation noise and vibration control since joining WIA in 1973. His project experience includes ground vibration prediction, ground vibration propagation measurement, modeling subway structure vibration radiation, numerical analysis of track and rail vehicle dynamics, measurement of wheel vibration and flange forces, subway air pressure transient prediction and mitigation, direct fixation fastener specification, measurement of long distance sound propagation conditions, seismic ground disturbance surveys and preparation of noise elements for environmental impact studies. He was instrumental in developing and refining groundborne prediction procedures.

Dr. Nelson is a recipient of the Pike Johnson Award from the Transportation Research Board, and has presented technical papers worldwide.

Project Experience

Transit Cooperative Research Program, Project C3 (1994-1997): Principal Investigator for preparation of the "Wheel/Rail Noise Control Manual", TCRP Report 23, Transportation Research Board. This work involved summarizing the state of the art in wheel/rail rolling and curving noise.

Transit Cooperative Research Program, Project C3A (1997-2000): Principal Investigator for testing and demonstration of wheel and rail vibration absorbers at participating transit systems.

Long Island Railroad ACL Viaduct, New York (2004): Project director for noise and vibration assessment and development of specifications for new track for the ACL Viaduct.

Central Puget Sound LRT System Facilities Design (2004): Ground vibration impact assessment of proposed Sound Transit LRV on University of Washington, including field testing and theoretical modeling of ground vibration propagation.

Long Island Railroad East Side Access Project, New York (2001): Used a seismic reflectivity model to predict the vibration responses of schist granite and overlying soil layer.

Queensland Rail, Australia (2000-2001): Review of wheel/rail noise control procedures employed by the Queensland Rail. Principal issues concerned wheel squeal, lubrication techniques, maintenance issues, rail fastener stiffness, contact conditions, geometrics, track gauge, wheel and rail profiles, humidity, and other factors.

Union Pacific/Southern Pacific Merger Environmental Assessment (1996-1997): Assessed the noise impact related to merger of the Union Pacific and Southern Pacific railroads.

Los Angeles County Metropolitan Transportation Authority (1999): Performance of environmental noise and vibration measurements, measurement and prediction of vibration transfer functions from tunnel invert to multi-story structures, review of trackwork specifications for floating slab vibration isolation systems, measurement of floating slab responses, and prediction and control of subway air pressure transients. Development of specifications for a soft track vibration isolation system.

San Francisco Bay Area Rapid Transit System (1973-2005): Measurement of subway pressure transients, wheel shock, vibration and strain, and lateral flange forces, review of direct fixation track fastener, running rail, floating and ballast mat specifications for Dublin-Pleasanton, Pittsburg-Antioch, and Colma Extensions, advisor regarding BART A&B Car Rehab Program.

Washington Metropolitan Area Transit Authority (1973-2004): Performance of environmental noise and vibration surveys, predictions of groundborne noise and vibration, measurement of transit vehicle noise and ground vibration, prediction and control of subway air pressure transient magnitudes and rates of change, tunnel portal design, measurement of aerial structure noise for various direct fixation fasteners, development of a high frequency direct fixation fastener vibration isolation testing apparatus and procedure, qualification testing of direct fixation fasteners.

Metropolitan Atlanta Rapid Transit Authority (1975-1995): Prediction and control of subway air pressure transient magnitudes, prediction of vibration impacts at the Northside Hospital, prediction of pedestrian induced bridge vibration.

Portland Tri-Met Westside Extension, Portland, Oregon (1989-1999): Developed a vibration impact element for environmental documents, measuring wayside noise and vibration, analyzing embedded track designs, including finite element analysis, reviewing rail corrugation mitigation methods, recommending noise and vibration mitigation provisions, and attending public meetings. Recent work includes detailed characterization of ground vibration forces for embedded and ballasted track.

San Francisco Municipal Railway (1991-1992): Assisted MUNI engineers with noise control provisions for San Francisco Cable Car, including noise reduction for depression beams.

Resilient Rail Fastener Study for Elevated Structure Noise Control, New York City Transit Authority, U.S. Department of Transportation (1984-1988): Extensive testing in New York to determine the effectiveness of resilient rail fasteners in reducing elevated structure noise. Work included recommending stiffness characteristics, assistance in developing a specification for procurement of rail fasteners, field testing, and laboratory testing that included development of a high frequency test apparatus and procedure for evaluating fastener isolation characteristics.

Prediction Procedures for Groundborne Noise and Vibration from Rapid Transit Systems, U.S. Department of Transportation (1980-1984): Developed a comprehensive prediction procedure for groundborne noise and vibration from rail transit systems. Work included a review of the state-of-the-art, preparation of an annotated bibliography, theoretical and experimental studies, and field testing.

Subway Structure Vibration Radiation (1975-1986): Developed analytical model for far field seismic responses to point loads directed against the inner surface of a lined hollow tube in an infinite elastic medium. The model was applied to prediction of ground vibration from subway tunnels, and used for determining vibration coupling losses as a function of tunnel wall thickness. The model was implemented in Fortran at Wilson, Ihrig & Associates, Inc. for the U.S. DOT as part of the development of prediction procedures for rail transit systems.

Development of Transfer Function Testing of Soils (1980-1984): Transfer function procedures were developed for measuring dynamic Green's functions for soils. These procedures include a load cell and multiple geophone receivers at various distances. The data allow direct prediction of vibration responses in soils due to point sources, and, using numerical integration procedures, the data are used for prediction of the response due to line sources such as trains. The procedure is applied to surface as well as downhole sources. This work was performed at Wilson, Ihrig & Associates, Inc., for the US DOT.

Transportation Test Center, Pueblo, CO (1983-1990): Ground vibration propagation testing at the transit test loop, measurement of mechanical impedance of the MARTA C-Car prototype, measurement of ground vibration and trackbed force spectra for the MARTA C-Car prototype, Portland Tri-Met prototype, and the NFTA prototype vehicles.

Toronto Transit Commission (1975): Assisted in reviewing ground vibration data for the purpose of identifying reasons for efficient long distance ground vibration propagation in response to complaints at ranges up to 800 feet from subways. The work included a limited theoretical analysis of tunnel vibration radiation and propagation.

Baltimore MTA (1985-1988): Vibration propagation testing for predicting surgical theater vibration magnitudes, measurement of groundborne noise and vibration from BRRT vehicles.

Subway Air Pressure Transient Prediction and Control (1975-1986): A procedure was developed for predicting subway air pressure transients, using the low frequency acoustic response of the tunnel, friction factors for the tunnel wall and train sides, conservation laws for air flow about the train, and test data collected at various systems. The tunnel is modeled as an acoustic delay line with reflections, and includes effects due to cross passages and flared transitions. The model has been used for predicting pressure transients at the Washington Metropolitan Area Transit Authority, the Metropolitan Atlanta Rapid Transit Authority, the Baltimore MTA, and at the San Francisco Bay Area Rapid Transit Systems. The method can be used for assessing the influence of cross-passages and flared entrance transitions for controlling pressure magnitude and rate of rise.

Tunnel Pressure Transient Measurements (1974-1980): Tunnel wall and vehicle interior pressure during motion of rail transit trains in subways was measured at the San Francisco Bay Area Transit System. These data were used for validating a computer model developed by Associated Engineers, Inc. Custom instrumentation was designed and developed. Later measurements were performed at the Washington Metropolitan Area Transit Authority to determine the cause of intertunnel CMU wall and cross-passage door failures. Later, measurements were performed at the San Francisco Bay Area Rapid Transit System's transbay tube to determine the cause of death due to smoke inhalation during a fire.

Kamloops Railroad Vibration Study (1988): Performed analysis and review of vibration data to determine the cause of excessive ground vibration adjacent to the Canadian National Railway in Kamloops, Canada. Waviness in the rail due to roller straightener wheel runout was identified as the principal cause of high vibration, and replacement of the rail with lower rail height profile perturbation reduced ground vibration velocity levels about 10 to 15 dB. The problem was identified by narrow band analyses which revealed spectral peaks in wayside vibration coincident with profile wavelengths equivalent to roller wheel diameters. This work was performed at Wilson, Ihrig & Associates, Inc., for the Canadian National Railway system.

Centex Cement, Railroad Vibration Study, Beale AFB, Marysville, CA (1992): Prediction of vibration due to aggregate trains at the Beale AFB metrology and calibration laboratory. The work included measurement of long range ground vibration from freight trains.



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DEREK L. WATRY

Associate Principal / Chief Executive Officer

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National Science Foundation Fellowship Recipient (1988-1991)
B.S. (1988) in Mechanical Engineering, University of California at San Diego
(*Summa Cum Laude*)
M.B.A. (2000), Saint Mary's College of California (*Summa Cum Laude*)

Affiliations: Member, Acoustical Society of America
Member, National Council of Acoustical Consultants

Employment History: Wilson, Ihrig & Associates, Inc. (1992 to present)
University of California, Berkeley (1988 - 1992)

Qualifications: Since 1992, Mr. Watry has specialized in the control of noise and vibration from rail transit systems. He has been involved in projects concerning rail transit systems in the San Francisco Bay Area, Los Angeles, Washington, D.C., and Portland, Oregon. His project experience has ranged from the initial environmental phase through the final design of trackwork, and noise and vibration field and/or design work. He has made many measurements of various types of noise and vibration and also has experience measuring the vibration propagation characteristics of soils.

Project Experience

Hong Kong Mass Transit Railway (1997-2002): Assisted with extensive measurement program of noise from rail system on the Tsing Ma Bridge.

San Francisco Municipal Railway – New Central Subway Project (2003): Oversaw and participated in work to predict future groundborne noise and vibration levels from new subway system. Project involved developing innovative measurement technique to obtain subterranean vibration data using existing de-watering wells. Groundborne noise and vibration levels were predicted in nearby residences.

San Francisco Municipal Railway - Third Street Light Rail Project (2001): Calculated future vibration levels along new rail alignment, accounting for MUNI vehicle characteristics and speed, regional soil properties, and structural vibration amplification. Reviewed vibration criteria used for Environmental Impact Statement and analysis supporting EIS findings.

San Francisco Municipal Railway B N-Line Rail Replacement Conceptual Engineering Report (1998): Measured and assessed vibration in areas with reported high vibration levels. Worked with Parsons-Brinckerhoff track designers to determine replacement track designs and maintenance practices that will reduce future vibration levels. Made controlled measurements to assess the performance of a commercially available vibration isolation system, DS-ISO-RAIL.

San Francisco Municipal Railway B Noise and Vibration Measurements for Breda C.F. (1998): Measured wayside vibration levels to determine effects of modified Breda LRV2 primary suspension on ground vibration. Extensive testing program controlled for vehicle speed and loading, track fixation, and underlying soil conditions. Wayside noise measurements and analysis assessed effectiveness of modified propulsion system software at reducing tonal noise.

San Francisco Municipal Railway B LRV2 Noise Study (1997): Measured sound intensity from all propulsion system components to located primary source of wayside tonal noise.

San Francisco Municipal Railway B LRV2 Vibration Study (1997): Measured and assessed vibration levels around the MUNI systems. Empirically derived both Breda LRV2 and Boeing SLRV train force density levels and conducted modal analysis testing of vehicle truck dynamics. Work led to redesign of vehicle's primary suspension to reduce vibration. Conducted measurements to determine wood-frame building structural amplification.

Santa Clara VTA Vasona Corridor LRT Vibration Study (2000-2002): Final design vibration predictions and mitigation recommendations. Predictions accounted for VTA train, local soil properties, and specific building types along the corridor. Vibration mitigation requirements led to the design, development and testing of track resiliently supported by shredded, recycled tires.

San Francisco Bay Area Rapid Transit - San Francisco Powell Street Station (1999): Empirically characterized station acoustical environment and recommended number of acoustically absorbing panels that could be removed without degrading PA system performance.

Caltrain CEMOF (Lenzen Yard) Project (2002): Measured the existing ambient noise, characterized the ambient noise sources, predicted and assessed sound levels from future yard activity for several alternative wall designs, and presented the findings to an Oversight Committee.

Central Puget Sound LRT System Facilities Design (2000-2005): Predicted and mitigated low level, low frequency vibration from a planned subway route under the University of Washington campus, including vibration propagation and ambient vibration measurements.

Los Angeles County Metropolitan Transportation Authority B Metro Red Line Project (1993-1995): Identified noise and vibration sensitive buildings and measured ambient noise and vibration for proposed alignment alternatives. Conducted analysis to determine groundborne noise and vibration levels due to transit trains. Empirically determined vehicle force density level. Formulated special trackwork recommendations to control groundborne noise and vibration.

Wilson, Ihrig & Associates B Research Project (1997): Measured and assessed the effectiveness of Clouth AVibrex 1000" Ballast Mat in reducing groundborne vibration.

San Francisco Bay Area Rapid Transit Extensions Program (1992-1998): Identified noise and vibration sensitive buildings and measured ambient noise and vibration for proposed train alignments.

São Paulo Metrô B Extensão da Linha Paulista (1997-1998): Coordinated and conducted field measurements and analysis of soil vibration propagation characteristics for metro rail extension.

FIRM PROFILE

Client service – the ability to meet the needs and exceed the expectations of our clients with respect to performance, budget, and schedule – is one of the reasons that Shannon & Wilson has been in business for over 50 years.

Shannon & Wilson was established in 1954. We are an employee-owned environmental and geotechnical and natural resource consulting firm consisting of 220 scientists, engineers and support personnel in our offices in Seattle and Richland, Washington; Anchorage and Fairbanks, Alaska; Portland, Oregon; Saint Louis, Missouri; Denver, Colorado, and Jacksonville, Florida.

Our Natural Resources Group specializes in wetland studies, fisheries investigations, stream restoration, threatened and endangered species studies, wildlife studies, habitat evaluation, environmental documentation, and permitting. Our natural resources staff works with our engineers and hydrogeologists to address environmental issues that can impact projects. Our relationships with agencies help us acquire permits for projects that may impact wetlands, streams, threatened and endangered species, or sensitive areas in a timely and cost-effective manner.

Our experience is demonstrated through our success on hundreds of natural resource projects for public and private clients.

NATURAL RESOURCE SERVICES

Shannon & Wilson provides unique solutions for each specific project and individualized, client-focused service. We focus on the critical elements of a project to assure that it is accomplished on schedule and budget and to the satisfaction of all interested parties.

Our range of natural resources services include:

- Permitting/Regulatory Compliance
- Wetlands
- Plant and Animal Surveys
- Fisheries/Stream Studies
- Habitat Surveys and Restoration
- Water Quality Analysis
- Stormwater/Watershed Management
- Biological Assessments
- SEPA/NEPA studies

SAINT LOUIS OFFICE

Since its founding in 1954, the firm has successfully completed over 20,000 projects, located in all 50 states and throughout the world. Approximately 3,000 of these projects have been completed by our Eastern Region headquarters in Saint Louis.

Shannon & Wilson offers a complete staff of professional geotechnical engineers and geologists, technicians, and support personnel. Our personnel are adept at developing project scope and planning exploration programs, directing field drilling and sampling operations, completing laboratory testing, and performing engineering analysis, all of which result in practical design and construction recommendations.

In addition to our design capabilities, Shannon & Wilson excels in construction observation and management, working on site with contractors and subcontractors and helping them identify and resolve construction problems. This has been a key to our success in engineering cost-effective, constructible designs. Often we act as the owner's design and site representative, reviewing plans and specifications, overseeing construction, approving invoices and quantities, reviewing change orders, and providing field direction.

MURRAY L. MEIERHOFF, CHMM

Vice President

Office Manager and Environmental Group Manager

EDUCATIONM.A., Aquatic Biology, University of
Missouri - Columbia, 1977B.A., Zoology, University of Missouri
- Columbia, 1974**REGISTRATION**Master Certified Hazardous
Materials Manager, Institute of
Hazardous Materials Manage-
ment, 1993HAZWOPER Supervisor Training,
1987Corps Wetland Delineation, Institute
for Wetland & Environmental
Education & Research**PROFESSIONAL
ASSOCIATIONS**Adjunct Professor at Maryville
University, 1999 - 2003Gateway Society of Hazardous
Materials Managers
Water Environmental Federation
Society of Wetland Scientists**PROFESSIONAL SUMMARY**

Mr. Meierhoff has extensive academic background in aquatic ecology, ichthyology, invertebrate zoology, and aquatic botany. He has 20 years experience dealing with issues in aquatic biology, ecology, and limnology. He has conducted more than 30 biological surveys of lakes and rivers in Illinois, Missouri, Pennsylvania, Kansas, Mississippi, Alaska, and Iowa. These surveys have included assessments of water and sediment chemistry; nutrient balances; and populations of plankton, benthos, fish, and aquatic macrophytes. He has conducted work in support of site-specific water quality variances for clients with problem discharges of heated water, fluoride, chloride, and ammonia-nitrogen. He has also conducted ecological risk assessments in support of the Iowa Department of Environmental Quality efforts to characterize the hazards associated with the (then) top-priority CERCLA site in the state of Iowa.

RELEVANT EXPERIENCE

- Project Manager for studies was to characterize water-quality-related impacts to the fish and benthic macroinvertebrates populations in Saline Creek in northern Jefferson County, Missouri from wastewater treatment plant discharges on Saline Creek. Biological monitoring was conducted at six locations chosen to bracket the multiple WWTP discharges on the stream. Sampling locations were carefully selected to be comparable in habitat diversity. Our stream survey also included chemical sampling conducted around-the-clock, to characterize the diurnal dissolved oxygen and nutrient pulse in the stream.
 - Project Manager for a water quality / aquatic biology investigation of an urban stream watershed for the City of Sunset Hills in Missouri. Impacts to receiving stream water quality and aquatic biology from non-point runoff from salt-treated streets in the winter were an issue in the development of a new city maintenance / storage facility. We collected snowmelt runoff samples to document the impacts of the street runoff before and after the completion of a new salt storage facility. Our testimony at a public hearing, and final report allowed the proposed developments to proceed as planned.
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MURRAY L. MEIERHOFF, CHMM

- Project manager for a habitat assessment to reduce fish attraction at an eastern Missouri casino complex. The river hydrology at the casino resulted in an accumulation of large woody debris under the boat, which attracted numerous fish species including shovelnose sturgeon. We developed a plan to enable the casino to minimize this accumulation, and worked with them to remove the existing debris with minimal impacts to the existing fish.
 - Principal-in-Charge and Project Biologist for the Piasa Creek Watershed Restoration Project in Madison, Macoupin, and Jersey Counties, Illinois. The project area is a 78,000-acre watershed along the Mississippi River. Shannon & Wilson surveyed and recorded habitat and ecosystems within the watershed and identified areas for restoration. Both structural and non-structural measures were evaluated for reduction of sediment load.
 - Field Team Leader for the collection of approximately 200 individual samples of water, soil, sediment, benthic macroinvertebrates, and fish from the island of Amchitka (in the Aleutian Islands) for the Alaska COE in September 1998. This project was an ecological risk assessment and study of water and sediment quality, benthic macroinvertebrates, and fish in seven streams on the eastern quarter of the island. These seven streams included five potentially impacted streams, and two reference (or control) streams. This portion of the island had been impacted by drilling programs and underground nuclear detonations conducted by the U.S. Atomic Energy Commission from 1965 to 1972. Potential contaminants included heavy metals from drilling additives, hydrocarbons from the drilling process, and radionuclides from the nuclear events. Since the entire island is uninhabited, our contract included full-scale staffing and provisioning of an independent field camp on the island, and complex health & safety issues due to the presence of unexploded WWII ordnance on the island.
 - Project Manager for three aquatic biology / water quality investigations conducted for a major Missouri mining company. These investigations documented the impacts (if any) to the receiving streams from discharges associated with the mining processes. Benthic macroinvertebrates in the streams were collected and identified to determine the levels of impact to the receiving streams. Results from these investigations identified both mine-related and non-mine-related water quality impacts to the receiving streams. Our
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conclusions allowed the company to alter their processes to reduce the observed impacts, and to discuss management and discharge issues with other property owners in the watersheds.

- Project Manager for biological stream monitoring following an inadvertent release of rock fines into a pristine Ozark stream in southeast Missouri. This work successfully supported our client's position that impacts to the aquatic ecology of the receiving stream from the release were limited in duration and extent.
 - Conducted site investigations in Alaska for hydrocarbon contamination at several locations on the Elliot Highway northwest from Fairbanks, AK. This effort included negotiations with the state regulatory agency regarding acceptable remedial measures for contaminated soil and groundwater in a permafrost area. Biological monitoring was conducted to estimate the downstream extent of impacts from spills of diesel fuel.
 - Project Manager for biological and chemical stream monitoring at a coal preparation facility in south central Illinois, including characterizing the benthic macroinvertebrate and fish communities in a receiving stream. This monitoring program successfully supported a site-specific water quality variance for elevated concentrations of fluoride in the discharge. Our client realized savings of more than \$500,000 by acquiring the variance rather than constructing a treatment facility to remove fluoride.
 - Prepared water quality and aquatic ecology sections of an environmental impact statement for the Tennessee Department of Transportation for a proposed port and industrial park where at least 12 threatened or endangered species were found; and for the Pennsylvania Department of Transportation for a proposed realignment and replacement bridge in a historically sensitive area of Bucks County.
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MURRAY L. MEIERHOFF, CHMM

- Collected, identified, enumerated, and tabulated the phytoplankton, periphyton, rooted macrophytes, zooplankton, macrobenthos, fish, and other aquatic vertebrates found in the Salt River in northeastern Missouri for the University of Missouri at Columbia under contract to the U.S. Army Engineer District, Saint Louis.
 - Initiated a fathead minnow bioassay program designed to test chemicals and mixtures of special interest to Iowa water quality.
 - Reviewed and revised Iowa's water quality standards as a member of the Iowa Water Quality Review Subcommittee. This review is mandated by the USEPA for every state every third year.
 - Planned and conducted a survey of the aquatic ecology of Cedar River in northeastern Iowa, downstream from the state's top-priority Superfund site. The survey included analyses of the water, sediment, macroinvertebrates, and fish of the Cedar River over a 20-mile reach of the river. The Superfund site included leachate releases containing nitro-anilines, organo-arsenates, and other heavy metals from a veterinary pharmaceutical producer.
 - Project Manager for biological and chemical monitoring of an 8-acre lake near Chester, IL, following impacts to the lake from upstream agricultural applications of organo-phosphate pesticides. The non-target organism impact included a total fish kill in the lake, with the loss of a trophy bluegill fishery.
 - Project Manager for biological and chemical monitoring of a one-acre lake in Saint Charles County, MO, following impacts to the lake from upstream disposal of pentachlorophenol. Impacts to the lake included a partial fish kill, and loss of fishery resource due to continued bio-accumulation of pentachlorophenol from the soils and sediments.
 - Master's Thesis in Aquatic Biology entitled, "Seasonal Fluctuations in the Benthic and Planktonic Communities of the Salt River, Missouri."
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Womack & Associates, Inc.
Geotechnical Engineering and Geology

WOMACK & ASSOCIATES, INC. STATEMENT OF QUALIFICATIONS

1.0 BACKGROUND AND EXPERIENCE

Ray Womack established a consulting practice in Billings in 1982 which grew into Womack & Associates, Inc. (WAI). The firm now has offices in Billings and Bozeman, and specializes in geotechnical engineering, engineering geology, and geomorphology. We work in a large geographical area, routinely performing projects throughout the western United States and abroad. Our work has consisted of a mix of commercial, residential, and industrial projects. We have provided geotechnical consulting services for many hotels, schools, roads, and high-end residences. Our industrial experience has been gained from work on large mine structures and cleanups at contaminated industrial sites, including many CERCLA (Superfund) projects. We have particular expertise in evaluation of slope stability and seismicity.

At present the staff consists of two geotechnical engineers and a drafter. Although we are a small firm, we have been involved in many large, complex projects, and we believe our background and experience prepare us very well to address the problems that occur at complex sites. Resumes for our professional staff are available upon request, and brief discussions of their experience follow.

Ray Womack, P.E., P.G., President and Principal Engineer, has 30 years experience as a geotechnical engineer and geoscientist. Mr. Womack holds degrees from Virginia Polytechnic Institute (BS-geophysics and geology) and Colorado State University (MS-geology). He is registered as a Professional Engineer in six states and as a Professional Geologist. He is a member of the Association of Engineering Geologists and the American Society of Civil Engineers. Mr. Womack has written many papers and presented technical courses dealing with landslides, risk assessment, and river mechanics.

Mr. Womack has conducted foundation investigations, stability analyses, and geologic hazards evaluations in 17 states, including most of the Rocky Mountain states. He has worked extensively in southern and eastern Africa, as well as Guatemala, Haiti, Kazakhstan and the Republic of Georgia. He has prepared foundation reports for hundreds of structures, including mine facilities, railroads, power plants, hotels, schools, and roads. He has been responsible for investigation of many landslides and other difficult sites. He has led geotechnical efforts at numerous environmental projects, including Asarco CERCLA projects in Tacoma, Washington; East Helena, Montana; Murray, Utah, and elsewhere.

David Cameron, P.E., has 21 years professional experience, including 14 years as a geotechnical engineer. He is a graduate of the University of Colorado at Denver (B.S., Civil

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Engineering). Mr. Cameron works under contract to WAI in Bozeman. He has been responsible for slope stability issues along the proposed 119-mile Tongue River Railroad and the Central Montana Railway. He prepared cover and liner designs for the hazwaste landfill at the Asarco Tacoma Smelter. Major mining projects have included the Cyprus Miami and Magma Pinto Valley copper projects in Arizona, the Chino and Ortiz projects in New Mexico, the Bullfrog Mine in Nevada, Grouse Creek and Black Pine mines in Idaho, Rock Creek and Zortman in Montana, and Freeport Indonesia in Irian Jaya.

2.0 GEOTECHNICAL ENGINEERING

WAI provides site investigation and design services for earthworks, dams, roads, railways, and other structures. Many of our projects have involved landslides and other slope stability problems. Monitoring instruments, including extensometers, tiltmeters, and slope indicators have frequently been installed. In seismically active areas, we have analyzed seismicity and liquefaction potential for sensitive structures. A short list of selected projects follows:

- Tongue River Railroad geotechnical investigation and design
- Beartooth Highway Emergency Repair
- BNSF Yellowstone River slope stability mitigation
- Central Montana Railway landslide mitigation
- Asarco Ray copper electrowinning facility settlement, Arizona
- Asarco Mission tailings impoundments, Arizona
- Asarco lead battery recycling plant, North Carolina
- Hazwaste landfill, roads, landslide mitigation, seismicity, Tacoma Smelter
- PPL Montana impoundments, Colstrip
- Bearpaw Reservoir, Montana DNRC
- BLM dams, near Zortman
- Stillwater Mine East Boulder Access Road, near Big Timber
- Western Energy settlement investigations, Colstrip
- Dinosaur National Monument landslide, Colorado
- Buffalo Jump landslide
- Cathedral Mountain landslide litigation
- Big Sky landslides
- Schools at Malta, Glasgow, Drummond, and Billings
- Jackson and Wilson Schools, Wyoming
- Teton Science School, Jackson, Wyoming
- Beaver Creek and Gros Ventre housing facilities, Grand Teton National Park

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Geotechnical Engineering and Geology

- JY and Moose Visitor Centers, Grand Teton National Park
- Four Seasons Resort, Teton Village, Wyoming
- Renaissance Hotel, Teton Village, Wyoming
- Teton Lodge, Teton Village, Wyoming
- Teton Club, Teton Village, Wyoming
- Red Lodge Mountain slope stability and lined water storage
- Navajo Reservation bridges, New Mexico and Arizona
- Moonlight Basin, Big Sky

3.0 ENVIRONMENTAL PROJECTS

WAI has provided geotechnical and geological services on major environmental cleanups, including CERCLA sites in several states. These sites are large industrial facilities with numerous problems and complex geotechnical requirements. Several of the projects have been ongoing for more than nine years. The Asarco Tacoma Smelter CERCLA site has been particularly challenging, involving geotechnical design of a hazardous waste landfill on a sensitive site adjacent to Puget Sound. The site is seismically active and subject to serious potential settlement, liquefaction, and slope stability problems. Our experience and background on environmental projects includes the following:

- Hazardous waste landfill design
- Seismic and liquefaction analysis
- Slope stability
- Foundation design
- Geosynthetic covers and liners
- Site investigations

WAI has worked on the following environmental projects:

- Asarco Tacoma Smelter CERCLA site, Washington
- Asarco Murray Smelter CERCLA site, Utah
- Asarco East Helena Smelter CERCLA site
- Asarco Omaha Smelter CERCLA site, Nebraska
- Asarco Yak Tunnel CERCLA site, Leadville, Colorado
- Asarco Beckemeyer CERCLA site, Illinois
- Asarco Henrietta CERCLA site, Oklahoma
- Pacific Recycling CECRA sites, Billings
- Asarco lead battery recycling plant, North Carolina

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Geotechnical Engineering and Geology

- Major refinery gasoline plume interception, Billings
- Pennsylvania Power and Light (PPL) interception drains, Colstrip, Montana
- PPL fly ash and process water impoundments, Colstrip
- Rosebud Power fly ash pond, Colstrip
- Columbia Falls aluminum landfill cover
- Getter Trucking facilities, Wyoming, North Dakota, Montana
- Lander and Winkelman Dome oil fields, Wyoming
- Hardscrabble oil field, North Dakota
- Four Eyes oil field, Montana
- Brush Lake oil field, Montana
- Injection wells, North Dakota and Montana

4.0 ACTIVE MINES

Ray Womack has worked on coal and hardrock projects in Montana since 1978. WAI has been involved in design, operation, and closure of many major projects in Montana and the western U.S. Our background includes the following areas of work:

- Slope stability--heap leach pads, waste repositories, landslides
- Reclamation--covers, liners, water treatment facilities
- Dams
- Major diversions
- Foundations for surface facilities

4.1 HARDROCK MINES

Hardrock mining projects include the following:

- Pegasus Zortman
- Stillwater platinum
- Asarco Rock Creek
- Noranda Crown Butte
- Phelps Dodge/Canyon Resources MacDonald and Sevenup Pete
- CR Kendall
- Basin Creek
- Hecla Grouse Creek, Idaho
- Stibnite, Idaho
- Echo Bay Republic, Washington

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- CR Briggs, California
- Sonora Mining, California
- Asarco Ray and Mission, Arizona
- Asarco Coy, New Market, and Young zinc mines, Tennessee
- Cambior Carlota, Arizona
- Bolnisi heap leach, Republic of Georgia
- Jezkazgan copper leach, Kazakhstan

4.2 COAL MINES

Coal projects include the following:

- Westmoreland Absaloka
- Montco
- Bull Mountains (Louisiana Land and Exploration)
- Wesco Cook Mountain
- Consolidation Coal Otter Creek
- Meridian Cook Creek
- Meridian Circle West
- Ft. Union, Wyoming
- Consolidation Coal Ash Creek, Wyoming

5.0 GEOMORPHOLOGY

WAI has performed stream channel investigations and remediation projects for mines, conservation districts, and landowners. Ray Womack has published technical papers and has served as an expert witness and consultant in litigations involving boundary disputes and erosion problems along rivers. His work on stream channel erosion has been cited in a number of textbooks. The company has recently prepared cumulative impact assessments for channel training projects along the Yellowstone River near Billings, the first study of its type to be performed in this region. We are currently doing similar assessments for proposed channel training projects along the BNSF railroad Yellowstone River corridor between Billings and the North Dakota line. Specific projects include the following:

- Yellowstone cumulative impact study, Yellowstone Co.
- BNSF Yellowstone cumulative impact study
- Clark Fork litigation, Missoula
- Yellowstone litigation, Sidney

Womack & Associates, Inc.
Geotechnical Engineering and Geology

- Missouri River litigation, Culbertson
- Sun River litigation, Cascade County
- Careless Creek erosion, Musselshell County
- Two Medicine Canal blowout, Blackfoot Reservation
- Alder and McGinnis Canal failures, Blackfoot Reservation
- Douglas Creek erosion, Colorado
- Carter Gulch debris flows and channel reclamation, Zortman
- Ruby Gulch channel reclamation, Zortman

6.0 CLIENT LIST

6.1 INDUSTRIAL CLIENTS

Asarco • BNSF • Cambior • Canyon Resources • Central Montana Railway • Consolidation Coal • Darling International • Echo Bay Minerals • Exxon Billings Refinery • Getter Trucking • Hecla Mines • Koch Materials • Montana Power Co. • Montco • Nance Petroleum • Noranda • Pacific Recycling • Pegasus Gold • Pennsylvania Power and Light (PPL Montana) • Phelps-Dodge • Stillwater PGM • The Industrial Company (TIC) • Tongue River Railroad • Western Energy • Westmoreland Resources • Zortman Mining Inc.

6.2 PUBLIC CLIENTS

Billings Public Utilities Department • City of Lander, Wyoming • Montana Dept. Environmental Quality • Montana Dept. Fish Wildlife and Parks • Montana Dept. Natural Resources and Conservation • Montana Dept. Transportation • Northern Cheyenne Housing Authority • U.S. Bureau of Indian Affairs • U.S. Department of Justice • U.S. Forest Service • U.S. National Park Service • U.S. Public Health Service • U.S. NRCS • Wyoming Dept. of Environmental Quality

6.3 PRIVATE CLIENTS

Briarwood Country Club • Dreyfus Property Group • Grand Targhee Ski Resort • Leon Hirsch • Jackson Hole Ski Corporation • Michael Keaton • Moonlight Basin Ranch • Red Lodge Mountain Ski Area • Snake River Associates • State Farm Insurance • Travelers Insurance

6.4 ENGINEERS AND ARCHITECTS

A&E Architects • CTA Architects Engineers • Carney Architects • Charney Architects • CDM • Engineering Inc. • Fluidyne • Jonathan Foote Architects • Golder Associates • Hydrometrics •

W. RAYMOND WOMACK, P.E., P.G.
Principal Engineer
Womack & Associates, Inc.

Slope Stability
Dams
Mining Structures
Foundations
Environmental Projects
River Mechanics

SUMMARY OF EXPERIENCE

Mr. Womack has 30 years experience in geotechnical engineering and engineering geology, providing site investigations, design, and construction supervision. Project experience includes earth fill and tailings dams; landfills; copper and gold mining projects; coal mines; railroads; commercial, municipal, and residential construction; and hazardous waste and ground water pollution sites in 17 states and 7 countries outside the US. Mr. Womack has particular expertise in investigation and mitigation of landslides and other slope stability problems, including seismic and liquefaction studies. He has presented short courses and technical papers, as well as provided expert consulting and witness services in litigations involving foundations, slope failures, and river changes. He has worked extensively in southern Africa, and has also been involved in mining projects in the Republic of Georgia and Kazakhstan.

EDUCATION AND TRAINING

Virginia Polytechnic Institute
Colorado State University

B.S. (Geophysics and Geology), 1970
M.S. (Geology), 1975

REGISTRATIONS & AFFILIATIONS

Professional Engineer in Arizona, Colorado, Montana, Washington, and Wyoming
Professional Geologist in Wyoming
Licensed Monitoring Well Constructor in Montana

American Society of Civil Engineers (ASCE)
Association of Engineering Geologists (AEG)
1988-1989 President, Billings Engineers Club
American Scientific Affiliation (ASA)

PROFESSIONAL HISTORY

Womack & Associates, Inc., Principal Engineer/Engineering Geologist, 1982-Present
Geowest, Inc., Billings, MT, Project Manager, 1979-1982
IntraSearch, Inc. (Spectrum), Billings, MT, Geological Engineer, 1978-1979
Partridge, de Villiers & Associates (South Africa), Engineering Geologist, 1975-1978

Womack & Associates, Inc.
Geotechnical Engineering and Geology

Womack, W.R., 2001, Response and recovery of the Missouri River downstream of Ft. Peck Dam, with resulting property boundary disputes *in* Applying Geomorphology to Environmental Management: Water Resources Publications, Ft. Collins, Colorado, p. 429-456.

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Womack, W.R., F.R. Greguras, G.S. Vick, D.K. Nation, and T. Aldritch, 1998, Hidden hazard: liquefaction assessment for a buried glacial stream valley at a Superfund site offshore of Tacoma, Washington: Proceedings for Geo-Institute ASCE Geotechnical Earthquake Engineering and Soil Dynamics III, Geotechnical Special Publication No. 75, Reston, Virginia.

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Cameron D.P., and B.R. Bronson, 1997, Leach facility construction on placed rockfill overburden: Proceedings of the Fourth International Conference on Tailings and Mine Waste, Tailings and Mine Waste, Colorado State University, A.A. Balkema.

Womack, W.R., J. Volberding, and L. Johnson, 1997, Glacial geology and landslides at the SevenUp Pete site, Montana: Mine Design, Operations, and Closure Conference, Polson, Montana.

Womack, W.R., and D.J. van Zyl, 1997, Geological uncertainty and risk: Short course presented at Mine Design, Operations, and Closure Conference, Polson, Montana.

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Womack, W.R., 1996, Montana landslides; diagnosis, prevention, and cure: Short course presented at Montana Joint Engineers Conference, Fairmont.

Hutchison, I.P.G, M.L. Leonard, and D.P. Cameron, 1995, Remedial alternatives identification and evaluation. Proceedings of the Summitville Forum, Colorado State University, A.A. Balkema.

Womack & Associates, Inc.
Geotechnical Engineering and Geology

Womack, W.R. and G. Rome, 1989, Irrigation waste water triggers severe natural channel erosion: Amer. Soc. Agri. Engineers International Summer Meeting, Quebec.

Womack, W.R., 1984, Detection of shallow abandoned room and pillar workings using high resolution earth resistivity: Proceedings of the National Symposium and Workshops on Abandoned Mine Land Reclamation, p. 42-62.

Womack, W.R., and S.A. Schumm, 1977, Terraces of Douglas Creek, northern Colorado: an example of episodic erosion: Geology, v.5, p. 72-76.

Womack, W.R., 1976, Applications of Thermal Infrared Scanning to Engineering Geology in South Africa: South African Symposium on Remote Sensing.

W. RAYMOND WOMACK, P.E., P.G.
Principal Engineer
Womack & Associates, Inc.

Slope Stability
Dams
Mining Structures
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Environmental Projects
River Mechanics

SUMMARY OF EXPERIENCE

Mr. Womack has 30 years experience in geotechnical engineering and engineering geology, providing site investigations, design, and construction supervision. Project experience includes earth fill and tailings dams; landfills; copper and gold mining projects; coal mines; railroads; commercial, municipal, and residential construction; and hazardous waste and ground water pollution sites in 17 states and 7 countries outside the US. Mr. Womack has particular expertise in investigation and mitigation of landslides and other slope stability problems, including seismic and liquefaction studies. He has presented short courses and technical papers, as well as provided expert consulting and witness services in litigations involving foundations, slope failures, and river changes. He has worked extensively in southern Africa, and has also been involved in mining projects in the Republic of Georgia and Kazakhstan.

EDUCATION AND TRAINING

Virginia Polytechnic Institute
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B.S. (Geophysics and Geology), 1970
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REGISTRATIONS & AFFILIATIONS

Professional Engineer in Arizona, Colorado, Montana, Washington, and Wyoming
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PROFESSIONAL HISTORY

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Partridge, de Villiers & Associates (South Africa), Engineering Geologist, 1975-1978

TECHNICAL PRESENTATIONS AND PUBLICATIONS

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Author of numerous private reports on geotechnical engineering, engineering geology, and river mechanics.

SLOPE STABILITY

PROJECT	LOCATION
Beartooth Highway Reconstruction	Montana
Dinosaur National Monument Landslide	Colorado
Hecla Grouse Creek Mine Landslides	Idaho
Stibnite Mine	Idaho
PD\Canyon Resources Seven-Up Pete and McDonald	Montana
Zortman Mine	Montana
ASARCO East Helena Smelter	Montana
ASARCO Tacoma Smelter Landfill	Washington
ASARCO Ray Mine	Arizona
ASARCO Murray Smelter	Utah
BNSF Shirley and Savage Projects	Montana
Crown Butte Power Line Corridor	Wyoming
Westmoreland Absaloka Mine	Montana
Stillwater Mine East Boulder Road	Montana
Cambior Carlota Mine	Arizona

Sonora Mine	California
Columbia Falls Aluminum Landfill	Montana
W.R. Grace Vermiculite Tailings	Montana
Consolidation Coal Ash Creek	Wyoming
Canyon Resources CR Kendall	Montana
Tongue River Railway	Montana
Central Montana Railway	Montana
ASARCO Young Mine Zinc Tailings	Tennessee
Billings Heights Sanitary Sewers	Montana
Red Lodge Sewer Outfall Failure	Montana
Wrongful Death Litigation, Butte	Montana
Rimrock Drilling Litigation, Billings	Montana
Mountain View Subdivision, Billings	Montana
Teton Wilderness Landslide	Wyoming
Bozeman Railway Stability	Montana
McClain Creek Slide	Montana
Buffalo Jump Slide	Montana
Cathedral Mountain Slide	Montana
Michael Keaton Residence, Bridger Bowl	Montana
Leon Hirsch Residence, Lima	Montana
Lee Residence, Cromwell Island, Flathead Lake	Montana
Stayner Residence, Big Sky	Montana
Faubert Residence, Big Sky	Montana
Lyman Creek Water Supply Project, Bozeman	Montana
Aspen Grove Subdivision, Big Sky	Montana
Skywood Preserve Subdivision, Big Sky	Montana
Beehive Subdivision, Big Sky	Montana
Moonlight Basin, Big Sky	Montana
Blue Grouse Development, Big Sky	Montana
Beaver Creek, Gallatin County	Montana
Sunwest Subdivision, Madison County	Montana
Bench Ranch, Sunlight Basin	Wyoming
Roger Altman Residence, Jackson Hole	Wyoming
Jackson Hole Ski Area	Wyoming
Red Lodge Mountain Ski Area	Montana

DAMS AND TAILINGS IMPOUNDMENTS

PROJECT	LOCATION
PPL Montana Saddle Dam	Montana
PPL Montana Main Dam	Montana
Hecla Grouse Creek Tailings	Idaho
Westmoreland Absaloka Mine Dams	Montana
ASARCO Young Mine Zinc Tailings	Tennessee
ASARCO Coy Impoundment Failures (karst)	Tennessee
ASARCO E. Helena Smelter Sludge Repository	Montana
Zortman Mine Dams	Montana
Echo Bay Republic Mine Dams	Washington
ASARCO Blackhawk Tailings	New Mexico
ASARCO Mission Tailings	Arizona

ASARCO Ray Mine Dams	Arizona
W.R. Grace Vermiculite Tailings	Montana
McNeil Slough Reservoir	Montana
Bearpaw Reservoir	Montana
Nilan Reservoir	Montana
Hauser Reservoir FERC Expansion Permit	Montana
Thompson Falls FERC Expansion Permit	Montana
Huntley Irrigation Dam	Montana
Worthen Meadows Reservoir, Lander	Wyoming
Chapek Reservoirs, Sheridan	Wyoming
Chevron Carter Creek Gas Plant Impoundment	Wyoming
Glaston Reservoirs, Big Timber	Montana
Upper and Lower Flagstaff Dams	Montana
BLM Reservoirs	Montana
Billings PUD Impoundment	Montana
Yellowstone Country Club, Billings	Montana
Yates Dam	Montana
Lebowa Dam	South Africa
Sterkspruit Dam, Transkei	South Africa
Transkei Dams(25 sites)	South Africa

FOUNDATIONS

PROJECT

LOCATION

Four Seasons Resort, Teton Village	Wyoming
Snake River Lodge, Teton Village	Wyoming
Teton Club, Teton Village	Wyoming
Teton Lodge, Teton Village	Wyoming
Gondola Restaurant, Teton Village	Wyoming
Bridger Center, Teton Village	Wyoming
Cody Center, Teton Village	Wyoming
Rendezvous Peak Lodge, Teton Village	Wyoming
Granite Ridge Subdivision, Teton Village	Wyoming
Grouse Creek Mill and Crusher	Idaho
ASARCO E. Helena Storage Tanks	Montana
ASARCO Lead Battery Recycling Plant	North Carolina
Murray Pacific Log Yard, Tacoma	Washington
Zortman Mine Water Treatment Plants	Montana
Zortman Mine Cable Belt Conveyor	Montana
Western Energy Housing Studies, Colstrip	Montana
ASARCO Ray SX-EW Plant	Arizona
Navajo Bridges, BIA	Arizona
Faith Chapel Church, Billings	Montana
Michael Keaton Residence, Bridger Bowl	Montana
Chambless Ranch, Bridger Bowl	Montana
Leon Hirsch Residence, Lima	Montana
Four Corners Ice Palace, Bozeman	Montana
Koch Materials, Laurel	Montana
Moonlight Basin, Big Sky	Montana
Russell and Karen Fagg Residence, Billings	Montana

Stone Crop Subdivision, Jackson Hole	Wyoming
Crescent H Ranch, Jackson Hole	Wyoming
Thurston Residence, Jackson Hole	Wyoming
Roger Altman Residence, Jackson Hole	Wyoming
Teton Springs Development	Idaho
Warbonnet Subdivision, Billings	Montana
Northern Cheyenne Housing	Montana
Sheridan V.A. Hospital	Wyoming
Spring Creek Subdivision, Bozeman	Montana
Safeco Insurance, Great Falls	Montana
State Farm Insurance, Bozeman and Miles City	Montana
Intermountain Foods, Bozeman	Montana
Aldworth Construction, Bozeman	Montana
Briarwood Subdivision, Billings	Montana
Drummond School	Montana
Independent School, Billings	Montana
Malta High School	Montana
Glasgow High School	Montana
Jackson Hole High School	Wyoming
Wilson High School	Wyoming
Homestead Post Office, Billings	Montana
Hysham Water Treatment Plant	Montana
Kandisi River Bridge	Kenya
Moffat College Library	Kenya
Bukaleba Clinic and School	Uganda
Pretoria Hospital	South Africa
Urban Beltway Roads and Bridges, Johannesburg	South Africa
Dwangwa Sugar Mill	Malawi

ENVIRONMENTAL AND MINING PROJECTS

PROJECT	LOCATION
ASARCO Yak Tunnel CERCLA Site, Leadville	Colorado
ASARCO E. Helena Smelter CERCLA site	Montana
ASARCO Tacoma Smelter CERCLA site	Washington
ASARCO Omaha Smelter CERCLA site	Nebraska
Murray Pacific Log Yard, Tacoma	Washington
Murray Smelter, Salt Lake City	Utah
Crown Butte Land Application	Montana
Zortman Waste Repositories	Montana
Stillwater Mine Land Application	Montana
ASARCO Lead Battery Recycling Plant EA	North Carolina
EXXON Refinery Interception Drain, Billings	Montana
PPL Montana Interception Drains, Colstrip	Montana
PPL Montana Fly Ash, Colstrip	Montana
Rosebud Power Fly Ash, Colstrip	Montana
NRCS Animal Waste Projects	Montana
Columbia Falls Aluminum Landfill	Montana
Getter Trucking Facilities EA	Wyoming, North Dakota, Montana
Lander Oil Field	Wyoming

Winkelman Dome Oil Field	Wyoming
Hardscrabble Oil Field	North Dakota
Four Eyes Oil Field	North Dakota
Brush Lake Oil Field	Montana
Landtech Injection Wells	Montana and North Dakota
Balco Injection Well and Pipelines	North Dakota
Pacific Recycling, Billings	Montana
Fremont County Abandoned Mines	Wyoming
Montana Abandoned Mines	Montana
Elkhorn Abandoned Mine/CERCLA	Montana
Alladin Tipple Reclamation	Wyoming
Underground Storage Tanks	Montana
Lewistown Clay Reclamation	Montana
Livingston Gravel Reclamation	Montana
Northern Tier Pipeline	Washington, Montana
Zortman Mine Goslin Gulch	Montana
Phelps-Dodge Seven Up Pete	Montana
Phelps-Dodge McDonald	Montana
Canyon Resources CR Kendall	Montana
Canyon Resources CR Briggs	California
Cambior Carlota	Arizona
Bolnisi Madneuli Mine	Republic of Georgia
Jezkazgan SX-EW	Kazakhstan
Montco Project, Tongue River	Montana
Wesco Cook Mountain	Montana
Meridian Cook Creek projects	Montana
Consolidation Coal Otter Creek	Montana
Westmoreland Absaloka	Montana
Western Energy and Montana Power Colstrip	Montana
Arch Youngs Creek	Montana
Bull Mountains	Montana
Meridian Circle West Project	Montana
Ft. Union mine	Wyoming
Consolidation Ash Creek	Wyoming
Carrizozo	New Mexico

RIVER MECHANICS

PROJECT	LOCATION
Yellowstone River Cumulative Impact Assessment	Montana
BNSF Yellowstone Channel Training Assessment	Montana
Clark Fork Litigation, Missoula	Montana
Yellowstone Litigation, Sidney	Montana
Missouri River Litigation, Culbertson	Montana
Horse Creek Erosion, Forsyth	Montana
Careless Creek Erosion, Musselshell County	Montana
Yellowstone Access Sites	Montana
Sweetgrass Creek Reclamation	Montana
Riverfront Park Litigation, Billings	Montana
Big Horn Litigation, Custer	Montana

Langman Litigation, Yellowstone River	Montana
Clarks Fork Yellowstone Boundary Dispute	Montana
Douglas Creek Erosion, Rangely	Colorado
Rock Creek Erosion, Carbon County	Montana
Two Medicine Canal, Blackfoot Reservation	Montana
Huntley Irrigation Diversion	Montana
Alder and McGinnis Erosion, Blackfoot	Montana
Carter Gulch Channel Reclamation, Zortman	Montana
Ruby Gulch Channel Reclamation, Zortman	Montana
Huntley Flood Dike	Montana
Sun River Boundary Dispute	Montana
Bayeux Channel Stabilization	Haiti

APPENDIX 2
PRELIMINARY PROPOSAL OF RESEARCH TO
ASSESS POTENTIAL IMPACTS OF THE
TONGUE RIVER RAILROAD ON PALLID STURGEON
AT THE MILES CITY STATE FISH HATCHERY



United States Department of the Interior

FISH AND WILDLIFE SERVICE

FISH TECHNOLOGY CENTER
4050 BRIDGER CANYON ROAD
BOZEMAN, MT 59715
(406) 587-9265/FAX 586-5942



February 17, 2005

Ecological Services Montana Field Sub-Station
2900 4th Ave. North Rm 301
Billings, MT 59101

Dear Lou,

Enclosed is a preliminary research proposal from Dr. Molly Webb and other researchers at our facility to assess potential impacts of the Tongue River Railroad on the endangered pallid sturgeon at the Miles City State Fish Hatchery. We are providing this for your benefit in understanding what needs to be done to understand specific stress-related impacts from noise or vibration.

Our researchers outlined the relevant hypotheses as such:

Null Hypotheses:

Ho1a: The vibration and noise equivalent to that of the proposed project does not cause a stress response in adult pallid sturgeon held for captive spawning.

Ho1b: A stress response resulting from vibration and noise equivalent to that of the proposed project does not impede reproduction by reducing gamete and/or progeny quality.

Ho1c: A stress response resulting from vibration and noise equivalent to that of the proposed project does not impede the immunological response of adult pallid sturgeon thereby reducing fish health and condition.

Ho2: The vibration and noise equivalent to that of the proposed project does not impact embryo development or larval and juvenile growth of pallid sturgeon captive-reared.

In the attached preliminary proposal, Dr. Webb provides brief preliminary descriptions of 3 research objectives to address the above hypotheses. We include rough cost estimates and an estimate of our facilities in-kind contribution to give you an idea of what you might expect as a comparable cost from an outside research entity.

If you have any questions, please feel free to call me at 994-9903.

Sincerely,

Yvette Converse
Assistant Center Director

**Preliminary Proposal of Research to
Assess Potential Impacts of the Tongue River Railroad on Pallid Sturgeon
at the Miles City State Fish Hatchery**

**Molly A.H. Webb, Ph.D.
USFWS
Bozeman Fish Technology Center
February 2006**

After discussions regarding the Tongue River Railroad (TRR) on February 1 2006, it was requested that I write a brief overview of studies that could be conducted to determine the impact of the TRR on pallid sturgeon at the Miles City State Fish Hatchery (MCSFH). The impacts of the TRR may differ at different life stages.

Pallid sturgeon broodstock are maintained at the MCSFH for approximately 2 to 3 months prior to spawning. These females are released back into the wild within one week of spawning. The length of time required for wild adult pallid sturgeon to become habituated to a stressor, such as the potential vibration or noise associated with the TRR, is unknown. However, I am concerned that, given the short time these fish are present at the hatchery, the females will not become habituated to the potential stress of the TRR. It has been shown in modern teleosts that stress can impede reproduction in fishes by reducing gamete and/or progeny quality (e.g., Campbell et al. 1994; Pankhurst and Van der Kraak 1997; Semenkov et al. 1999; Schreck et al. 2001), increasing the incidence of gonadal atresia (e.g., Clearwater and Pankhurst 1997; Pankhurst and Van der Kraak 1997; Cleary et al. 2000), and compromising immune function (e.g., Georgiadis et al. 2001). Stress may also lead to direct mortality (Schreck 2000).

Pallid sturgeon embryos hatch in approximately 5 to 7 days at MCSFH. A portion of the young-of-year are released into the Missouri River in the fall, while the remaining young-of-year are reared at the facility and released in the early spring. The TRR may also have impacts on embryo development and larval and juvenile growth and survival. These fish may remain in the hatchery long enough to become habituated to the TRR, but there is no literature describing habituation to a stress for sturgeon.

The challenge in assessing the impacts of the TRR on pallid sturgeon is mimicing the vibration/noise that the individuals would experience in the hatchery. This aspect of the experimental design would need to be determined and designed by someone familiar with hearing and noise issues with fishes. The experiments proposed below are designed to 1) collect immediate information needs to implement the studies, 2) assess whether simulation of the TRR will induce a stress response in pallid sturgeon, and 3) if simulation of the TRR does induce a stress response, determine the physiological effects of that stress on the reproduction, development, growth, survival, and, potentially, the immune function of pallid sturgeon. This work could be completed in 2 years.

Study Objectives:

1) *Collect immediate information needs to implement studies.* Critical information includes the current background vibration/noise levels experienced by pallid sturgeon from operation of the hatchery, and the existing railroad and the vibration/noise that would be experienced by pallid sturgeon from the TRR.

2) *Assess whether simulation of the TRR will induce a stress response in pallid sturgeon.* This should be conducted with both adult and juvenile pallid sturgeon. Adult shovelnose sturgeon may be used as a surrogate for pallid sturgeon adults. These experiments may be conducted at the Bozeman Fish Technology Center (BFTC).

Adult shovelnose (n=6) during oocyte maturation (June) will be exposed to vibration/noise that simulates the TRR at the intervals mimicing the proposed train schedule for a 24 hour period. Control fish (n=6) will be maintained in a tank under identical conditions as the treatment fish except they will not be exposed to vibration/noise. Blood will be collected from the caudal vasculature at time 0 (when fish are placed into the treatment or control tanks), 1, 6, 12, 24, and 48 hours. Plasma cortisol, glucose, lactate dehydrogenase, triglycerides, albumin, alkaline phosphatase, alanine transferase, ammonia, aspartate aminotransferase, carbon dioxide, and phosphorus will be measured by radioimmunoassay or blood chemistry analyzer. These blood plasma parameters have been shown to be physiological indicators of stress and tissue trauma in pallid sturgeon (Barton et al. 2000; Webb and Allert, unpublished). Plasma parameters will be compared by analysis of variance (ANOVA) within and between treatments over time.

Juvenile pallid sturgeon (n=30 per tank) will be exposed to vibration/noise that simulates the TRR at the intervals mimicing the proposed train schedule for a 24 hour period in triplicate. Control fish (n=30 fish per tank) will be maintained in a tank under identical conditions as the treatment fish except they will not be exposed to vibration/noise. Blood will be collected from the caudal vasculature at time 0 (when fish are placed into the treatment or control tanks), 1, 6, 12, 24, and 48 hours. Plasma will be pooled and the same plasma parameters described above will be measured. Plasma parameters will be compared ANOVA within and between treatments over time.

The results of these two experiments will determine whether the TRR will induce a stress response in pallid sturgeon juveniles and shovelnose sturgeon adults. If a stress response occurs in the shovelnose sturgeon adults, it is safe to assume that the stress response would also be elicited in pallid sturgeon adults.

3) *If simulation of the TRR does induce a stress response, determine the physiological effects of that stress on the reproduction, development, growth, survival, and, potentially, the immune function of pallid sturgeon.* The stress response has been described in sturgeon (Sangalang et al. 1971; Barton et al. 2000; Belanger et al. 2001; Bayunova et al. 2002; Lankford et al. 2003; Webb, unpublished data), however there is little information on the physiological effects of stress. Adult shovelnose sturgeon may be used as a surrogate for pallid sturgeon adults. These experiments may be conducted at the BFTC.

Adult shovelnose (n=6) during oocyte maturation (April - spawning) will be exposed to vibration/noise that simulates the TRR at the intervals mimicing the proposed train schedule. Control fish (n=6) will be maintained in a tank under identical conditions as the treatment fish except they will not be exposed to vibration/noise. Oocyte maturation will be monitored and females will be spawned according to the protocols described for pallid sturgeon. Once the eggs are fertilized, they will be placed in McDonald jars for incubation with or without vibration/noise based on their respective treatment groups (i.e. eggs from females exposed to vibration/noise will be incubated in jars exposed to vibration/noise, while eggs from females not exposed to vibration/noise will not be exposed to vibration/noise during incubation). Ovulation success, rates of atretia (resorption of developing eggs), fertilization success, developmental

abnormalities, and hatch success will be quantified. These endpoints will be compared between the control and treatment groups.

Hatched larvae (n=200) from each female that successfully ovulates will be maintained for 120 days according to the methods described for pallid sturgeon with or without vibration/noise based on their respective treatment groups. Survival will be assessed on a daily basis. Length and weight will be determined on a monthly basis. Proximate analysis will be conducted on a subsample of fish at the end of the 120-day period to assess overall fish condition. Survival, growth, condition factor, and proximate analysis will be compared within and between control and treatment groups by ANOVA.

Juvenile pallid sturgeon (n=30 per tank) will be exposed to vibration/noise that simulates the TRR at the intervals mimicing the proposed train schedule for a 120 days in triplicate. Control fish (n=30 fish per tank) will be maintained in a tank under identical conditions as the treatment fish except they will not be exposed to vibration/noise. Survival will be assessed on a daily basis. Length and weight will be determined on a monthly basis. Proximate analysis will be conducted on a subsample of fish at the end of the 120-day period to assess overall fish condition. Survival, growth, condition factor, and proximate analysis will be compared within and between control and treatment groups by ANOVA.

We are currently working on the optimization of immunological assays for pallid sturgeon to assess immune function. If these assays become available, immune function of pallid sturgeon juveniles could be determined at the completion of the 120-day period and compared between the treatment and control group.

The results of these experiments will determine the physiological effects of the TRR on the reproduction, development, growth, survival, and, potentially, the immune function of sturgeon. If a stress response occurs in the shovelnose sturgeon adults, it is safe to assume that the stress response would also be elicited in pallid sturgeon adults.

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***Estimated Budget**

Objective	Year	In-Kind Cost	Cost
1 – Noise/Vibration	1	\$10-30K**	\$10K-100K**
2 – Stress Response	1	\$64.5K	\$50K (itemized below)
3 – Physiological Effects	2	\$66.5K	\$50K (itemized below)

*Budget is not final and depends on a number of cost and technology factors not available at short notice but is otherwise as good as can be provided at this time.

Detailed Budget for Objective 1 (Year 1):

Not yet determined.

** Estimating the appropriate noise/vibration parameters and technology has not been investigated as part of this preliminary proposal. This cost estimate gives a very rough idea of the possible range depending on if the information exists and can be readily simulated or whether expertise and technology needs to be acquired or developed to simulate physiologically relevant noise/vibration equivalent to proposed project.

Detailed Budget for Objective 2 (Year 1):

\$20,741.00	PhD student Salary with Benefits for 12 months
\$720.00	Radio-immuno assay analysis (\$10/sample x 72 samples)
\$3,960.00	Blood-plasma analysis (\$5/sample x 72 samples x 11 parameters)
\$5,000.00	Fish culture, care and feeding
\$2,000.00	Personnel and travel to acquire fish
\$12,000.00	½ of 20% Facilities operations
\$7,551.57	17% US Fish and Wildlife Service Administrative Overhead
\$51,972.57	TOTAL outside funding for Objective 2 (Year 1)
\$24,000.00	20% of GS-13 Senior Researcher Salary plus benefits
\$17,000.00	20% of GS-11 Fish Culturist Salary plus benefits
\$8,500.00	10% of GS-11 Fish Ecologist Salary plus benefits
\$12,000.00	½ of 20% Facilities operations
\$3,000.00	Laboratory supplies and chemicals
\$64,500.00	TOTAL In-Kind Agency Contribution
\$116,472.57	TOTAL PROJECT COST FOR OBJECTIVE 2 (YEAR 1)

Detailed Budget for Objective 3 (Year 2):

\$20,741.00	PhD student Salary with Benefits for 12 months
\$5,000.00	Fish culture, care and feeding
\$3,000.00	Immunological supplies and equipment/experimental design
\$2,000.00	Personnel and travel costs to acquire fish
\$12,000.00	½ of 20% Facilities operations
\$7,265.97	17% US Fish and Wildlife Service Administrative Overhead
\$50,006.97	TOTAL outside funding for Objective 3 (Year 2)
\$24,000.00	20% of GS-13 Senior Researcher Salary plus benefits
\$17,000.00	20% of GS-11 Fish Culturist Salary plus benefits
\$8,500.00	10% of GS-11 Fish Ecologist Salary plus benefits
\$12,000.00	½ of 20% Facilities operations
\$5,000.00	Equipment and on-site supplies
\$66,500.00	TOTAL In-Kind Agency Contribution
\$116,506.97	TOTAL PROJECT COST FOR OBJECTIVE 2 (YEAR 1)

Appendix H

Air Quality Impact Analysis Update Tongue River III

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Air Quality Impact Analysis Update

TRR III

Tongue River Railroad Project

Submitted to

Douglas Day
Tongue River Railroad Co., Inc.
2280 Grant Road, Suite B
Billings, Montana 59102

Prepared by

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June 1, 2004

1.0 SUMMARY

Based on conservative emission estimates for operational and temporary construction emissions, National Ambient Air Quality Standards (NAAQS), and Clean Air Act (CAA) major source thresholds, neither the proposed or approved southern end alternatives will have an adverse impact on air quality in the Rosebud and Big Horn County project area.

The purpose of this document is to update the 1998 air quality analysis for the Western Alignment and Four-Mile Creek alternatives so that the most current information is reflected in emission approximation, regulatory requirements, and estimated impacts. From an air quality perspective, the Western Alignment represents the best operational alternative with regard to air quality and actually provides an overall reduction of between 20 and 30 percent in air emissions from the already approved Four-Mile Creek alternative.

Construction of the southern end by any route will result in two principal categories of air emissions: temporary construction emissions, which are typically of short duration, and operational emissions, which will occur indefinitely after construction of the rail line is complete. In this report, emissions are estimated for both construction and operational activities and are presented along with all engineering assumptions and references. A regulatory section that summarizes current air quality regulations is also included.

2.0 BACKGROUND

By separate decisions of the Surface Transportation Board (STB) and its predecessor the Interstate Commerce Commission (ICC), the Tongue River Railroad Company (TRRC) has been granted authority to construct and operate a railroad running from Miles City to near Decker, Montana. The Tongue River Railroad (TRR) will connect to the Burlington Northern Santa Fe (BNSF) mainline at Miles City, Montana, on the north end and to the Spring Creek Mine rail spur near Decker, Montana, at the south end. The separate authorizations include:

- TRR I—in 1986, the ICC granted authority to construct and operate 89 miles of railroad between Miles City, Montana, and two terminus points located near Ashland, Montana.
- TRR II—in 1996, the STB granted authority to construct and operate a 51-mile extension from Terminus Point 1 near Ashland, Montana, to near Decker, Montana. Although TRRC preferred to construct the extension via a southern end route known as the “Original Preferred Alignment,” the STB approved the extension via a southern end route known as the “Four-Mile Creek Alternative.”

Concerns regarding the operation of the approved Four-Mile Creek Alternative prompted TRRC to evaluate other routes on the southern end of the 51-mile extension. In 1998, the TRRC filed an application (TRR III) to construct and operate an alternative to the Four-Mile Creek route. The TRR III application included engineering and environmental reports focused on a third alternative for the southern end known as the “Western Alignment.” The environmental report contained an air quality impacts analysis that included updated emission estimates demonstrating that the Western Alignment would

be the shortest route and would have the least overall air quality impact of the three alternatives: Original Preferred Alignment (18.7 miles), approved Four-Mile Creek Alternative (29.4 miles), and the Western Alignment (17.3 miles). In response to TRRC's filing of the Western Alignment application, the STB's Section of Environmental Analysis (SEA) is preparing a Supplement to the Final Environmental Impact Statement (EIS) for TRR III.

For the purposes of this air quality analysis, the term "railroad alignment" refers to construction and operation of the railway, including adjacent affected land for the 29.4-mile Four-Mile Creek Alternative or the 17.3-mile Western Alignment.

3.0 REGULATORY REQUIREMENTS SUMMARY

The CAA requires the U.S. Environmental Protection Agency (EPA) to establish NAAQS for pollutants considered harmful to human health and the environment. Two types of standards are in force: primary standards, which set limits to protect public health, including sensitive populations such as children and the elderly; and secondary standards, which protect public welfare, including protection against decreased visibility as well as damage to animals, crops, and property. Table 1 details the primary and secondary standards for each of the six principal pollutants regulated under the NAAQS. These pollutants are referred to as criteria pollutants. Note that where different from the NAAQS, State of Montana standards are provided in parentheses for additional reference.

Table 1. National Ambient Air Quality Standards				
Criteria Pollutant	Primary		Secondary	
	ppm	µg/m³	ppm	µg/m³
Carbon Monoxide (CO)				
Maximum 8-hour Concentration	9	10,000	None	None
Maximum 1-hour Concentration	35 (23)	40,000		
Lead (Pb) – Quarterly Average		1.5		1.5
Nitrogen Dioxide (NO ₂)	0.053	100	0.053	100
Ozone (O ₃)				
Maximum 8-hour Concentration	0.08	157	0.08	157
Maximum 1-hour Concentration	0.12 (0.1)	235	0.12	235
Particulate Matter (PM ₁₀)				
Annual Arithmetic Mean	--	50	--	50
Maximum 24-hour Concentration		150		150
Particulate Matter (PM _{2.5})				
Annual Arithmetic Mean	--	15	--	15
Maximum 24-hour Concentration		65		65
Sulfur Oxides (SO ₂)				
Annual Arithmetic Mean	0.03 (0.02)	80	None	None
Max 24-hour Concentration	0.14 (0.01)	365	None	None
Max 3-hour Concentration			0.5	1,300
Max 1-hour Concentration	(0.5)			
Where: ppm = parts per million by volume and µg/m ³ = micrograms per cubic meter of air. More stringent State of Montana ambient air quality standards (ARM 17.8.210-223) are provided in parentheses().				

In addition to the NAAQS, which establish a minimum standard of quality for ambient air, the CAA has developed thresholds for analyzing the air quality impacts of proposed air emission sources. Major sources are defined as sources with emissions of 250 tons per year of a criteria pollutant or 100 tons per year for sources in 1 of 28 categories of stationary sources specifically defined in the CAA. Although construction of a railroad is not included in the list of categories, the CAA thresholds for the 28 sources were applied in this analysis as a conservative screening value to determine the significance of air quality impacts from the proposed project. The EPA thresholds are:

- 250 tons per year emissions increase in attainment and maintenance areas;
- 100 tons per year emissions increase in attainment and maintenance areas for 1 of 28 source categories;
- 50 tons per year emissions increase in moderate non-attainment areas;
- 25 tons per year emissions increase in serious ozone non-attainment areas;
- 10 tons per year emissions increase in severe ozone non-attainment areas.

Sources with estimated emissions more than the threshold value are required to perform modeling to demonstrate that the project will not adversely affect the airshed or contribute to any violation of the NAAQS.

Prevention of significant deterioration (PSD) regulations provide special air quality protection for certain national parks, wilderness areas, and native reservations. These areas are referred to as Class I areas under the CAA and include Lake Deer, Montana, and the surrounding Northern Cheyenne reservation.

In a final rule effective May 15, 2003, EPA revised the agency's *Guideline on Air Quality Models* to adopt a new dispersion model – CALPUFF – as the preferred method for assessing long-range transport of pollutants and their impacts on federal Class I areas (68 Federal Register 18, 400 [April 15, 2003]). If the threshold analysis indicated that the emissions were at or above the threshold, then the conservative screening version of CALPUFF would be used.

The screening version of CALPUFF is considered a worst-case approach and is supported by the EPA. All recent and current projects with estimated emissions greater than the threshold values in eastern and south-central Montana have used CALPUFF to assess project impacts in three required areas:

- Compliance with NAAQS—Model project emissions for SO₂, NO_x¹, PM₁₀, PM_{2.5}, and CO. Compare modeled impacts to significant impact levels (SILS), which are established in the PSD program at approximately 2 percent of the NAAQS. If the project emissions are at or below the SIL, the project emissions are considered "insignificant," and no further effort is required for demonstrating NAAQS compliance. If the project emissions fall above the SIL, then background concentrations must be added to impacts from the proposed project for a final determination of NAAQS impacts.

¹ NO_x is a family of compounds that include the criteria pollutant, NO₂.

- Prevention of Significant Deterioration Increment Analysis – In addition to the need to establish NAAQS, PSD increments are quantitatively defined in the CAA to prevent degradation of air quality. PSD increments have been established for SO₂, PM₁₀, and NO₂. In attainment areas, the PSD increment is used to prevent air quality from reaching NAAQS levels. The PSD increment analysis involves evaluating current, proposed, and future emissions in relation to an established baseline date, specifically:
 - The cumulative effects of proposed project emissions; plus
 - Other sources with recent emissions increases (competing sources); plus
 - Proposed (future) source emissions (i.e. Roundup Power Project and Hardin Power Project, if applicable).

If the impacts from all increment-consuming sources falls below the established allowable increment, no further effort is required as part of this analysis.

- Air Quality Related Values (AQRV) Analyses for Visibility and Deposition – AQRV impacts include effects such as visibility degradation and acidic deposition. Because the Northern Cheyenne Reservation is a voluntary Class I airshed, visibility and deposition impacts are not federally protected as they would be in a National Park or Wilderness Area. Other area projects where minor impacts were proposed have completed visibility impact analyses and have been approved.

4.0 TECHNICAL APPROACH

EPA guidance directing project applicants on the technical approach to determining air quality impacts for construction and operation of a railroad alignment does not exist. As a mobile source with relatively insignificant emissions, the project does not require an air quality construction or operating permit from the Montana Department of Environmental Quality. The approved alignment (Four-Mile Creek) is longer in length and will result in more air emissions during operations than the proposed alternative (Western Alignment). Taking these issues into consideration and relying on the approach taken in recent similar projects, current interpretation of federal and Montana State requirements, and conversations with agency personnel, the following technical approach was followed to assess air quality impacts from the proposed project:

- Use currently accepted and referenced emission factors to update estimated emissions inventory for operational and short-term construction activities from both the Western Alignment and Four-Mile Creek Alternative.
- Mitigate PM emissions from construction activities with water trucks and other commonly accepted dust control methods. Because construction emissions are temporary and of short duration, no further analysis is required.
- Estimate operational emissions, particularly the combustion by-products of diesel fuel combustion in locomotive engines, and summarize the data by county on a ton per mile per year basis.

- Calculate the difference between the approved Four-Mile Creek and the proposed Western Alignment alternatives. Where the Western Alignment emission totals by county are less than the approved Four-Mile Creek Alternative (hence a decrease in emissions from the already approved project), no further analysis will be completed. If the Western Alignment emission totals by county are more than for the Four-Mile Creek Alternative, a comparison to the EPA threshold definition for major stationary sources will be made. An increase of 100 tons per year or more is considered major and will require a modeling analysis, as described in Section 3—Regulatory Requirement Summary. Emissions less than 100 tons per year are not considered significant, and no further analysis will be required.

A similar approach was used in the Powder River Basin (PRB) Expansion Project EIS. The Dakota, Minnesota, and Eastern (DM&E) Railroad—proposed action involved construction and operation of approximately 280 miles of new rail line and the reconstruction of over 600 miles of existing rail line to support up to 34 daily round train trips for Powder River Basin coal. Although significantly larger in scope than the approved TRR project, the DM&E EIS presented a thorough air quality analysis that demonstrated no impacts to NAAQS or PSD increments in Class I and Class II areas.

5.0 TECHNICAL RESULTS

Three sources of emissions result from the construction and operation of the railroad alignment. Estimated emissions are summarized by alignment alternative in Table 2 and include temporary fugitive dust from construction activities, temporary combustion emissions from construction activities, and emissions resulting from the day-to-day operation of the completed railroad. The operational emissions are the principal focus of the air quality analysis and include combustion emissions from locomotive engines, fugitive emissions from wind-blown dust along the constructed alignment, and any fugitive dust coming off loaded rail cars in transit.

Table 2. Emissions Summary by Route (tons per mile per year)				
Criteria Pollutant	Temporary Construction Emissions		Operational Emissions	
	Western Alignment	Four-Mile Creek	Western Alignment	Four-Mile Creek
CO	1.49	0.88	5.0	6.9
NO_x	0.26	0.15	22.9	31.2
PM₁₀	13.3 ¹ /0.44 ²	9.8 ¹ /0.26 ²	1.4 ³	1.8 ³
SO₂	1.28	0.75	4.1	5.6
VOC	0.08	0.05	1.4	2.0

¹ Includes temporary fugitive dust emissions generated from earth disturbance during railroad construction.

² Includes PM emissions from diesel combustion in construction equipment.

³ Includes fugitive dust from constructed railroad, wind-blown dust from railcars in transit, and PM emissions from diesel combustion in locomotive engines.

Engineering assumptions, technical references, and other citations used for emission factors and equations are summarized in Table 3. Where possible, EPA guidance was

used, followed by equipment manufacturer specifications and documented assumptions from similar approved projects.

Table 3. Emission References		
Source Type	Reference	Notes
Temporary Construction – Combustion	EPA 420-P-02-016, Exhaust and Crankcase Emission Factors for Non-road Engine Modeling – Compression-Ignition, November 2002. Tier 0 – 1988-2000 engines, assumed all engines >100 hp, conservatively used largest emission factors (tractors/loaders/backhoes).	Construction schedule of two shifts per day for 6 months each year for 2 years. SO ₂ emissions based on an average sulfur content of 0.34 percent by weight (Federal Register, May 23, 2003).
Temporary Construction – Fugitive	Section 13.2.3-1, AP-42, Volume I, January 1995. General Construction factor for PM ₁₀ is 1.2 T/acre/month*0.19=0.23 T/acre/month Bulldozer factor for PM ₁₀ is $(SC*1.0*s^{1.5})/M^{1.4} = 0.75 \text{ lb/hr}$ where : s = silt content = 6.9% M = soil moisture content = 7.9% SC = scaling factor = 0.75 Ratio of PM ₁₀ /TSP is 0.19	Total disturbed construction acreage for Western Alignment is 364 acres. Total disturbed construction acreage for Four-Mile Creek Alternative is 456 acres.
Operational Emissions – Combustion	EPA 420-F-97-051, Emission Factors for Locomotives, December 1997.	SO ₂ emissions based on an average sulfur content of 0.34 percent by weight (Federal Register, May 23, 2003). Annual fuel usage values include: • Western-Rosebud – 397,113 gal. • Western-Big Horn – 909,034 gal. • Four-Mile-Rosebud – 813,079 gal. • Four-Mile-Big Horn – 2,933,755 gal.
Operational Emissions – Wind Erosion	Table 11.9-4, AP-42, Volume I, July 1998.	Value is for TSP for wind erosion of exposed areas. Operational acreage is assumed as follows: • Western-Rosebud – 63.63 acres • Western-Big Horn – 41.2 acres • Four-Mile-Rosebud – 69.08 acres • Four-Mile-Big Horn – 109.08 acres

Where: TSP = total suspended particulate, T = tons, hp = horsepower, and gal. = gallon(s).

5.1 Temporary Construction Emissions – Fugitive Dust

Fugitive dust from construction activities refers to air pollutants that enter the atmosphere without first passing through a stack or duct designed to direct or control their flow. During construction of the railroad alignment, fugitive dust results primarily from disturbing earth (digging, earth moving, compacting, scraping, grading, etc.) and is

calculated based on a percentage of total disturbed acres. Although the Western Alignment is shorter in length, a greater amount of acreage is expected to be disturbed; consequently, PM fugitive dust emissions from construction activity are estimated at 13.3 tons per mile per year while PM fugitive dust emissions from the Four-Mile Creek Alternative are estimated at 9.8 tons per mile per year.

The estimated PM values are overly conservative because no credit was taken for dust control activities that will be implemented during construction. During earth-moving activities, water trucks will be used to water the alignment area and haul roads to control dust. Areas adjacent to the rail bed that are disturbed during construction will be graded as necessary and stockpiled topsoil spread over the area, with both activities significantly reducing the amount of dust generated during construction.

5.2 Temporary Construction Emissions – Combustion Activity from Construction Equipment

Diesel fuel consumed by construction equipment results in the emission of several criteria pollutants, including CO, NO_x, PM₁₀, SO₂, and VOC. To calculate combustion emissions from construction activity, a variety of conservative assumptions were made:

- Construction activity will take approximately 2 years with field crews working 6 months per year, two shifts per day.
- Approximately 13 large pieces of equipment (including scrapers, tractors, loaders, dozers, backhoes, blades, water trucks, and compactors) having an average horsepower of 523 will be used.
- Emission factors resulting in the largest emission release (tractors/loaders) were assumed for all equipment.
- A diesel fuel sulfur content of 0.34 percent by weight or 3,400 parts per million (ppm) and a fuel density of 7.05 pounds per gallon were assumed.

Like the construction fugitive emissions, the construction combustion emissions are short-term and temporary; consequently, no further analysis is required.

5.3 Operational Emissions

The operation of the Tongue River Railroad, regardless of the alignment, will result in combustion emissions from locomotive engines, fugitive emissions from wind-blown dust along the constructed alignment, and fugitive dust coming off loaded rail cars in transit. The emission inventory determination for operational emissions results in minimal releases of fugitive dust; consequently, the emission estimates for PM₁₀ reflect the total amount of particulate resulting from both fugitive releases and combustion.

As detailed in Section 4, Technical Approach, operational emissions were calculated by county. Table 4 illustrates emissions for both Rosebud and Big Horn counties and also details the difference between estimated operational emissions from the proposed Western Alignment and the approved Four-Mile Creek Alternative. The Western

Alignment would result in operational emissions of between 20 and 30 percent less than the approved Four-Mile Creek Alternative.

The difference of total emissions by county for the Western Alignment and Four-Mile Creek Alternative was also calculated and resulted in an emissions decrease. Because the emissions of all pollutants decreases for the proposed Western Alignment in comparison to the approved Four-Mile Creek Alternative, the EPA's project significance threshold of 100-tons-per-year which per the proposed project technical approach triggers analysis of NAAQS, PSD increments, AQRVs, visibility, and deposition, is not reached.

Table 4. Operational Emissions by County (average tons per mile per year)					
	CO	NO_x	PM₁₀¹	SO₂	VOC
Rosebud County					
Western Alignment	1.1	5.0	0.4	0.9	0.3
Four-Mile Creek Alternative	2.1	9.5	0.6	1.7	0.6
<i>Difference</i>	-1.0	-4.5	-0.2	-0.8	-0.3
Bighorn County					
Western Alignment	3.9	17.8	1.0	3.2	1.1
Four-Mile Creek Alternative	4.8	21.7	1.2	3.9	1.4
<i>Difference</i>	-0.9	-3.9	-0.2	-0.7	-0.3

¹ Includes fugitive dust from the constructed railroad and wind-blown dust from railcars in transit.

Operational emissions were estimated using a variety of resources and assumptions. Most notable is the applicability of locomotive emission standards promulgated by EPA in 1998. By phasing out older, more polluting locomotive engines and regulating allowable emissions from new engines over time, a significant decrease in products of combustion are expected over the next decade. For purposes of the TRR analysis, it was assumed that operational emissions would result from a 50/50 split between Tier I and Tier II locomotive engines. A conservative sulfur content of 0.34 percent based on the EPA documents detailed in Table 3 was also assumed.

Fugitive dust resulting from operation of the railroad as well as dust blowing off rail cars in transit was estimated using an EPA emission factor. Dust from rail cars in transit was determined to be negligible based on other railroad proposals that have addressed the issue of coal dust blowing from rail cars and the potential impact on Class I airsheds. In other projects, the SEA of the STB concluded that fugitive coal dust would not present a significant environmental concern based on two important physical characteristics unique to Powder River Basin coal: high moisture content, which produces less dust than other types of coal, and high clay content, which forms a crust over the exposed coal, thereby significantly reducing fugitive dust. Anecdotal evidence, including observation of loaded rail cars leaving the PRB with no signs of fugitive dust, lack of coal accumulating on or along the existing rail lines, and lack of public complaints concerning coal dust, has also been reported in other proposals before the STB. Also, most fugitive coal dust is larger than 10µ in size; consequently, dust particles fall out of the air in a relatively short distance and are not carried high into the atmosphere or for long distances as would be necessary to contribute to regional visibility degradation.

6.0 CONCLUSION

Based on conservative emission estimates for both temporary construction emissions and operational emissions, neither the Four Mile Creek Alternative nor the Western Alignment will have an adverse impact on air quality in the Rosebud and Big Horn County project areas. Operation of the Western Alignment would result in operational air emissions that are between 20 and 50 percent less than the approved Four-Mile Creek Alternative.

Appendix I

Supplemental Information from Steptoe and Johnson

Letter Dated April 20, 2005 Regarding Water Access,
Construction Camps, and a Hybrid Alignment

Letter Dated May 12, 2005 Regarding Planned Cut and
Fills, Culvert Design, Soil Erosion, Wildlife and Cattle
Movement, and Visual Issues

Letter Dated June 6, 2005 Regarding Feasibility of
Rerouting the TRRC Alignment to Avoid Wolf Mountain
Battlefield

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May 12, 2005

Via Hand Delivery

Mr. Kenneth H. Blodgett
Environmental Protection Specialist
Section of Environmental Analysis
Surface Transportation Board
1925 K Street, N.W.
Washington, D.C. 20423

RECEIVED
SURFACE TRANSPORTATION BOARD
2005 MAY 12 P 3:23

Re: **Tongue River Railroad Company, Inc. - Finance Docket 31086 (Sub-No. 3) -
Construction and Operation of the Western Alignment - Draft
Supplemental Environmental Impact Statement**

Dear Mr. Blodgett:

In response to SEA's request for information on the use of trestles instead of cuts and fills for the TRRC line, please find enclosed a letter from Mr. Daniel Hadley of Mission Engineering, Inc., a consultant to TRRC, Inc. Mr. Hadley's letter describes the problems that would attend the use of trestles in place of planned cuts and fills, and the measures that will mitigate the impacts of such cuts and fills.

We trust that this fully responds to the concerns that have been raised, but look forward to any further questions that you might have on this matter.

Sincerely,



Betty Jo Christian
David H. Coburn
Attorneys for Tongue River Railroad Company, Inc.

cc: Ms. Victoria Rutson
Mr. Scott Steinwert
Mr. Douglas Day



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MINE PLANNING

TRANSPORTATION DESIGN

CIVIL ENGINEERING

May 11, 2005

Mr. Douglas Day
Wesco Resources, Inc.
P.O. Box 80902
Billings, MT 59108-0902

Re: Tongue River Railroad Company

Dear Mr. Day:

This will respond to your request that I respond to an inquiry received from the third party contractor working with the Section of Environmental Analysis ("SEA") at the Surface Transportation Board on the whether TRRC would consider the use of trestles in place of fill embankments, especially in locations where the rail line would cross side canyons. Apparently, this question has been raised as a result of comments filed by the Bureau of Land Management ("BLM") in response to the Draft Supplemental Environmental Impact Statement ("DSEIS") issued by SEA. The answer, in short, is that trestles would pose engineering, safety and visual problems that, in our view, make their use infeasible relative to planned cuts and fills. Further, the planned cuts and fills will not, as discussed below, have the adverse impacts that have been raised, particularly in view of SEA's recommended mitigation measures.

General Considerations Regarding Planned Cuts and Fills

The engineering design criteria, considerations and procedures for developing the TRR alignment are based on sound civil and railroad engineering experience and expertise. The process has been multifaceted, taking into account many factors including: type of rail traffic; Federal Railroad Administration specifications; location and alignment with respect to the Tongue River flood plain and its major tributaries; location and alignment with respect to the existing transportation and irrigation systems; existing residences; land use; wildlife habitat; wetlands; and, many other social economic, land use and environmental factors.

In conjunction with the above design criteria and constraints, the design process requires the engineers to develop an alignment which minimizes the amount of earthwork but simultaneously incorporates the least amount of grade and curvature. The design process must consider reasonable front end capital construction cost expenditures balanced with sustaining economic long term operating and maintenance characteristics. Items such as excessive steepness of grade or horizontal curvature can exponentially increase the operating and maintenance costs for the railroad.

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For example, rail alignments carrying "unit train coal traffic" must replace curved track and ties five times as often as compared to tangent (straight) track. Steeper grades not only require additional locomotives and excessive amounts of fuel to operate, but also require longer starting and stopping distances which have an effect on safety.

The earthwork design criteria take into consideration cut and fill slopes which are chosen to minimize the amount of excavation required to obtain a balance of material without jeopardizing the stability of the constructed slopes. Special design criteria were considered in the design of the Western Alignment. As an example, for cuts and fills exceeding 100 feet in height, slope ratios are flattened to provide for greater stability and horizontal "benches" are added for each elevation increase of 50 feet. The benches not only provide greater slope stability, but also provide erosion control features by intercepting and diverting water away from the constructed slope, maximizing erosion control and minimizing sediment loss. During the final engineering design process, additional geotechnical information will be gathered for cuts and fills throughout the alignment to develop specific slope recommendations for final earthwork design to ensure slope stability and minimize soil erosion loss.

With respect to the question that has been asked as to the feasibility of utilizing railroad trestles in place of large fills to cross side drainages on the Western Alignment, some history is worthy of note. During the late 1800's and early 1900's, trestles were constructed in high mountainous areas where canyons or valleys were crossed with tunnels on each end. The tunneling through "granite type" rock left insufficient fill material to cross valleys. Since timber was readily available, trestles were constructed to "bridge" the valleys. Today, with more sophisticated designs, engineers utilize "pre-stressed concrete" bridge beams or "steel box girders" to construct rail bridges. In any event, throughout the length of the TRRC alignment there are no "granite" rock types that will require tunneling.

In the case of the Western Alignment, materials are suitable for excavation, and thus the use of optimum cut and fill design techniques is available. If pre-stressed concrete bridges or trestles were incorporated into the design of the Western Alignment, excavated material would have to be disposed of in large stockpiles. As an example, if a trestle were constructed at Post Creek instead of fill, an off-site stock pile of 3.3 million cubic yards would have to be created. The process of disposing of the excavated material and trestle construction would increase the amount of land and right-of-way necessary for construction of the rail line. Again, using Post Creek as an example, the additional right-of-way for a 3.3 million cubic yard stockpile (30 feet high x 2000 ft long x 1600 ft wide, with 2:1 side slopes), would require an additional 73.5 acres of right-of-way.

Further, trestles are very expensive to build, maintain and operate as compared to earth embankments. Earthwork embankments can be inspected during the normal "High Rail" track inspection process. However high trestles would require specialized equipment and trained individuals to annually review all of the trestle joints, abutments, piers, etc. In addition, a derailment occurrence on a trestle could be catastrophic. Normally if a train derails on a large fill section the locomotives, and or rail cars will roll on their sides, and perhaps partially slide down

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the slope. The "clean-up" process can be done from the top or the bottom of the fill slopes. However, with a derailment on a trestle, the locomotive or cars will fall off the trestle, which may also damage the trestle piers, and abutments, causing major damage to the trestle. In addition, the likelihood of deaths or serious injuries could be heightened, along with the possibility of catastrophic damage to the locomotive and cars.

In summary, the result of incorporating trestle design into the Western Alignment would not only greatly increase the safety risks, construction, operating and maintenance costs of the railroad, but would also increase the right-of-way requirements for trestle construction and disposal of "excavated" materials.

BLM's comments to the DSEIS have suggested that the implementation of trestles for the crossing of large drainages should be considered for the Western Alignment due to the following concerns: possible hydrological impacts, including fills creating an embankment or "dam" effect across drainages; potential increase in soil erosion; potential impacts on wildlife; and visual resource effects. These issues are addressed in the following sections of this letter, in which I will explain that the cut/fill impacts feared by BLM will be addressed through the recommended mitigation.

Culvert design criteria and hydrological impacts

Hydrologic control measures for the TRRC project were designed by first developing flood flows for all major drainages intercepting the alignment using the Soil Conservation Service ("SCS") triangular unit hydrograph procedures outlined in detail in the SCS National Engineering Handbook, Hydrology: Section 4, particularly Chapters 7, 9, 15, and 16. Parameters required for this procedure for each drainage basin include area in square miles, stream length in miles, basin relief, and adjusted point precipitation.

Area, stream length, and basin relief were measured on USGS 7 1/2-minute quad maps. Depth-duration analyses for the area were then performed using methods outlined in NOAA Atlas 2, Precipitation-Frequency Atlas of the Western United States. Point precipitation values were adjusted according to standard procedure when the drainage basins were large.

Based on corresponding flood flow determinations, round, corrugated metal pipes ("CMP") with either a galvanized or bituminous coating were sized for the 10- and 25-year, 24 hour peak flows. The CMP's are designed to pass the 10-year peak with no headwater at the entrance, to safely pass the 25-year peak flow with one-pipe diameter of headwater at the entrance, and are sized with a minimum diameter of 24". The 50-year and 100-year flood flows also were checked to insure that the peak runoff would not overtop the fill and that the integrity of the constructed rail embankments would be maintained.

Mr. Doug Day
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Providing that existing channels are not excessively steep, CMP's will be designed to conform to the existing flow-line, in order to provide a smooth interface between the bottom of the CMP and the existing channel, and to maintain the gradient of each of the drainages. Factors such as channel slope and flow velocities will govern the final gradient for culvert installation. For normal (non-flood-flow) conditions, culverts will be designed to prevent scour and to keep flow velocities below 5 feet per second.

For the few drainages that could support fish movement, the inverts of the culverts will be lowered below the normal flow-line to enhance the development of a natural stream bed. Box culverts and/or low profile arch culverts may also be used to maintain a natural stream bed and minimize disturbance. It should be noted that all perennial drainages supporting fisheries and crossed by the TRR line are crossed with bridges, not culverts.

The source of the criteria used by TRRC in culvert sizing is derived from the Montana Department of Transportation (DOT) Hydraulics Manual, Chapter 7, Hydrology, October 1995. The Montana DOT criteria are developed in compliance with Federal Highway Administration standards. According to the Montana DOT criteria, culverts must satisfy the following criteria: no railroad/roadway overtopping; no backwater damage to adjacent property; minimum 24" CMP under all railroad facilities; and, Maximum Allowable Headwater design criteria. Culvert sizing for the Western Alignment were developed following the Montana DOT criteria and range in size from 36" to 120" in diameter. Further, subject to recommended Mitigation Measure 49 contained in the DSEIS, the TRRC is required to ensure that all culverts and other drainage structures comply with the design guidelines adopted by the American Railway Engineering and Maintenance of Way Association.

The BLM has stated concerns indicating that the use of culverts utilizing the design criteria stated above will cause "damming" and creation of "large lakes" behind the rail embankments. The largest, or peak, flood flows are caused by high intensity thunderstorms. Because of this, the largest "flood peaks" occur over a short period of time, and usually subside over a few hours depending upon the geometry of the drainage area. In any case, any headwater that might be created during a 25, 50 or 100 year flood event would dissipate in less than 8 hrs with the proposed design methods. It again should be noted that these "culvert drainage design criteria" are not unique, but recommended and utilized by the Montana Department of Transportation, the Federal Highway Administration, and the Federal Railroad Administration.

Soil Erosion Issues

As noted in the DSEIS, potential gross soil loss estimates are very conservative and do not reflect the application of erosion and sediment control Best Management Practices (BMPs) to be required during construction. In addition, the soil loss estimates assume the entire area would be disturbed at the same time. In fact, only a small percentage of the soil that would be eroded from the disturbed areas would actually be delivered to a stream. The amount of soil delivered to a stream would depend on the size of the watershed, the distance between the construction area and the stream, the degree and shape of the slope between the construction area and the stream,

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the texture of the eroded material, surface roughness, vegetative cover, and other factors. The use of BMP control features during and after construction will significantly enhance erosion control and sediment control.

Further, as would be required by recommended Mitigation Measure No. 36, the TRRC will be required to prepare a Stormwater Pollution Prevention Plan (SWPPP) and an Erosion Control Plan using Montana Department of Environmental Quality Guidelines Best Management Practices (BMPs) and obtain coverage under the Montana Pollutant Discharge Elimination System General Permit for Storm Water Discharges associated with construction activity. Prior to construction of the rail line, TRRC will be required to determine which BMPs are to be employed at each location in the project area and receive Montana DEQ approval.

Nearly 20 percent of the recommended mitigation measures identified in the Draft SEIS are directed toward the control of erosion and sediment loss, reclamation and re-vegetation standards for disturbed areas during and after construction, and, ephemeral and perennial stream protection measures. In particular, the protection provided by the required Stormwater Pollution Prevention Plan (SWPPP) and Erosion Control Plan using Montana DEQ guidelines for Best Management Practices, and coverage under the Montana Pollutant Discharge Elimination System General Permit for Storm Water Discharges assures the implementation of appropriate measures to control potential erosion and sediment loss.

The SWPPP will identify areas with a high potential for soil erosion due to topography, slope characteristics, construction activities, and other factors. The SWPPP will incorporate erosion control practices to protect the soil surface and prevent soil particles from being detached by water or wind. Erosion control BMPs include: preserving natural vegetation; establishing vegetative buffer zones; designating clearing limits; temporary and permanent seeding; mulching; erosion control nets and blankets; surface roughening; gradient terracing; interceptor dikes and swales; grass lined channels; and water bars.

The SWPPP will also incorporate sediment control practices to trap the soil particles after being detached and moved by wind or water. Sediment control BMP measures include: sediment traps and basins; check dams; fiber rolls; silt fencing; gravel bag barriers; straw bale barriers; outlet and inlet protection; and vegetation strips. All BMPs are installed according to standard specifications and good engineering practices.

Wildlife and Cattle Movement Issues

Pursuant to recommended Mitigation Measure No. 3 in the DSEIS, numerous cattle passes will be installed along the rail alignment in appropriate locations identified in consultation with affected landowners. The cattle passes will be arched corrugated metal structures, approximately 11 feet high and 12 feet wide at the base sufficient to allow movement of livestock and wildlife across the rail alignment. The cattle passes will be large enough to accommodate the passage of a ¼ ton pickup truck. In addition, several recommended mitigation

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measures presented in the DSEIS are intended to address areas such as fencing, biological surveys, big game assessment, habitat assessment, and development of additional mitigation measures to protect biological resources providing adequate protection of wildlife resources.

Visual Issues

The proposed Western Alignment and the Four Mile Creek Alternative would traverse mostly undeveloped rangeland with natural visual resources. The potential affect on aesthetics would be related to the change in the natural landscape resulting from construction and operation of the rail line. The DSEIS did not identify any potentially significant aesthetics-related impacts, and does not recommend the adoption of any aesthetics-related mitigation measures.

Construction of some segments of either the proposed Western Alignment or the Four Mile Creek Alternative would be visible from public roads. Due to its overall length and proximity to public roads, construction activities on the Four Mile Alternative route would be more visible from public roads than the Western Alignment.

Much of the Western Alignment would be constructed in cuts, most of which would be deep enough to hide the rail line from public roadway view. The construction of some fills across drainages would be visible from some sections of public roads. Recommended mitigation measures requiring the re-vegetation of disturbed slopes would make disturbed slopes less visible from public roads and allow those slopes to blend in with adjacent undisturbed areas. By contrast, concrete or metal trestle structures would not blend in with the surroundings and would have adverse visual impacts due to their size and height.

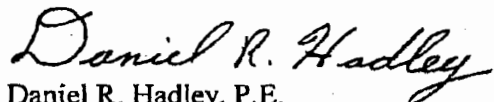
The BLM has stated that visibility will be blocked looking up "side canyons" due to the large embankments. The side canyons that are crossed via the Western Alignment are small and very narrow, (base-width of less than 800 feet at the mouth) and have limited sight distance. If a driver or passenger were traveling at 30 mph along the existing dirt road paralleling the Western Alignment, and looked up one of the "side canyons" they would only have approximately 18 seconds to see up the narrow draw.

In addition, re-vegetation of cut and fill slopes would return visible slopes to a more natural-looking setting. Natural hills and vegetation located between the proposed Western Alignment and sections of public roads would shield views of much of the proposed Western Alignment from public roads. The Western Alignment also would not be visible for most of the Tongue River Canyon corridor. Along most of the Canyon, the Western Alignment would be located approximately 1 mile west of the public road. On the other hand, the Four Mile Alternative parallels and crosses Montana State Secondary #566 for 8.3 miles and also parallels and crosses Montana State Hwy, #314 for 8.7 miles.

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I would be pleased to answer any further questions that might arise.

Sincerely,

A handwritten signature in cursive script that reads "Daniel R. Hadley". The signature is written in dark ink and is positioned above the printed name and title.

Daniel R. Hadley, P.E.
MISSION ENGINEERING, INC.

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April 20, 2005

Via Hand Delivery

Mr. Kenneth H. Blodgett
Environmental Protection Specialist
Section of Environmental Analysis
Surface Transportation Board
1925 K Street, N.W.
Washington, D.C. 20423

Re: **Tongue River Railroad Company, Inc. - Finance Docket 31086 (Sub-No. 3) -
Construction and Operation of the Western Alignment - Draft
Supplemental Environmental Impact Statement**

Dear Mr. Blodgett:

This will provide additional information for SEA's consideration in connection with three separate issues raised in the comments filed in this proceeding. The issues addressed here concern (a) access to water for construction of the line; (b) location of construction camps and (c) an assessment of a so-called "hybrid" alternative that would consist in part of the Western Alignment and in part of the Four Mile Creek Alternative.

A. Water Access

A question has been raised about how TRRC might obtain additional water resources should this be needed during construction of the line. The DEIS properly notes, at page 4-115, that water usage is likely to be low relative to the amount of water available from the Tongue River. The volume of water required would range from about 0.25 percent of the annual discharge from the dam (for the Western Alignment) to about 0.13 percent (for the Four Mile Creek Alternative.)

Water for constructing the TRRC line will be obtained according to the water allocation process established by Montana's Water Use Act of 1973, which is administered by the Montana Department of Natural Resources and Conservation ("MTDNRC"). An application for ground water in excess of 35 GPM or 10 Acre-Feet per year and all surface water appropriations must be submitted to MTDNRC on Form No. 600, Application for Beneficial Water Use Permit, and through a Criteria Addendum A

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Application for a beneficial water use permit for appropriations of less than 5.5 CFS and 4,000 acre-feet.¹

Application requirements of Form No. 600 include the following: name of applicant; source of water supply; point of diversion(s); means of diversion; reservoir(s); period of appropriation; proposed beneficial use; place(s) of use; flow rate, volume, purpose of use, and period of use; proposed completion period; location map; contact information; and, an affidavit.

According to MCA Section 85-2-311(1), the MTDNRC shall approve a water use permit for an appropriation of less than 5.5 CFS and 4,000 AC-FT of water if the applicant proves by a preponderance of evidence that the criteria listed below and submitted as part of a "Criteria Addendum A" Application are met by the applicant.

1. substantial, credible information to prove there is water physically available at the proposed point of diversion in the amount being sought for appropriation;
2. substantial, credible information or data to prove water is legally available during the period and in the amount requested;
3. substantial, credible information to prove the proposed use of water will not adversely affect a prior appropriator using an existing water right, a certificate, a permit, or a state water reservation;
4. description of the proposed means of diversion, construction, and operation of the diversion works intended to be used and presentation of substantial, credible information to prove the means of diversion, construction and operation are adequate; and,
5. substantial, credible information and data to prove the proposed use is a beneficial use of water and the flow rate and volume requested is reasonable.

The Criteria Addendum A application is also to include a general project plan and timeline for purchasing and installing equipment, the anticipated completion date, and a description of when and how much water will be put to beneficial use.

The information necessary to apply for beneficial use of water to construct the TRRC line will be developed during the final engineering and design process. The appropriate application for beneficial use of water will be completed and submitted to the MTDNRC for processing and approval. Further, to the extent feasible and necessary, TRRC will also explore purchasing water from various sources that may have available water, as noted at page 4-115 of the DEIS.

¹ More information on the Water permitting process is available on the MTDNRC website at <http://www.dnrc.state.mt.us/wrd/home.htm>.

B. Construction Camps

The second point on which we offer a response to comments concerns the location of construction camps. At this time, TRRC does not know the specific locations for the camps. It is anticipated that a primary construction camp will be located in or near Ashland on approximately 10 acres and a smaller construction camp will be located at the southern end of railroad near the connection with Spring Creek mine spur on approximately 5 acres. The land for the construction camps will be leased from area property owner(s) based on terms acceptable to the landowner(s). All construction camp structures will be temporary and no permanent foundations will be required. The construction camps will be self contained and all solid and sanitary waste will be collected and transported to a licensed landfill or sewage treatment facility.

The exact final location, size, and makeup of such camp(s) are dependent on final engineering and landowner negotiation. The camps will be situated in an acceptable location, i.e., subject to successful negotiation and agreement with the necessary landowner(s). Following completion of the railroad construction, both camp areas will be cleaned up, reclaimed and restored pursuant to the agreement(s) with the individual landowner(s).

C. Hybrid Alignment

The last point on which we offer information concerns the viability of a proposed "hybrid" route consisting of the upper portion of the Western Alternative, where S566 crosses the Tongue River, and the lower portion of the Four Mile Creek Alternative. There are several serious problems that make such an alternative infeasible. In fact, as described further below, the hybrid alternative would result in the same operational, maintenance, safety and other problems that resulted in the Western Alignment being proposed. The information offered in this section was provided by Mr. Dan Hadley of Mission Engineering, Inc., a consultant to TRRC.

First, due to the fact that the Western Alignment and the Four Mile Alternative Alignment are essentially perpendicular to each other at the point they would intersect, a sharp 3 degree curve (radius = 1910 ft), would be required to connect the two alignments. This "sharp 3 degree curve" would be located at the bottom of the very steep 2.31% grade profile of the Four Mile Alternative Alignment. The sharp curve and steep grade creates a much higher probability for train derailments at the mouth of Four Mile Creek as it enters the Tongue River.

Second, combining the two alignments would require a longer, higher, skewed crossing by the hybrid alignment of the Four Mile Creek drainage on a sharp curve. The drainage crossing would need to be approximately 2,200 feet long with a 120 foot high fill. By contrast, the proposed Western Alignment would cross the Four Mile Creek drainage perpendicularly. That crossing would be approximately 800 feet long, with a 60 ft. high bridge. Thus, impacts on the drainage from the Western Alignment would be less than the impacts of the hybrid alignment crossing.

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In addition to the increased amount of fill across the Four Mile drainage (approximately 1.7 million cubic yards), the addition of increased curvature on very steep grades greatly reduces the safety and operational characteristics of the TRRC line. It should be noted that this hybrid alignment would not meet the present design requirements for "Unit Trains" operated by the major rail companies.

In this regard, Pg 4-138, DSEIS states as follows:

"Loss of Train Control. TRRC proposes the following design criteria to ensure the safe operation of unit coal trains of 115 to 125 cars with design speeds between 45 and 55 mph. These design criteria are as stringent as, or more stringent than, the criteria established by the American Railway Engineering and Maintenance-of-Way Association:

- Maximum horizontal curvature of three degrees;
- Minimum tangent distance between horizontal curves of 200 feet;
- Maximum grade against empties of 1 percent, compensated for curvature;
- Maximum grade against loads of 0.50 percent;
- Maximum vertical curvature of 0.05 feet per 100 feet in sags and 0.10 feet per 100 feet at summits."

The proposed Western Alignment meets these design criteria; therefore, a loss of train control would not be likely. However, from the Spring Creek Spur connection to the top of the Four Mile drainage, the Four Mile Creek Alternative alignment, and the Four Mile Creek/Western Alignment hybrid alignment, would have adverse grades (against loads) in excess of 1.53 percent. Specifically, loaded coal trains would have to climb 648 feet with varying adverse grades from 0.594 percent to 1.533 percent over a distance of 13.07 miles. After the alignment would reach the top of the Four Mile Creek drainage, it would then descend 828 feet along Four Mile Creek. In this loaded coal train descent there would be 3.18 miles of a descending 2.31 percent grade. Therefore, there would be a much greater probability of losing control of a train with the Four Mile Creek Alternative or the Four Mile Creek/Western Alignment hybrid alignment than with the proposed Western Alignment.

In addition, the steeper grades of the Four Mile Creek Alternative and Four Mile Creek/Western Alignment hybrid alignment would require complicated operations to comply with safety requirements associated with train control, as well as result in much higher long-term maintenance and operating costs as compared to the Western Alignment. The higher maintenance and operating costs associated with the Four Mile Creek Alternative are addressed in the Verified Statement of Robert Leilich, submitted with TRRC's April 27, 1998 Application in this proceeding. To a significant degree, these same higher costs would apply to the hybrid alignment.

The following points also bear note:

- ⇒ The Four Mile Creek Alternative and Four Mile Creek/Western Alignment hybrid alignment are approximately 1.7 times longer than the Western Alignment
- ⇒ The Four Mile Creek Alternative and Four Mile Creek/Western Alignment hybrid elevation climb for loaded trains is more than 10 times greater than the Western Alignment
- ⇒ The Four Mile Creek Alternative and Four Mile Creek/Western Alignment hybrid alignment maximum climbing grades are nearly 4 times as steep for ascending trains than the Western Alignment
- ⇒ The Four Mile Creek Alternative and Four Mile Creek/Western Alignment hybrid alignment maximum grades are 2.5 times as steep for descending trains than the Western Alignment
- ⇒ The Four Mile Creek Alternative and Four Mile Creek/Western Alignment hybrid alignment have more public road crossings than the Western Alignment
- ⇒ The Four Mile Creek Alternative and Four Mile Creek/Western Alignment hybrid require 13.8% and 27.2% more land respectively for right of way than the Western Alignment

In proposing the Western Alignment, the TRRC sought to reduce the environmental impacts, improve operating and maintenance characteristics, and remove safety concerns resulting from the steep grades and the associated potential for loss of train control associated with operating on the Four Mile Creek Alternative alignment. The hybrid alignment described here would undermine, if not entirely defeat, the goals sought to be attained through design of the Western Alignment, and would recreate most of the operational, safety and other disadvantages of the Four Mile Creek Alternative. The summary of the three alternatives set forth below, together with the information supplied above, underscores this point:

	<u>Western Alignment</u>	<u>Four Mile Alternative</u>	<u>Hybrid</u>
Length (miles)	17.3	29.4	28.7
Climb for loaded train	64 ft.	694 ft.	694 ft.
Max. climbing grade for loaded trains	0.4%	1.53%	1.53%
Max. descending grade for loaded trains	0.93%	2.31%	2.31%
# of Public road crossings	4	7	8
Amount of r-o-w required	672 acres	765 acres	855 acres

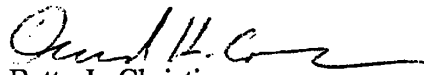
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Est. Construction cost	\$108.9mm	\$95.17mm	\$102.6mm
Homes displaced	0	2	2
Est. Volume of earth moved	17.3 mm cu/yds	10.3 mm cu/yds	12.6 mm cu/yds
River bridge crossings	1	1	1
Round trip (Miles City to Decker) fuel consumption	1,826 gallons	2,798 gallons	2,798 gallons

For all of these reasons, we do not believe that the hybrid alternative is feasible or practical, and strongly urge that it not be given further consideration as an alternative in this proceeding.

Please let us know if you have any questions concerning any of these matters.

Sincerely,



Betty Jo Christian
David H. Coburn
Attorneys for Tongue River
Railroad Company, Inc.

cc: Ms. Victoria Rutson
Mr. Scott Steinwert
Mr. Douglas Day

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June 6, 2005

VIA HAND DELIVERY

Ms. Victoria Rutson
Chief
Section of Environmental Analysis
Surface Transportation Board
1925 K Street, N.W.
Washington, D.C. 20423

**Re: Reply to Your Request for Information on Possible Bypasses Around Wolf
Mountains Battlefield Site**

Dear Ms Rutson:

This letter will respond on behalf of TRRC, Inc. to your request concerning the feasibility of using a different rail routing to avoid the area encompassed by the Wolf Mountains Battlefield. The following provides further details as to why it is not feasible to bypass the site boundary. We will also explain that the impacts on this area will be minimal.

At the outset, we note that the TRR II Draft EIS found that the TRR's preferred alignment would affect all or parts of three known historic properties, including the Wolf Mountains Battlefield. See TRRC II DEIS at 5-5. Further, the Tongue River II DEIS designated the battlefield site as probably eligible for listing in the National Register since it is a documented, definable event. TRRC II DEIS at 4-119. The TRR II DEIS indicated that impacts to any sites determined eligible for the National Register could be mitigated through appropriate data recovery procedures conducted pursuant to an approved Programmatic Agreement. TRRC II DEIS at 5-6.

The TRR III Draft Supplemental EIS found that both the approved alignment and the 1998 proposed refinements to that alignment would cross a portion of the Wolf Mountains Battlefield. The DEIS also notes that the site is now listed on the National Register of Historic Places. The Wolf Mountains Battlefield site was entered in the National Register on January 10, 2001. Further, the Draft

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Supplemental EIS noted that, as stipulated in the revised Programmatic Agreement, a treatment plan would be developed that would outline procedures to avoid or mitigate the impacts of the railroad to this site.

According to the NRHP Registration Form submitted for the Wolf Mountains Battlefield site, that site is located approximately four miles southwest of Birney, Montana in a narrow corridor of the Tongue River valley. The Battlefield NRHP boundary spans the width of the Tongue River valley for approximately two-and-a-half miles, and extends along the axis of the river about two miles. The battlefield is naturally divided into three sections by two streams passing through the site: the Tongue River, which passes through the center of the site, separating the eastern and western portions of the battlefield, and Battle Butte Creek, which is a dry ephemeral stream.

Straddling the Battle Butte Creek at its intersection with the river are two areas significant to the battle. East and slightly north of the junction is the field where troops established their camp. West of the campsite, a plateau rises from Battle Butte Creek's intersection with the Tongue River. This elevation (known locally as Battle Butte) follows the smaller stream across the valley floor to the mouth of a small canyon approximately one-half mile from the river. As pointed out in Section 7 of the NRHP Registration Form for Wolf Mountain, the "Battle Butte" shown on the U.S.G.S. map, which is used as the basis for the map attached to this letter as Figure 1, is actually mislabeled. The correct location for Battle Butte, which is distinguished by the conical knoll in its center, is shown on the attached map.

Infeasibility of Rerouting TRRC Alignment to Avoid Wolf Mountains Battlefield

Based on an analysis undertaken by Mission Engineering, TRRC's consultant in this matter, bypass routings either to the north/west or east/south of the NRHP boundary are infeasible from an engineering perspective and inconsistent with the objective the TRRC line -- to efficiently transport coal using unit coal trains. Engineering design criteria used in connection with the TRRC rail line design effort include, as relevant, the following:

- maximum horizontal curvature of 3 degrees
- minimum tangent distance between horizontal curves of 200 feet
- maximum grade against empties of 1 percent compensated for curvature
- maximum grade against loads of 0.50 percent
- maximum vertical curvature of 0.05 feet per 100 feet in sags and 0.10 feet per 100 feet at summits

In addition, the TRRC engineering design process takes into consideration environmental screening criteria including the following: avoid to the extent possible Tongue River flood-plain; avoid to the extent possible prime farmland/cropland; avoid to the extent possible wetland areas; and, to the extent possible limit the amount of right-of-way required and avoid disturbance to the landscape.

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While some have suggested that reasonable and feasible alternatives exist that bypass the Wolf Mountains Battlefield site to the north and west or to the east and south of the boundary, the fact is that there are no such alternative routes that would be either reasonable or feasible.

The attached Figure 1 illustrates the following:

- Wolf Mountains Battlefield National Register of Historic Places boundary;
- Topographic relief surrounding the battlefield site;
- The Tongue River and its meanders;
- Existing County Road # F.A.S. 566;
- 1996 STB approved alignment;
- 1998 proposed refinements to the TRR alignment;
- The possible routings of bypasses around the NRHP boundary to the north/west or to the south/east around the NRHP boundary. It is these bypasses, deemed by TRRC to be infeasible, which are considered here.

Figure 1 clearly depicts the substantial topographic and elevation changes that would be required for either a north/west or east/south bypass as compared to the 1996 initial alignment or the refinements to that alignment described by TRRC in 1998. The topography graphically illustrates why the cut and fill volumes for either bypass route are significantly greater than either the initial or the refined routes.

The major problem associated with either bypass route is that the existing terrain and natural grades are far in excess of TRRC's engineering and other criteria. The adverse terrain and grade issues could possibly be addressed only by implementing enormous cuts and fills which are otherwise unnecessary. As noted previously, however, the criteria implemented in the design of the TRRC line seek to avoid unnecessary and avoidable disturbance to the landscape and the host of environmental issues that would be associated with such cuts and fills. In both the north/ west and east/south bypasses discussed here, the amounts of excavation and embankment would be increased by tens of millions of cubic yards in order to meet the TRRC design criteria of rail grades not to exceed 1% compensated for curvature and the maximum "degree of curvature" not to exceed 3 degrees. These are the design criteria recommended by major rail carriers, including the BNSF, for "main line" unit train operations and they have been consistently applied by TRRC in its consideration of alternative routes.

If the TRR alignment were "rerouted" to the north/west of the NRHP boundary the following specific impacts would result:

1. The overall rail alignment would be increased in length by 4,700 ft.
2. The crossing of the Tongue River would require a 4,600 foot long fill across the Tongue River alluvial valley floor, exceeding fill heights of 90 feet.
3. A minimum of 8 ridges and valleys would have to be crossed with maximum cut lengths of up to 4,250 feet and exceeding 260 feet in depth at maximum.

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If the TRRC alignment were "rerouted" to the east/south of the NRHP boundary, the following impacts would result:

1. The overall rail alignment would be increased in length by over one mile -- 6,400 feet.
2. A minimum of 6 ridges and valleys would have to be crossed with maximum cut lengths of up to 12,500 feet and exceeding 620 feet in depth at maximum.

It should be noted that the refined route described by TRRC in 1998 contemplates a maximum cut length of 1,100 feet with a maximum 75 foot depth, substantially less than either bypass route described above.

In addition to the greater cut and fill, any routing to the north/west or to the east/south would also result in the following impacts:

- a more circuitous alignment;
- grade and curvature demands that are inconsistent with the criteria set forth above and with safe rail operations absent the described cut/fill;
- significantly more disruption to the landscape and thus to the environment generally;
- significantly greater construction expense;
- higher operating (largely, fuel and labor) and maintenance costs;
- increased amount of total private and federal land disturbance by a minimum of 400 acres, based on an assessment of the amount of land that would be disturbed in connection with the cuts and fills described above;
- increased encroachment on the Tongue River flood-plain by a minimum of 40 acres, 14 acres of this being irrigated farm land, based on an assessment of the amount of land that would be disturbed in connection with the cuts and fills described above;
- increased likelihood of derailments due to increased curves and grades; and
- greater air quality impacts associated with train operations due to increased fuel consumption resulting from greater length of the line.

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The NEPA requirement that alternatives be considered is subject to a "rule of reason" such that unreasonable or infeasible alternatives need not be addressed. *See National Resources Defense Council, Inc. v. Hodel*, 865 F.2d 288, 294-95 (D.C. Cir. 1988). According to the Supreme Court, "[T]he concept of alternatives [under NEPA] must be bounded by some notion of feasibility." *Vermont Yankee Nuclear Power Corp. v. NRDC*, 435 U.S. 519, 551 (1978). Thus, alternatives that are neither practical nor effective, which is the case with either of the bypasses around the Wolf Mountains Battlefield, need not be evaluated in depth. *See Airport Neighbors Alliance, Inc. v. U.S.*, 90 F.3d 426 (10th Cir. 1996). Indeed, any alternative that would thwart a primary purpose of the TRRC line, which is the efficient transportation of coal, need not be evaluated.

In short, the size and extent of the NRHP boundary designation for the Wolf Mountains Battlefield (approximately 2,756 acres) and the surrounding difficult terrain would pose very difficult problems relative to any effort to re-route the TRR line around that boundary. For that reason, and the other reasons identified above, TRRC cannot feasibly develop such a bypass routing. However, any adverse impacts of the rail route on the battlefield area can be mitigated, as previously determined by SEA and discussed next.

The Impacts on the Battlefield of the Current Planned Routing Can be Mitigated

While TRRC's alignment through the NRHP area (as refined in 1998) traverses the NRHP boundaries and thus will impact the area to some degree, that alignment avoids all of the most historically sensitive features of the Wolf Mountains Battlefield site, including Battle Butte itself, an area of heavy fighting during the battle. The line, as per the refinements made in 1998, would be located about 2,000 feet south of the correct site Battle Butte, and further away from the site than the approved alignment, as shown on Figure 1. This is considerably farther from that site than the existing county road. Further, the line would avoid important site features situated to the south and southeast of Battle Butte, including reported warrior positions, warrior movement routes and the location where the Cheyenne medicine man Big Crow fell during the battle.

The impacts of the approved route on cultural resources have been noted in the TRRC II DEIS, which concluded that "impacts to any sites determined eligible for the National Register could be mitigated through appropriate data recovery procedures." TRRC II DEIS at 5-6. The Supplemental DEIS issued in TRRC III notes that, with respect to the resources at the Wolf Mountains (Battle Butte) Battlefield, "a treatment plan would be developed that would outline procedures to avoid or mitigate the impacts of the railroad to this site." Supplemental DEIS at 5-19. The Programmatic Agreement discussed below provides for the measures necessary to identify and mitigate any features of the site which may be impacted by the rail alignment.

TRRC believes that its consideration of routes has demonstrated a good faith effort in regard to addressing cultural resource. In conformity with the requirements of the Section 6 of the National Historic Preservation Act process, TRRC is prepared to work under the terms specified in the Programmatic Agreement to identify, assess impacts, and mitigate any adverse impacts to cultural

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resources that may be encountered during the course of a more intensive review of resources that may be located along the final alignment in the Wolf Mountains Battlefield area.

The Programmatic Agreement

The TRRC III Draft Supplemental EIS requires development and approval of a Programmatic Agreement (PA) to ensure proper identification and treatment of cultural and paleontology resources identified during the construction and operation of the TRR line. The Bureau of Land Management, which has raised concerns about impacts to the Wolf Mountains Battlefield site, is a signatory party to this PA and has had an opportunity to comment on its terms.

The PA sets forth the detailed requirements on how the impacts associated with the construction and operation of the TRR line would be addressed, including impacts to paleontology, architectural, historic, and cultural properties. The PA guides and regulates the procedures by which the identification and treatment of paleontology and cultural resources would occur. The PA includes detailed requirements for additional surveys of the entire rail line from Miles City to Decker; identification and evaluation of paleontology, prehistoric, historic, or traditional cultural sites or structures; development of a detailed Treatment Plan in consultation with the parties to the PA and the Native American community; and procedures for reviewing and addressing objections and/or disagreements. The PA is thus uniquely well-suited to provide a framework for mitigating any adverse impacts to cultural resources at the Wolf Mountains Battlefield site.

Please let us know if you have any questions regarding the above.

Respectfully,



Betty Jo Christian

David H. Coburn

Attorney for Tongue River Railroad
Company, Inc.

cc: Ken Blodgett, SEA
Scott Steinwert, Circlepoint

Appendix J

SEA Route Analysis for TRRC Wyoming Coal

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Appendix J

SEA Route Analysis for TRRC Wyoming Coal

For the Wyoming coal originated by BNSF, SEA examined which of TRRC's markets would have a shorter route by using TRRC compared to what BNSF would have without using TRRC. SEA assumed that these would be the only markets where TRRC and BNSF could reduce their transportation rates in response to the competition from DM&E. If BNSF has an existing route that is shorter route than a route using TRRC, the TRRC route would not make BNSF any more competitive than it already is. Therefore, for those situations, SEA assumed rates would not change because of the TRRC construction. In those markets where TRRC would provide a shorter route than any other BNSF alternative, SEA assumed TRRC and BNSF could reduce their transportation rates in proportion to the mileage savings from using TRRC because, in general, it costs less to move traffic a shorter distance.¹

BNSF has two alternative routes to utilities in the Midwest for traffic that originates in Wyoming and exits the PRB out of the north via Donkey Creek, Wyoming. The first route turns northwest at Donkey Creek, before turning back east through Forsyth, Montana (the Northern route). The second route turns southeast out of Donkey Creek and travels down to Alliance, Nebraska and then eastward (the Southern route). Only the northern route would be shortened by using TRRC as a bridge carrier. The southern route through Alliance would not realize any mileage savings from the construction of TRRC. Therefore, BNSF and TRRC would only be

¹ This assumption tends to overstate transportation rate reductions. In simple terms, there are costs to load and originate a coal train, there are costs to move the coal train from origin to destination, and there are costs to terminate and unload a coal train. If there was a 10% mileage savings, and the cost to move the train from origin to destination were 80% of the total cost of the movement, this would translate to cost savings of 8% (10% of 80%) - not the full 10%.

likely to reduce rates on northern route traffic where the BNSF/TRRC route is shorter than the BNSF route through Alliance.

TRRC is expected to serve markets in Minnesota, Wisconsin, Michigan, Washington, northern Illinois, and the Dakotas – with other possible destinations in Ohio, Pennsylvania, New York, and Canada. SEA considers the upper Midwest to be the main target market for the coal that would be delivered via TRRC/BNSF.

DM&E is expected to serve mainly the upper Midwest market (rail-served power plants primarily in Wisconsin and Minnesota); the Great Lake Market; and the Chicago Gateway market (power plants served by rail in the Chicago/Gary area, and using Chicago to reach the power plants along the Ohio River and points to the east).

SEA examined mileage savings that representative utilities might realize by using a TRRC/BNSF joint route, as opposed to a BNSF-only route, to markets that would compete with DM&E, namely, Minnesota, northern Illinois, Wisconsin and Michigan.

1. Potential Mileage Savings to the Minnesota Market

The Minnesota market includes plants in and around the Twin Cities of Minneapolis and St. Paul. A representative movement for this market is from the Caballo mine in Wyoming to Minneapolis. The mileage on BNSF from the Caballo mine to Minneapolis via Forsyth, Montana is 1,120.2 miles, while the mileage via Alliance, Nebraska is 1,047.7 miles.² The mileage on BNSF from the Caballo mine to Decker, Montana (133.8 miles), transferred to TRRC from Decker to Miles City via the proposed Western Alignment (117.9 miles) and then

² Mileages were calculated using PC*Miler/Rail version 11 developed by ALK Technologies. See www.alk.com.

transported by BNSF from Miles City to Minneapolis (732.8 miles) would be a total of 984.5 miles. Table 1 shows the mileage differences between these alternative routes.

Table 1 – Rail Mileages to Minneapolis, Minnesota

Route	Mileage	BNSF/TRRC Savings
BNSF (via Forsyth)	1,120.2	12.1%
BNSF (via Alliance)	1,047.7	6.0%
BNSF-TRRC-BNSF Joint Route	984.5	

The BNSF-TRRC-BNSF joint route has a mileage savings of 12.1 percent over the BNSF route via Forsyth and a mileage savings of 6.0 percent over the BNSF route via Alliance. Therefore, use of TRRC would shorten the mileage of BNSF's existing route for Wyoming coal to the Minnesota market and, therefore, SEA assumed TRRC and BNSF might lower its rate in response to competition from DM&E.

Map 1 displays the two routing alternatives BNSF could use to serve Minneapolis, Minnesota.

Map 1 – BNSF Routes to Minneapolis, Minnesota



2. Potential Mileage Savings to the Northern Illinois Market

The northern Illinois market includes plants in and around Chicago. The mileage on BNSF for a representative movement from the Caballo mine in Wyoming to Chicago via Forsyth is 1,551.5 miles; while the mileage via Alliance is 1,130.3 miles. The mileage on BNSF from the Caballo mine to Decker, Montana (133.8 miles), on TRRC from Decker to Miles City via the proposed Western Alignment (117.9 miles), and on BNSF from Miles City to Chicago (1,164.1 miles) is a total of 1,415.8 miles. Table 2 shows the mileage differences between these alternative routes.

Table 2 – Rail Mileages to Chicago, Illinois

Route	Mileage	BNSF/TRRC Savings
BNSF (via Forsyth)	1,551.5	8.7%
BNSF (via Alliance)	1,130.3	n/a
BNSF-TRRC-BNSF Joint Route	1,415.8	

The BNSF-TRRC-BNSF joint route has a mileage savings of 8.7 percent over the BNSF route via Forsyth, but no mileage savings over the BNSF route via Alliance. Since BNSF would not have a more direct route to Chicago by using TRRC, SEA assumed BNSF would be no more competitive in this market because of the TRRC construction.

Map 2 displays the two routing alternatives BNSF could use to serve Chicago.

Map 2 – BNSF Routes to Chicago, Illinois



3. Potential Mileage Savings to the Wisconsin Market

The Wisconsin market includes plants on the western shore of Lake Michigan (eastern border of Wisconsin) accessible by rail or water (via barge or great lakes vessel). Representative movements to this market include an all-rail movement from the Caballo mine to Milwaukee and a rail-to-water movement to Green Bay.

All-Rail Routes to Milwaukee, Wisconsin

Since BNSF does not directly serve Milwaukee, SEA compared movements with BNSF interchanging its traffic to two different railroads. The first movement would be a BNSF route via Forsyth, interchanged to the Canadian Pacific Railway (CPRS) at Minneapolis. The mileage on BNSF from the Caballo mine to Minneapolis via Forsyth would be 1,120.2 miles. The mileage on CPRS from Minneapolis to Milwaukee would be 333.4 miles, resulting in a total of 1,453.6 miles.

The second movement would be a BNSF route via Alliance interchanged to Canadian National (CN) at Chicago. The mileage on BNSF from the Caballo mine to Chicago via Alliance would be 1,128.7 miles. The mileage on CN from Chicago to Milwaukee would be 115.6 miles for a total of 1,244.3 miles.

The mileage on BNSF from the Caballo mine to Decker, Montana (133.8 miles), on TRRC from Decker to Miles City via the proposed Western Alignment (117.9 miles), on BNSF from Miles City to Minneapolis (732.8 miles), and then on CPRS from Minneapolis to Milwaukee (333.4 miles), for a total of 1,317.9 miles. Table 3 shows the mileage differences between these alternative routes.

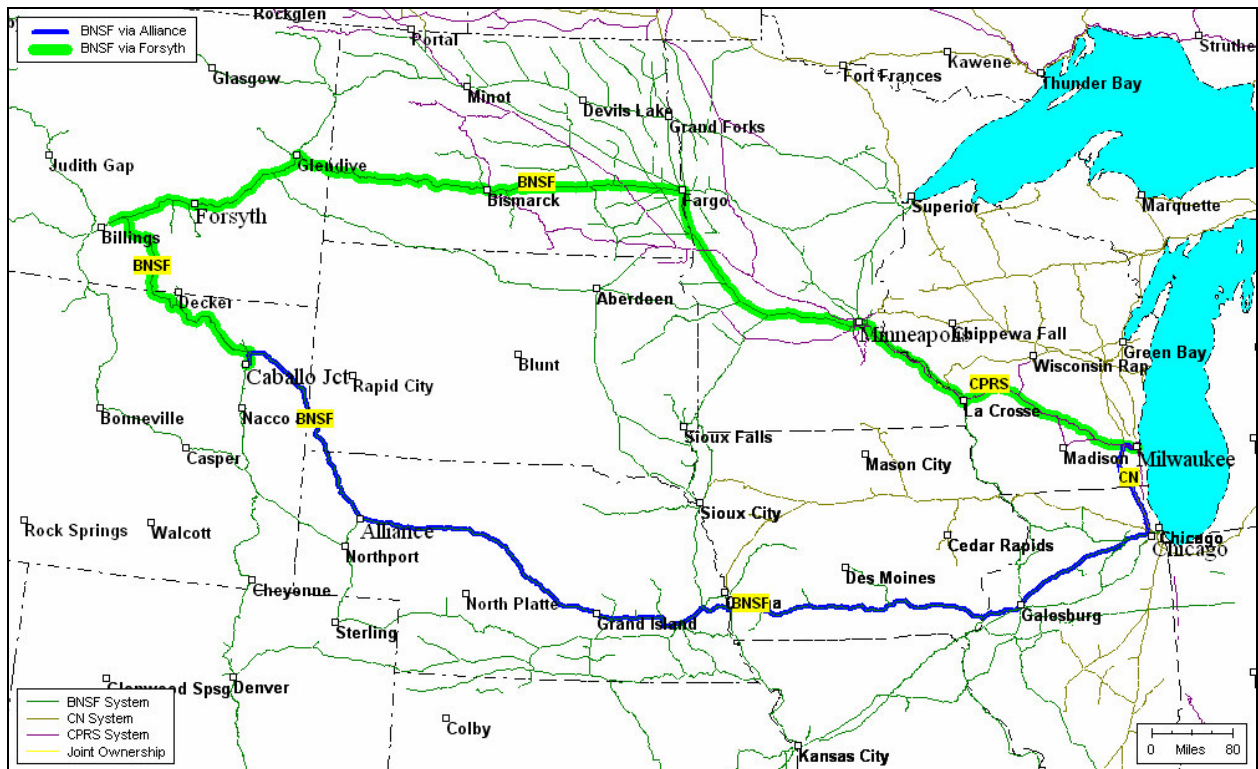
Table 3 – Rail Mileages to Milwaukee, Wisconsin

Route	Mileage	BNSF/TRRC Savings
BNSF-Minneapolis-CPRS (via Forsyth)	1,453.6	9.3%
BNSF-Chicago-CN (via Alliance)	1,244.3	n/a
BNSF-TRRC-BNSF-Minneapolis-CPRS	1,317.9	

The BNSF-TRRC-BNSF joint route has a mileage savings of 9.3 percent over the BNSF-CPRS route via Forsyth, but there is no mileage advantage over the BNSF route via Alliance. Because BNSF would not have a more direct route to Milwaukee by using TRRC, SEA assumed BNSF would be no more competitive in this market because of the TRRC construction.

Map 3 displays the two routing alternatives BNSF could use to serve Milwaukee.

Map 3 – BNSF Routes to Milwaukee, Wisconsin



Rail-to-Water Routes to Green Bay, Wisconsin

Because BNSF does not directly serve Green Bay, SEA compared movements with BNSF transloading to a water carrier at two different ports. The first movement studied was a BNSF route via Forsyth to the Superior Midwest Energy terminal (SMET) in Superior, Wisconsin. The mileage on BNSF from the Caballo mine to the SMET terminal in Superior via Forsyth is 1,129.7 miles. The distance on the Great Lakes from the SMET terminal to Green Bay is 682 miles, for a total of 1,811.7 miles.³

The second movement was a BNSF route via Alliance to the KCBX terminal in Chicago. The mileage on BNSF from the Caballo mine to the KCBX terminal in Chicago via Alliance is 1,130.3 miles. The distance on the Great Lakes from KCBX to Green Bay is 255 miles, for a total of 1,385.3 miles.

The mileage on BNSF from the Caballo mine to Decker, Montana (133.8 miles), on TRRC from Decker to Miles City via the proposed Western Alignment (117.9 miles), on BNSF from Miles City to Superior (742.3 miles), and on the Great Lakes from the SMET terminal to Green Bay (682 miles), would result in a total of 1,676.0 miles. Table 4 shows the mileage differences between these alternative routes.

Table 4 – Rail-to-Vessel Mileages to Green Bay, Wisconsin

Route	Mileage	BNSF/TRRC Savings
BNSF-Superior-Vessel (via Forsyth)	1,811.7	7.5%
BNSF-Chicago-Vessel (via Alliance)	1,385.3	n/a
BNSF-TRRC-BNSF- Superior-Vessel	1,676.0	

³ Vessel distances on the Great Lakes from *Distances Between United States Ports*, 2002 (9th) Edition. See <http://chartmaker.ncd.noaa.gov/nsd/distances-ports/distances.pdf>, page T-22. SEA assumed that distances from Superior, Wisconsin would be comparable to distances from Duluth, Minnesota.

The BNSF-TRRC-BNSF-Vessel route via the SMET terminal in Superior has a mileage savings of 7.5 percent over the BNSF-Vessel route via Superior, but no mileage advantage over the BNSF-Vessel route via Chicago. Because BNSF would not have a more direct route to Green Bay by using TRRC, SEA assumed BNSF would be no more competitive in this market than it would be without the TRRC construction.

4. Potential Mileage Savings to the Michigan Market

The Michigan market includes plants in central Michigan, which are accessible by rail; plants on the eastern shore of Lake Michigan (western border of Michigan), which are accessible by water; and plants around Detroit, which are accessible by either rail or water.

Plants in central Michigan or around Detroit served by all-rail routes would not have a shorter route on BNSF by using TRRC. BNSF would have to interchange to an eastern railroad in Chicago to reach any of the rail-served power plants in central Michigan or Detroit. As shown in the Chicago market discussion above, the BNSF route to Chicago via Alliance is shorter than any route using TRRC. Therefore, BNSF would not have a more direct route to central Michigan or Detroit by using TRRC. In these circumstances, SEA assumed that BNSF would be no more competitive in these markets because of the TRRC construction.

SEA also examined the plants served by rail-to-water routes in the Michigan market. These are a subset of the Michigan market. SEA focused on two representative movements: a movement from the Caballo mine to Muskegon, Michigan on the eastern shore of Lake Michigan (on the western border of Michigan) and a movement from the Caballo mine to Detroit.

Rail-to-Water Routes to Muskegon, Michigan

For the rail-to-water movement from the Caballo mine to Muskegon, SEA compared movements with BNSF transloading to a water carrier at two different ports. The first movement was a BNSF route via Forsyth to the SMET Terminal in Superior, Wisconsin. The mileage on BNSF from the Caballo mine to the SMET terminal in Superior via Forsyth is 1,129.7 miles. The distance on the Great Lakes from the SMET terminal to Muskegon is 709 miles, for a total of 1,838.7 miles.

The second movement studied was a BNSF route via Alliance to the KCBX terminal in Chicago. The mileage on BNSF from the Caballo mine to the KCBX terminal in Chicago via Alliance is 1,130.3 miles. The distance from the KCBX terminal in Chicago to Muskegon is 114 miles, for a total of 1,244.3 miles.

The mileage on BNSF from the Caballo mine to Decker, Montana (133.8 miles), on TRRC from Decker to Miles City via the proposed Western Alignment (117.9 miles), on BNSF from Miles City to Superior (742.3 miles), and on the Great Lakes from the SMET terminal to Muskegon (709 miles) is a total of 1,703.0 miles. Table 5 shows the mileage differences between these alternative routes.

Table 5 – Rail-to-Vessel Mileages to Muskegon, Michigan

Route	Mileage	BNSF/TRRC Savings
BNSF-Superior-Vessel (via Forsyth)	1,838.7	7.4%
BNSF-Chicago-Vessel (via Alliance)	1,244.3	n/a
BNSF-TRRC-BNSF- Superior-Vessel	1,703.0	

The BNSF-TRRC-BNSF-Vessel route via the SMET terminal in Superior has a mileage savings of 7.4 percent over the BNSF-Vessel route via Superior, but no mileage savings over the BNSF-

Vessel route via Chicago. Because BNSF would not have a more direct route to Muskegon by using TRRC, SEA assumed that BNSF would be no more competitive in this market because of the TRRC construction.

Rail-to-Water Routes to Detroit, Michigan

For the rail-water movement from the Caballo mine to Detroit, SEA again compared movements with BNSF transloading to a water carrier at two representative ports. The first movement was a BNSF route via Forsyth to the SMET Terminal in Superior, Wisconsin. The mileage on BNSF from the Caballo mine to the SMET terminal in Superior via Forsyth is 1,129.7 miles. The distance on the Great Lakes from the SMET terminal to Detroit is 726 miles, for a total of 1,855.7 miles.

The second movement assessed was a BNSF route via Alliance to the KCBX terminal in Chicago. The mileage on BNSF from the Caballo mine to the KCBX terminal in Chicago is 1,130.3 miles. The distance on the Great Lakes from the KCBX terminal in Chicago to Detroit is 633 miles, for a total of 1,763.3 miles.

The mileage on BNSF from the Caballo mine to Decker, Montana (133.8 miles), on TRRC from Decker to Miles City (117.9 miles), on BNSF from Miles City to Superior (742.3 miles), and on the Great Lakes from the SMET terminal to Detroit (726 miles), is a total of 1,720.0 miles. Table 6 shows the mileage differences between these alternative routes.

Table 6 – Rail-to-Vessel Mileages to Detroit, Michigan

Route	Mileage	BNSF/TRRC Savings
BNSF-Superior-Vessel (via Forsyth)	1,855.7	7.3%
BNSF-Chicago-Vessel (via Alliance)	1,763.3	2.5%
BNSF-TRRC-BNSF- Superior-Vessel	1,720.0	

The BNSF-TRRC-BNSF-Vessel route via the SMET terminal in Superior has a mileage savings of 7.3 percent over the BNSF-Vessel route via Superior and a mileage savings of 2.5 percent over the BNSF-Vessel route via Chicago. Use of TRRC would shorten BNSF's mileage from the Caballo mine to Detroit and, therefore, SEA assumed TRRC and BNSF might offer lower rates in response to DM&E's entry into the PRB coal market place.

Appendix K

Verified Statement from Francis A.
Roberts

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September 20, 2005

Ms. Victoria Rutson
Chief
Section of Environmental Analysis
Surface Transportation Board
1925 K Street, N.W.
Washington, D.C. 20423

**Re: Tongue River Railroad Company, Inc. - Finance Docket 31086 (Sub-No. 3) -
Construction and Operation of the Western Alignment - Draft
Supplemental Environmental Impact Statement**

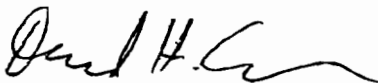
Dear Ms. Rutson:

This will respond to your August 29, 2005 Information Request concerning air quality issues for the Final Environmental Impact Statement being prepared for the Tongue River Railroad Company's proposed construction and operation of the Western Alignment. Attached to this letter please find the Statement of Francis A. Roberts of Platts, which addresses the coal volume forecast and chemical composition/quality questions raised in your letter. This is the same Mr. Roberts who has previously submitted testimony for TRRC on the merits side of the TRRC proceeding.

With respect to the permit status of Ashland area mines, no permits have to date been sought or issued.

Concerning the questions about BNSF line capacity, TRRC will respond to these shortly under separate cover.

Sincerely,



Betty Jo Christian
David H. Coburn
Attorneys for Tongue River Railroad Company, Inc.

cc: Mr. Ken Blodgett

Ms. Victoria Rutson
September 20, 2005
Page 2

Mr. Scott Steinwert
Ms. Mary Bean
Mr. Douglas Day

September 19, 2005

**STATEMENT OF FRANCIS A. ROBERTS IN RESPONSE TO THE SURFACE
TRANSPORTATION BOARD'S SECTION OF ENVIRONMENTAL ANALYSIS
INFORMATION REQUEST OF AUGUST 29, 2005**

My name is Francis A. Roberts, and I reside at 4118 Stoneham Circle, Loveland, CO 80538. I am a Sr. Consultant at Platts, a division of The McGraw-Hill Companies and the world's largest energy information provider. In my capacity as a Principal at Platts Research & Consulting, a Platts subsidiary, in Boulder, CO, I submitted a Rebuttal Verified Statement to the STB on November 26, 2003 in Finance Docket 30186 (Sub-No. 3), *Tongue River Railroad Company -- Construction and Operation of the Western Alignment*. I also assisted Mark T. Morey in the preparation of his Verified Statement to the STB in the same proceeding, which Verified Statement was submitted to the STB on May 1, 2003.

At the request of Tongue River Railroad Company, we have prepared responses to a portion of the August 29, 2005 Information Request addressed by SEA to David H. Coburn. That request concerns air quality issues related to the construction and operation of the Tongue River Railroad. Specifically, Platts has responded to the series of questions posed in the paragraphs that begin "Second" and "Last" of the Information Request. I understand that Tongue River Railroad Company representatives will respond to you under separate cover concerning the questions about BNSF capacity.

In the paragraph of the Information Request that begins with the word "Second", SEA seeks to confirm that the current record for the Sub-3 proceeding is up-to-date and accurate with respect to coal forecasts. Specifically, SEA desires to know if there have been changes of note since the TRRC's May 2003 filing supplementing its April 1998 application. The answer is that there have been no significant changes. Platts has not appreciably altered its forecast of production tonnage for the Northern Powder River Basin (NPRB) nor has it altered in any substantial manner its forecast of the amount of coal that is expected to be hauled by the TRRC.

In fact, as of this date, the forecast prepared in Table 1 of Mr. Morey's May 2003 Statement has proved to be extremely accurate. The 2004 NPRB demand forecast in the Table 1 of Mr. Morey's May 2003 filing (40.8 million tons) was less than 3% different than actual 2004 NPRB production (39.6 million tons) with stockpile reductions likely contributing to some of the small difference. The current Platts forecast of 2005 NPRB production (39.8 million tons) is less than 3% different than the 2005 NPRB demand forecast set forth in Table 1 of Mr. Morey's May 2003 filing (40.9 million tons) with stockpile reductions again possibly contributing to some of the difference. These figures can be seen in Table 1 of this document, below.

TABLE 1
Northern Powder River Basin Forecast Demand -vs- Actual Production

	<i>Millions of Tons</i>	
	2004	2005
May 2003 STB Filing	40.8	40.9
Actual Annual Production	39.6	
August 2005 Platts Forecast		39.8
<i>Forecast Error in May 2003 Filing</i>	<i>-3%</i>	<i>-3%</i>

Source: Actual production from Platts COAldat™ database

Thus, the forecast in the May 2003 filing has proven accurate within expected error limits and has not required revision. Since the forecast of NPRB demand has proven accurate there has been no reason to adjust the tonnage amounts expected to be hauled by the TRRC.

Further, I have reviewed the "Total Tonnage Forecast" table, which is set forth on the last page of Mr. Morey's May 2003 Statement. I know of no developments since that Table was prepared that would require any revisions to that Table.

The SEA desires to know if the TRRC has produced estimates of the power plants it expects to serve, the mileage savings owing to use of the TRRC track, and the market share the TRRC expects to capture. In the May 2003 filing, the projected market for NPRB coal was considered to exist largely of the market already served by existing NPRB mines, with most out-year demand growth resulting from increases in capacity factors at those plants. In fact, the market for NPRB has been remarkably stable and predictable over the years. In 2004, 86% of the coal sold from the NPRB into the electric generation market was sold to a power plant that had been an NPRB customer for at least 14 years. The stable customer base for NPRB coal is illustrated in Table 2.

TABLE 2
Utility Market Demand for NPRB Coal

<i>Thousands of Tons</i>			
Power Plant	1990	2004	2005 (Through May)
Colstrip	8,798	6,378	2,730
Sherburne	4,258	5,584	2,463
Clay Boswell Energy Center	3,994	3,727	2,023
St. Clair	4,523	4,010	976
Belle River	4,056	3,853	939
Stateline (DOMENE)	348	1,739	554
Centralia (TRAENE)		915	315
Stanton (GRERIV)		266	314
B. C. Cobb	312	929	271
Hoot Lake	174	442	247
Taconite Harbor Energy Center		933	233
Syl Laskin	31	408	181
Presque Isle	883	488	166
J. C. Weadock		239	149
Grand Rivers Terminal (BRT Tra		243	139
King	384	351	111
Dewey	388	538	108
Others	7,165	2,418	366
Grand Total	35,292	33,438	12,286

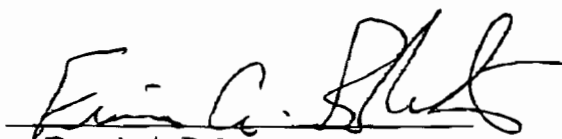
Source: Platts COALdat™ Database

This stable market is the core of the future market for NPRB coal. Ashland area mines will, in large part, simply substitute as supply sources for current Decker/Spring Creek area mines as those latter mines deplete their reserves. Given the similarity in coal characteristics between Ashland area coal and Decker/Spring Creek area coal, purchasers of Ashland area coal would not be influenced in their choice of coal by the small incremental differences in transportation mileage and cost savings that might be realized due to a switch from Decker/Spring Creek sources to Ashland sources. The TRRC will thus "capture" essentially the full market share currently held by Decker/Spring Creek area mines. Similarly, as stated in the May 2003 filing, the TRRC will "capture" some of the coal traffic currently originating in Wyoming as the market for these Southern Powder River Basin (SPRB) coals grows and their alternative rail capacity limits are reached. This "captured" market share is insignificant when compared to total SPRB demand. Beyond the information set forth previously on behalf of TRRC and the above information, TRRC has no more specific data to share with SEA concerning plants to be served, mileage savings and market share.

In the "Last" paragraph of its Information Request letter, SEA inquires as to substitution and usability issues with respect to Decker and Ashland coals and with respect to coals originating at Montana versus Wyoming mines. Regarding substitution potential, it is important to note that Ashland and Decker coals are both NPRB compliance coals. Substituting one NPRB coal with another is much simpler from a quality standpoint than is substituting NPRB coal with a non-Powder River Basin coal. The heat content of

NPRB coals is quite similar, as is the sulfur, ash, and moisture content. Therefore, when one NPRB coal is substituted for another NPRB coal, there is usually very little difference in coal tonnage requirement.

This is not true when substituting coals from different regions. For example, a utility substituting a Gillette, Wyoming SPRB coal for a Decker, Montana NPRB coal would require more SPRB coal to compensate for the lower heat content. The chlorine and moisture contents of Decker and Ashland coals are significantly different than those of other, even SPRB, coals and these factors could affect substitutability. Also, FOB mine and transportation costs for alternative NPRB coals are similar, while FOB mine and transportation costs for non-NPRB coals are usually quite dissimilar. These factors all indicate that substituting Ashland area NPRB coal for Spring Creek/Decker area NPRB coal would produce relatively smaller impacts than would substituting a coal from a different coal producing region.


Francis A. Roberts