# AIR QUALITY PERMIT

Issued To: Thompson River Co-Gen, L.L.C.
285 – 2nd Avenue West North
Kalispell, MT 59901

Permit: #3175-00
Application Complete: 08/28/01
Preliminary Determination Issued: 10/03/01
Department's Decision Issued: 10/24/01
Final Permit Issued: 11/09/01
AFS: #089-0009

An air quality permit, with conditions, is hereby granted to Thompson River Co-Gen, L.L.C. (TRC), pursuant to Sections 75-2-204 and 211 of the Montana Code annotated (MCA), as amended, and Administrative Rules of Montana (ARM) 17.8.701, *et seq*., as amended, for the following:

## SECTION I: Permitted Facilities

A. Permitted Facility

TRC operates a 12.5-megawatt capacity electricity/steam co-generation. A complete list of permitted equipment/emission sources is contained in Section I.A of the permit analysis.

B. Plant Location

The TRC plant is located approximately 3.7 miles east-southeast of Thompson Falls, MT. The legal description of the site is in the SW¼ of the NW¼ of the NE¼ of Section 13, Township 21 North, Range 29 West, Sanders County, Montana. The approximate universal transverse mercator (UTM) coordinates are Zone 11, Easting 631.6 kilometers (km), and Northing 5270.6 km.

## SECTION II. Conditions and Limitations

A. Limitations and Conditions

1. TRC shall not cause or authorize to be discharged into the atmosphere from any stack or vent any visible emissions that exhibit an opacity of 20% or greater averaged over 6 consecutive minutes (ARM 17.8.304).

2. TRC shall not cause or authorize to be discharged into the atmosphere from the fabric filter baghouse controlling emissions from the Boiler any visible emissions that exhibit an opacity of 20% or greater averaged over 6 consecutive minutes except for one 6-minute period per hour of not greater than 27% opacity (ARM 17.8.340 and 40 CFR Part 60.43b(f), Subpart Db).

3. Emissions from the Boiler shall not exceed the following (ARM 17.8.710):

   a. Oxides of Nitrogen ($NO_x$) Emissions:

      i. 34.32 lb/hr calculated on a rolling 30-day average; and
      ii. 0.22 lb/MMBtu calculated on a rolling 30-day average.

b. Carbon Monoxide (CO) Emissions:

   i. 49.92 lb/hr; and
   ii. 0.32 lb/MMBtu.

c. Sulfur Dioxide ($SO_2$) Emissions:

   i. 46.80 lb/hr; and
   ii. 0.30 lb/MMBtu.

d. Particulate Matter/Particulate Matter less than 10µm aerodynamic diameter ($PM/PM_{10}$) Emissions:

   i. 4.62 lb/hr*; and
   ii. 0.017 gr/dscf.*

   ∗ The hourly emission limit in Section II.A.3.d(i) shall apply at all times except periods of startup, shutdown, or malfunction (40 CFR Part 60.43b(g)). The grain loading limit in Section II.A.3.d(ii) is the Boiler Baghouse limit.

e. Volatile Organic Compound (VOC) Emissions:

   i. 5.93 lb/hr; and
   ii. 0.038 lb/MMBtu.

4. $NO_x$ emissions from the Boiler shall be controlled by the use of over-fire air (OFA) (ARM 17.8.715).

5. $SO_2$ emissions from the Boiler shall be controlled by a dry lime scrubber when combusting coal (ARM 17.8.715).

6. Particulate emissions from the Boiler shall be controlled by a fabric filter baghouse (Boiler Baghouse) (ARM 17.8.715).

7. The Boiler shall be fired with coal and/or wood waste bio-mass only except for periods of Boiler start-up when diesel fuel may be used (ARM 17.8.710).

8. TRC shall obtain a coal analysis, that is representative of each load of coal received, from each coal supplier. The analysis shall contain, at a minimum, sulfur content, ash content, and BTU value (ARM 17.8.710).

9. All railcar coal deliveries/transfers shall be unloaded via a bottom dump into an under-track hopper. $PM/PM_{10}$ emissions from railcar transfers to the under-track hopper shall be enclosed and controlled by a fabric filter baghouse (Fuel Handling Baghouse – DC1) (ARM 17.8.715).

10. All material transfer conveyors for coal fuel storage and handling shall be enclosed and routed to the Fuel Handling Baghouse – DC1 (ARM 17.8.715).

11. Particulate emissions from the Fuel Handling Baghouse – DC1 shall not exceed 0.02 gr/dscf (ARM 17.8.715).

12. All material transfer conveyors for wood waste bio-mass fuel storage and handling shall be enclosed and routed to a bin vent dust collector (Fuel Handling Bin Vent – DC2) (ARM 17.8.715).

13. Particulate emissions from the Fuel Handling Bin Vent – DC2 shall not exceed 0.02 gr/dscf (ARM 17.8.715).

14. TRC shall install and operate a bin vent dust collector (Lime Silo Bin Vent – DC3) to control $PM/PM_{10}$ emissions from the lime silo supplying the dry lime scrubber (ARM 17.8.715).

15. Particulate emissions from the Lime Silo Bin Vent – DC3 shall not exceed 0.02 gr/dscf (ARM 17.8.715).

16. TRC shall install and operate a bin vent dust collector (Fly Ash Silo Bin Vent – DC4) to control $PM/PM_{10}$ emissions from the ash silos collecting boiler ash/fly ash (ARM 17.8.710).

17. Particulate emissions from the Fly Ash Silo Bin Vent – DC4 shall not exceed 0.02 gr/dscf (ARM 17.8.715).

18. All fly ash transfers to trucks shall be gravity fed through a retractable load-out spout (ARM 17.8.710).

19. TRC shall install and operate a Continuous Opacity Monitoring System (COMS) to monitor opacity from the Boiler (ARM 17.8.340 and 40 CFR Part 60, Subpart Db).

20. TRC shall install and operate a $NO_x$ Continuous Emission Monitoring System (CEMS) to monitor $NO_x$ emissions from the Boiler (ARM 17.8.340 and 40 CFR Part 60, Subpart Db).

21. TRC shall not cause or authorize the use of any street, road, or parking lot without taking reasonable precautions to control emissions of airborne particulate matter (ARM 17.8.308).

22. TRC shall treat all unpaved portions of the haul roads, access roads, parking lots, or general plant area with water and/or chemical dust suppressant as necessary to maintain compliance with the reasonable precautions limitation (ARM 17.8.710).

23. TRC shall comply with all applicable standards and limitations, and the reporting, recordkeeping and notification requirements contained in 40 CFR 60, Subpart A and 40 CFR Part 60, Subpart Db (ARM 17.8.340, 40 CFR 60, Subpart A, and 40 CFR Part 60, Subpart Db).

B. Testing Requirements

1. Compliance with the $NO_x$ limits for the Boiler in Section II.A.3(a) shall be determined by an initial performance source test conducted within 60 days of achieving the maximum production rate at which the affected facility will be operated but not later than 180 days after initial startup. After the initial source test, testing shall continue on an every 2-year basis or according to another testing/monitoring schedule as may be approved by the Department of Environmental Quality (Department). TRC may use testing in conjunction

with the Relative Accuracy Test completed for certification of the CEMS, as a compliance test, if maximum achievable process rates are maintained (ARM 17.8.105, ARM 17.8.710, 40 CFR Part 60.8, and 40 CFR Part 60, Subpart Db).

2. Compliance with the PM/$PM_{10}$ limits for the Boiler in Section II.A.3(d) shall be determined by an initial performance source test conducted within 60 days of achieving the maximum production rate at which the affected facility will be operated but not later than 180 days after initial startup. After the initial source test, testing shall continue on an every 2-year basis or according to another testing /monitoring schedule as may be approved by the Department. (ARM 17.8.105,ARM 17.8.710, 40 CFR Part 60.8, and 40 CFR Part 60, Subpart Db).

3. Compliance with the CO limits for the Boiler in Section II.A.3(b) shall be determined by an initial performance source test conducted within 60 days of achieving the maximum production rate at which the affected facility will be operated but not later than 180 days after initial startup. The testing shall continue on an every 2-year basis or according to another testing/monitoring schedule as may be approved by the Department (ARM 17.8.105, 40 CFR Part 60, Subpart A, and 40 CFR Part 60, Subpart Db).

4. Compliance with the $SO_2$ emission limits for the Boiler in Section II.A.3(c) shall be determined by an initial performance source test conducted within 60 days of achieving the maximum production rate at which the affected facility will be operated but not later than 180 days after initial startup. The testing shall continue on an every 2-year basis or according to another testing/monitoring schedule as may be approved by the Department (ARM 17.8.105).

5. TRC shall provide the Department with a record of the amount of coal being combusted and a coal analysis for sulfur and BTU value during all compliance source tests on the Boiler (ARM 17.8.710 and ARM 17.8.106).

6. Compliance with the PM/$PM_{10}$ limits for the Fuel Handling Baghouse – DC1 shall be determined by an initial performance source test conducted within 60 days of achieving the maximum production rate at which the affected facility will be operated but not later than 180 days after initial startup. After the initial source test, testing shall continue on an every 2-year basis or according to another testing /monitoring schedule as may be approved by the Department. (ARM 17.8.105,ARM 17.8.710, ARM 17.8.715).

7. Compliance with the PM/$PM_{10}$ limits for the Fuel Handling Bin Vent – DC2 shall be determined by an initial performance source test conducted within 60 days of achieving the maximum production rate at which the affected facility will be operated but not later than 180 days after initial startup. After the initial source test, testing shall continue on an every 2-year basis or according to another testing /monitoring schedule as may be approved by the Department. (ARM 17.8.105,ARM 17.8.710, ARM 17.8.715).

8. Compliance with the PM/$PM_{10}$ limits for the Lime Silo Bin Vent – DC3 shall be determined by an initial performance source test conducted within 60 days of achieving the maximum production rate at which the affected facility will be operated but not later than 180 days after initial startup. After the initial source test, testing shall continue on an every 2-year basis or according to another testing /monitoring schedule as may be approved by the Department. (ARM 17.8.105,ARM 17.8.710, ARM 17.8.715).

9. Compliance with the $PM/PM_{10}$ limits for the Fly Ash Silo Bin Vent – DC4 shall be determined by an initial performance source test conducted within 60 days of achieving the maximum production rate at which the affected facility will be operated but not later than 180 days after initial startup. After the initial source test, testing shall continue on an every 2-year basis or according to another testing /monitoring schedule as may be approved by the Department. (ARM 17.8.105,ARM 17.8.710, ARM 17.8.715).

10. All compliance source tests shall conform to the requirements of the Montana Source Test Protocol and Procedures Manual (ARM 17.8.106).

11. The Department may require further testing (ARM 17.8.105).

C. Operational Reporting and Recordkeeping Requirements

1. TRC shall supply the Department with annual production information for all emission points, as required by the Department in the annual emission inventory request. The request will include, but is not limited to, all sources of emissions identified in the emission inventory contained in the permit analysis.

   Production information shall be gathered on a calendar-year basis and submitted to the Department by the date required in the emission inventory request. Information shall be in the units required by the Department. This information may be used to calculate operating fees, based on actual emissions from the facility, and/or to verify compliance with permit limitations. TRC shall submit the required information annually to the Department by February 15 (ARM 17.8.505).

2. TRC shall maintain on site a record of all coal analysis conducted in accordance with the requirement in Section II.A.8. TRC shall submit a summary of all coal analysis to the Department by February 15 of each year; the information may be submitted along with the annual emission inventory (ARM 17.8.505 and ARM 17.8.710).

3. TRC shall maintain on site a record of all annual COMS/CEMS certification as required in Section II. The records shall be maintained by TRC for at least 5 years following the date of the measurement, must be available at the facility site for inspection by the Department, and must be submitted to the Department upon request (ARM 17.8.710).

4. TRC shall notify the Department of any construction or improvement project conducted pursuant to ARM 17.8.705(l)(r), that would include a change in control equipment, stack height, stack diameter, stack flow, stack gas temperature, source location or fuel specifications, or would result in an increase in source capacity above its permitted operation or the addition of a new emission unit.

   The notice must be submitted to the Department, in writing, 10 days prior to start up or use of the proposed de minimis change, or as soon as reasonably practicable in the event of an unanticipated circumstance causing the de minimis change, and must include the information requested in ARM 17.8.705(l)(r)(iv) (ARM 17.8.705).

5. All records compiled in accordance with this permit must be maintained by TRC as a permanent business record for at least 5 years following the date of the measurement, must be available at the plant site for inspection by the Department, and must be submitted to the Department upon request (ARM 17.8.710).

D. Monitoring Requirements

1. TRC shall install, operate, and maintain the applicable COMS/CEMS listed in Section II.A. Emission monitoring shall be subject to 40 CFR 60, Subpart Db, Appendix B (Performance Specifications) and Appendix F (Quality Assurance/Quality Control) provisions. TRC shall conduct a Relative Accuracy Test Audit (RATA) for the CEMS and shall inspect and audit the COMS annually, using neutral density filters (EPA Technical Assistance Document: Performance Audit Procedures for Opacity Monitors; EPA-450/4-92-010, April 1992). The annual monitor RATA/audit can coincide with the required compliance source testing.

2. Any stack testing requirements that will be required (in Section II.B) shall be conducted according to 40 CFR Part 60, Appendix A, 40 CFR Part 60, Subpart Db, and ARM 17.8.105, Testing Requirements Provisions. Test methods and procedures, where there is more than one option for any given pollutant, shall be approved by the Department prior to commencement of testing. (ARM 17.8.106 and ARM 17.8.710).

3. Monitoring data shall be maintained for a minimum of 5 years at the TRC facility (ARM 17.8.710).

E. Notification

1. Within 30 days of commencement of construction of the Boiler with a fabric filter baghouse, a dry lime scrubber, an OFA system, COMS, and $NO_x$ CEMS, TRC shall notify the Department of the date of commencement of construction (40 CFR Part 60.7 and ARM 17.8.710)

2. Within 15 days after actual startup of the Boiler with a fabric filter baghouse, a dry lime scrubber, an OFA system, COMS, and $NO_x$ CEMS, TRC shall notify the Department of the date of actual startup (40 CFR Part 60.7 and ARM 17.8.710).

3. Within 30 days of commencement of construction of the fabric filter baghouse for the under-track hopper used for fuel unloading and handling, TRC shall notify the Department of the date of commencement of construction (ARM 17.8.710).

4. Within 15 days of actual startup of the fabric filter baghouse for the under truck hopper used for fuel unloading and handling, TRC shall notify the Department of the date of actual startup (ARM 17.8.710).

5. Within 30 days of commencement of construction of the fabric filter baghouse for the fuel storage and handling system, TRC shall notify the Department of the date of commencement of construction (ARM 17.8.710).

6. Within 15 days of actual startup of the fabric filter baghouse for the fuel storage and handling system, TRC shall notify the Department of the date of actual startup (ARM 17.8.710).

7. Within 30 days of commencement of construction of the bin vent dust collector for the lime silo, TRC shall notify the Department of the date of commencement of construction (ARM 17.8.710)

8. Within 15 days of actual startup of the bin vent dust collector for the lime silo, TRC shall notify the Department of the date of actual startup (40 CFR Part 60.7 and ARM 17.8.710).

9. Within 30 days of commencement of construction of the bin vent dust collector for the ash/fly ash silos, TRC shall notify the Department of the date of commencement of construction (ARM 17.8.710).

10. Within 15 days of actual startup of the bin vent dust collector for the ash/fly ash silos, TRC shall notify the Department of the date of actual startup (ARM 17.8.710).

SECTION III: General Conditions

A. Inspection – TRC shall allow the Department's representatives access to the source at all reasonable times for the purpose of making inspections or surveys, collecting samples, obtaining data, auditing any monitoring equipment (CEMS, CERMS) or observing any monitoring or testing, and otherwise conducting all necessary functions related to this permit.

B. Waiver – The permit and the terms, conditions, and matters stated herein shall be deemed accepted if TRC fails to appeal as indicated below.

C. Compliance with Statutes and Regulations – Nothing in this permit shall be construed as relieving TRC of the responsibility for complying with any applicable federal or Montana statute, rule or standard, except as specifically provided in ARM 17.8.701, *et seq*. (ARM 17.8.717).

D. Enforcement – Violations of limitations, conditions and requirements contained herein may constitute grounds for permit revocation, penalties or other enforcement action as specified in Section 75-2-401, *et seq*., MCA.

E. Appeals – Any person or persons jointly or severally adversely affected by the Department's decision may request, within 15 days after the Department renders it's decision, upon affidavit setting forth the grounds therefor, a hearing before the Board of Environmental Review (Board). A hearing shall be held under the provisions of the Montana Administrative Procedures Act. The Department's decision on the application is not final unless 15 days have elapsed and there is no request for a hearing under this section. The filing of a request for a hearing postpones the effective date of the Department's decision until conclusion of the hearing and issuance of a final decision by the Board.

F. Permit Inspection – As required by ARM 17.8.716, Inspection of Permit, a copy the air quality permit shall be made available for inspection by the Department at the location of the source.

G. Permit Fee – Pursuant to Section 75-2-220, MCA, as amended by the 1991 Legislature, failure to pay the annual operation fee by TRC may be grounds for revocation of this permit, as required by that section and rules adopted thereunder by the Board.

H. Construction Commencement – Construction must begin within 3 years of permit issuance and proceed with due diligence until the project is complete or the permit shall be revoked (ARM 17.8.731).

**Attachment 1** – No Ambient Air Quality Monitoring Requirements.

**Attachment 2**

INSTRUCTIONS FOR COMPLETING EXCESS EMISSION REPORTS

PART 1 Complete as shown. Report total time during the reporting period in hours. The determination of plant operating time (in hours) includes time during unit start up, shut down, malfunctions, or whenever pollutants of any magnitude are generated, regardless of unit condition or operating load.

Excess emissions include all time periods when emissions, as measured by the CEMS, exceed any applicable emission standard for any applicable time period.

Percent of time in compliance is to be determined as:

(1 – (total hours of excess emissions during reporting period / total hours of CEMS availability during reporting period)) x 100

PART 2 Complete as shown. Report total time the point source operated during the reporting period in hours. The determination of point source operating time includes time during unit start up, shut down, malfunctions, or whenever pollutants (of any magnitude) are generated, regardless of unit condition or operating load.

Percent of time CEMS was available during point source operation is to be determined as:

(1 – (CEMS downtime in hours during the reporting period* / total hours of point source operation during reporting period)) x 100

* All time required for calibration and to perform preventative maintenance must be included in the opacity CEMS downtime.

PART 3 Complete a separate sheet for each pollutant control device. Be specific when identifying control equipment operating parameters. For example: number of TR units, energized for ESPs; pressure drop and effluent temperature for baghouses; and bypass flows and pH levels for scrubbers. For the initial EER, include a diagram or schematic for each piece of control equipment.

PART 4 Use Table I as a guideline to report <u>all</u> excess emissions. Complete a separate sheet for each monitor. Sequential numbering of each excess emission is recommended. For each excess emission, indicate: 1) time and duration, 2) nature and cause, and 3) action taken to correct the condition of excess emissions. Do not use computer reason codes for corrective actions or nature and cause; rather, be specific in the explanation. If no excess emissions occur during the quarter, it must be so stated.

PART 5 Use Table II as a guideline to report all CEM system upsets or malfunctions. Complete a separate sheet for each monitor. List the time, duration, nature and extent of problems, as well as the action taken to return the CEM system to proper operation. Do not use reason codes for nature, extent or corrective actions. Include normal calibrations and maintenance as prescribed by the monitor manufacturer. Do not include zero and span checks.

PART 6 Complete a separate sheet for each pollutant control device. Use Table III as a guideline to report operating status of control equipment during the excess emission. Follow the number sequence as recommended for excess emissions reporting. Report operating parameters consistent with Part 3, Subpart e.

PART 7 Complete a separate sheet for each monitor. Use Table IV as a guideline to summarize excess emissions and monitor availability.

PART 8 Have the person in charge of the overall system and reporting certify the validity of the report by signing in Part 8.

**EXCESS EMISSIONS REPORT**

**PART 1**

a. Emission Reporting Period ______________________________

b. Report Date ______________________________

c. Person Completing Report ______________________________

d. Plant Name ______________________________

e. Plant Location ______________________________

f. Person Responsible for Review and Integrity of Report ______________________________

g. Mailing Address for 1.f. ______________________________

______________________________

h. Phone Number of 1.f. ______________________________

i. Total Time in Reporting Period ______________________________

j. Total Time Plant Operated During Quarter ______________________________

k. Permitted Allowable Emission Rates: Opacity ______________________________

$SO_2$ ____________ $NO_x$ ____________ TRS ____________

l. Percent of Time Out of Compliance: Opacity ______________________________

$SO_2$ ____________ $NO_x$ ____________ TRS ____________

m. Amount of Product Produced During Reporting Period ______________________________

n. Amount of Fuel Used During Reporting Period ______________________________

**PART 2 - Monitor Information: Complete for each monitor.**

a. Monitor Type (circle one)

Opacity $SO_2$ $NO_x$ $O_2$ $CO_2$ TRS Flow

b. Manufacturer ______________________________

c. Model No. ______________________ ______________

d. Serial No. ______________________

e. Automatic Calibration Value: Zero ______________ Span ______________

f. Date of Last Monitor Performance Test ______________________

g. Percent of Time Monitor Available:

1) During reporting period ______________________

2) During plant operation ______________________

h. Monitor Repairs or Replaced Components Which Affected or Altered Calibration Values ______________________

i. Conversion Factor (f-Factor, etc.)

j. Location of monitor (e.g. control equipment outlet)

PART 3 - Parameter Monitor of Process and Control Equipment. (Complete one sheet for each pollutant.)

a. Pollutant (circle one):

Opacity $SO_2$ $NO_x$ TRS

b. Type of Control Equipment ______________________

c. Control Equipment Operating Parameters (i.e., delta P, scrubber water flow rate, primary and secondary amps, spark rate)

______________________________________________

d. Date of Control Equipment Performance Test ______________________

e. Control Equipment Operating Parameter During Performance Test

______________________________________________

______________________________________________

______________________________________________

______________________________________________

PART 4 - Excess Emission (by Pollutant)

Use Table I: Complete table as per instructions. Complete one sheet for each monitor.

PART 5 - Continuous Monitoring System Operation Failures

Use Table II: Complete table as per instructions. Complete one sheet for each monitor.

PART 6 - Control Equipment Operation During Excess Emissions

Use Table III: Complete as per instructions. Complete one sheet for each pollutant control device.

Part 7 - Excess Emissions and CEMS performance Summary Report

Use Table IV: Complete one sheet for each monitor.

PART 8 - Certification for Report Integrity, by person in 1.f.

THIS IS TO CERTIFY THAT, TO THE BEST OF MY KNOWLEDGE, THE INFORMATION PROVIDED IN THE ABOVE REPORT IS COMPLETE AND ACCURATE.

SIGNATURE ________________________________________

NAME ________________________________________

TITLE ________________________________________

DATE ________________________________________

TABLE I

EXCESS EMISSIONS

| Date | Time From | Time To | Duration | Magnitude | Explanation/Corrective Action |
|---|---|---|---|---|---|

TABLE II

CONTINUOUS MONITORING SYSTEM OPERATION FAILURES

| Date | Time From | Time To | Duration | Problem/Corrective Action |
|---|---|---|---|---|

TABLE III

CONTROL EQUIPMENT OPERATION DURING EXCESS EMISSIONS

| Date | Time From | To | Duration | Operating Parameters | Corrective Action |
|---|---|---|---|---|---|

TABLE IV

Excess Emission and CEMS Performance Summary Report

Pollutant (circle one): $SO_2$ $NO_x$ TRS $H_2S$ CO Opacity

Monitor ID

| Emission data summary [1] | **CEMS performance summary [1]** |
|---|---|
| 1. Duration of excess emissions in reporting period due to:<br><br>a. Startup/shutdown<br>b. Control equipment problems<br>c. Process problems<br>d. Other known causes<br>e. Unknown causes<br><br>2. Total duration of excess emissions<br><br>3. [ Total duration of excess emissions / Total time CEM operated ] X 100 = | 1. CEMS[2] downtime in reporting due to:<br><br>a. Monitor equipment malfunctions<br>b. Non-monitor equipment malfunctions<br>c. Quality assurance calibration<br>d. Other known causes<br>e. Unknown causes<br><br>2.Total CEMS downtime<br><br>3. [ Total CEMS downtime / Total time source emitted ] X 100 = |
| | |

[1] For opacity, record all times in minutes. For gases, record all times in hours. Fractions are acceptable (e.g., 4.06 hours)
[2] CEMS downtime shall be regarded as any time CEMS is not measuring emissions.

Permit Analysis
Thompson River Co-Gen., L.L.C.
Permit #3175-00

I. Introduction/Process Description

A. Permitted Equipment

The following table indicates all permitted sources of emissions and emission controls utilized for each emitting unit at the Thompson River Co-Gen, L.L.C. (TRC), facility:

| Emitting Unit/Process | Control Device/Practice |
|---|---|
| Boiler (156 MMBtu/hr) | $PM/PM_{10}$ – Baghouse (31,685 dry standard cubic feet per minute (dscfm) capacity)<br>$SO_2$ – Dry Lime Scrubber<br>$NO_x$ – Over-Fire Air (OFA) |
| Wet Cooling Tower | NA |
| Fuel Storage and Handling Operations (Coal) | Enclosures, Fuel Handling Baghouse – DC1 (2200 dscfm) |
| Fuel Storage and Handling Operations (Wood Waste Bio-Mass) | Enclosures, Fuel Handling Bin Vent Dust Collector – DC2 (1000 dscfm) |
| Lime Storage and Handling Operations | Enclosures, Lime Silo Bin Vent Dust Collector – DC3 (1000 dscfm) |
| Ash/Fly Ash Storage and Handling Operations | Enclosures, Fly Ash Bin Vent Dust Collector – DC4 (1000 dscfm), Retractable Load-out Spout (Truck Transfer) |
| Truck Traffic/Haul Roads | Paved Roads, Water and/or Chemical Dust Suppressant. |

B. Source Description

TRC operates a 12.5 megawatt (MW) coal/wood waste bio-mass fired electricity and steam co-generation plant. The plant incorporates a 156 MMBtu/hr capacity Boiler (Boiler) capable of producing approximately 125,000 pounds of steam per hour. Most of the steam is sent to a turbine generator for the production of electricity to be sent to the power grid with a small percentage (up to 10%) of the steam and energy produced sent directly to Thompson River Lumber, Inc. (TRL), for use in the lumber dry kilns and general operations at the sawmill. TRC will have a parasitic load (use) of approximately 0.4 MW.

The relationship between TRC and TRL is symbiotic, however, because the two sources are under separate ownership and control; are not considered contiguous and adjacent; and are covered under separate Standard Industrial Classification (SIC) codes, the two sources are considered separate sources.

The Boiler is supported by a coal and wood-waste bio-mass fuel handling system, a cooling tower, a lime handling system, an ash/fly ash handling system, and various support trucks/vehicles. The boiler will incorporate various emission control devices to limit potential pollutant emissions from the source.

The Boiler will use OFA to control $NO_x$ emissions, a combination of low sulfur coal and a dry lime scrubber to control $SO_2$ emissions, combustion control to limit CO emissions, a baghouse to control $PM/PM_{10}$ emissions, and proper design and combustion to control volatile organic compound (VOC) emissions. Boiler combustion gases will first enter the dry lime scrubber then pass through the Boiler baghouse and eventually vent to the atmosphere through the Boiler baghouse stack.

The Boiler will fire low-sulfur coal and/or wood waste bio-mass only. Coal will be delivered by railcar and unloaded to an under-track hopper. Air displaced from the under-track hopper will be vented to DC1. From the under-track hopper the fuel will be transferred to a 100 ton/hr capacity enclosed conveyor (C1) that will transfer coal to a second 100 ton/hr capacity enclosed conveyor (C2) that will unload to a 25,000 ton capacity fuel storage silo (S1). Air displaced from the transfer between C1 and C2 will be vented to DC1 while air displaced from the transfer between C2 and S1 will vent to DC2. Additionally, wood waste bio-mass will be transferred to S1 via an enclosed conveyor (C3). Air displaced from the transfer between C3 and S1 will be vented to DC2. S1 will unload to an enclosed 70 ton/hr capacity conveyor (C4) that will transfer fuels to a day bin (S2) atop the Boiler-House. Air displaced from the transfer between S1 and C4 will be vented to DC1 while the transfer from C4 to S2 will be enclosed and controlled by negative pressure from the Boiler. S2 will feed fuel to the Boiler for operational firing. The transfer of fuel from S2 to the Boiler will also be controlled by negative pressure from the boiler.

Lime for use in the dry lime scrubber will be delivered by trucks and pneumatically conveyed to a 1000-ton capacity storage silo (S3). From S3 lime will be pneumatically conveyed to the dry lime scrubber. Air that is displaced from S3 will be vented through DC3.

Combustion in the Boiler will produce bottom ash and fly ash. The ash will be temporarily stored in silos on site including bottom ash silo (S4) and fly ash silo (S5). Bottom ash will be sluiced from S4 to a truck for removal from the site while fly ash from S5 will be gravity fed through a retractable load out spout to a truck for removal from the site. Air displaced from the transfer between trucks and S4 and S5 will be vented to DC4.

A cooling tower will be used to dissipate heat from the boiler by using the latent heat of water vaporization to exchange heat between the process and the air passing through the cooling tower. The cooling tower uses an induced counter flow draft incorporating 3 cells. The make up rate for the cooling tower is 125 gallons per minute. Water for the cooling tower will come from the Clark Fork River. TRC will use a portion of the water rights granted to TRL to acquire the water for operations. Cooling tower water will be discharged to an on-site evaporation pond.

II. Applicable Rules and Regulations

A. ARM 17.8, Subchapter 1 – General Provisions, including but not limited to:

1. <u>ARM 17.8.101 Definitions</u>. This rule includes a list of applicable definitions used in this chapter, unless indicated otherwise in a specific subchapter.

2. ARM 17.8.105 Testing Requirements. Any person or persons responsible for the emission of any air contaminant into the outdoor atmosphere shall, upon written request of the Department, provide the facilities and necessary equipment (including instruments and sensing devices, and shall conduct test, emission or ambient, for such periods of time as may be necessary using methods approved by the Department of Environmental Quality (Department)).

3. ARM 17.8.106 Source Testing Protocol. The requirements of this rule apply to any emission source testing conducted by the Department, any source or other entity as required by any rule in this chapter, or any permit or order issued pursuant to this chapter, or the provisions of the Clean Air Act of Montana, 75-2-101, *et seq*., Montana Code Annotated (MCA).

   TRC shall comply with the requirements contained in the Montana Source Test Protocol and Procedures Manual, including, but not limited to, using the proper test methods and supplying the required reports. A copy of the Montana Source Test Protocol and Procedures Manual is available from the Department upon request.

4. ARM 17.8.110 Malfunctions. (2) The Department must be notified promptly by telephone whenever a malfunction occurs that can be expected to create emissions in excess of any applicable emission limitation or to continue for a period greater than 4 hours.

5. ARM 17.8.111 Circumvention. (1) No person shall cause or permit the installation or use of any device or any means that, without resulting in reduction of the total amount of air contaminant emitted, conceals or dilutes an emission of air contaminant that would otherwise violate an air pollution control regulation. (2) No equipment that may produce emissions shall be operated or maintained in such a manner as to create a public nuisance.

B. ARM 17.8, Subchapter 2 – Ambient Air Quality, including, but not limited to the following:

1. ARM 17.8.204 Ambient Air Monitoring.
2. ARM 17.8.210 Ambient Air Quality Standards for Sulfur Dioxide.
3. ARM 17.8.211 Ambient Air Quality Standards for Nitrogen Dioxide.
4. ARM 17.8.212 Ambient Air Quality Standards for Carbon Monoxide.
5. ARM 17.8.213 Ambient Air Quality Standard for Ozone.
6. ARM 17.8.220 Ambient Air Quality Standard for Settled Particulate Matter.
7. ARM 17.8.221 Ambient Air Quality Standard for Visibility.
8. ARM 17.8.223 Ambient Air Quality Standard for $PM_{10}$.

TRC shall maintain compliance with all applicable ambient air quality standards.

C. ARM 17.8, Subchapter 3 – Emission Standards, including, but not limited to:

1. ARM 17.8.304 Visible Air Contaminants. This rule requires that no person may cause or authorize emissions to be discharged into the outdoor atmosphere from any source installed after November 23, 1968, that exhibit an opacity of 20% or greater averaged over 6 consecutive minutes.

2. ARM 17.8.308 Particulate Matter Airborne. (1) This rule requires an opacity limitation of 20% for all fugitive emission sources and that reasonable precautions be taken to control emissions of airborne particulate matter. (2) Under this rule, TRC shall not cause or authorize the use of any street, road or parking lot without taking reasonable precautions to control emissions of airborne particulate matter.

3. ARM 17.8.309 Particulate Matter Fuel Burning Equipment. This section requires that no person shall cause, allow or permit to be discharged into the atmosphere particulate matter caused by the combustion of fuel in excess of the amount determined by this section.

4. ARM 17.8.310 Particulate Matter Industrial Process. This section requires that no person shall cause, allow or permit to be discharged into the atmosphere particulate matter in excess of the amount set forth in this section.

5. ARM 17.8.322 Sulfur Oxide Emissions--Sulfur in Fuel. This section requires that no person shall burn liquid, solid or gaseous fuel in excess of the amount set forth in this section. TRC has proposed a limit less than that required in this section. Permit #3175-00 contains a federally enforceable permit limit for coal sulfur content.

6. ARM 17.8.340 Standard of Performance for New Stationary Sources and Emission Guidelines for Existing Sources. This section incorporates, by reference, 40 CFR 60, Standards of Performance for New Stationary Sources (NSPS). TRC is considered an NSPS affected facility under 40 CFR 60 and is subject to the requirements of the following subparts:

   40 CFR 60, Subpart Db, Standard of Performance for Industrial-Commercial-Institutional Steam Generating Units. This subpart applies to the Boiler because the Boiler meets the definition of an affected source under this Subpart.

D. ARM 17.8, Subchapter 4 – Stack Height and Dispersion Techniques, including, but not limited to:

1. ARM 17.8.401 Definitions. This rule includes a list of definitions used in this chapter, unless indicated otherwise in a specific subchapter.

2. ARM 17.8.402 Requirements. TRC must demonstrate compliance with the ambient air quality standards with a stack height that does not exceed Good Engineering Practices (GEP). The proposed height of the new or altered stack for TRC is below the allowable 65-meter GEP stack height.

E. ARM 17.8, Subchapter 5 – Air Quality Permit Application, Operation and Open Burning Fees, including, but not limited to:

1. ARM 17.8.504 Air Quality Permit Application Fees. This section requires that an applicant submit an air quality permit application fee concurrent with the submittal of an air quality permit application. A permit application is incomplete until the proper application fee is paid to the Department. TRC submitted the appropriate permit application fee for the permit action.

2. ARM 17.8.505 Air Quality Operation Fees. An annual air quality operation fee must, as a condition of continued operation, be submitted to the Department by each source of air contaminants holding an air quality permit (excluding an open burning permit) issued by the Department. The air quality operation fee is based on the actual or estimated actual amount of air pollutants emitted during the previous calendar year.

   An air quality operation fee is separate and distinct from an air quality permit application fee. The annual assessment and collection of the air quality operation fee, described above, shall take place on a calendar-year basis. The Department may insert into any final permit issued after the effective date of these rules, such conditions as may be necessary to require the payment of an air quality operation fee on a calendar-year basis, including provisions that prorate the required fee amount.

F. ARM 17.8, Subchapter 7 – Permit, Construction and Operation of Air Contaminant Sources, including, but not limited to:

1. ARM 17.8.701 Definitions. This rule is a list of applicable definitions used in this chapter, unless indicated otherwise in a specific subchapter.

2. ARM 17.8.704 General Procedures for Air Quality Preconstruction Permitting. This air quality preconstruction permit contains requirements and conditions applicable to both construction and subsequent use of the permitted equipment.

3. ARM 17.8.705 When Permit Required--Exclusions. This rule requires a facility to obtain an air quality permit or permit alteration if they construct, alter or use any air contaminant sources that have the potential to emit greater than 25 tons per year of any pollutant. TRC has the potential to emit greater than 25 tons per year of $NO_x$, CO, $SO_2$, VOC's, PM, and $PM_{10}$, therefore, a permit is required.

4. ARM 17.8.706 New or Altered Sources and Stacks--Permit Application Requirements. This rule requires that a permit application be submitted prior to installation, alteration or use of a source. TRC submitted the required permit application.

5. ARM 17.8.707 Waivers. ARM 17.8.706 requires that a permit application be submitted 180 days before construction begins. This rule allows the Department to waive this time limit. The Department hereby waives this time limit.

6. ARM 17.8.710 Conditions for Issuance of Permit. This rule requires that TRC demonstrate compliance with applicable rules and standards before a permit can be issued. Also, a permit may be issued with such conditions as are necessary to ensure compliance with all applicable rules and standards. TRC demonstrated compliance with all applicable rules and standards as required for permit issuance.

7. ARM 17.8.715 Emission Control Requirements. This rule requires a source to install the maximum air pollution control capability that is technically practicable and economically feasible, except that Best Available Control Technology (BACT) shall be utilized. The required BACT analysis is included in Section III of this permit analysis.

8. ARM 17.8.716 Inspection of Permit. This rule requires that air quality permits shall be made available for inspection by the Department at the location of the source.

9. ARM 17.8.717 Compliance with Other Statutes and Rules. This rule states that nothing in the permit shall be construed as relieving TRC of the responsibility for complying with any applicable federal or Montana statute, rule or standard, except as specifically provided in ARM 17.8.701, *et seq*.

10. ARM 17.8.720 Public Review of Permit Applications. The rule requires that the applicant notify the public by means of legal publication in a newspaper of general circulation in the area affected by the application for a permit. TRC submitted an affidavit of publication of Public Notice for the September 11, 2001, issue of the *Sanders County Ledger*, a newspaper of general circulation in the Town of Thompson Falls in Sanders County, Montana, as proof of compliance with the public notice requirements.

11. ARM 17.8.731 Duration of Permit. An air quality permit shall be valid until revoked or modified, as provided in this subchapter, except that a permit issued prior to construction of a new or altered source may contain a condition providing that the permit will expire unless construction is commenced within the time specified in the permit, that in no event may be less than 1 year after the permit is issued.

12. ARM 17.8.733 Modification of Permit. An air quality permit may be modified for changes in any applicable rules and standards adopted by the Board of Environmental Review (Board) or changed conditions of operation at a source or stack that does not result in an increase of emissions as a result of those changed conditions. A source may not increase its emissions beyond those found in its permit unless the source applies for and receives another permit.

13. ARM 17.8.734 Transfer of Permit. This section states that an air quality permit may be transferred from one person to another if written notice of Intent to Transfer, including the names of the transferor and the transferee, is sent to the Department.

G. ARM 17.8, Subchapter 8 – Prevention of Significant Deterioration of Air Quality, including, but not limited to:

1. ARM 17.8.801 Definitions. This rule is a list of applicable definitions used in this subchapter.

2. ARM 17.8.818 Review of Major Stationary Sources and Major Modifications--Source Applicability and Exemptions. The requirements contained in ARM 17.8.819 through ARM 17.8.827 shall apply to any major stationary source and any major modification, with respect to each pollutant subject to regulation under the Federal Clean Air Act (FCAA) that it would emit, except as this subchapter would otherwise allow.

This facility is not a major stationary source since this facility is not a listed source and the facility's potential to emit is below 250 tons per year of any pollutant (excluding fugitive emissions).

Because the proposed project has a symbiotic relationship with TRL there was some question as to whether or not the two sources should be considered a single source under the requirements of New Source Review (NSR). If TRC and TRL were considered a single source, the source would be subject to the requirements of the NSR Prevention of Significant Deterioration (PSD) program. In order for two separate facilities to be considered a single source the following three criteria must be met:

- The facilities must be under common control and ownership;
- The facilities must be located on contiguous and adjacent properties; and
- The facilities must share the same Standard Industrial Classification code (SIC).

While TRC and TRL do sit on contiguous and adjacent properties, the companies are owned by separate companies and have separate SIC codes. Therefore, TRC and TRL are considered separate sources under the requirements of NSR/PSD.

H. ARM 17.8, Subchapter 12 – Operating Permit Program Applicability, including, but not limited to:

1. ARM 17.8.1201 Definitions. (23) Major Source under Section 7412 of the FCAA is defined as any source having:

   a. Potential to emit (PTE) > 100 ton/year of any pollutant; or

   b. PTE > 10 ton/year of any one Hazardous Air Pollutant (HAP), PTE > 25 ton/year of a combination of all HAPs, or lesser quantity as the Department may establish by rule; or

   c. Sources with the PTE > 70 ton/year of PM-10 in a serious PM-10 nonattainment area.

2. ARM 17.8.1204 Air Quality Operating Permit Program. (1) Title V of the FCAA amendments of 1990 requires that all sources, as defined in ARM 17.8.1204(1), obtain a Title V Operating Permit. In reviewing and issuing Air Quality Permit #3175-00 for TRC, the following conclusions were made.

   a. The facility's PTE is greater than 100 ton/year for $NO_x$, CO, and $SO_2$.

   b. The facility's PTE is less than 10 ton/year for any one HAP and less than 25 ton/year of all HAPs.

   c. This source is not located in a serious PM-10 nonattainment area.

   d. This facility is subject to 40 CFR Part 60, Subpart Db.

   e. This facility is not subject to any current NESHAP standards.

   f. This source is not a Title IV affected source, nor a solid waste combustion unit.

   g. This source is not an EPA designated Title V source.

   Based on these facts, the Department determined that TRC is a major source of emissions as defined under Title V. On August 28, 2001, TRC submitted a Title V Operating permit application concurrently with the current preconstruction permit application.

## III. BACT Determination

A BACT determination is required for each new or altered source. TRC shall install on the new or altered source the maximum air pollution control capability that is technically practicable and economically feasible, except that BACT shall be utilized.

A BACT analysis was submitted by TRC in Permit Application #3175-00, addressing some available methods of controlling $NO_x$, CO, PM/$PM_{10}$, $SO_2$, and VOC emissions from the Boiler (Boiler), PM/PM10 emissions from material handling operations, and PM/PM10 emissions from haul trucks and roads. The Department reviewed these methods, as well as previous BACT determinations. The following control options have been reviewed by the Department in order to make a BACT determination.

### A. BACT Review for the Boiler

#### 1. $NO_x$ Emissions

Uncontrolled $NO_x$ emissions from coal fired utility boilers generally range from 0.5 to 1.5 pounds (lb) per million Btu (MMBtu) on a heat input basis, with stoker boilers, similar to the proposed Boiler, averaging 0.5 lb/MMBtu. Most of the $NO_x$ emissions from Boiler operation will be fuel $NO_x$ derived from fuel bound nitrogen. In addition, thermal $NO_x$ can result when the intense heat of combustion causes atmospheric nitrogen to combine with atmospheric oxygen.

Applicable $NO_x$ control strategies for the Boiler can be divided into two main categories: combustion controls, which limit $NO_x$ production and post-combustion controls, which destroy $NO_x$ after formation. The following $NO_x$ control strategies/technologies were reviewed for the current permit action:

a. Low Excess Air (LEA);
b. Overfire Air (OFA);
c. Flue Gas Re-circulation (FGR);
d. Selective Catalytic Reduction (SCR);
e. Selective Non-Catalytic Reduction (SNCR); and

<u>$NO_x$ Emission Control Options</u>

The following analysis explains and summarizes the potential $NO_x$ control options. A complete analysis is contained in the permit application for Permit #3175-00:

a. LEA $NO_x$ Emission Control

LEA operation involves lowering the amount of combustion air to the minimum level compatible with efficient and complete combustion. Limiting the amount of air fed to the furnace reduces the availability of oxygen for the formation of fuel $NO_x$ and lowers the peak flame temperature inhibiting thermal $NO_x$ formation.

Emission reductions achieved by LEA are limited by the need to have sufficient oxygen present for flame stability and to ensure complete combustion. As excess air levels decrease, emissions of CO, hydrocarbons, and unburned carbon increase, resulting in lower boiler efficiency. Other problems with LEA operation include the possibility of increased corrosion and slagging (formation of large agglomerates of solidified ash) in the upper boiler as a result of the reducing atmosphere created at low oxygen levels. Further, because stoker boilers use primary combustion air to cool the grate, overheating of the grate may occur with LEA operation.

As previously described, the use of LEA invokes various technical problems including decreased boiler efficiency, increased corrosion and slagging, and possible over-heating of the grate. Therefore, the Department has determined that LEA will not constitute BACT in this case.

b. OFA $NO_x$ Emission Control

OFA allows for staged combustion by supplying less than the stoichiometric amount of air theoretically required for complete combustion through the burners, with the remaining air injected into the furnace through overfire air ports. Having an oxygen-deficient primary combustion zone in the furnace lowers the formation of $NO_x$. In the previously described atmosphere, most of the fuel nitrogen compounds are driven into the gas phase. Having combustion occur over a larger portion of the furnace lowers peak flame temperatures, thus, limiting thermal $NO_x$ formation.

Poorly controlled OFA may result in increased CO and hydrocarbon emissions, as well as unburned carbon in the resultant fly ash. These products of incomplete combustion would be accompanied by a decrease in boiler efficiency. OFA may also lead to reducing conditions in the lower furnace that in turn may lead to corrosion. When using OFA with stoker boilers, too much OFA can result in too little under-fire air caused by a diversion of combustion air to OFA ports. Further, OFA may lead to overheating and slagging of the grate.

Because OFA is intrinsic to the design of the boiler as combustion control, is capable of achieving significant $NO_x$ reductions, and has been utilized by similar sources in the industry as a means of $NO_x$ control, the Department considers the use of OFA to be BACT for control of $NO_x$ emissions from the Boiler.

c. FGR $NO_x$ Emission Control

FGR systems control $NO_x$ by recycling a portion of the cooled flue gas back into the primary combustion zone. The recycled air lowers $NO_x$ emissions by two separate mechanisms. First the recycled gas is made up of combustion products that act as inerts during combustion, thereby lowering combustion temperatures. Second, the oxygen content in the primary flame zone is lowered. The amount of re-circulation is limited by flame instability, increased CO concentrations, and reduced boiler efficiency. Typically, 15-20% of the total flue gas is recycled. Lower temperatures and altered temperature profiles attributable to FGR may result in reduced boiler efficiency.

Because FGR reduces thermal $NO_x$ formation and has only a minor effect on fuel $NO_x$ levels, its principal application is for oil and gas fired boilers. However, FGR is also applicable to coal fired stoker boilers; by replacing the combustion air flowing through the grate, it allows operation at reduced excess air levels without grate over-heating.

Retrofitting FGR onto existing boilers requires installation of ductwork, re-circulation fans, air foils for re-circulated flue gas, and combustion air and controls for variable load operation. Because the proposed boiler would require retro-fitting to facilitate FGR, retro-fitting was factored into the incremental cost of installation.

As previously described, the use of FGR invokes various technical problems including the need to retro-fit existing boilers with ductwork, re-circulation fans, air foils for re-circulated flue gas, and combustion air and controls for variable load operation. Therefore, the Department has determined that FGR will not constitute BACT in this case.

d. SCR $NO_x$ Emission Control

SCR is a post combustion gas treatment technique that uses a catalyst to reduce NO and $NO_2$ to molecular Nitrogen, water, and oxygen. Ammonia ($NH_3$) is commonly used as the reducing agent.

Ammonia vaporized and injected into the flue gas upstream of the catalyst bed combines with $NO_x$ at the catalyst surface to form an ammonium salt intermediate. The ammonium salt intermediate then decomposes to produce elemental nitrogen and water.

The catalyst lowers the temperature required for the chemical reaction between $NO_x$ and $NH_3$. Catalysts used for the $NO_x$ reduction include base metals, precious metals, and zeolites. Commonly, the catalyst of choice for the reaction is a mixture of titanium and vanadium oxides.

An attribute common to all catalysts is the narrow "window" of acceptable system temperatures. In this case, the temperature window is approximately 575°F to 800°F. At temperatures below 575°F, the $NO_x$ reduction reaction will not proceed, while operation at temperatures exceeding 800°F will shorten catalyst life and can lead to the oxidation of $NH_3$ to either nitrogen oxides (thereby increasing $NO_x$ emissions) or possibly generating explosive levels of ammonium nitrate in the exhaust gas stream. The stack temperature for the Boiler is approximately 300°F making the use of SCR technically difficult.

Other factors impacting the effectiveness of SCR include catalyst reactor design, operating temperature, type of fuel fired, sulfur content of the fuel, design of $NH_3$ injection system, and the potential for catalyst poisoning.

As previously described, the use of SCR invokes various technical problems including the narrow "window" of acceptable system temperatures, short catalyst life, a possible increase in $NO_x$ production due to high operating temperatures, and the possible production of explosive levels of ammonium nitrate. In addition, various physical problems exist including limited placement locations for the catalyst and limited physical spacing for an in-line duct burner to raise temperatures. Also, the burning of various combinations of coal and wood waste bio-mass lead to varying contaminant/particulate loading to the SCR unit increasing the potential to foul and ultimately deactivate the catalysts. If the SCR is placed downstream of the baghouse, additional fuel costs will be incurred. Finally, the annual operating/maintenance costs of SCR have been shown to be $14,678/ton of $NO_x$ reduction making the cost effectiveness of SCR control economically infeasible. Therefore, the Department has determined that SCR will not constitute BACT in this case.

e. SNCR $NO_x$ Emission Control

SNCR involves the non-catalytic decomposition of $NO_x$ to nitrogen and water. A nitrogenous reducing agent, typically ammonia or urea, is injected into the upper reaches of the furnace. Because a catalyst is not used to drive the reaction, temperatures of 1600 to 2100°F are required.

$NO_x$ removal efficiency varies considerably for this technology, depending on inlet $NO_x$ concentrations, fluctuating flue gas temperatures, residence time, amount and type of nitrogenous reducing agent, mixing effectiveness, and the presence of interfering chemical substances in the gas stream.

As with SCR, technical difficulties exist for SNCR application. Since SNCR requires a flue gas temperature of 1600 to 2100°F additional burners would be required to raise the flue gas temperature. Additional burners would produce additional emissions and consume additional energy resources. In addition, physical considerations limit the placement of reagent injection nozzles and an in-line duct burner to raise temperatures. Also, SNCR is not as widely used as SCR and may require additional research. Finally, annual operating/maintenance costs of SNCR have been shown to be $107,091/ton of $NO_x$ reduction making the cost effectiveness of SNCR control economically infeasible. Therefore, the Department has determined that SNCR will not constitute BACT in this case.

In summary, the Department analyzed the use of LEA, OFA, FGR, SCR, and SNCR as possible $NO_x$ control strategies for the Boiler. Due to various technical and economic feasibility factors, as previously discussed, the Department determined that OFA will constitute BACT for the control of $NO_x$ emissions from the Boiler.

2. CO Emissions

The CO BACT analysis was conducted using information from the *Office of Air Quality Planning and Standards Control Cost Manual,* 5th Edition, February 1996 (OAOPS Manual). The most recent RACT/BACT/LAER Clearinghouse (RBLC) Ranking Report for CO from boilers was also used as reference.

The following control strategies were determined to be "available" control strategies for the Boiler.

a. Proper Design and Combustion
b. Post-Combustion Oxidation.

CO Emission Control Options

The following analysis explains and summarizes the potential CO control options. A complete analysis is contained in the application for Permit #3175-00.

a. Proper Design and Combustion

In an ideal combustion process, all of the carbon and hydrogen contained within the fuel are oxidized to carbon dioxide ($CO_2$) and water ($H_2O$). The emission of CO in a combustion process is the result of incomplete organic fuel combustion.

Reduction of CO can be accomplished by controlling the combustion temperature, residence time, and available oxygen. Normal combustion practice at the TRC facility will involve maximizing the heating efficiency of the fuel in an effort to minimize fuel usage. This efficiency of fuel combustion will also minimize CO formation.

Because proper design and combustion control has been proposed to control CO emissions from the Boiler and this methodology is capable of achieving significant CO reductions and has been utilized by similar sources in the industry as a means of CO control, the Department considers proper design and combustion control to be BACT for the Boiler.

b. Oxidation of Post-Combustion Gases

Although various specialized technologies exist, fundamentally, oxidizers or incinerators use heat to destroy CO in the gas stream. Incineration is an oxidation process that ideally breaks down the molecular structure of an organic compound into carbon dioxide and water vapor.

Temperature, residence time, and turbulence of the system affect CO control efficiency. A thermal incinerator generally operates at temperatures between 1450 and 1600°F. Catalytic incineration is similar to thermal incineration; however, catalytic incineration allows for oxidation at temperatures ranging from 600 to 1000°F. The catalyst systems that are used are typically metal oxides such as nickel oxide, copper oxide, manganese dioxide, or chromium oxide. Noble metals such as platinum and palladium may also be used. Due to the high temperatures required for complete destruction, fuel costs can be expensive and fuel consumption can be excessive with oxidation units. To lower fuel usage, regenerative thermal oxidizers (RTOs) or regenerative catalytic oxidizers (RCOs) can be used to preheat exhaust gases.

As previously described, oxidation of post-combustion gases invokes various technical problems including the need for high combustion temperatures and subsequent increased fuel use. The use of RTO’s and/or RCO’s can decrease fuel use needs. However, the cost effectiveness of using RTO or RCO was determined to be $402,677/ton of CO reduction and $416,154/ton of CO reduction respectively making oxidation of post-combustion gases economically infeasible. Therefore, the Department has determined that oxidation of post-combustion gases will not constitute BACT in this case.

In summary, the Department analyzed the use of proper design and combustion and oxidation of post combustion gases as possible CO control strategies for the Boiler. Due to various technical and economic feasibility factors, as previously discussed, the Department determined that proper design and combustion practices will constitute BACT for the control of CO emissions from the Boiler.

3. $SO_2$ Emissions

Sulfur dioxide ($SO_2$) emissions from boilers like the one proposed for TRC result from the oxidation of sulfur contained in the fuels. There are two general means for reducing the amount of $SO_2$ emissions from the generation of electric power:

a. $SO_2$ Add-On Control Strategies;
b. Low Sulfur Fuels; and
c. Combination Control – Low Sulfur Fuel and a Lime Spray Dryer System

<u>$SO_2$ Emission Control Options</u>

The following analysis explains and summarizes the potential $SO_2$ control options. A complete analysis is contained in the application for Permit #3175-00:

a. $SO_2$ Add-On Control Strategies

Many methods have been successfully used to control $SO_2$ emissions from fossil fuel fired boilers. The vast majority of those techniques rely upon the reaction of $SO_2$ in the flue gas with an alkaline reagent to form a particulate. Those systems that rely upon the $SO_2$/alkali reaction, commonly referred to as scrubbers, differ mainly in the type of reagent used and the method employed to bring the $SO_2$ in the flue gas in contact with the alkali reagent.

Reagents successfully employed in $SO_2$ scrubbers include limestone (comprised mainly of calcium carbonate, $CaCO_3$), quicklime (calcium oxide, CaO), magnesium oxide (MgO), sodium hydroxide (NaOH), ammonium hydroxide ($NH_4OH$) and various combinations of those reagents. The reaction with $SO_2$ yields compounds such as $CaSO_3$, $CaSO_4$, $NaSO_4$, $NH_4SO_3$, which are solids at ambient conditions and easily collected.

Contacting techniques vary somewhat but fall into two main categories: wet systems and dry systems. Wet systems use a reagent slurry that is typically brought into contact with the flue gas in a scrubber "tower." The tower typically has trays, baffles or other similar features to divert the gas stream, create a contacting surface, and/or create turbulence in order to achieve maximum interaction between the $SO_2$ gas and the alkaline reagent. Dry systems typically spray or atomize the reagent into the flue gas stream to achieve the required contact. Many "dry" systems actually use a wet reagent slurry, that is injected into a spray chamber where it contacts the flue gas stream. The hot flue gas vaporizes the water leaving a dry particulate that either settles out in the spray chamber or is entrained in the flue gas stream and captured by the downstream particulate control device.

Under the right conditions, nearly all of these systems are capable of removing up to 95 percent of the $SO_2$ in boiler flue gas and, under certain conditions, even greater removal is achievable. The removal efficiency achieved by these systems mainly depends upon the amount of reagent used, the effectiveness of the contacting technique and the amount of $SO_2$ in the flue gas. Generally, the more reagent used the better the removal efficiency, the more effective the contacting technique the better the removal efficiency, and the more $SO_2$ in the flue gas the better the removal efficiency.

The amount of reagent used and the type of contacting technique are generally controllable and can be adjusted as conditions change. However, as $SO_2$ concentrations decrease, high removal efficiencies are more difficult to achieve even with highly effective contacting techniques and copious amounts of reagent.

Because TRC is unable to predict the cost and availability of low sulfur fuels, TRC has proposed the use of a dry lime scrubber in conjunction with low sulfur fuels, when available and cost effective, to maintain compliance with the $SO_2$ emission limit. However, because low sulfur coal availability and cost factors are suspect, the Department considers the use of a Lime Spray Dryer $SO_2$ add-on control to be BACT for the Boiler.

b. Sulfur in Fuels (Low Sulfur Fuel)

Fossil fuels typically used to fire boilers for electricity generation include natural gas, fuel oil and coal. Petroleum coke, bagasse, and wood waste are also used in some generating facilities. The sulfur content and associated $SO_2$ emissions vary widely among these fuels. Pipeline quality natural gas generally contains very little sulfur while petroleum coke may contain as much as 6 percent sulfur by weight. Ordinarily, where sulfur in fuel is very low (e.g., pipeline quality natural gas), no add-on $SO_2$ controls are considered necessary. Instead, the use of low sulfur fuel is considered BACT. Where higher sulfur fuels are used (e.g., petroleum coke or coal), add-on controls are generally required in order to reduce $SO_2$ emissions to the atmosphere.

Because TRC is unable to predict the cost and availability of low sulfur fuels, TRC has proposed the use of a Lime Spray Dryer in conjunction with low sulfur fuels to maintain compliance with the $SO_2$ emission limit. Therefore, the Department does not consider the use of low sulfur fuels to be BACT for the Boiler.

c. Low Sulfur Fuel and Lime Spray Dryer System

TRC proposed a combination of low sulfur fuels and add-on controls as BACT for its project. TRC proposed to use the combination of controls to achieve a maximum $SO_2$ emission rate of 0.30 pound $SO_2$ per million Btu heat input (averaged over a 1-hour period).

Of the two fuels currently proposed for this project (coal and wood), coal is by far the predominant source of sulfur. Regionally available coals (i.e., from Montana, Wyoming, and North Dakota) contain sulfur in the range of 0.3 percent to over 3 percent by weight. Assuming a nominal higher heating value of 10,000 Btu per pound and complete conversion of all fuel-bound sulfur to $SO_2$, uncontrolled $SO_2$ emissions from the TRC boiler fired with these coals can range from 0.6 to over 6.0 pounds per million Btu (on a heat input basis).

Wood waste by comparison contains relatively little sulfur. C&B reports the sulfur content of wood waste to be approximately 0.02 percent by weight. Assuming a nominal higher heating value of 5,000 Btu per pound for the wood waste and complete conversion of all sulfur to $SO_2$, uncontrolled $SO_2$ emissions from the TRC boiler fired exclusively with wood waste would be approximately 0.08 pound per million Btu (on a heat input basis).

In order to meet a 0.30 pound per million Btu emission limitation, TRC will install and operate a Lime Spray Dryer to control $SO_2$ emissions from the boiler. The Lime Spray Dryer is a "dry" scrubber system that converts $SO_2$ in the flue gas to $CaSO_3/CaSO_4$, that will be collected by the Lime Spray Dryer system and/or the particulate control device.

The Lime Spray Dryer system uses quicklime and water to create a lime slurry. The slurry will be blended to obtain the maximum control efficiency while creating the minimum amount of waste. Additionally, the Lime Spray Dryer system provides for the re-circulation of a portion of the fly ash (a combination of coal ash and entrained lime) to maximize the $SO_2$ removal efficiency while minimizing the amount of waste generated.

Depending upon the sulfur content of the fuel fired, the Lime Spray Dryer system will achieve up to 94 percent control of the $SO_2$ emitted from the boiler. TRC will endeavor to control emissions of $SO_2$ primarily by limiting the amount of sulfur introduced into the boiler with the fuel. When low sulfur fuels are available, $SO_2$ emission rates considerably lower than 0.30 pound per million Btu will be achieved. Additionally, as wood waste supplies allow, TRC will fire a coal/wood waste blended fuel designed to minimize the amount of sulfur introduced into the boiler.

However, TRC may not be able to control supplies of low sulfur fuels or the price of those fuels. In order to maintain the economic viability of the project, TRC may be forced to fire higher sulfur fuels or fuel blends due to low supplies of low sulfur fuels and/or high costs of low sulfur fuels. TRC will control emissions of $SO_2$ generated in the combustion process to no more than 0.30 pound per million Btu with the proposed Lime Spray Dryer system.

In summary, the Department analyzed the use of $SO_2$ add-on control strategies, the firing of low sulfur fuels, and a combination of $SO_2$ add-on controls and the firing of low sulfur fuels as possible $SO_2$ control strategies for the Boiler. Due to the availability and cost effectiveness of firing low sulfur fuels and various technical and economic feasibility factors, as previously discussed, the Department determined that use of the Lime Spray Dryer will constitute BACT for the control of $SO_2$ emissions from the Boiler.

4. $PM/PM_{10}$ Emissions

The most common control devices used to reduce $PM/PM_{10}$ emissions from spreader stoker boilers similar to that proposed are:

a. mechanical collectors (multitube cyclones or multiclones);
b. wet scrubbers;
c. electrostatic precipitators (ESPs);and

d. fabric filters (baghouses).

PM/PM10 control Options

The following summaries discuss potential $PM/PM_{10}$ control options in common use for boilers similar to that proposed.

a. Multiclones

The use of multiclones (mechanical collectors) provides particulate control for many similar type spreader stoker boilers. Often, two multiclones are used in series, allowing the first collector to remove the bulk of the dust and the second to remove the smaller particles. The efficiency of this arrangement ranges from 25 to 65 percent reduction.

Because TRC has proposed the use of a fabric filter baghouse to reduce $PM/PM_{10}$ emissions from the proposed boiler operations and because the proposed strategy is capable of significant $PM/PM_{10}$ reduction, the use of a multiclone will not constitute BACT in this case.

b. Wet Scrubbers

The most widely used wet scrubbers for spreader stoker type boilers are venturi scrubbers. With gas-side pressure drops exceeding 15 inches of water, particulate collection efficiencies of 85 percent or greater have been reported.

Because TRC has proposed the use of a fabric filter baghouse to reduce $PM/PM_{10}$ emissions from the proposed boiler operations and because the proposed strategy is capable of significant $PM/PM_{10}$ reduction, the use of a wet scrubber will not constitute BACT in this case.

c. ESPs

ESPs are employed when collection efficiencies of greater than 90 percent are required. When applied to spreader stoker boilers, ESPs are often used downstream of mechanical collector pre-cleaners that remove the larger size particulate matter. Collection efficiencies of 90 to 99 percent for $PM/PM_{10}$ have been observed for ESPs.

A variation of the ESP is the electrostatic gravel bed filter. In this device, $PM/PM_{10}$ in flue gases is removed by impaction with gravel media inside a packed bed and collection is augmented by an electrically charged grid within the bed. $PM/PM_{10}$ collection efficiencies are typically over 80 percent for this strategy.

Because TRC has proposed the use of a fabric filter baghouse to reduce $PM/PM_{10}$ emissions from the proposed boiler operations and because the proposed strategy is capable of significant $PM/PM_{10}$ reduction, the use of an ESP will not constitute BACT in this case.

d. Baghouses

Baghouses have had limited applications to spreader stoker boilers, particularly those boilers fired exclusively on wood or wood-waste biomass. The principal drawback to this strategy, as perceived by potential users, is a fire danger arising from the collection of combustible carbonaceous fly-ash. Steps can be taken to reduce this hazard, including the installation of a mechanical collector upstream of the baghouse to remove larger burning particles of fly-ash (i.e. sparklers). Despite complications, baghouses are generally preferred for particulate control. In this case, a majority of the fuel combusted will be low sulfur coal for which the baghouse control strategy is best suited. Collection efficiencies are typically 80 percent or higher for this control strategy.

In summary, the Department analyzed the use of multiclones, wet scrubbers, ESP's, and baghouses as possible $PM/PM_{10}$ control strategies for the Boiler. All of the previously mentioned control strategies are capable of significant $PM/PM_{10}$ emission reductions, however, TRC has proposed the use of a baghouse to reduce $PM/PM_{10}$ emissions from the proposed Boiler. Because this control strategy is capable of significant reduction of $PM/PM_{10}$ and this strategy is commonly used for sources of this type, the Department considers the use of a baghouse BACT in this case.

B. BACT Review for Fuel Handling and Storage (Coal/Wood Waste Bio-Mass), Lime Handling and Storage, and Ash/Fly Ash Handling and Storage

Typically, fuel (coal and wood-waste biomass), lime, and fly-ash handling operations can result in high potential emissions of particulate matter. Because the proposed project is located in relatively close proximity to the Thompson Falls $PM_{10}$ nonattainment area, emissions of particulate matter are a major concern.

TRC is required to enclose all coal transfers and operate a Fuel Handling Baghouse (DC1) for all coal handling operations at the facility. Particulate emissions from DC1 shall be limited to 0.02 gr/dscf. Further, TRC shall enclose all wood waste bio-mass transfers and operate a Fuel Handling Bin Vent (DC2) for all wood waste bio-mass handling operations at the facility. Particulate emissions from DC2 shall be limited to 0.02 gr/dscf. In addition, TRC shall enclose all lime transfers and operate a Lime Silo Bin Vent (DC3) for all lime handling operations at the facility. Particulate emissions from DC3 shall be limited to 0.02 gr/dscf. Finally, TRC shall enclose all ash/fly ash transfers and operate a Fly Ash Silo Bin Vent (DC4) for all ash/fly ash handling operations at the facility. Particulate emissions from DC4 shall be limited to 0.02 gr/dscf.

Because TRC proposed the previous control technologies for particulate emissions from the various fuel, lime, and ash handling operations, and because the controls selected will effectively control particulate emissions from these sources, the Department determined that the use of enclosures and operation of the various baghouses and bin vent dust collectors for material handling operations constitutes BACT for these sources.

C. BACT Review for Vehicle Traffic – Haul Roads, Access Roads, Parking Areas, and General Plant Property

TRC must take reasonable precautions to limit the fugitive emissions of airborne particulate matter on haul roads, access roads, parking areas, and the general plant property. TRC proposed to pave all haul roads leading to and from the facility and all parking areas on site to maintain compliance with the opacity and reasonable precautions limitations for these sources of particulate emissions. In addition, TRC shall have available at all times, and use as necessary, water and/or chemical dust suppressant for all unpaved access roads and any unpaved areas in the general plant property.

Because the proposed project is located in relatively close proximity to the Thompson Falls $PM_{10}$ nonattainment area, the Department determined that maintaining compliance with the reasonable precautions limitations will constitute BACT for these sources.

The control options selected have controls and control costs comparable to other recently permitted similar sources and are capable of achieving the appropriate emission standards.

IV. Emission Inventory

| | Ton/Year | | | | | | |
|---|---|---|---|---|---|---|---|
| **Source** | **PM** | **$PM_{10}$** | **$NO_x$** | **CO** | **$SO_x$** | **VOC** | **Pb** |
| Babcock & Wilcox Boiler (156 MMBtu/hr) | 0.00 | 0.00 | 150.32 | 218.65 | 204.98 | 25.96 | 0.03 |
| Boiler Baghouse (56,200 cfm) | 20.24 | 20.24 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Fuel Handling Baghouse (2,200 cfm) | 1.66 | 1.66 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Fuel Silo Bin Vent (1000 cfm) | 0.74 | 0.74 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Lime Silo Bin Vent (1000 cfm) | 0.74 | 0.74 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Fly Ash Silo Bin Vent (1000 cfm) | 0.74 | 0.74 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Vehicle Traffic | 5.35 | 2.41 | 0.02 | 0.03 | 0.13 | 0.01 | 0.00 |
| Cooling Tower | 3.01 | 3.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| **Total Emissions** | 32.48 | 29.54 | 150.34 | 218.68 | 205.11 | 25.96 | 0.03 |

Boiler

Heat Input Capacity: 156 MMBtu/hr
Operating Hours: 8760 hr/yr

$NO_x$ Emission Calculations

Emission Factor: 0.22 lb/MMBtu (Carter and Burgess, Inc. (C&B) – Engineering Estimate/Source Test Information)
Calculations: 0.22 lb/MMBtu * 156 MMBtu/hr * 8760 hr/yr * 0.0005 ton/lb = 150.32 ton/yr

CO Emission Calculations

Emission Factor: 0.32 lb/MMBtu (C&B – Engineering Estimate/Source Test Information)
Calculations: 0.32 lb/MMBtu * 156 MMBtu/hr * 8760 hr/yr * 0.0005 ton/lb = 218.65 ton/yr

$SO_x$ Emission Calculations

Emission Factor: 0.30 lb/MMBtu (TRC Proposed Emission Limit)
Calculations: 0.30 lb/MMBtu * 156 MMBtu/hr * 8760 hr/yr * 0.0005 ton/lb = 204.98 ton/yr

VOC Emission Calculations

Emission Factor: 0.038 lb/MMBtu (AP-42, Table 1.6-3, 2/99)
Calculations: 0.038 lb/MMBtu * 156 MMBtu/hr * 8760 hr/yr * 0.0005 ton/lb = 25.96 ton/yr

Pb Emission Calculations

Emission Factor: 4.9E-05 lb/MMBtu (AP-42, Table 1.6-5, 2/99)
Calculations: 4.9E-05 lb/MMBtu * 156 MMBtu/hr * 8760 hr/yr * 0.0005 ton/lb = 0.03 ton/yr

Boiler Baghouse

Air-Flow Capacity: 31,685 dscfm (53,620 acfm)

PM Emission Calculations

Emission Factor: 0.017 gr/dscf (C&B – Engineering Estimate/Source Test Information)
Calculations: 0.017 gr/dscf * 31,685 dscfm * 1 lb/7000 gr * 60 min/hr = 4.62 lb/hr
4.62 lb/hr * 8760 hr/yr * 0.0005 ton/lb = 20.24 ton/yr

$PM_{10}$ Emission Calculations

Emission Factor: 0.017 gr/dscf (C&B – Engineering Estimate/Source Test Information)
Calculations: 0.017 gr/dscf * 31,685 dscfm * 1 lb/7000 gr * 60 min/hr = 4.62 lb/hr
4.62 lb/hr * 8760 hr/yr * 0.0005 ton/lb = 20.24 ton/yr

Fuel Handling Baghouse – DC1

Air-Flow Capacity: 2,200 cfm

PM Emission Calculations

Emission Factor: 0.02 gr/dscf (C&B – Engineering Estimate/Source Test Information)
Calculations: 0.02 gr/dscf * 2,200 cfm * 1 lb/7000 gr * 60 min/hr = 0.38 lb/hr
0.38 lb/hr * 8760 hr/yr * 0.0005 ton/lb = 1.66 ton/yr

$PM_{10}$ Emission Calculations

Emission Factor: 0.02 gr/dscf (C&B – Engineering Estimate/Source Test Information)
Calculations: 0.02 gr/dscf * 2,200 cfm * 1 lb/7000 gr * 60 min/hr = 0.38 lb/hr
0.38 lb/hr * 8760 hr/yr * 0.0005 ton/lb = 1.66 ton/yr

Fuel Handling Bin Vent – DC2

Air-Flow Capacity: 1,000 cfm

PM Emission Calculations

Emission Factor: 0.02 gr/dscf (C&B – Engineering Estimate/Source Test Information)
Calculations: 0.02 gr/dscf * 1,000 cfm * 1 lb/7000 gr * 60 min/hr = 0.17 lb/hr
0.17 lb/hr * 8760 hr/yr * 0.0005 ton/lb = 0.74 ton/yr

$PM_{10}$ Emission Calculations

Emission Factor: 0.02 gr/dscf (C&B – Engineering Estimate/Source Test Information)
Calculations: 0.02 gr/dscf * 1,000 cfm * 1 lb/7000 gr * 60 min/hr = 0.17 lb/hr
0.17 lb/hr * 8760 hr/yr * 0.0005 ton/lb = 0.74 ton/yr

Lime Silo Bin Vent – DC3

Air-Flow Capacity: 1,000 cfm

PM Emission Calculations

Emission Factor: 0.02 gr/dscf (C&B – Engineering Estimate/Source Test Information)
Calculations: 0.02 gr/dscf * 1,000 cfm * 1 lb/7000 gr * 60 min/hr = 0.17 lb/hr
0.17 lb/hr * 8760 hr/yr * 0.0005 ton/lb = 0.74 ton/yr

$PM_{10}$ Emission Calculations

Emission Factor: 0.02 gr/dscf (C&B – Engineering Estimate/Source Test Information)
Calculations: 0.02 gr/dscf * 1,000 cfm * 1 lb/7000 gr * 60 min/hr = 0.17 lb/hr
0.17 lb/hr * 8760 hr/yr * 0.0005 ton/lb = 0.74 ton/yr

Fly Ash Silo Bin Vent – DC4

Air-Flow Capacity: 1,000 cfm

PM Emission Calculations

Emission Factor: 0.02 gr/dscf (C&B – Engineering Estimate/Source Test Information)
Calculations: 0.02 gr/dscf * 1,000 cfm * 1 lb/7000 gr * 60 min/hr = 0.17 lb/hr
0.17 lb/hr * 8760 hr/yr * 0.0005 ton/lb = 0.74 ton/yr

$PM_{10}$ Emission Calculations

Emission Factor: 0.02 gr/dscf (C&B – Engineering Estimate/Source Test Information)
Calculations: 0.02 gr/dscf * 1,000 cfm * 1 lb/7000 gr * 60 min/hr = 0.17 lb/hr
0.17 lb/hr * 8760 hr/yr * 0.0005 ton/lb = 0.74 ton/yr

Vehicle Traffic

Miles/Round Trip (miles/hr): 0.2036
PM Emission Calculations

Emission Factor: 6 lb/vehicle mile traveled (VMT) (MT-DEQ Guidance Statement)
Calculations: 6 lb/VMT * 0.2036 VMT/hr * 8760 hr/yr * 0.0005 ton/lb = 5.35 ton/yr

PM$_{10}$ Emission Calculations

Emission Factor: 2.70 lb/VMT
Calculations: 2.70 lb/VMT * 0.2036 VMT/hr * 8760 hr/yr * 0.0005 ton/lb = 2.41 ton/yr

Cooling Tower

Operating Capacity: 125 gallon/min
Total Dissolved Solids (TDS) Value: 55,000 ppm (lb TDS/MM lb $H_2O$)
Drift Factor: 0.02 lb/100 lb $H_2O$

PM Emission Calculations

0.02 lb drift/100 lb $H_2O$ * 125 gal $H_2O$/min * 60 min/hr * 8.34 lb/gal * 55,000 ppm = 0.69 lb/hr
0.69 lb/hr * 8760 hr/yr * 0.0005 ton/lb = 3.01 ton/yr

PM$_{10}$ Calculations

0.02 lb drift/100 lb $H_2O$ * 125 gal $H_2O$/min * 60 min/hr * 8.34 lb/gal * 55,000 ppm = 0.69 lb/hr
0.69 lb/hr * 8760 hr/yr * 0.0005 ton/lb = 3.01 ton/yr

## V. Existing Air Quality

The air quality classification for the immediate area is "Unclassifiable or Better than National Standards" (40 CFR 81.327) for all pollutants. The closest nonattainment areas is the Thompson Falls PM$_{10}$ nonattainment area. The boundary is approximately 2 miles from the proposed facility. ISC3 computer modeling conducted for the proposed project demonstrates that operation of the proposed facility will not adversely impact the Thompson Falls PM$_{10}$ nonattainment area.

## VI. Ambient Air Impact Analysis

The Department determined, based on ambient air modeling, that the impact from this permitting action will be minor. The Department believes it will not cause or contribute to a violation of any ambient air quality standard.

Bison Engineering Inc. (Bison) submitted air dispersion modeling on behalf of TRC. The airborne concentrations of CO, $SO_2$, $NO_x$, and PM$_{10}$ were modeled to demonstrate compliance with the Montana and National Ambient Air Quality Standards (MAAQS and NAAQS). The ISC3 model was used along with 10 years of meteorological data. The National Weather Service surface data sets for Missoula (1986-1987, and 1989-1991) and Kalispell (1987-1991) were used along with the corresponding years of upper air data from Spokane, Washington.

The receptor grid was generated, using the linear interpolation method, from digital elevation model (DEM) files of 7.5 minute United States Geological Survey (USGS) topographical maps for Eddy Mountain and Thompson Falls. The receptor spacing was 100 meters along the fence-line and out to a distance of 1,000 meters. Beyond 1000 meters, additional receptors were spaced at 200-meter intervals out to a distance of 2,000 meters and at 500-meter intervals from 2000 meters to 5000 meters from the fence-line.

The modeled impacts from TRC did not exceed the modeling significance levels for CO. Because the modeled impacts from $SO_2$ and $NO_x$ exceeded the modeling significance levels, additional modeling was performed to demonstrate compliance with the MAAQS/NAAQS. Additionally, a demonstration was made that $PM_{10}$ emissions from the facility would not adversely affect the Thompson Falls $PM_{10}$ nonattainment area. The results for the $SO_2$ and $NO_x$ modeling are summarized in the following table.

*$NO_x$ and $SO_2$ MAAQS/NAAQS Modeling Results for the TRC Facility*

| Pollutant | Period | Concentration ($\mu g/m^3$) | | | |
|---|---|---|---|---|---|
| | | Modeled Value | Background Value | Post-Processed | MAAQS/NAAQS Standard[a] |
| $SO_2$ | 1-hr H19H | 163[b] | 35 | 198 | 1300 |
| | 3-hr H2H | 112 | 26 | 138 | 1300 |
| | 24-hr H2H | 32 | 11 | 43 | 262 |
| | Annual | 6 | 3 | 9 | 52 |
| $NO_x$ | 1-hr H2H | 139 | 75 | 214[c] | 564 |
| | Annual | 4 | 6 | 10[c] | 94 |

[a] Only the most restrictive standard is shown in the table.
[b] The 1-hr modeled $SO_2$ concentration is actually the high-tenth high as opposed to the high-nineteenth high.
[c] The post-processes $NO_x$ concentrations are conservative over-estimates of $NO_2$ concentrations as ratio methods were not used.

As shown in the above table, all of the modeled concentrations for $SO_2$ and $NO_x$ are significantly below the MAAQS/NAAQS.

Finally, a demonstration was made that the $PM_{10}$ emissions from the proposed facility would not impact the Thompson Falls $PM_{10}$ nonattainment area. All of the $PM_{10}$ emissions were modeled at the facility and the radius of the significant impact area was calculated at 1.2 kilometers (0.74 miles) for the 24-hour averaging period and 1.1 kilometers (0.68 miles) for the annual averaging period. Significant impact is defined as $1\mu g/m^3$ for the 24-hour standard and $5\mu g/m^3$ for the annual standard. The closest edge of the nonattainment area is approximately 2 miles from the proposed facility.

Therefore, the Department concluded that the modeled impacts from the proposed TRC facility would not contribute to a violation of the MAAQS/NAAQS or adversely affect the Thompson Falls $PM_{10}$ nonattainment area.

## VII. Taking or Damaging Implication Analysis

As required by 2-10-105, MCA, the Department conducted a private property taking and damaging assessment and determined there are no taking or damaging implications.

## VIII. Environmental Assessment

An environmental assessment, required by the Montana Environmental Policy Act, was completed for this project. A copy is attached.

DEPARTMENT OF ENVIRONMENTAL QUALITY
Permitting and Compliance Division
Air and Waste Management Bureau
P.O. Box 200901, Helena, Montana 59620
(406) 444-3490

## FINAL ENVIRONMENTAL ASSESSMENT (EA)

Issued For: Thompson River Co-Gen, L.L.C.
285 – 2nd Avenue West North
Kalispell, MT 59901

Air Quality Permit Number: 3175-00

Preliminary Determination Issued: October 3, 2001
Department's Decision Issued: October 24, 2001
Permit Final: November 9, 2001

1. *Legal Description of Site*: The Thompson River Co-Gen, L.L.C. (TRC), facility is located in Section 13, Township 21 North, Range 29 West, Sanders County, Montana.

2. *Description of Project*: TRC is proposing to construct and operate a 12.5 megawatt (MW) coal/wood waste bio-mass fired electricity and steam co-generation plant. The proposed facility would incorporate a 156 MMBtu/hr capacity Boiler (Boiler) capable of producing approximately 125,000 pounds of steam per hour, a cooling tower, a lime silo, two ash silos, various material handling operations, and increased truck support traffic in the area. Most of the generated steam would be sent to a turbine generator for the production of electricity to be sent to the power grid. A small percentage (up to 10%) of the steam produced would be sent to Thompson River Lumber, Inc. (TRL), for use in the lumber dry kilns at the sawmill. TRL would also receive a small portion of the total power produced at the facility.

3. *Objectives of Project*: To produce business and revenue for the company and provide power and steam to the existing Thompson River Lumber Company (TRL).

4. *Description of Alternatives*: The only other alternative considered was for the Department of Environmental Quality (Department) to take no action. The "no-action" alternative was dismissed because TRC demonstrated, to the Department's satisfaction, compliance with all applicable rules and standards as required for permit issuance. Furthermore, TRC submitted modeling demonstrating that the project, as proposed, would not cause an exceedance of any ambient air quality standards.

5. *A Listing of Mitigation, Stipulations and Other Controls*: A list of enforceable conditions and a Best Available Control Technology (BACT) analysis would be contained in Permit #3175-00.

6. *Regulatory Effects on Private Property*: The Department considered alternatives to the conditions imposed in this permit as part of the permit development. The Department determined that the permit conditions are reasonably necessary to ensure compliance with applicable requirements and demonstrate compliance with those requirements and do not unduly restrict private property rights.

7. *Pre-Assessment Site Visit*: On September 20, 2001, the Department conducted a site visit to evaluate the proposed site location. In addition to information gathered during the permit application process, various decisions/assessments contained in the following evaluation are based on information collected during the site visit.

8. The following table summarizes the potential physical and biological effects of the proposed project on the human environment. The "no-action alternative" was discussed previously.

| | | **Major** | **Moderate** | **Minor** | **None** | **Unknown** | **Comments Included** |
|---|---|---|---|---|---|---|---|
| A. | Terrestrial and Aquatic Life and Habitats | | | ŏ | | | yes |
| B. | Water Quality, Quantity, and Distribution | | | | ŏ | | yes |
| C. | Geology and Soil Quality, Stability, and Moisture | | | ŏ | | | yes |
| D. | Vegetation Cover, Quantity, and Quality | | | ŏ | | | yes |
| E. | Aesthetics | | | ŏ | | | yes |
| F. | Air Quality | | | ŏ | | | yes |
| G. | Unique Endangered, Fragile, or Limited Environmental Resource | | | ŏ | | | yes |
| H. | Demands on Environmental Resource of Water, Air, and Energy | | | ŏ | | | yes |
| I. | Historical and Archaeological Sites | | | | ŏ | | yes |
| J. | Cumulative and Secondary Impacts | | | ŏ | | | yes |

SUMMARY OF COMMENTS ON POTENTIAL PHYSICAL AND BIOLOGICAL EFFECTS: The following comments have been prepared by the Department.

A. Terrestrial and Aquatic Life and Habitats

The impacts from this project to terrestrial and aquatic life and habitats would be minor because of the relatively small portion of land that would be disturbed and the minor impact to the surrounding area from the air emissions (see Section VI of the permit analysis). Terrestrials (such as deer, antelope, rodents) would use the general area of the facility. The area around the facility would be fenced to limit access to the facility. The fencing would likely not restrict access from all animals that frequent the area, but it may discourage some animals from entering the facility property. Further, because other industrial sources, including the Thompson River Lumber Company and a solid waste disposal facility are located directly adjacent to the proposed TRC property boundary, terrestrials, that routinely inhabit the area, are accustomed to the industrial character of the site.

Because TRC is not proposing to directly discharge any material to surface or ground water sources in the area, other than an evaporation pond, aquatic life and habitats would realize little or no impact from the proposed facility. Further, the amount of water needed is small, and the resulting air emissions to any water body would be minor.

The ambient air quality impact analysis of the air emissions from this facility indicates that the impacts from the TRC emissions on land or surface water would be very minor and would consume only a small portion of the ambient air quality standards as discussed in Section VI of the permit analysis (see Section 7.F of this EA). The small amount of air impact would correspond to an equally small amount of deposition.

B. Water Quality, Quantity, and Distribution

Cooling tower operations at the facility would require 125 gallons of water per minute to operate properly. TRC would use water rights from TRL to acquire the necessary water from the Clark Fork River. Water would not be discharged to any navigable Montana waters but instead would be released to an evaporation or holding pond. Because normal operation would require discharge to the holding pond, TRC would be responsible for acquiring any applicable permits.

No surface water quality problems would result from the current permit action. In addition, because TRC would incorporate a non-permeable lining into the evaporation pond design, no groundwater quality problems would result from the current permit action. Any accidental spills or leaks from equipment would be subject to the appropriate environmental regulations.

C. Geology and Soil Quality, Stability, and Moisture

The impacts to the geology and soil quality, stability, and moisture from this facility would be minor because the project would impact a relatively small portion of land and the amount of resulting deposition of the air emissions would be small. Approximately 6 acres or less would be disturbed for the physical construction of the electric/steam co-generation plant. Soil stability in the immediate vicinity of the proposed facility would likely be impacted by the new footings and foundations required for the facility. However, because the proposed construction site is currently used as a log storage yard for TRL and because normal operations at the mill include routine disturbance of topsoil and gravel, it is unlikely that any new facility construction activities would have any affect on soil quality, stability, and moisture.

TRL conducted drilling projects in the area to determine the geologic make-up of the proposed site. Two drilling projects of 50’ and a single drilling project of 100’ were conducted on site which demonstrated that the geologic make-up of the site is sand and gravel down to at least 100’ below the proposed surface of operations.

The major construction required for the facility would be the building that would house the boiler and turbine. Some of the air emissions from the facility may deposit on local soils, but that deposition would result in only a minor impact to local areas because of the air dispersion characteristics of the area as discussed in Section VI of the permit analysis (see Section 7.F of this EA). Any impacts to the existing geology and soil quality, stability, and moisture would be minor.

D. Vegetation Cover, Quantity, and Quality

Construction and operation of the facility, as proposed, would impact existing vegetative cover, quantity, and quality in the area. However, given that the proposed area of operation is currently used as a log storage yard, that routinely undergoes industrial surface disturbance, the vegetation on site currently consists only of transient vegetation that would not be affected by the proposed construction.

Further, given the relatively small size of the facility and the small amount of land proposed for construction disturbance (< 6 acres) any impacts would be minor. Further, as discussed in Section VI of the permit analysis, air dispersion modeling has demonstrated that general deposition of air pollutants in the area would be minor, thus, the corresponding deposition of air pollutants on the surrounding vegetation would also be minor (see Section 7.F of this EA).

E. Aesthetics

The proposed facility would include the installation and operation of a boiler, a cooling tower, a lime silo, two ash silos, various material handling operations, and increased truck support traffic in the area. The boiler house would include a baghouse incorporating a 145' stack that would be visible from various locations in the area. However, because the proposed area of construction is located in a previously disturbed industrial location with an existing gravel pit, a solid waste transfer station, and lumber sawmill in relatively close proximity, any aesthetic impacts would be minor and consistent with current land use in the area.

The facility would be visible from MT Highway 200 (approximately ½ mile to the north), a small residential subdivision (approximately ¾ mile west/southwest), an individual residence (approximately ½ mile west), and may be visible from the Clark Fork River (approximately ¼ mile south and located in the river valley below the proposed site). In addition, steam plumes might be visible from the facility on those days with temperatures low enough to cause steam plumes to form. However, emission controls are required in Permit #3175-00 to minimize emissions and opacity is limited to less than 20%.

Further, the facility would result in additional noise for the area. The noise impacts from this facility on the surrounding area would be minor because the majority of noise from the facility would occur from rail movements on a new rail spur to support the facility. The facility would increase the rail traffic to that area, but the noise associated with rail movements is already common to the area with the existing rail line. Most rail activity associated with the facility would occur during the day. The other major noise source would be the fuel transfer mechanisms and the boiler. Much of the material handling operation and the boiler would be located inside the property boundary and would thus minimize potential noise impacts due to the distance between the facility and the nearest residence.

The area would also receive increased vehicle use as a result of the proposed project; however, the Department does not believe that the amount of vehicle trips in the area would increase substantially over the existing traffic in the area. The facility would be located very near to an existing truck route and to other industrial facilities that currently use the route. Vehicles would likely use the existing roads (specifically the truck route) in the area en route to the roads established as part of the actual facility. In addition, most of the transportation of products and raw materials in and out of the proposed facility would take place on the existing rail lines and proposed rail spur. Visible emissions from access roads (whether the county's responsibility or TRC's responsibility) would be limited to 20% opacity.

Finally, operation of the proposed TRC facility may result in increased industrial odors in the area. However, operation of the proposed facility would take the place of similar operations at TRL that result in the same odors.

F. Air Quality

The air quality impacts from the construction and operation of the proposed facility would be minor. Permit #3175-00 would include conditions limiting emissions of $NO_x$, CO, $SO_2$, VOC's, PM, and $PM_{10}$. Lead emissions were also evaluated as part of the application process. Because potential uncontrolled lead emissions were shown to be negligible, the permit does not limit these emissions. The operations would be limited by Permit #3175-00 to criteria pollutant emissions of 250 tons per polutant during any rolling 12-month time period or less from non-fugitive sources at the plant.

In addition, ISC3 computer modeling was conducted to demonstrate compliance with the Montana and National Ambient Air Quality Standards (MAAQS/NAAQS). The airborne concentrations of $NO_x$, CO, $SO_2$, and $PM_{10}$ were modeled. Total potential VOC emissions were shown to be less than 10 tons per year; therefore, the Department did not require a speciation of potential VOC emissions and modeling for VOC's was determined to be unnecessary. The ISC3 model was used along with ten years of meteorological data. The National Weather Service surface data sets for Missoula (1986-1987 and 1989-1991) and Kalispell (1987-1991) were used along with the corresponding years of upper air data from Spokane, Washington. The previously cited data sets were used because it was determined that this data would most accurately represent the conditions applicable to the proposed project.

The receptor grid was generated, using the linear interpolation method, from digital elevation model (DEM) files of 7.5 minute United States Geological Survey (USGS) topographical maps for Eddy Mountain and Thompson Falls. The receptor spacing was 100 meters along the fence-line and out to a distance of 1,000 meters. Beyond 1000 meters, additional receptors were spaced at 200-meter intervals out to a distance of 2,000 meters and at 500-meter intervals out to a distance of 5000 meters. The modeled impacts from TRC for $NO_x$, CO, and $SO_2$ were shown to be significantly below the MAAQS/NAAQS.

Finally, a demonstration was made that the $PM_{10}$ emissions from the proposed facility would not impact the Thompson Falls $PM_{10}$ nonattainment area. All $PM_{10}$ emissions were modeled at the facility and the radius of the significant impact area was calculated at 1.2 kilometers (0.74 miles) for the 24-hour averaging period and 1.1 kilometers (0.68 miles) for the annual averaging period. The closest edge of the nonattainment area is approximately 2 miles from the proposed facility.

Thus, the Department concluded that the modeled impacts from the proposed TRC facility would not contribute to a violation of the MAAQS/NAAQS or adversely affect the Thompson Falls $PM_{10}$ non-attainment area. In general, the modeling demonstrated that the dispersion characteristics, for the modeled pollutants, are such that any potential impacts would be minimized.

G. Unique Endangered, Fragile, or Limited Environmental Resources

The Department contacted the Montana Natural Heritage Program (MNHP) in an effort to identify any species of special concern associated with the proposed site location. Search results have concluded there are 5 such environmental resources in the area. Area in this case is defined by the township and range of the proposed site, with an additional one-mile buffer. The species of special concern identified by MNHP include the *oncorhynchus clarki lewisi* (Westslope Cutthroat Trout), *salvelinus confluentus* (Bull Trout), *felis lynx* (Lynx), *ursus arctos horribilis* (Grizzly Bear), and *clarkia rhomboidia* (Common Clarkia). While the previously cited species of special concern have been identified within the defined area, the MNHP search did not indicate any species of special concern located directly on the proposed site.

The proposed site of construction/operation has historically been used for industrial purposes. Construction/operation would take place within a 6-acre plot of land, purchased by TRC and located within the existing 165 acre TRL mill property boundary. Because industrial operations have been ongoing within the existing TRL property boundary for an extended period of time (exceeding 50 years), it is unlikely that any of these species of special concern would be affected by the proposed project.

H. Demands on Environmental Resource of Water, Air, and Energy

Demands on environmental resources of water, air, and energy would be minor. Cooling tower operations at the plant would require a maximum of 125 gallons per hour for proper operation. The water would come directly from the Clark Fork River using shared water rights from TRL. Further, TRC would not discharge any used process water back into any navigable waters, rather all water discharged from the cooling tower would be sent to a lined on-site evaporation pond.

As previously discussed, the proposed project would increase air pollutants in the area; however, air dispersion modeling has demonstrated compliance with the MAAQS/NAAQS.

Finally, additional energy would be used and produced at the facility; therefore, minor impacts to energy would occur. TRC would produce approximately 12.5 MW of power with a majority (approximately 10 MW) being sold and sent directly to the power grid and the remaining power purchased and used by TRL and used for operations at the TRC facility itself.

I. Historical and Archaeological Sites

The potential impact to historical and archaeological sites would be minor because the site location contains no visible standing structures, the facility would physically impact a small amount of property (approximately 6 acres), and the facility would locate within an area that has been previously disturbed for industrial purposes (log yard).

The area of the actual construction contains no visible standing structures and has been thoroughly disturbed by industrial activities (lumber operations). The lack of standing structures indicates lack of historical activity within the proposed site location. Since the topsoil in the area is 4-6 inches thick and covers mostly sand and gravel and because industrial operations have been ongoing, any possibility of historical or archaeological material being present was destroyed by the industrial activities in the area.

The Department contacted the Montana Historical Society – State Historic Preservation Office (SHPO) in an effort to identify any historical and/or archaeological sites that may be present in the proposed area of construction/operation. Search results concluded that there are no such sites on record in the search locale. According to SHPO, the absence of recorded cultural/historical properties in the search locale may be due to a lack of previous inventory. Due to the ground disturbing nature of the proposed project and the low topography of the area, the potential for the presence of historical/cultural sites that could be impacted by the project does exist. Therefore, SHPO recommended that a cultural resource inventory be conducted prior to project initiation.

J. Cumulative and Secondary Impacts

Cumulative and secondary impacts from this project would result in minor physical and biological impacts to the human environment in the immediate area. Because the proposed area of construction/operation includes existing industrial facilities, the proposed project could result in cumulative physical and biological impacts; however, as previously described in this environmental assessment, any cumulative impacts would be minor. In addition, the proposed project would not result in any known secondary impacts.

Air pollution from the facility would be controlled by Department-determined BACT and conditions in Permit #3175-00. The Department believes that this facility could be expected to operate in compliance with all applicable air quality rules as outlined in Permit #3175-00.

9. The following table summarizes the potential economic and social effects of the proposed project on the human environment. The "no action alternative" was discussed previously.

| | | **Major** | **Moderate** | **Minor** | **None** | **Unknown** | **Comments Included** |
|---|---|---|---|---|---|---|---|
| A. | Social Structures and Mores | | | | ŏ | | yes |
| B. | Cultural Uniqueness and Diversity | | | | ŏ | | yes |
| C. | Local and State Tax Base and Tax Revenue | | | ŏ | | | yes |
| D. | Agricultural or Industrial Production | | | ŏ | | | yes |
| E. | Human Health | | | ŏ | | | yes |
| F. | Access to and Quality of Recreational and Wilderness Activities | | | ŏ | | | yes |
| G. | Quantity and Distribution of Employment | | | ŏ | | | yes |
| H. | Distribution of Population | | | | ŏ | | yes |
| I. | Demands for Government Services | | | ŏ | | | yes |
| J. | Industrial and Commercial Activity | | | ŏ | | | yes |
| K. | Locally Adopted Environmental Plans and Goals | | | ŏ | | | yes |
| L. | Cumulative and Secondary Impacts | | | ŏ | | | yes |

SUMMARY OF COMMENTS ON POTENTIAL ECONOMIC AND SOCIAL EFFECTS: The following comments have been prepared by the Department.

A. Social Structures and Mores

The proposed facility would not cause a disruption to any native or traditional lifestyles or communities (social structures or mores) in the area because the land use proposal would not be out of place given the land use of the larger area surrounding the proposed site and the fact that the immediate surrounding area would remain the same. The addition of the TRC facility would be consistent with the current industrial use of the larger area surrounding the facility. In addition, there are other industrial sources including TRL and a solid waste transfer station directly adjacent to the proposed site, and an existing gravel pit in the greater surrounding area.

B. Cultural Uniqueness and Diversity

The proposed facility would not cause a change in the cultural uniqueness and diversity of the area because the area is currently used predominantly for industrial purposes. Further, the addition of TRC to the area would not change the existing industrial character of the area.

C. Local and State Tax Base and Tax Revenue

The facility would have a minor effect on the local and state tax base and tax revenue because TRC would be responsible for all appropriate state and county taxes imposed upon the business operation. In addition, TRC employees, and the numerous people that would be employed during construction of the facility, would add to the overall income base of the area.

D. Agricultural or Industrial Production

The proposed changes would not displace or otherwise affect any agricultural land or practices. The proposed site of construction and operation is currently used as a log storage yard by TRL. In addition, the proposed operations would have only a minor beneficial impact on local industrial production. TRC would provide power and steam for normal operations at TRL.

E. Human Health

There would be minor potential effects on human health due to the increase in emissions of pollutants. However, Permit #3175-00 would incorporate conditions to ensure that the facility would be operated in compliance with all applicable rules. These rules and standards are designed to be protective of human health.

F. Access to and Quality of Recreational and Wilderness Activities

The proposed operations would not affect access to any recreational or wilderness activities in the area. The proposed site is located within the 165-acre plot currently used for TRL's lumber mill operations. The area is comprised of private property with no public access and would continue in this state.

The proposed operations may have a minor effect on the quality of recreational or wilderness activities in the area by it's physical and visible presence and by creating additional noise and/or odors in the area. However, as previously stated, the area in question is currently utilized for industrial purposes and would not change from the current industrial status as a result of the proposed project.

G. Quantity and Distribution of Employment

There would be a minor effect on the employment of the area from this project because it would result in numerous construction-related employment opportunities and approximately 15-20 full-time positions upon completion of the facility.

H. Distribution of Population

The entire project would not affect the normal population distribution in the area because, although approximately 15-20 full-time positions would be created, TRC has indicated that many of those employed might come from the existing population in the area. The remainder of the jobs created from this project would be temporary. Neither the full-time positions nor the numerous temporary construction-related positions would likely affect the distribution of population in the area.

I. Demands of Government Services

Demands on government services from this facility would be minor. Minor increases may be seen in traffic on existing roads in the area during construction and while the facility is operating. As the proposed site is within an existing industrial location, employee water and sewage disposal facilities would be connected to existing water and sewer sources, but this connection would be financed by TRC. All process water for the facility operations would be obtained from TRL, and all spent water would be discharged to an evaporation pond to be located on site.

The acquisition of the appropriate permits by the facility (including local building permits and a state air quality permit), any permits for the associated activities of the project, and compliance verification with those permits would also require minor services from the government.

J. Industrial and Commercial Activity

Operation of the proposed TRC facility would result in an increase in industrial activity in the area. However, given the presence of other local industrial activities including TRL, a solid waste disposal facility, and a gravel mine, any increase in industrial activity would be minor.

K. Locally Adopted Environmental Plans and Goals

The City of Thompson Falls, Montana, located approximately 3.7 miles west of the proposed facility, is considered a $PM_{10}$ nonattainment area. The proposed facility would be outside of the nonattainment area and would not significantly contribute to the nonattainment area based on modeling. In addition, the modeling inputs were based on the "worst case" $PM_{10}$ emissions from the facility. Not only would the facility seldom operate at "worst case" conditions, but the prevailing wind pattern in the area would generally carry the emissions from the facility to the east of the plant, away from the nonattainment area.

The state air quality standards would protect air quality at the proposed site and the environment surrounding the site.

L. Cumulative and Secondary Impacts

Overall, cumulative and secondary impacts from this project would result in minor social and economic impacts to the human environment in the immediate area. Because the proposed area of construction/operation includes existing industrial facilities, the proposed project could result in cumulative social and economic impacts; however, as previously described in this environmental assessment, any cumulative impacts would be minor. In addition, the proposed project would not result in any known secondary impacts.

Air pollution from the facility would be controlled by Department-approved BACT and conditions in Permit #3175-00. The Department believes that this facility could be expected to operate in compliance with all applicable air quality rules as outlined in Permit #3175-00.

*Recommendation*: An EIS is not required.

*If an EIS is not required, explain why the EA is an appropriate level of analysis*: Permit #3175-00 would include conditions and limitations to ensure the facility would operate in compliance with all applicable air quality rules. The source would be applying the Best Available Control Technology and the analyses indicate compliance with all applicable air quality rules and no significant air quality impacts. Based on the foregoing review, there are no other significant impacts associated with this proposal and the scope of the review is appropriate, considering the nature and complexity of the project.

*Other groups or agencies contacted or that may have overlapping jurisdiction*: Montana Historical Society (State Historical Preservation Office), Montana Natural Heritage Program.

*Individuals or groups contributing to this EA*: Department of Environmental Quality - Air and Waste Management Bureau; Montana Historical Society (State Historical Preservation Office); and the Montana Natural Heritage Program.

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*Date*: September 21, 2001