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**PHASE I
ENVIRONMENTAL SITE ASSESSMENT
OF
West Baxter Business Park
Timberwood Drive
Baxter, MN 56425**

Prepared for:

Potlatch Lake States Timberlands LLC
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**PHASE I ENVIRONMENTAL SITE ASSESSMENT
WEST BAXTER BUSINESS PARK
TIMBERWOOD DRIVE
BAXTER, MN 56425**

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1. SUMMARY

Widseth Smith Nolting has completed a Phase I Environmental Site Assessment of the property referred to as West Baxter Business Park. West Baxter Business Park is at the western county limits of Crow Wing County, along Highway 210 in Baxter. This environmental site assessment was conducted to reveal evidence of recognized environmental conditions (RECs) identifying potential releases in connection with the target property, in accordance with the American Society of Testing and Materials Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process (Designation: E1527-13). Any exceptions or limitations to, or deletions from, this practice are described in Section 2.4 of this report.

Site reconnaissance, interviews, and historical research were completed for this assessment. Research and interviews revealed that West Baxter Business Park consists of 14 individual parcels totaling approximately 297 acres. About 5.1 acres are already developed. Remaining acreage is undeveloped. West Baxter Business Park is bounded to the north by BNSF railway, Cass County to the west, Mapleton Road to the south, and abuts private property to the east in the City of Baxter.

The target property was partially farmed in the early 1900s after the area was logged until the 1960s. After that the fields were allowed to revert to fields and woodland. In 1984 a portion of the target property was developed with an access road, buildings, and wood storage area.

The target property was used for pulpwood storage from the mid-1980's to the early 2000's. Harvested trees were stored on-site and loaded onto rail cars for processing in Cloquet, MN.

The target property was identified in the database report for a water discharge permit. The database report did identify one additional site as a concentrated animal feeding operation. Through an interview with Ed Patrias, Potlatch Corporations Minnesota Real Estate Manager, it was revealed that one above ground storage tank was onsite while the target property was used for lumber storage.

This assessment has revealed two recognized environmental conditions, the above ground storage tank and shop building area in connection with the target property.

2. INTRODUCTION

2.1 *Purpose*

Widseth Smith Nolting (WSN) was retained to perform a Phase I Environmental Site Assessment (ESA) of the West Baxter Business Park, Baxter, Minnesota, hereinafter referred to as the “target property”. The location of the target property is shown on Figure 1. The ESA was completed to disclose any potential for environmental impacts to the target property resulting from past or present uses of the target property or surrounding properties and render an opinion regarding the environmental data collected and information reviewed. The Phase I ESA was requested by HKGI, Inc. and Potlatch Corporation in association with the Shovel Ready application.

2.2 *Detailed Scope of Services*

WSN followed the American Society for Testing Materials (ASTM) Practice E 1527-13: Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process. ASTM is a national standards-writing organization based in Philadelphia, Pennsylvania. This practice outlines methods to complete an ESA for commercial real estate in the United States. Its purpose is to identify “recognized environmental conditions” (RECs) of contamination by hazardous materials and petroleum products, and as such, defines what constitutes appropriate inquiry to qualify for the innocent landowner defense of the CERCLA. Refer to Section 2.4 for information on limiting factors. The practice allows for “Prior Assessment Usage” if some current assessment is done to determine if anything has changed regarding RECs. The scope for this practice is as follows.

- 1) Review available public records/documents helping to identify RECs (hazardous substances or petroleum products) in connection with the target property. Request a search of state and federal agency databases listing known evidence of contamination at or near the property.
- 2) Conduct a site walk over to collect data and observe environmental conditions related to the property and any structures located on the premises to the extent not obstructed by adjacent buildings, bodies of water, bituminous or other paved surfaces or by limiting conditions such as snow or rain.
- 3) Interview the site-owner, occupants or designated persons to review property boundaries and obtain information relevant to the site or adjoining land. Briefly interview knowledgeable persons to establish previous property uses and conditions.
- 4) Prepare a site report containing observations relating to the apparent environmental condition of the site, describing areas of

impact, summary of records/documents reviewed, analysis of collected data and the consultant's conclusions.

2.3 Significant Assumptions

- 1) Offsite contamination has been documented and discovered through historical use information;
- 2) Site owner, occupant and/or manager have been forthcoming in revealing knowledge of environmental incidents; and
- 3) Historical use information is correct.

2.4 Limitations and Exceptions

The conclusions and recommendations in this report represent our opinions, which are based on the information gathered during the assessment. These opinions were arrived at in accordance with currently accepted engineering, hydrologic and geologic practices and are subject to the inherent limitations of environmental site assessments. No environmental site assessment can completely eliminate uncertainty regarding the potential for "recognized environmental conditions" in connection with the target property. Within reasonable limits of time and cost, an assessment conducted according to ASTM standards is intended to reduce uncertainty regarding the potential for contamination of the site.

There were no limitations or exceptions to the practices set forth in ASTM Designation: E1527-13 for this ESA except the following:

- Portions of the target property could not be observed because of the vegetative cover.
- The parcel west of the commercial building used to store lumber (Parcel Identification Number 0342001002009) is excluded from this assessment.

2.5 Special Terms and Conditions

No special terms or conditions were included for the purpose of this report.

2.6 User Reliance

This Phase I ESA was prepared specifically for HKGI, Inc. and Potlatch Corporation.

3. SITE DESCRIPTION

3.1. *Location and Legal Description*

The target property is at the western limits of Crow Wing County and the City of Baxter, Minnesota and consists of 14 parcels totaling approximately 297 acres. The target property is bounded to the north by BNSF railway, Cass County to the west, Mapleton Road to the south, and abuts property to the east in the City of Baxter. Of the 297 acres, 5.1 acres are currently developed for commercial usage. Parcel information is available on the Crow Wing County Geographic Information System (GIS) Public Map Service.

The legal description is as follows:

The West Half (W1/2) of Section 15, Township 133, Range 29 Crow Wing County, Minnesota, lying southerly of the Burlington Northern Railroad, EXCEPT Lot 2, Block 1, POTLATCH ADDITION TO BAXTER, according to the recorded plat thereof on file in the Recorder's office said Crow Wing County, and EXCEPT that part of said W1/2 deeded to the City of Baxter by Document No's 741072 and 741073 on file in said Crow Wing County Recorder's office.

The location of the target property is shown on Figure 1. The figure contains an excerpt from the Baxter, MN, United States Geological Survey (USGS), 7.5 minute topographic quadrangle maps.

3.2 *Site and Vicinity General Characteristics*

The target property is approximately 97 percent undeveloped with trees, brush, open fields, and wetlands. Developed commercial property accounts for about 3 percent of the target property. The northern third of the target property contained more open areas than what was primarily observed to the south. There is a greater concentration of wooded areas in the southwest third of the target property.

The area surrounding the target property is mostly undeveloped land with some tilled agricultural and residential development nearby. BNSF railway and Mapleton Road define the north and south boundary, respectively. While the Cass County line and private property define the west and east target property lines, respectively.

3.3 *Current Use*

The target property is mostly covered with various forms of vegetation. However, about 5.1 acres have been developed for two commercial business: Simonson Lumber and Brock White Company. Beyond the

commercial property access, further road access is prohibited by a clearly marked no trespassing sign at a locked gate.

3.4 Descriptions of Structures, Roads and Other Improvements on the Site

There is one structure on the target property related to the current commercial business. Timberwood Drive is paved from Highway 210 extending to where customers and employees can access the business. The remaining portion of Timberwood Drive is unimproved. There is a former access road and other two track roads that were probably developed during past logging operations.

3.5 Current Uses of Adjoining Property

Development on adjacent properties is as follows:

- North – BNSF railway, Highway 210 and undeveloped wooded areas;
- Northeast – BNSF railway, Highway 210 and undeveloped wooded areas;
- East – Minor residential development and undeveloped wooded areas;
- Southeast – Minor residential development and undeveloped wooded areas;
- South – Mapleton Road and undeveloped wooded areas;
- Southwest – Mapleton Road, minor residential development and undeveloped wooded areas;
- West – Minor residential development, tilled agricultural land, and undeveloped wooded areas;
- Northwest – Minor residential development, tilled agricultural land, and undeveloped wooded areas.

Figure 2 illustrates the target property and adjacent properties.

4. USER PROVIDED INFORMATION

4.1 Title Records

Title records for the target property were not provided to WSN for review.

4.2 Environmental Liens/Activity and Use Limitations

It is the user's responsibility to check title records for environmental liens or activity and use limitations. No environmental liens or activity and use limitations were indicated by the user.

4.3 Specialized Knowledge

No specialized knowledge was provided by the user.

4.4 Valuation Reduction for Environmental Knowledge

The user does not have any information indicating there is a valuation reduction from environmental information for this property.

4.5 Owner, Property Manager and Occupant Information

The target property is owned by Potlatch TRS MN, LLC.

4.6 Reason for Performing a Phase I

The purpose of this Phase I ESA is to identify, to the extent feasible, RECs in connection with the target property. HKGI, Inc. requested the ESA to accompany their Shovel Ready Development application and for future use.

4.7 Other

No other information was provided by the user.

5. RECORDS REVIEW

5.1 Environmental Record Sources

An environmental database review was completed by GeoSearch on November 5, 2015 (Appendix A). The search included the following databases:

FEDERAL RECORDS

- **AIRSAFS:** Aerometric Information Retrieval /Air Facility Subsystem
- **BRS:** Biennial Reporting System
- **CDL:** Clandestine Drug Laboratory Locations
- **DOCKETS:** EPA Docket Data
- **EC:** Federal Engineering Institutional Control Sites
- **ERNSMN:** Emergency Response Notification System
- **FRSMN:** Facility Registry System
- **HMIRSR05:** Hazardous Materials Incident Response System
- **ICIS:** Integrated Compliance Information System
- **ICISNPDES:** Integrated Compliance Information System National Pollutant Discharge Elimination System
- **MLTS:** Material Licensing Tracking System
- **NPDESR05:** National Pollutant Discharge Elimination System
- **PADS:** PCB Activity Database System

- **PCSR05:** Permit Compliance System
- **RCRASC:** RCRA Sites with Controls
- **SFLIENS:** CERCLIS Liens
- **SSTS:** Section Seven Tracking System
- **TRI:** Toxic Release Inventory
- **TSCA:** Toxic Substances Control Act Inventory
- **NLRRCRAG:** No Longer Regulated RCRA Generator Facilities
- **RCRAGR05:** RCRA – Generator Facilities
- **RCRANGR05:** RCRA – Non-Generator Facilities
- **BF:** Brownfields Management System
- **CERCLIS:** Comprehensive Environmental Response Compensation and Liability Information System
- **LUCIS:** Land Use Control Information System
- **NFRAP:** No Further Remedial Action Planned Sites
- **NLRRCRAT:** No Longer Regulated RCRA Non-Corrupts TSD Facilities
- **ODI:** Open Dump Inventory
- **RCRAT:** RCRA- Treatment, Storage and Disposal Facilities
- **DNPL:** National Priority List Deletions
- **DOD:** Department of Defense Sites
- **FUDS:** Formerly Used Defense Sites
- **NLRRCRAC:** No Longer Regulated RCRA Corrective Action Facilities
- **NPL:** National Priority List
- **PNPL:** Proposed National Priority List Sites
- **RCRAC:** Resource Conservation and Recovery Act – Corrective Action Facilities
- **RCRASUBC:** Resource Conservation and Recovery Act – Subject to Corrective Action Facilities
- **RODS:** Record of Decision System
- **HISTPST:** Historical Gas Station

STATE RECORDS

- **AIRS:** Permitted Air Facilities
- **CDL:** Clandestine Drug Laboratory Locations
- **IC:** Sites with Industrial Controls
- **PCASPILLS:** Spills Listing
- **SWUP:** Solid Waste Utilization Projects
- **TIER II:** Tier Two Facility Listing
- **FEEDLOT:** Feedlots
- **HWGS:** Hazardous Waste Generator Sites
- **WDP:** Water Discharge Permits
- **BULKSTORAGE:** Bulk Storage Permits
- **CLEANERS:** Registered Drycleaning Facilities
- **UAST:** Registered Storage Tanks
- **AGSPILLS:** Agricultural Spills Listing
- **CAFO:** Concentrated Animal Feeding Operations
- **CERCLIS:** CERCLIS Sites
- **CLF:** Closed Landfills
- **CONTINGENCIES:** Agricultural Contingency Sites
- **HWSTSD:** Hazardous Waste Treatment Storage Disposal Sites
- **LUAST:** Registered Leaking Storage Tanks
- **PBF:** Petroleum Brownfields Program Sites
- **PBRLF:** Permitted by Rule Landfills
- **PVICP:** Potential Voluntary Investigation and Cleanup Sites Program Sites
- **RECYCLERS:** Recycling Market Directory
- **SRS:** Site Remediation Section Database
- **SWF:** Open Solid Waste Facilities

- **UNPERMDUMPS:** Unpermitted Dump Sites
- **VICP:** Voluntary Investigation and Cleanup Sites Program Sites
- **CSTF:** Contaminated Soil Treatment Facilities
- **HWCS:** Hazardous Waste Cleanup Sites
- **SAS:** State Assessment Sites
- **SF:** Superfund Site Information Listing

TRIBAL RECORDS

- **USTR05:** Underground Storage Tanks on Tribal Lands
- **LUSTR05:** Leaking Underground Storage Tanks on Tribal Lands
- **ODINDIAN:** Open Dump Inventory on Tribal Lands
- **INDIANRES:** Indian Reservations

The following table summarizes sites identified within ASTM search distances (Designation: E1527-13 section 8.2.1) by the electronic database search. Refer to Section 5.1 or Appendix A for definitions of database acronyms.

MAP ID NUMBER	DATABASE NAME	SITE NAME	DISTANCE AND DIRECTION
1	WDP	Potlatch Drive and TH 210 Improvements	0.11 Miles E
2	CAFO	Jennie-O Turkey Store	0.47 Miles SW

Note: *Distances may be misleading; this database search treats the site as a point rather than an area. Overview and Detail maps: see pages 10 - 13 of Appendix A.

5.2 Additional Environmental Record Sources

A review of the Minnesota Pollution Control Agency’s (MPCA) “What’s in My Neighborhood?” incorrectly revealed one additional site within the ASTM minimum search distances. MPCA incorrectly indicates that Potlatch Demolition Landfill is located on Timberwood Drive.

5.3 Physical Setting Sources

The following information was obtained from, USGS 7.5 Minute Topographic Maps, United States Geological Survey (USGS) and Minnesota Geological Survey (MGS) publications, and Well and Boring Records obtained from the Minnesota Department of Health County Well Index Online.

Regional Geology/Hydrogeology

According to the Crow Wing County Atlas Series C-16, Plate 3- Surficial Geology, the target property is on Glacial Lake Brainerd deposits. This material has been shown to be well sorted sand that is very fine to medium grained and non-calcareous. At depths greater than 10 feet, sediment may contain interbedded silt and clay layers, as well deltaic sands and gravels deposited by meltwater streams of the retreating Rainy Lobe. The surficial

outwash deposits have been reworked by wind forming fine-grained eolian sand. The eolian sands overlay 30 to 40 feet of lacustrine sediments. The water table is typically shallow, less than ten feet below the surface. The surficial aquifer is characterized by high porosity, permeability and transmissivity. Based on local well records, outwash sands and gravels and variable clay layers extend between 60 feet up to 150 feet, or more. Bedrock in the area is located at a depth of 100 to 150 feet and consists chiefly of siltstone and some sandstone.

Local Geology/Hydrogeology

Elevation at the target property is rather level near 1,200 feet above the National Geodetic Vertical Datum (NGVD).

A surficial water table is present in most of the lacustrine sand throughout the area at an approximate depth of 20 feet below the ground surface. Nearby well logs indicate clay is present in the surficial sands. This layer can extend to a depth of 108 feet. Static water level in the vicinity of the site ranges from 23 to 58 feet below the ground surface.

Regional groundwater flow within this water table is to the west-southwest, toward Gull River and Crow Wing River. Groundwater can also be found in buried sand layers and to a much lesser extent, in the fractures in underlying bedrock. Groundwater flow in these units is probably also to the south with regional flow.

5.4 Historical Use Information on the Property

Historical information was collected and reviewed to identify past land use and document the presence of possible RECs in connection with the target property. Below is a synopsis of the results of historical research.

Aerial Photographs

Aerial images from 1939, 1954, 1966, 1973, 1978, 1985, 1991, 1997, 2003, 2008, and 2013 were reviewed and are included in Appendix B. Following is a brief synopsis of the project area and immediate vicinity:

- 1939 – There appear to be large open and tree covered areas scattered across the target property. Logged or farmed areas are visible on the northern parts of the target property. Highway 210 and BNSF railway are visible to the north. Minor residential structures appear in the image.
- 1954 – The target property appears unchanged with the exception of what appears to be more farmed land on the northern portion.
- 1966 - The target property appears unchanged. Highway 210 has been widened.
- 1973 – The target property appears unchanged.
- 1978 – The target property appears unchanged.

- 1985 – The target property appears to have been improved. Visible in the image are lumber piles, some small structures, road access to Highway 210, and a railroad spur connects to the BNSF railway.
- 1991 – The target property and vicinity appear relatively unchanged.
- 1997 – The target property and vicinity appear relatively unchanged.
- 2003 – The target property and vicinity appear relatively unchanged.
- 2008 – The target property and vicinity appear as they look currently. Timberwood Drive has been not been completed but appears to be under construction. The commercial buildings that are present currently have been completed.
- 2013 – The target property and vicinity appear relatively unchanged. Timberwood Drive has been completed.

Fire Insurance Maps

Fire insurance maps were not available for the target property.

City Directories

A city directory for 2013 was available. The directory listed two business on the target property; Dan Veith Construction and Brock White Company. A copy of the available city directory is included in Appendix D.

Historical & Topographical Maps

Historical topographic maps are included in Appendix C. The USGS 7.5 minute topographic map of Baxter, Minnesota quadrangle is included as Figure 1. Topographic maps from 1916, 1919, 1954, 1979, 1994, and 2013 were available for review and indicate development generally consistent with what was discerned from aerial imagery as described above.

Property Information

Maps and general property information are available from the Crow Wing County GIS Public Map Service online, (Appendix F).

5.5 *Historical Use on Adjoining Properties*

Adjoining properties are primarily tilled agricultural, residential, and undeveloped wooded and some open fields. Simonson Lumber is located adjacent to the target property.

6. SITE RECONNAISSANCE

6.1 *Methods and Limiting Factors*

Vladimir Zivkovic, WSN, conducted a site reconnaissance on November 6, 2015, to collect data and observe environmental conditions relative to the target property and any structures located on the premises to the extent not obstructed by adjacent buildings, bodies of water, bituminous or other paved surfaces or by limiting conditions such as snow or rain. Photographs documenting site conditions are included in Appendix E.

6.2 General Site Setting

The target property consists mainly of grass and brush covered open spaces and forested or wooded areas. The target property is approximately 97 percent covered with trees, brush, and open fields and wetland. Developed commercial property accounts for about 3 percent of the target property. The northern third of the target property contained more open areas than what was primarily observed to the south. There is a greater concentration of wooded areas in the south and western portions of the target property.

The area surrounding the target property is mostly undeveloped land with some tilled agricultural and residential development nearby. BNSF railway and Mapleton Road define the north and south boundary, respectively. While the Cass County line and private property define the west and east target property lines, respectively.

6.3 Exterior Observations

The target property appears to be generally well maintained.

Underground Storage Tanks

No evidence of underground storage tanks was observed on the target property during site reconnaissance.

Aboveground Storage Tanks

No aboveground storage tanks were observed on the target property during site reconnaissance. The site where a previous above ground storage tank was identified and photographed.

Polychlorinated Biphenyls (PCBs)

No PCB containing materials were observed on the target property during site reconnaissance. Any electrical transformers associated with the target property do not likely contain PCBs.

Solid Waste Disposal

There is no indication of a pattern of solid waste disposal.

Soil Staining

No soil staining was observed during the site reconnaissance.

Pavement Staining

There is no pavement on the target property.

Stressed Vegetation

No stressed vegetation was observed during the site reconnaissance.

On-Site Water Wells

No water wells were observed on the target property during site reconnaissance.

Hazardous Substance and Petroleum Products Containers

No hazardous substances, petroleum products, or containers were observed outside during site reconnaissance.

Unidentified Substance Containers

No unidentified substance containers were observed outside during the site reconnaissance.

Septic Systems

No septic systems were observed on the target property during site reconnaissance.

Pits, Ponds or Lagoons

There were no pits, ponds, or lagoons associated with solid waste observed on the target property during site reconnaissance.

Fill Material

Fill material was not observed on the target property during the site reconnaissance.

Miscellaneous Concerns

No miscellaneous concerns were observed during site reconnaissance.

6.4 Interior Observations

The commercial building on-site was constructed in and the occupants appear to keep the interior in good order.

Underground Storage Tanks

No underground storage tanks were observed in the interior of the building during site reconnaissance.

Aboveground Storage Tanks

One above ground storage tanks was observed in the interior of the Brock White Company building during site reconnaissance. The above ground storage tank has a capacity of 100 gallons, is used to fuel the forklifts on-site, and appears to be in good condition. Above ground storage tanks less than 500 gallons are not subject to MPCA regulations.

Heating/Cooling

The main building is heated with natural gas and cooled with electric air conditioning units.

Pavement Staining

No abnormal discoloration or evidence of large spills was observed.

Soil Staining

No exposed soil was observed on the interior of the main building.

Odors

No unknown odors were noticed during the site reconnaissance.

Hazardous Substance and Petroleum Product Containers

Additional hazardous substances or solvents were not observed.

Miscellaneous Concerns

No miscellaneous concerns were observed in the interior of the main building or accessory building during site reconnaissance.

7. INTERVIEWS

7.1 *Interview with Owner*

The target property is owned by Potlatch TRS MN LL. Mr. Ed Patrias, Potlatch Corporations Minnesota Real Estate Manager, was interviewed on the behalf of the owner. The interview was conducted by Vladimir Zivkovic of WSN on November 6, 2015. The following is a synopsis of the information provided:

- There have been no known spills, releases of hazardous waste or petroleum products on the target property;
- No above ground or below ground tanks are present on the target property;
- An above ground storage tank approximately 1,500 – 2,000 gallons was on-site, but was removed over 10 years ago;
- The target property had a shop area near the above ground storage tank for vehicle maintenance;
- No hazardous substances, unidentified waste materials, batteries, or other waste materials have been dumped or burned on the target property;
- The target property has a historical use for lumber storage prior to being loaded at the railhead.

7.2 *Interview with Occupants*

The target property has two commercial business housed in one building on-site; the Brock White Company and Simonson Lumber. An interview with Merry Rohloff of Brock White Company was conducted on November 17, 2015 and revealed no additional information. A representative from Simonson Lumber did not respond to outreach attempts.

7.3 *Interview with Site Manager*

A site manager has not been assigned to the target property.

7.4 Interview with Local Government Officials

No spills were recorded for the target property according to the Brainerd Fire Department.

7.5 Interviews with Others

No other interviews were conducted for the purpose of this Phase I ESA.

8. FINDINGS

The target property consists of 14 contiguous individual parcels totaling approximately 297 acres. One parcel is currently occupied by commercial businesses and totals approximately 5.1 acres. Of the 297 acres, about 257.5 are suitable for development. The target property is at the boundary between Crow Wing County and Cass County, Minnesota.

The commercially developed portion of the property, prior to current usage, was used for pulpwood storage from the mid-1980's until the early 2000's. Additionally, based on available aerial photography, development on adjacent properties has remained consistent since the 1950's.

During site reconnaissance, the target property appeared in good condition and there were no signs of refuse or debris.

The target property was listed in the database report for a water discharge permit for Potlatch Drive and TH 210 improvements. Additionally, the database report identified one site within ASTM search distances. A concentrated animal feeding operation (CAFO) was identified at Jennie-O turkey store. The target property was also incorrectly identified as the Potlatch Demolition Landfill on the MPCA What's In My Neighborhood website.

In addition to the sites in the database report, other sources of information revealed one above ground storage tank that was used to fuel a loader that was on-site while the target property operated as a lumber storage yard. The location of the above ground storage tank was determined to be at the former facility entrance by the site offices and shop building.

9. OPINION

Two sites were identified by the database report within minimum search distances. These two sites are not RECs. The identified sites are either located a sufficient distance from the target property or they are hydrologically downgradient or side gradient of the target property.

The former above ground storage tank is an REC. The former above ground storage tank is an REC because the tank was in place and in operation prior to regulatory oversight and the age of the tank when removed from service. The shop building is an REC because of activity generally associated with vehicle repair and maintenance.

10. CONCLUSIONS

WSN has performed a Phase I ESA in conformance with the scope and limitations of ASTM Designation E 1527-13 of the target property collectively referred to as West Baxter Business Park. Any exceptions to, or deletions from, this practice are described in Section 2.4 of this report. This assessment has revealed no evidence recognized environmental conditions in connection with the target property except for the following:

- Former above ground storage tank
- A former maintenance shop area

11. DEVIATIONS

No deletions or deviations from the ASTM standard were utilized during the preparation of this Phase I Environmental Site Assessment.

12. ADDITIONAL SERVICES

The Potlatch West Baxter Alternative Urban Areawide Review (AUAR) from August 2008 is included as Appendix G. The AUAR provides an archaeological and endangered species assessment.

13. REFERENCES

- Minnesota Department of Health County Well Index
- Minnesota Geological Survey
- United States Geological Survey

14. SIGNATURES OF ENVIRONMENTAL PROFESSIONALS

We declare that, to the best of our professional knowledge and belief, we meet the definition of Environmental Professional as defined in §312.10 of 40 CFR312. We have the specific qualifications based on education, training, and experience to assess a property of the nature, history and setting of the project area. We have developed and performed the all appropriate inquiries in conformance with the standards and practices set forth in 40 CFR Part 312.

Prepared by:



Vladimir B. Zivkovic
Environmental Scientist

12/30/15

Date

Reviewed by:



Brian A. Ross, PG
Director of Environmental Services

12/30/15

Date

15. STAFF QUALIFICATIONS

WSN has been performing environmental work and conducting ESAs for more than 20 years. To date, WSN has completed more than 200 Phase I and Phase II ESAs on a wide variety of businesses and industries. Qualifications of the principal ESA staff are provided below.

Vladimir B. Zivkovic
Environmental Scientist

Mr. Zivkovic has a Bachelor of Science in geology from Temple University in Philadelphia, PA. and Master of Science from the University of Memphis, Memphis, TN.

Mr. Zivkovic joined WSN in 2014 with more than 13 years' experience working on projects across the United States, including Colorado, Illinois, Iowa, Minnesota, Missouri, Nevada, and Tennessee. His experience includes hydrological studies, geophysical surveying, geochemical modeling, geotechnical investigations, sanitary landfill monitoring, and environmental site assessments.

Brian A. Ross, P.G.
Director of Environmental Services

Mr. Ross has a B.A. in Earth Science and a M.S. in Geology from the University of Minnesota. He is a Registered Professional Geologist and a licensed monitoring well contractor. He has a strong computer background with experience in modeling groundwater flow.

Mr. Ross joined WSN in 1991, after six years with a Twin Cities environmental consulting firm. He has extensive experience in site investigation activities including sludge, sediment, soil, surface water and groundwater sampling as well as soil boring logging, monitoring well installation and aquifer testing.

Mr. Ross has experience as Project Manager for conducting hydrogeologic assessments at several landfills and wastewater ponds. One of these involved completing quarterly monitoring of groundwater as part of the closure of an industrial waste landfill. This project included development of a quality assurance plan and quarterly reports showing changes in groundwater flow and chemical concentrations. Another project involved assessing a county demolition landfill to determine if it impacted groundwater.

Mr. Ross has conducted more than 50 hydrogeologic investigations of underground storage tank (UST) releases for several major petroleum distributors. In addition, he has completed assessments, inspections, or investigations for the U.S. Environmental Protection Agency at more than three dozen hazardous waste sites all around the United States. He has also been involved in pesticide release studies, more than three dozen environmental property assessments and provided input into Environmental Impact Statements (EISs).

FIGURES

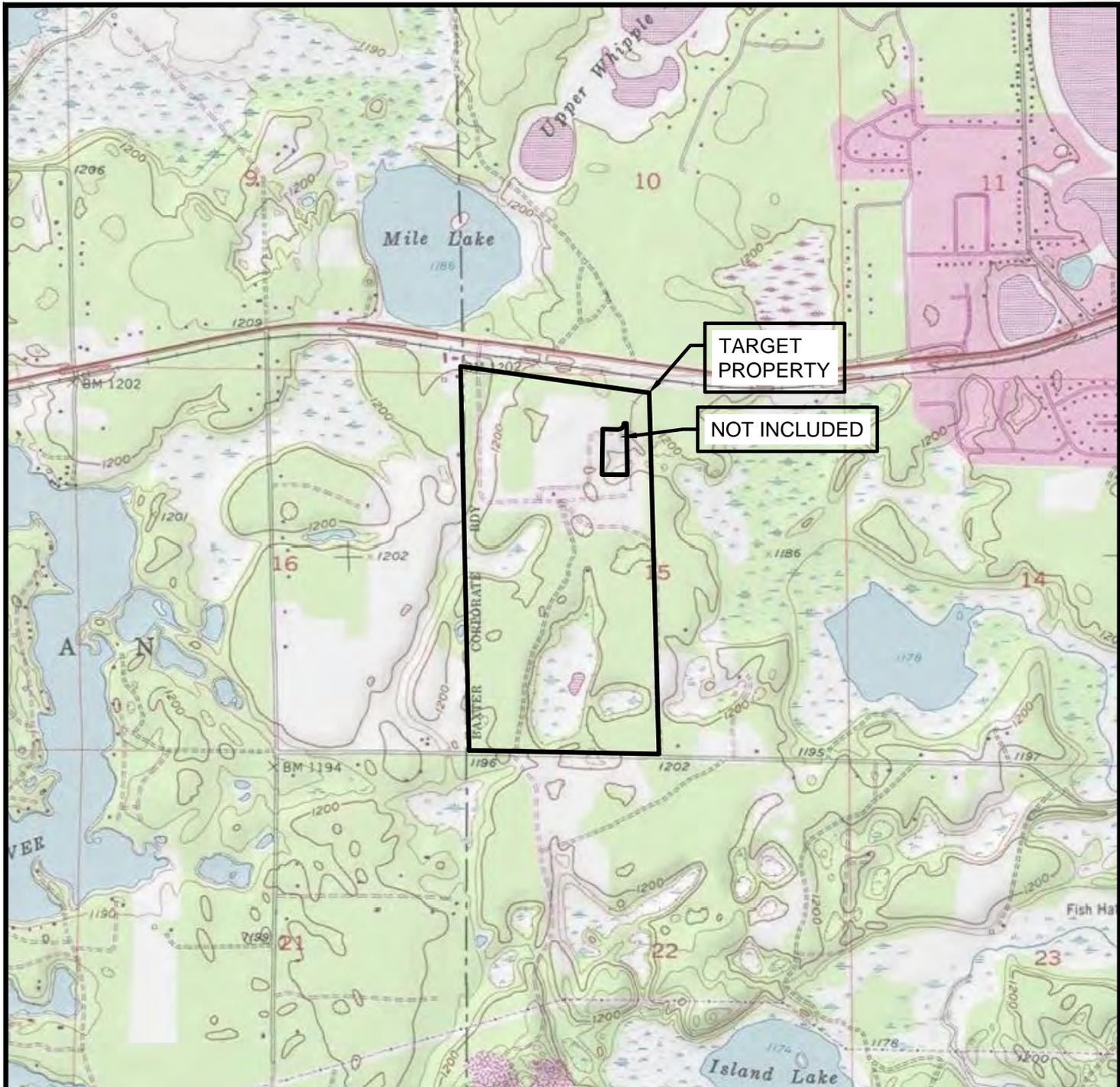
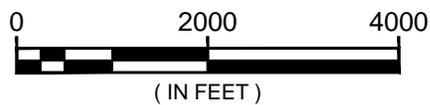
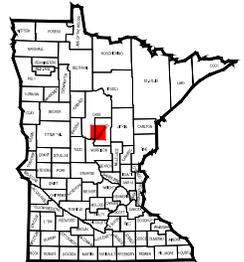


IMAGE: UNITED STATES DEPARTMENT OF THE INTERIOR - GEOLOGICAL SURVEY

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AREA LOCATION



U.S.G.S. QUADRANGLE MAPS:
BAXTER

PUBLISHED: 1954
PHOTOREVISED: 1994



**Engineering
Architecture
Surveying
Environmental**

PHASE I ENVIRONMENTAL SITE ASSESSMENT
WEST BAXTER BUSINESS PARK
BAXTER, MN

DATE:
NOVEMBER 2015

JOB No. FIGURE
0270B0714.000 **01**

SITE LOCATION MAP



© 2015 WIDSETH SMITH NOLTING

IMAGE: ESRI, INC.



Engineering
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PHASE I ENVIRONMENTAL SITE ASSESSMENT

WEST BAXTER BUSINESS PARK

BAXTER, MN

SITE MAP

DATE:

NOVEMBER 2015

JOB No. FIGURE

0270B0714.000 **02**



© 2015 WIDSETH SMITH NOLTING

IMAGE: ESRI, INC.



Engineering
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PHASE I ENVIRONMENTAL SITE ASSESSMENT
WEST BAXTER BUSINESS PARK
BAXTER, MN

SITE DETAIL OF BUILDING AREA

DATE: NOVEMBER 2015	
JOB No. 0270B0714.000	FIGURE 03

APPENDICIES

APPENDIX A
DATABASE REPORT

Radius Report

[Satellite view](#)

Target Property:

Potlatch

Timberwood Drive

Baxter, Crow Wing County, Minnesota 56425

Prepared For:

Historical Information Gatherers

Order #: 59117

Job #: 127275

Project #: 1523718

Date: 11/05/2015

Table of Contents

<i>Target Property Summary</i>	1
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<i>Locatable Database Findings</i>	7
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<i>Topographic Map</i>	14
<i>Report Summary of Locatable Sites</i>	15
<i>Unlocatable Summary</i>	18
<i>Environmental Records Definitions</i>	20
<i>Unlocatable Report</i>	See Attachment
<i>Zip Report</i>	See Attachment

Disclaimer

This report was designed by GeoSearch to meet or exceed the records search requirements of the All Appropriate Inquiries Rule (40 CFR §312.26) and the current version of the ASTM International E1527, Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process or, if applicable, the custom requirements requested by the entity that ordered this report. The records and databases of records used to compile this report were collected from various federal, state and local governmental entities. It is the goal of GeoSearch to meet or exceed the 40 CFR §312.26 and E1527 requirements for updating records by using the best available technology. GeoSearch contacts the appropriate governmental entities on a recurring basis. Depending on the frequency with which a record source or database of records is updated by the governmental entity, the data used to prepare this report may be updated monthly, quarterly, semi-annually, or annually.

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Target Property Summary

Potlatch

Timberwood Drive

Baxter, Crow Wing County, Minnesota 56425

USGS Quadrangle: **Baxter, MN**

Target Property Geometry: **Area**

Target Property Longitude(s)/Latitude(s):

(-94.327497, 46.340172), (-94.317283, 46.339076), (-94.316940, 46.325890), (-94.327154, 46.326009), (-94.327497, 46.340172)

County/Parish Covered:

Cass (MN) , Crow Wing (MN)

Zipcode(s) Covered:

Brainerd MN: 56401

Baxter MN: 56425

Pillager MN: 56473

State(s) Covered:

MN

***Target property is located in Radon Zone 2.**

Zone 2 areas have a predicted average indoor radon screening level between 2 and 4 pCi/L (picocuries per liter).

This report may have unlocatable records. Please see the Unlocatables Report, attached to this file.

Database Findings Summary

FEDERAL LISTING

Standard Environmental Records

Database	Acronym	Locatable	Unlocatable	Search Radius (miles)
EMERGENCY RESPONSE NOTIFICATION SYSTEM	ERNSMN	0	0	TP/AP
FEDERAL ENGINEERING INSTITUTIONAL CONTROL SITES	EC	0	0	TP/AP
LAND USE CONTROL INFORMATION SYSTEM	LUCIS	0	0	TP/AP
RCRA SITES WITH CONTROLS	RCRASC	0	0	TP/AP
NO LONGER REGULATED RCRA GENERATOR FACILITIES	NLRRCRAG	0	0	0.1250
RESOURCE CONSERVATION & RECOVERY ACT - GENERATOR FACILITIES	RCRAGR05	0	0	0.1250
RESOURCE CONSERVATION & RECOVERY ACT - NON-GENERATOR FACILITIES	RCRANGR05	0	0	0.1250
BROWNFIELDS MANAGEMENT SYSTEM	BF	0	0	0.5000
COMPREHENSIVE ENVIRONMENTAL RESPONSE, COMPENSATION & LIABILITY INFORMATION SYSTEM	CERCLIS	0	0	0.5000
DELISTED NATIONAL PRIORITIES LIST	DNPL	0	0	0.5000
NO FURTHER REMEDIAL ACTION PLANNED SITES	NFRAP	0	0	0.5000
NO LONGER REGULATED RCRA NON-CORRACTS TSD FACILITIES	NLRRCRAT	0	0	0.5000
RESOURCE CONSERVATION & RECOVERY ACT - NON-CORRACTS TREATMENT, STORAGE & DISPOSAL FACILITIES	RCRAT	0	0	0.5000
NATIONAL PRIORITIES LIST	NPL	0	0	1.0000
NO LONGER REGULATED RCRA CORRECTIVE ACTION FACILITIES	NLRRCRAC	0	0	1.0000
PROPOSED NATIONAL PRIORITIES LIST	PNPL	0	0	1.0000
RESOURCE CONSERVATION & RECOVERY ACT - CORRECTIVE ACTION FACILITIES	RCRAC	0	0	1.0000
RESOURCE CONSERVATION & RECOVERY ACT - SUBJECT TO CORRECTIVE ACTION FACILITIES	RCRASUBC	0	0	1.0000
SUB-TOTAL		0	0	

Additional Environmental Records

Database	Acronym	Locatable	Unlocatable	Search Radius (miles)
AEROMETRIC INFORMATION RETRIEVAL SYSTEM / AIR FACILITY SUBSYSTEM	AIRSAFS	0	0	TP/AP
BIENNIAL REPORTING SYSTEM	BRS	0	0	TP/AP
CERCLIS LIENS	SFLIENS	0	0	TP/AP
CLANDESTINE DRUG LABORATORY LOCATIONS	CDL	0	0	TP/AP
EPA DOCKET DATA	DOCKETS	0	0	TP/AP
FACILITY REGISTRY SYSTEM	FRSMN	0	0	TP/AP

Database Findings Summary

Database	Acronym	Locatable	Unlocatable	Search Radius (miles)
HAZARDOUS MATERIALS INCIDENT REPORTING SYSTEM	HMIRSR05	0	0	TP/AP
INTEGRATED COMPLIANCE INFORMATION SYSTEM (FORMERLY DOCKETS)	ICIS	0	0	TP/AP
INTEGRATED COMPLIANCE INFORMATION SYSTEM NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM	ICISNPDES	0	0	TP/AP
MATERIAL LICENSING TRACKING SYSTEM	MLTS	0	0	TP/AP
NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM	NPDESR05	0	0	TP/AP
PCB ACTIVITY DATABASE SYSTEM	PADS	0	0	TP/AP
PERMIT COMPLIANCE SYSTEM	PCSR05	0	0	TP/AP
SECTION SEVEN TRACKING SYSTEM	SSTS	0	0	TP/AP
TOXIC SUBSTANCE CONTROL ACT INVENTORY	TSCA	0	0	TP/AP
TOXICS RELEASE INVENTORY	TRI	0	0	TP/AP
HISTORICAL GAS STATIONS	HISTPST	0	0	0.2500
OPEN DUMP INVENTORY	ODI	0	0	0.5000
DEPARTMENT OF DEFENSE SITES	DOD	0	0	1.0000
FORMERLY USED DEFENSE SITES	FUDS	0	0	1.0000
RECORD OF DECISION SYSTEM	RODS	0	0	1.0000
SUB-TOTAL		0	0	

Database Findings Summary

STATE (MN) LISTING

Standard Environmental Records

Database	Acronym	Locatable	Unlocatable	Search Radius (miles)
SITES WITH INSTITUTIONAL CONTROLS	IC	0	0	TP/AP
HAZARDOUS WASTE GENERATOR SITES	HWGS	0	0	0.1250
WATER DISCHARGE PERMITS	WDP	1	0	0.1250
REGISTERED STORAGE TANKS	UAST	0	0	0.2500
CERCLIS SITES	CERCLIS	0	0	0.5000
CLOSED LANDFILLS	CLF	0	0	0.5000
HAZARDOUS WASTE TREATMENT STORAGE DISPOSAL SITES	HWSTSD	0	0	0.5000
OPEN SOLID WASTE FACILITIES	SWF	0	0	0.5000
PERMITTED BY RULE LANDFILLS	PBRLE	0	0	0.5000
PETROLEUM BROWNFIELDS PROGRAM SITES	PBF	0	0	0.5000
POTENTIAL VOLUNTARY INVESTIGATION AND CLEANUP PROGRAM SITES	PVICP	0	0	0.5000
REGISTERED LEAKING STORAGE TANKS	LUAST	0	0	0.5000
SITE RESPONSE SECTION DATABASE	SRS	0	0	0.5000
UNPERMITTED DUMP SITES	UNPERMDUMPS	0	0	0.5000
VOLUNTARY INVESTIGATION AND CLEANUP PROGRAM SITES	VICP	0	0	0.5000
HAZARDOUS WASTE CLEANUP SITES	HWCS	0	0	1.0000
STATE ASSESSMENT SITES	SAS	0	0	1.0000
SUPERFUND SITE INFORMATION LISTING	SF	0	0	1.0000
SUB-TOTAL		1	0	

Additional Environmental Records

Database	Acronym	Locatable	Unlocatable	Search Radius (miles)
CLANDESTINE DRUG LABORATORY LOCATIONS	CDL	0	0	TP/AP
PERMITTED AIR FACILITIES	AIRS	0	0	TP/AP
SOLID WASTE UTILIZATION PROJECTS	SWUP	0	0	TP/AP
SPILLS LISTING	PCASPILLS	0	0	TP/AP
TIER TWO FACILITY LISTING	TIERII	0	0	TP/AP
FEEDLOTS	FEEDLOT	0	0	0.1250
BULK STORAGE PERMITS	BULKSTORAGE	0	0	0.2500
REGISTERED DRYCLEANING FACILITIES	CLEANERS	0	0	0.2500
AGRICULTURAL CONTINGENCY SITES	CONTINGENCIES	0	0	0.5000
AGRICULTURAL SPILLS LISTING	AGSPILLS	0	0	0.5000

Database Findings Summary

Database	Acronym	Locatable	Unlocatable	Search Radius (miles)
CONCENTRATED ANIMAL FEEDING OPERATIONS	CAFO	1	0	0.5000
RECYCLING MARKETS DIRECTORY	RECYCLERS	0	0	0.5000
CONTAMINATED SOIL TREATMENT FACILITIES	CSTF	0	0	1.0000
SUB-TOTAL		1	0	

Database Findings Summary

TRIBAL LISTING

Standard Environmental Records

Database	Acronym	Locatable	Unlocatable	Search Radius (miles)
UNDERGROUND STORAGE TANKS ON TRIBAL LANDS	USTR05	0	0	0.2500
LEAKING UNDERGROUND STORAGE TANKS ON TRIBAL LANDS	LUSTR05	0	0	0.5000
OPEN DUMP INVENTORY ON TRIBAL LANDS	ODINDIAN	0	0	0.5000
SUB-TOTAL		0	0	

Additional Environmental Records

Database	Acronym	Locatable	Unlocatable	Search Radius (miles)
INDIAN RESERVATIONS	INDIANRES	0	0	1.0000
SUB-TOTAL		0	0	
TOTAL		2	0	

Locatable Database Findings

FEDERAL LISTING

Standard environmental records are displayed in **bold**.

Acronym	Search Radius (miles)	TP/AP (0 - 0.02)	1/8 Mile (> TP/AP)	1/4 Mile (> 1/8)	1/2 Mile (> 1/4)	1 Mile (> 1/2)	> 1 Mile	Total
AIRSAFS	0.0200	0	NS	NS	NS	NS	NS	0
BRS	0.0200	0	NS	NS	NS	NS	NS	0
CDL	0.0200	0	NS	NS	NS	NS	NS	0
DOCKETS	0.0200	0	NS	NS	NS	NS	NS	0
EC	0.0200	0	NS	NS	NS	NS	NS	0
ERNSMN	0.0200	0	NS	NS	NS	NS	NS	0
FRSMN	0.0200	0	NS	NS	NS	NS	NS	0
HMIRSR05	0.0200	0	NS	NS	NS	NS	NS	0
ICIS	0.0200	0	NS	NS	NS	NS	NS	0
ICISNPDES	0.0200	0	NS	NS	NS	NS	NS	0
LUCIS	0.0200	0	NS	NS	NS	NS	NS	0
MLTS	0.0200	0	NS	NS	NS	NS	NS	0
NPDES05	0.0200	0	NS	NS	NS	NS	NS	0
PADS	0.0200	0	NS	NS	NS	NS	NS	0
PCSR05	0.0200	0	NS	NS	NS	NS	NS	0
RCRASC	0.0200	0	NS	NS	NS	NS	NS	0
SFLIENS	0.0200	0	NS	NS	NS	NS	NS	0
SSTS	0.0200	0	NS	NS	NS	NS	NS	0
TRI	0.0200	0	NS	NS	NS	NS	NS	0
TSCA	0.0200	0	NS	NS	NS	NS	NS	0
NLRRCRAG	0.1250	0	0	NS	NS	NS	NS	0
RCRAGR05	0.1250	0	0	NS	NS	NS	NS	0
RCRANGR05	0.1250	0	0	NS	NS	NS	NS	0
HISTPST	0.2500	0	0	0	NS	NS	NS	0
BF	0.5000	0	0	0	0	NS	NS	0
CERCLIS	0.5000	0	0	0	0	NS	NS	0
DNPL	0.5000	0	0	0	0	NS	NS	0
NFRAP	0.5000	0	0	0	0	NS	NS	0
NLRRCRAT	0.5000	0	0	0	0	NS	NS	0
ODI	0.5000	0	0	0	0	NS	NS	0
RCRAT	0.5000	0	0	0	0	NS	NS	0
DOD	1.0000	0	0	0	0	0	NS	0
FUDS	1.0000	0	0	0	0	0	NS	0
NLRRCRAC	1.0000	0	0	0	0	0	NS	0
NPL	1.0000	0	0	0	0	0	NS	0

Locatable Database Findings

Acronym	Search Radius (miles)	TP/AP (0 - 0.02)	1/8 Mile (> TP/AP)	1/4 Mile (> 1/8)	1/2 Mile (> 1/4)	1 Mile (> 1/2)	> 1 Mile	Total
PNPL	1.0000	0	0	0	0	0	NS	0
RCRAC	1.0000	0	0	0	0	0	NS	0
RCRASUBC	1.0000	0	0	0	0	0	NS	0
RODS	1.0000	0	0	0	0	0	NS	0
SUB-TOTAL		0	0	0	0	0	0	0

Locatable Database Findings

STATE (MN) LISTING

Standard environmental records are displayed in **bold**.

Acronym	Search Radius (miles)	TP/AP (0 - 0.02)	1/8 Mile (> TP/AP)	1/4 Mile (> 1/8)	1/2 Mile (> 1/4)	1 Mile (> 1/2)	> 1 Mile	Total
AIRS	0.0200	0	NS	NS	NS	NS	NS	0
CDL	0.0200	0	NS	NS	NS	NS	NS	0
IC	0.0200	0	NS	NS	NS	NS	NS	0
PCASPILLS	0.0200	0	NS	NS	NS	NS	NS	0
SWUP	0.0200	0	NS	NS	NS	NS	NS	0
TIERII	0.0200	0	NS	NS	NS	NS	NS	0
FEEDLOT	0.1250	0	0	NS	NS	NS	NS	0
HWGS	0.1250	0	0	NS	NS	NS	NS	0
WDP	0.1250	0	1	NS	NS	NS	NS	1
BULKSTORAGE	0.2500	0	0	0	NS	NS	NS	0
CLEANERS	0.2500	0	0	0	NS	NS	NS	0
UAST	0.2500	0	0	0	NS	NS	NS	0
AGSPILLS	0.5000	0	0	0	0	NS	NS	0
CAFO	0.5000	0	0	0	1	NS	NS	1
CERCLIS	0.5000	0	0	0	0	NS	NS	0
CLF	0.5000	0	0	0	0	NS	NS	0
CONTINGENCIES	0.5000	0	0	0	0	NS	NS	0
HWSTSD	0.5000	0	0	0	0	NS	NS	0
LUAST	0.5000	0	0	0	0	NS	NS	0
PBF	0.5000	0	0	0	0	NS	NS	0
PBRLF	0.5000	0	0	0	0	NS	NS	0
PVICP	0.5000	0	0	0	0	NS	NS	0
RECYCLERS	0.5000	0	0	0	0	NS	NS	0
SRS	0.5000	0	0	0	0	NS	NS	0
SWF	0.5000	0	0	0	0	NS	NS	0
UNPERMDUMPS	0.5000	0	0	0	0	NS	NS	0
VICP	0.5000	0	0	0	0	NS	NS	0
CSTF	1.0000	0	0	0	0	0	NS	0
HWCS	1.0000	0	0	0	0	0	NS	0
SAS	1.0000	0	0	0	0	0	NS	0
SF	1.0000	0	0	0	0	0	NS	0
SUB-TOTAL		0	1	0	1	0	0	2

Locatable Database Findings

TRIBAL LISTING

Standard environmental records are displayed in **bold**.

Acronym	Search Radius (miles)	TP/AP (0 - 0.02)	1/8 Mile (> TP/AP)	1/4 Mile (> 1/8)	1/2 Mile (> 1/4)	1 Mile (> 1/2)	> 1 Mile	Total
USTR05	0.2500	0	0	0	NS	NS	NS	0
LUSTR05	0.5000	0	0	0	0	NS	NS	0
ODINDIAN	0.5000	0	0	0	0	NS	NS	0
INDIANRES	1.0000	0	0	0	0	0	NS	0

SUB-TOTAL		0						
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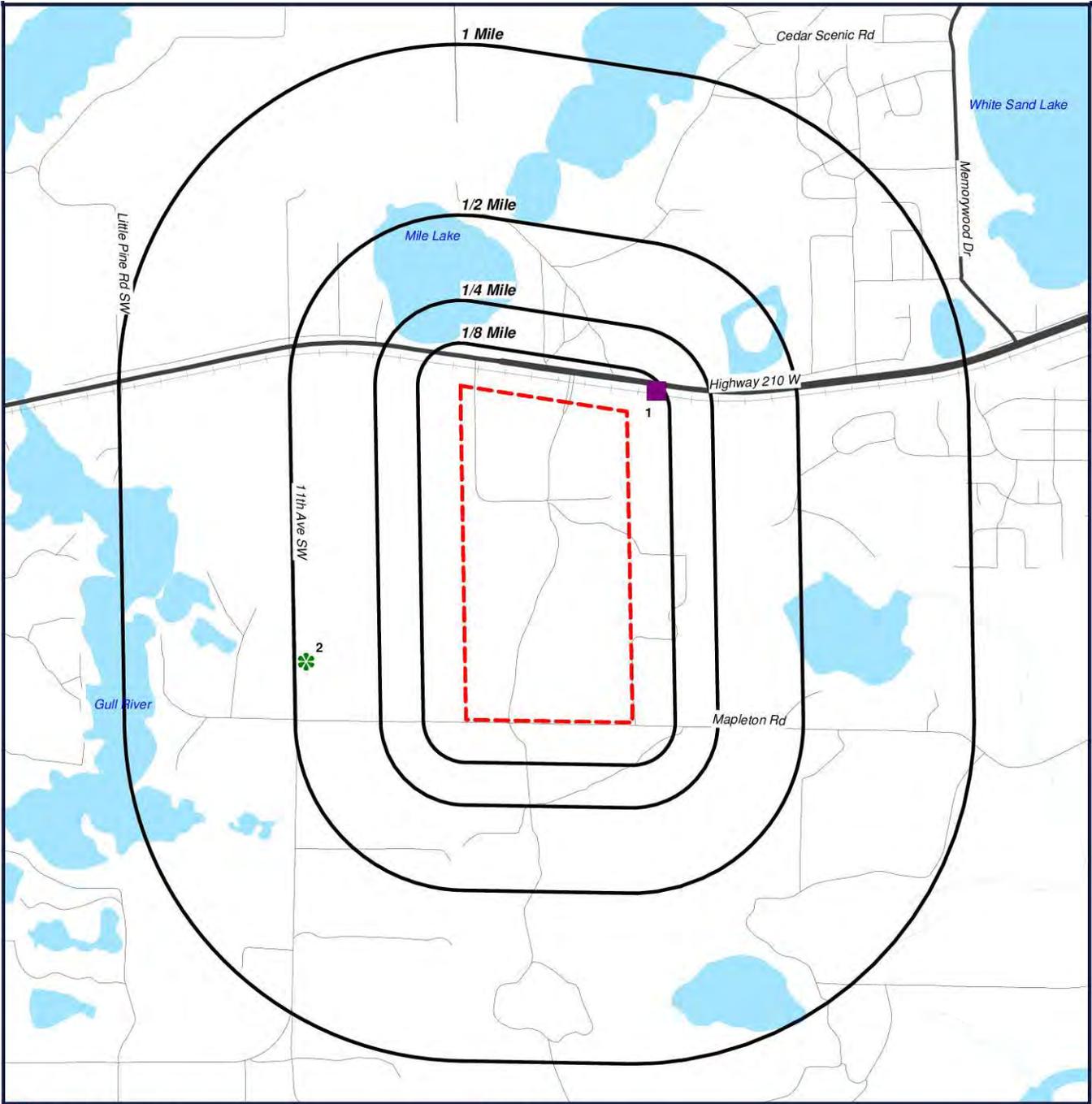
TOTAL		0	1	0	1	0	0	2
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NOTES:

NS = NOT SEARCHED

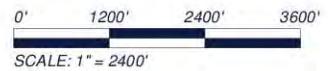
TP/AP = TARGET PROPERTY/ADJACENT PROPERTY

Radius Map 1



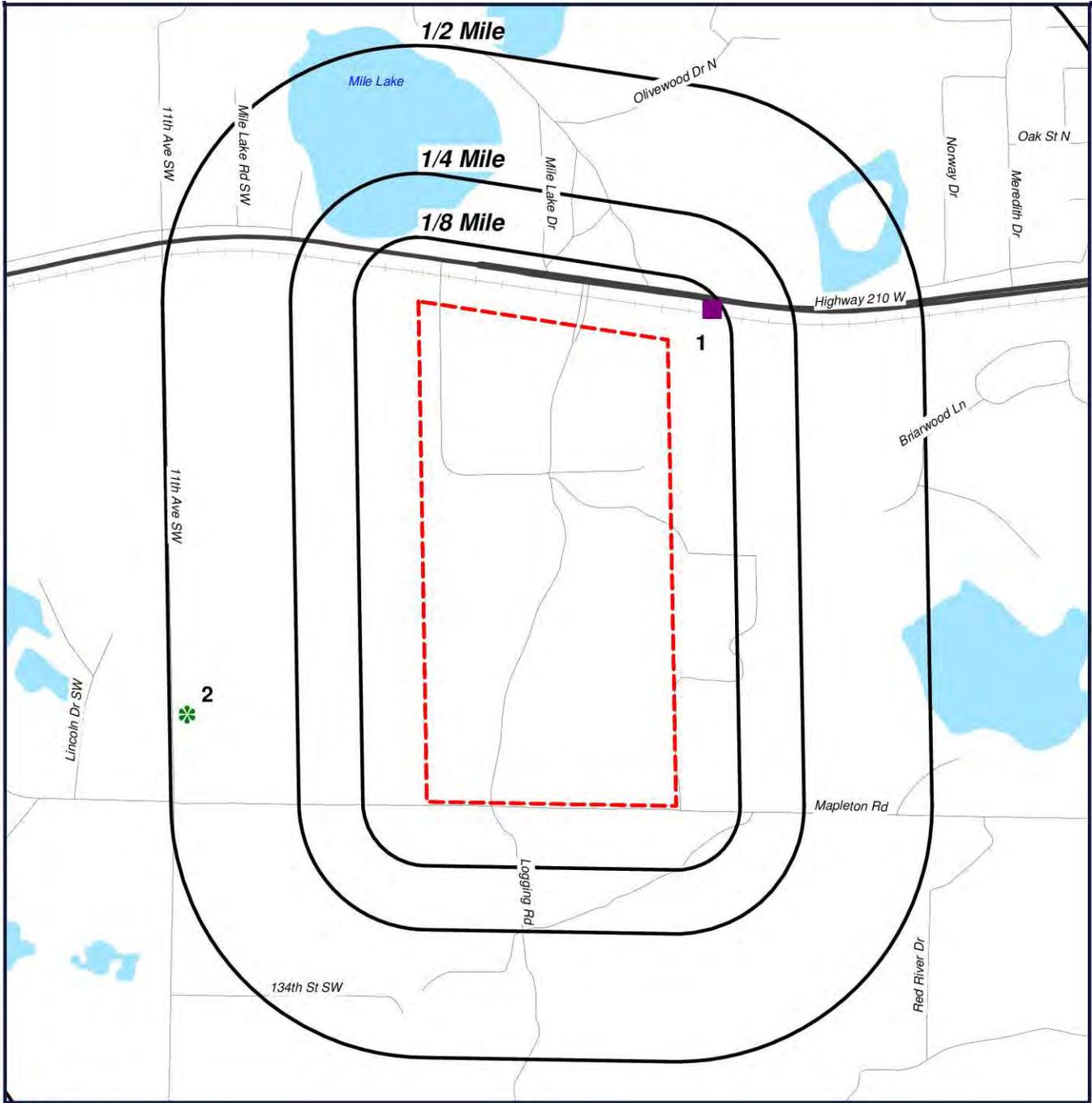
- Target Property (TP)
- WDP
- CAFO

**Potlatch
Timberwood Drive
Baxter, Minnesota
56425**



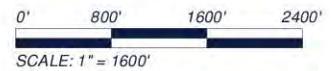
[Click here to access Satellite view](#)

Radius Map 2



- Target Property (TP)
- WDP
- CAFO

**Potlatch
Timberwood Drive
Baxter, Minnesota
56425**



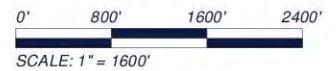
[Click here to access Satellite view](#)

Ortho Map



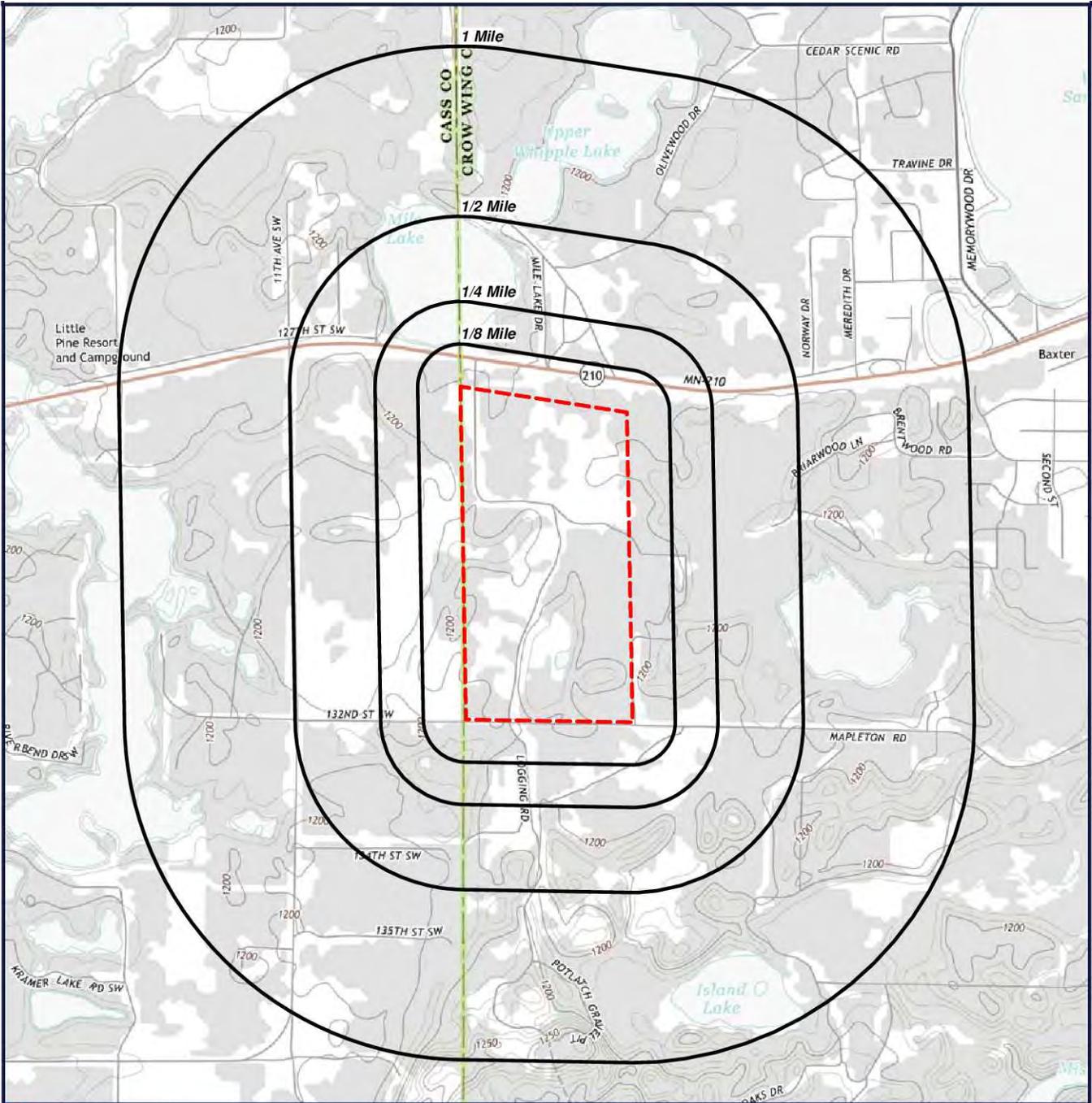
- Target Property (TP)
- WDP
- CAFO

**Quadrangle(s): Baxter
Potlatch
Timberwood Drive
Baxter, Minnesota
56425**



[Click here to access Satellite view](#)

Topographic Map



 Target Property (TP)

Quadrangle(s): Baxter
Source: USGS, 09/03/2013
Potlatch
Timberwood Drive
Baxter, Minnesota
56425



0' 1200' 2400' 3600'
SCALE: 1" = 2400'

[Click here to access Satellite view](#)

Report Summary of Locatable Sites

NOTE: Standard environmental records are displayed in **bold**.

Map ID#	Database Name	Site ID#	Distance From Site	Site Name	Address	PAGE #
1	WDP	58161022	0.11 E	POTLATCH DRIVE AND TH 210 IMPROVEMENTS	ADDRESS UNKNOWN, BAXTER, MN 56425	16
2	CAFO	021-105020	0.47 SW	JENNIE-O TURKEY STORE - BAXTER FARM	13060 CASS COUNTY 36, BAXTER, MN 56425	17

Water Discharge Permits (WDP)

[MAP ID# 1](#)

Distance from Property: 0.11 mi. E

FACILITY INFORMATION

SITE ID: 58161022

SITE NAME: POTLATCH DRIVE AND TH 210 IMPROVEMENTS

ADDRESS: ADDRESS UNKNOWN

BAXTER, MN 56425 CROW WING

PDF URL: http://cf.pca.state.mn.us/wimn/siteInfo_print.cfm?siteid=58161022

FACILITY DETAILS

ID: C00030205

TYPE: CONSTRUCTION STORMWATER PERMIT

WATERSHED: MISSISSIPPI RIVER - BRAINERD

CURRENTLY ACTIVE: NO

INDUSTRY CLASSIFICATION: NOT REPORTED

[Back to Report Summary](#)

Concentrated Animal Feeding Operations (CAFO)

MAP ID# 2

Distance from Property: 0.47 mi. SW

FACILITY INFORMATION

PREFERRED ID: **021-105020**

FEEDLOT NAME: **JENNIE-O TURKEY STORE - BAXTER FARM**

ADDRESS: **13060 CASS COUNTY 36**

BAXTER, MN 56425

COUNTY: **CASS**

REGISTRATION DATE: **08/14/2013**

OWNER CONTACT: **WAYNE KELLING**

OWNER ORGANIZATION: **JENNIE-O TURKEY STORE INC**

OWNER TITLE: **NOT REPORTED**

OWNER MAILING ADDRESS: **PO BOX 778**

WILLMAR, MN 56201-0778

OWNER PHONE: **320-214-2853**

FACILITY DETAILS

EXISTING PERMIT: **NO**

PERMIT NUMBER: **NOT REPORTED**

PERMIT EXPIRATION: **NO**

MAILING ADDRESS: **PO BOX 778**

WILLMAR, MN 56201-0778

CONTACT PERSON: **WAYNE KELLING**

CONTACT ADDRESS: **PO BOX 778**

WILLMAR, MN 562010778

CONTACT PHONE: **320-214-2853**

IS THIS AN OPEN LOT?: **NO**

ARE THERE CONFINEMENT BUILDINGS?: **YES**

IS THERE A PASTURE?: **NO**

IS THERE A MANURE STORAGE BASIN?: **NO**

IS THERE A MANURE STOCKPILE?: **NO**

IS THERE SURFACE WATER WITHIN 1000FT?: **NO**

IF SO, IS IT A LAKE?: **NO**

IF SO, IS IT A RIVER OR STREAM?: **NO**

IF SO, IS IT A WETLAND?: **NO**

IF SO, IS IT A DRAINAGE DITCH?: **NO**

IF SO, IS IT A TILE INTAKE?: **NO**

IF SO, IS IT OTHER SURFACE WATER?: **NO**

IS IT WITHIN SHORELAND?: **NO**

IS SHORELAND WITHIN 1000FT?: **NO**

HOLDING AREA DISTANCE?: **NOT REPORTED**

STORAGE AREA DISTANCE?: **NOT REPORTED**

TOTAL ANIMAL UNITS: **666**

IS THIS A CONCENTRATED ANIMAL FEEDING OPERATION?: **NO**

FEEDLOT PERMIT NUMBER: **NOT REPORTED**

Concentrated Animal Feeding Operations (CAFO)

ORGANIZATION ID: **65372**

SITE ID: **155152**

PROGRAM INTEREST ID: **312073**

REGISTRATION ID: **3**

REGISTRATION STATUS: **COMPLETE**

NUMBER OF OWNERS: **1**

BASIN NAME: **UPPER MISSISSIPPI RIVER, UPPER PORTION**

MAJOR WATERSHED NAME: **CROW WING RIVER**

MINOR WATERSHED NAME: **GULL R**

[Back to Report Summary](#)

Unlocatable Summary

This list contains sites that could not be mapped due to limited or incomplete address information.

No Records Found

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AIRSAFS Aerometric Information Retrieval System / Air Facility Subsystem

VERSION DATE: 10/20/14

The United States Environmental Protection Agency (EPA) modified the Aerometric Information Retrieval System (AIRS) to a database that exclusively tracks the compliance of stationary sources of air pollution with EPA regulations: the Air Facility Subsystem (AFS). Since this change in 2001, the management of the AIRS/AFS database was assigned to EPA's Office of Enforcement and Compliance Assurance.

BRS Biennial Reporting System

VERSION DATE: 12/31/11

The United States Environmental Protection Agency (EPA), in cooperation with the States, biennially collects information regarding the generation, management, and final disposition of hazardous wastes regulated under the Resource Conservation and Recovery Act of 1976 (RCRA), as amended. The Biennial Report captures detailed data on the generation of hazardous waste from large quantity generators and data on waste management practices from treatment, storage and disposal facilities. Currently, the EPA states that data collected between 1991 and 1997 was originally a part of the defunct Biennial Reporting System and is now incorporated into the RCRAInfo data system.

CDL Clandestine Drug Laboratory Locations

VERSION DATE: 07/02/15

The U.S. Department of Justice ("the Department") provides this information as a public service. It contains addresses of some locations where law enforcement agencies reported they found chemicals or other items that indicated the presence of either clandestine drug laboratories or dumpsites. In most cases, the source of the entries is not the Department, and the Department has not verified the entry and does not guarantee its accuracy. Members of the public must verify the accuracy of all entries by, for example, contacting local law enforcement and local health departments. The Department does not establish, implement, enforce, or certify compliance with clean-up or remediation standards for contaminated sites; the public should contact a state or local health department or environmental protection agency for that information.

DOCKETS EPA Docket Data

VERSION DATE: 12/22/05

The United States Environmental Protection Agency Docket data lists Civil Case Defendants, filing dates as far back as 1971, laws broken including section, violations that occurred, pollutants involved, penalties assessed and superfund awards by facility and location. Please refer to ICIS database as source of current data.

EC Federal Engineering Institutional Control Sites

VERSION DATE: 08/03/15

This database includes site locations where Engineering and/or Institutional Controls have been identified as part

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of a selected remedy for the site as defined by United States Environmental Protection Agency official remedy decision documents. A site listing does not indicate that the institutional and engineering controls are currently in place nor will be in place once the remedy is complete; it only indicates that the decision to include either of them in the remedy is documented as of the completed date of the document. Institutional controls are actions, such as legal controls, that help minimize the potential for human exposure to contamination by ensuring appropriate land or resource use. Engineering controls include caps, barriers, or other device engineering to prevent access, exposure, or continued migration of contamination.

ERNSMN Emergency Response Notification System

VERSION DATE: 05/10/15

This National Response Center database contains data on reported releases of oil, chemical, radiological, biological, and/or etiological discharges into the environment anywhere in the United States and its territories. The data comes from spill reports made to the U.S. Environmental Protection Agency, U.S. Coast Guard, the National Response Center and/or the U.S. Department of Transportation.

FRSMN Facility Registry System

VERSION DATE: 07/20/15

The United States Environmental Protection Agency's Office of Environmental Information (OEI) developed the Facility Registry System (FRS) as the centrally managed database that identifies facilities, sites or places subject to environmental regulations or of environmental interest. The Facility Registry System replaced the Facility Index System or FINDS database.

HMIRSR05 Hazardous Materials Incident Reporting System

VERSION DATE: 06/21/15

The HMIRS database contains unintentional hazardous materials release information reported to the U.S. Department of Transportation located in EPA Region 5. Region 5 includes the following states: Illinois, Indiana, Michigan, Minnesota, Ohio, and Wisconsin.

ICIS Integrated Compliance Information System (formerly DOCKETS)

VERSION DATE: 10/20/14

ICIS is a case activity tracking and management system for civil, judicial, and administrative federal Environmental Protection Agency enforcement cases. ICIS contains information on federal administrative and federal judicial cases under the following environmental statutes: the Clean Air Act, the Clean Water Act, the Resource Conservation and Recovery Act, the Emergency Planning and Community Right-to-Know Act - Section 313, the Toxic Substances Control Act, the Federal Insecticide, Fungicide, and Rodenticide Act, the Comprehensive Environmental Response, Compensation, and Liability Act, the Safe Drinking Water Act, and the Marine Protection, Research, and Sanctuaries Act.

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ICISNPDES Integrated Compliance Information System National Pollutant Discharge Elimination System

VERSION DATE: 10/20/14

In 2006, the Integrated Compliance Information System (ICIS) - National Pollutant Discharge Elimination System (NPDES) became the NPDES national system of record for select states, tribes and territories. ICIS-NPDES is an information management system maintained by the United States Environmental Protection Agency's Office of Compliance to track permit compliance and enforcement status of facilities regulated by the NPDES under the Clean Water Act. ICIS-NPDES is designed to support the NPDES program at the state, regional, and national levels.

LUCIS Land Use Control Information System

VERSION DATE: 09/01/06

The LUCIS database is maintained by the U.S. Navy and contains information for former Base Realignment and Closure (BRAC) properties across the United States.

MLTS Material Licensing Tracking System

VERSION DATE: 03/11/15

MLTS is a list of approximately 8,100 sites which have or use radioactive materials subject to the United States Nuclear Regulatory Commission (NRC) licensing requirements.

NPDES05 National Pollutant Discharge Elimination System

VERSION DATE: 04/01/07

Information in this database is extracted from the Water Permit Compliance System (PCS) database which is used by United States Environmental Protection Agency to track surface water permits issued under the Clean Water Act. This database includes permitted facilities located in EPA Region 5. This region includes the following states: Illinois, Indiana, Michigan, Minnesota, Ohio, and Wisconsin. The NPDES database was collected from December 2002 until April 2007. Refer to the PCS and/or ICIS-NPDES database as source of current data.

PADS PCB Activity Database System

VERSION DATE: 07/01/14

The PCB Activity Database System (PADS) is used by the United States Environmental Protection Agency to monitor the activities of polychlorinated biphenyls (PCB) handlers.

PCSR05 Permit Compliance System

VERSION DATE: 08/01/12

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The Permit Compliance System is used in tracking enforcement status and permit compliance of facilities controlled by the National Pollutant Discharge Elimination System (NPDES) under the Clean Water Act and is maintained by the United States Environmental Protection Agency's Office of Compliance. PCS is designed to support the NPDES program at the state, regional, and national levels. This database includes permitted facilities located in EPA Region 5. This region includes the following states: Illinois, Indiana, Michigan, Minnesota, Ohio, and Wisconsin. PCS has been modernized, and no longer exists. National Pollutant Discharge Elimination System (ICIS-NPDES) data can now be found in Integrated Compliance Information System (ICIS).

RCRASC RCRA Sites with Controls

VERSION DATE: 05/19/15

This list of Resource Conservation and Recovery Act sites with institutional controls in place is provided by the U.S. Environmental Protection Agency.

SFLIENS CERCLIS Liens

VERSION DATE: 06/08/12

A Federal CERCLA ("Superfund") lien can exist by operation of law at any site or property at which United States Environmental Protection Agency has spent Superfund monies. These monies are spent to investigate and address releases and threatened releases of contamination. CERCLIS provides information as to the identity of these sites and properties. This database contains those CERCLIS sites where the Lien on Property action is complete.

SSTS Section Seven Tracking System

VERSION DATE: 12/08/14

The United States Environmental Protection Agency tracks information on pesticide establishments through the Section Seven Tracking System (SSTS). SSTS records the registration of new establishments and records pesticide production at each establishment. The Federal Insecticide, Fungicide and Rodenticide Act (FIFRA) requires that production of pesticides or devices be conducted in a registered pesticide-producing or device-producing establishment. ("Production" includes formulation, packaging, repackaging, and relabeling.)

TRI Toxics Release Inventory

VERSION DATE: 12/31/13

The Toxics Release Inventory, provided by the United States Environmental Protection Agency, includes data on toxic chemical releases and waste management activities from certain industries as well as federal and tribal facilities. This inventory contains information about the types and amounts of toxic chemicals that are released each year to the air, water, and land as well as information on the quantities of toxic chemicals sent to other facilities for further waste management.

Environmental Records Definitions - FEDERAL

TSCA Toxic Substance Control Act Inventory

VERSION DATE: 12/31/06

The Toxic Substances Control Act (TSCA) was enacted in 1976 to ensure that chemicals manufactured, imported, processed, or distributed in commerce, or used or disposed of in the United States do not pose any unreasonable risks to human health or the environment. TSCA section 8(b) provides the United States Environmental Protection Agency authority to "compile, keep current, and publish a list of each chemical substance that is manufactured or processed in the United States." This TSCA Chemical Substance Inventory contains non-confidential information on the production amount of toxic chemicals from each manufacturer and importer site.

NLRRCRAG No Longer Regulated RCRA Generator Facilities

VERSION DATE: 10/13/15

This database includes RCRA Generator facilities that are no longer regulated by the United States Environmental Protection Agency or do not meet other RCRA reporting requirements. This listing includes facilities that formerly generated hazardous waste.

Large Quantity Generators: Generate 1,000 kg or more of hazardous waste during any calendar month; or Generate more than 1 kg of acutely hazardous waste during any calendar month; or Generate more than 100 kg of any residue or contaminated soil, waste or other debris resulting from the cleanup of a spill, into or on any land or water, or acutely hazardous waste during any calendar month; or Generate 1 kg or less of acutely hazardous waste during any calendar month, and accumulate more than 1kg of acutely hazardous waste at any time; or Generate 100 kg or less of any residue or contaminated soil, waste or other debris resulting from the cleanup of a spill, into or on any land or water, of acutely hazardous waste during any calendar month, and accumulated more than 100 kg of that material at any time.

Small Quantity Generators: Generate more than 100 and less than 1000 kilograms of hazardous waste during any calendar month and accumulate less than 6000 kg of hazardous waste at any time; or Generate 100 kg or less of hazardous waste during any calendar month, and accumulate more than 1000 kg of hazardous waste at any time.

Conditionally Exempt Small Quantity Generators: Generate 100 kilograms or less of hazardous waste per calendar month, and accumulate 1000 kg or less of hazardous waste at any time; or Generate one kilogram or less of acutely hazardous waste per calendar month, and accumulate at any time: 1 kg or less of acutely hazardous waste; or 100 kg or less of any residue or contaminated soil, waste or other debris resulting from the cleanup of a spill, into or on any land or water, or acutely hazardous waste; or Generate 100 kg or less of any residue or contaminated soil, waste or other debris resulting from the cleanup of a spill, into or on any land or water, or acutely hazardous waste during any calendar month, and accumulate at any time: 1 kg or less of acutely hazardous waste; or 100 kg or less of any residue or contaminated soil, waste or other debris resulting from the cleanup of a spill, into or on any land or water, of acutely hazardous waste.

RCRAGR05 Resource Conservation & Recovery Act - Generator Facilities

VERSION DATE: 10/13/15

This database includes sites listed as generators of hazardous waste (large, small, and exempt) in the RCRAInfo

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system. The United States Environmental Protection Agency defines RCRAInfo as the comprehensive information system which provides access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. RCRAInfo replaces the data recording and reporting abilities of the Resource Conservation and Recovery Information System (RCRIS) and the Biennial Reporting System (BRS). This database includes sites located in EPA Region 5. This region includes the following states: Illinois, Indiana, Michigan, Minnesota, Ohio, and Wisconsin.

Large Quantity Generators: Generate 1,000 kg or more of hazardous waste during any calendar month; or Generate more than 1 kg of acutely hazardous waste during any calendar month; or Generate more than 100 kg of any residue or contaminated soil, waste or other debris resulting from the cleanup of a spill, into or on any land or water, or acutely hazardous waste during any calendar month; or Generate 1 kg or less of acutely hazardous waste during any calendar month, and accumulate more than 1kg of acutely hazardous waste at any time; or Generate 100 kg or less of any residue or contaminated soil, waste or other debris resulting from the cleanup of a spill, into or on any land or water, of acutely hazardous waste during any calendar month, and accumulated more than 100 kg of that material at any time.

Small Quantity Generators: Generate more than 100 and less than 1000 kilograms of hazardous waste during any calendar month and accumulate less than 6000 kg of hazardous waste at any time; or Generate 100 kg or less of hazardous waste during any calendar month, and accumulate more than 1000 kg of hazardous waste at any time.

Conditionally Exempt Small Quantity Generators: Generate 100 kilograms or less of hazardous waste per calendar month, and accumulate 1000 kg or less of hazardous waste at any time; or Generate one kilogram or less of acutely hazardous waste per calendar month, and accumulate at any time: 1 kg or less of acutely hazardous waste; or 100 kg or less of any residue or contaminated soil, waste or other debris resulting from the cleanup of a spill, into or on any land or water, or acutely hazardous waste; or Generate 100 kg or less of any residue or contaminated soil, waste or other debris resulting from the cleanup of a spill, into or on any land or water, or acutely hazardous waste during any calendar month, and accumulate at any time: 1 kg or less of acutely hazardous waste; or 100 kg or less of any residue or contaminated soil, waste or other debris resulting from the cleanup of a spill, into or on any land or water, of acutely hazardous waste.

RCRANGR05

Resource Conservation & Recovery Act - Non-Generator Facilities

VERSION DATE: 10/13/15

This database identifies RCRAInfo system sites that only handle hazardous waste, such as transporters, without generating any amount hazardous waste. The United States Environmental Protection Agency defines RCRAInfo as the comprehensive information system which provides access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. RCRAInfo replaces the data recording and reporting abilities of the Resource Conservation and Recovery Information System (RCRIS) and the Biennial Reporting System (BRS). This database includes sites located in EPA Region 5. This region includes the following states: Illinois, Indiana, Michigan, Minnesota, Ohio, and Wisconsin.

HISTPST

Historical Gas Stations

VERSION DATE: NR

This historic directory of service stations is provided by the Cities Service Company. The directory includes

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Cities Service filling stations that were located throughout the United States in 1930.

BF Brownfields Management System

VERSION DATE: 10/08/15

Brownfields are real property, the expansion, redevelopment, or reuse of which may be complicated by the presence or potential presence of a hazardous substance, pollutant, or contaminant. Cleaning up and reinvesting in these properties takes development pressures off of undeveloped, open land, and both improves and protects the environment. The United States Environmental Protection Agency maintains this database to track activities in the various brown field grant programs including grantee assessment, site cleanup and site redevelopment. This database included tribal brownfield sites.

CERCLIS Comprehensive Environmental Response, Compensation & Liability Information System

VERSION DATE: 10/25/13

CERCLIS is the repository for site and non-site specific Superfund information in support of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA). This United States Environmental Protection Agency database contains an extract of sites that have been investigated or are in the process of being investigated for potential environmental risk. In 2014, the Superfund Program implemented a new information system, the Superfund Enterprise Management System (SEMS). Efforts to migrate data to SEMS and to enhance data quality control are now in the final stages. The Program will continue to rely on the final CERCLIS data set (dated November 12, 2013, which reflects official end of Fiscal Year 2013 Program progress) for public reporting until a complete and accurate SEMS data set is available.

DNPL Delisted National Priorities List

VERSION DATE: 07/22/15

This database includes sites from the United States Environmental Protection Agency's Final National Priorities List (NPL) where remedies have proven to be satisfactory or sites where the original analyses were inaccurate, and the site is no longer appropriate for inclusion on the NPL, and final publication in the Federal Register has occurred.

NFRAP No Further Remedial Action Planned Sites

VERSION DATE: 10/25/13

NFRAP sites may be sites where, following an initial investigation, no contamination was found, contamination was removed quickly without the need for the site to be placed on the National Priorities List, or the contamination was not serious enough to require Federal Superfund action.

NLRRCRAT No Longer Regulated RCRA Non-CORRACTS TSD Facilities

VERSION DATE: 10/13/15

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This database includes RCRA Non-Corrective Action TSD facilities that are no longer regulated by the United States Environmental Protection Agency or do not meet other RCRA reporting requirements. This listing includes facilities that formerly treated, stored or disposed of hazardous waste.

ODI Open Dump Inventory

VERSION DATE: 06/01/85

The open dump inventory was published by the United States Environmental Protection Agency. An "open dump" is defined as a facility or site where solid waste is disposed of which is not a sanitary landfill which meets the criteria promulgated under section 4004 of the Solid Waste Disposal Act (42 U.S.C. 6944) and which is not a facility for disposal of hazardous waste. This inventory has not been updated since June 1985.

RCRAT Resource Conservation & Recovery Act - Non-CORRACTS Treatment, Storage & Disposal Facilities

VERSION DATE: 10/13/15

This database includes Non-Corrective Action sites listed as treatment, storage and/or disposal facilities of hazardous waste in the RCRAInfo system. The United States Environmental Protection Agency defines RCRAInfo as the comprehensive information system which provides access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. RCRAInfo replaces the data recording and reporting abilities of the Resource Conservation and Recovery Information System (RCRIS) and the Biennial Reporting System (BRS).

DOD Department of Defense Sites

VERSION DATE: 06/21/10

This information originates from the National Atlas of the United States Federal Lands data, which includes lands owned or administered by the Federal government. Army DOD, Army Corps of Engineers DOD, Air Force DOD, Navy DOD and Marine DOD areas of 640 acres or more are included.

FUDS Formerly Used Defense Sites

VERSION DATE: 06/01/15

The 2012 Formerly Used Defense Sites (FUDS) inventory includes properties previously owned by or leased to the United States and under Secretary of Defense Jurisdiction, as well as Munitions Response Areas (MRAs). The remediation of these properties is the responsibility of the Department of Defense. This data is provided by the U.S. Army Corps of Engineers (USACE), the boundaries/polygon data are based on preliminary findings and not all properties currently have polygon data available. **DISCLAIMER:** This data represents the results of data collection/processing for a specific USACE activity and is in no way to be considered comprehensive or to be used in any legal or official capacity as presented on this site. While the USACE has made a reasonable effort to insure the accuracy of the maps and associated data, it should be explicitly noted that USACE makes no warranty, representation or guaranty, either expressed or implied, as to the content, sequence, accuracy, timeliness or completeness of any of the data provided herein. For additional information on Formerly Used Defense Sites please contact the USACE Public Affairs Office at (202) 528-4285.

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NLRRCRAC No Longer Regulated RCRA Corrective Action Facilities

VERSION DATE: 10/13/15

This database includes RCRA Corrective Action facilities that are no longer regulated by the United States Environmental Protection Agency or do not meet other RCRA reporting requirements.

NPL National Priorities List

VERSION DATE: 07/22/15

This database includes United States Environmental Protection Agency (EPA) National Priorities List sites that fall under the EPA's Superfund program, established to fund the cleanup of the most serious uncontrolled or abandoned hazardous waste sites identified for possible long-term remedial action.

PNPL Proposed National Priorities List

VERSION DATE: 07/22/15

This database contains sites proposed to be included on the National Priorities List (NPL) in the Federal Register. The United States Environmental Protection Agency investigates these sites to determine if they may present long-term threats to public health or the environment.

RCRAC Resource Conservation & Recovery Act - Corrective Action Facilities

VERSION DATE: 10/13/15

This database includes all hazardous waste sites with ongoing corrective action activity and where corrective action is statutorily required to be address but have not had corrective action imposed in the RCRAInfo system. The Corrective Action Program requires owners or operators of RCRA facilities (or treatment, storage, and disposal facilities) to investigate and cleanup contamination in order to protect human health and the environment. The United States Environmental Protection Agency defines RCRAInfo as the comprehensive information system which provides access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. RCRAInfo replaces the data recording and reporting abilities of the Resource Conservation and Recovery Information System (RCRIS) and the Biennial Reporting System (BRS).

RCRASUBC Resource Conservation & Recovery Act - Subject to Corrective Action Facilities

VERSION DATE: 10/13/15

This database includes hazardous waste sites which are potentially subject to corrective action regardless of whether they have correction action underway, plus any sites showing a corrective action event of RFI or beyond in the RCRAInfo system. Sites conducting corrective action under analogous state authorities are also included. The United States Environmental Protection Agency defines RCRAInfo as the comprehensive information system which provides access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. RCRAInfo replaces the data recording and

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reporting abilities of the Resource Conservation and Recovery Information System (RCRIS) and the Biennial Reporting System (BRS).

RODS Record of Decision System

VERSION DATE: 07/01/13

These decision documents maintained by the United States Environmental Protection Agency describe the chosen remedy for NPL (Superfund) site remediation. They also include site history, site description, site characteristics, community participation, enforcement activities, past and present activities, contaminated media, the contaminants present, and scope and role of response action.

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AIRS Permitted Air Facilities

VERSION DATE: 07/15/15

This database contains facilities with air permits issued by the by the Minnesota Pollution Control Agency. These permits identify the units at each facility that generate air pollutants and, where applicable, the limits on those emissions. In some cases a permit may also authorize construction or modification of a facility.

CDL Clandestine Drug Laboratory Locations

VERSION DATE: 07/21/15

This listing of clandestine methamphetamine laboratories is provided by the Minnesota Department of Health. Each meth lab, spill or dump is a potential hazardous waste site, requiring assessment and remediation by experienced and qualified personnel. Former meth lab sites are being cleaned (or remediated) in many Minnesota communities. In these communities, the cleanups are being guided by city and county ordinances, local housing laws, and Minnesota Statute 145A, the Public Health Nuisance Statute.

IC Sites with Institutional Controls

VERSION DATE: 05/13/15

Institutional controls are defined by Minnesota Statute, Section 115B.02, subdivision 9a, as legally enforceable restrictions, conditions, or controls on the use of real property, ground water, or surface water located at or adjacent to a facility where response actions are taken that are reasonably required to assure that the response actions are protective of public health or welfare or the environment. Institutional controls include restrictions, conditions, or controls enforceable by contract, easement, restrictive covenant, statute, ordinance, or rule, including official controls such as zoning, building codes, and official maps. An affidavit required under section 115B.16, subdivision 2, or similar notice of a release recorded with real property records is also an institutional control.

PCASPILLS Spills Listing

VERSION DATE: 07/01/15

The Minnesota Pollution Control Agency's Emergency Response Team maintains this listing of reported petroleum product, hazardous substance, and/or other spills.

SWUP Solid Waste Utilization Projects

VERSION DATE: 07/15/15

According to the Minnesota Pollution Control Agency, a solid waste utilization project uses certain wastes in a new way to recycle the material instead of putting it into a landfill. An example is using tires to create furniture. The beneficial use of waste products saves landfill capacity for materials that do not have alternative uses. By using solid waste, individuals and organizations can reduce disposal costs, or even generate profit through the sale of materials that have a beneficial use.

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TIERII Tier Two Facility Listing

VERSION DATE: 09/02/15

The Minnesota Department of Public Safety's Emergency Planning and Community Right-to-Know Act Program (EPCRA) maintains this listing of Tier Two facilities which store hazardous chemicals on-site. These facilities subject to EPCRA reporting submit Tier II forms which provide information such as the Material Safety Data Sheet (MSDS) chemical or common name, emergency contact information, approximate amount of chemical stored, along with the location of the chemical at the facility.

FEEDLOT Feedlots

VERSION DATE: 07/15/15

Feedlots may be small farms or large-scale commercial livestock operations. They are places where animals are confined for feeding, breeding or holding. The Minnesota Pollution Control Agency (MPCA) and its county partners place requirements on how manure is managed at feedlots, so that it does not contaminate nearby surface water and groundwater.

HWGS Hazardous Waste Generator Sites

VERSION DATE: 12/22/14

The Minnesota Pollution Control Agency (MPCA) provides this list of active and inactive Hazardous Waste Generator Sites, including large quantity and small to minimal quantity generators. A large quantity generator (LQG) is a facility that generates at least 1,000 kilograms (2,200 pounds) of hazardous waste or 1 kilogram (2.2 pounds) of acutely hazardous waste per calendar month. An MPCA permit is not required for a large quantity generator, but the facility must have a current hazardous waste license. A small to minimal quantity generator is a facility that generates less than 1,000 kilograms (2,200 pounds) of hazardous waste or 1 kilogram (2.2 pounds) of acutely hazardous waste per calendar month. These facilities have less stringent rules than large quantity generators. This group includes Small Quantity Generators (SQGs), which produce 100 - 1000 kg of hazardous waste per month; Very Small Quantity Generators (VSQGs), which produce less than 100 kg of hazardous waste per month; and Conditionally Exempt Generators, which produce less than 100 kg or 10 gallons of hazardous waste per year. Like large quantity generators, SQGs and VSQGs must have current hazardous waste licenses.

WDP Water Discharge Permits

VERSION DATE: 10/14/15

This Minnesota Pollution Control Agency (MPCA) database includes the following types of water permits: Construction Stormwater Permits, Construction Stormwater Site Subdivisions, Industrial Stormwater Permits, MS4 Projects, and Wastewater Dischargers. A construction stormwater permit is designed to limit pollution during and after construction by controlling the erosion associated with construction activities. A construction stormwater site subdivision is a site where a construction project with an existing stormwater permit has been sub-divided into smaller parcels. Industrial stormwater permits are designed to limit the amount of harmful contaminants that reach surface water and groundwater, by requiring good practices for storing and handling

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materials. A Municipal Separate Storm Sewer System (MS4) is a system of conveyances - such as gutters, ditches, city streets and storm drains - which is used as a path for stormwater. Regulated MS4s cover large areas, and are owned or operated by a public entity such as a city, county, township, watershed district or university. A wastewater discharger is a facility that generates or treats wastewater for discharge onto land or into water.

BULKSTORAGE Bulk Storage Permits

VERSION DATE: 07/23/15

The Minnesota Department of Agriculture's Licensing Information System (LIS) lists individuals or companies who hold licenses, certificates and/or permits required by state law and regulated by the Department. This database only contains those LIS licenses related to anhydrous ammonia storage facilities and bulk pesticide/fertilizer storage facilities. Please note the data is real time and therefore constantly changing.

CLEANERS Registered Drycleaning Facilities

VERSION DATE: 10/05/10

The Minnesota Pollution Control Agency maintains this listing of registered dry cleaning facilities.

UAST Registered Storage Tanks

VERSION DATE: 07/01/15

The Registered Storage Tanks Database provides information on aboveground and underground storage tanks registered with the Minnesota Pollution Control Agency. Owners of USTs and ASTs with a capacity of 500 gallons or more which contain petroleum or hazardous substances must notify the MPCA of the existence of these tanks. Tanks not subject to notification include farm and residential motor fuel tanks less than 1,100 gallons; heating oil tanks less than 1,100 gallons; flow-through process tanks; septic tanks; and agricultural chemical tanks.

AGSPILLS Agricultural Spills Listing

VERSION DATE: 09/24/15

This list of reported spill incidents is provided by the Minnesota Department of Agriculture (MDA). The MDA is the lead agency for response to, and cleanup of, agricultural chemical contamination (pesticides and fertilizers) in Minnesota. The MDA has grouped these spills into three categories: Old Emergencies, Small Spills and Investigations, and Investigations Boundaries. Old Emergencies represent emergencies which were closed prior to March 1, 2004. These files and the locations plotted have not been reviewed for accuracy and completeness. Small Spills and Investigations represent the location of small spills and investigations, which were closed after March 1, 2004. Investigation Boundaries represent the approximate extent of large spills and other types of facility investigations. Facility Investigations are further subdivided into the following program areas: Awaiting Prioritization Investigation files of known or potential agricultural chemical contamination that are waiting to be prioritized; Prioritized Investigation files of known or potential agricultural chemical contamination that have been prioritized and are awaiting activation; Comprehensive Facility Investigation / MERLA Investigation files of known

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or potential agricultural chemical contamination that have been activated in MDA's Comprehensive Facility Investigation Program or are active Superfund sites under MDA's oversight; AgVIC Investigation files of known or potential agricultural chemical contamination that have enrolled in the MDA's Agricultural Voluntary Investigation and Cleanup (AgVIC) Program; and Agricultural Chemical Emergency Response Investigation files that were reported as emergency spills of agricultural chemicals and are large enough in size to be represented by a polygon.

CAFO Concentrated Animal Feeding Operations

VERSION DATE: 06/30/15

A Concentrated Animal Feeding Operation (CAFO) is any feeding operation with a capacity of 1,000 or more animal units according to federal animal unit calculations. The Minnesota Pollution Control Agency can also define a facility with less than 1,000 animal units as a CAFO on a case-by-case basis, depending on site conditions, and if manure or process wastewater is directly discharged to waters of the state. Facilities that are CAFOs must comply with both federal regulations and state rules. Two or more feedlots under common ownership are considered a single facility if they adjoin each other or use the same manure storage or disposal system.

CERCLIS CERCLIS Sites

VERSION DATE: 10/14/15

CERCLIS sites are places that are listed in the federal Comprehensive Environmental Response, Compensation and Liability Information System. This means that they are or were suspected of being contaminated. The CERCLIS database contains information on preliminary assessments, site inspections, and cleanup activities for these sites. After CERCLIS sites are investigated, they may be elevated to state or federal Superfund lists, or it may be determined that no action is necessary. This database is provided by the Minnesota Pollution Control Agency.

CLF Closed Landfills

VERSION DATE: 10/14/15

The Minnesota Pollution Control Agency Closed Landfill Program (CLP) is a voluntary program established by the legislature in 1994 to properly close, monitor, and maintain Minnesota's closed municipal sanitary landfills. Any MPCA-permitted mixed-municipal solid waste landfill that stopped accepting mixed municipal solid waste (MMSW) by April 9, 1994, and demolition debris before May 1, 1995, can qualify for application to this program.

CONTINGENCIES Agricultural Contingency Sites

VERSION DATE: 09/24/15

The Minnesota Department of Agriculture (MDA) Incident Response Unit (IRU) is the state lead agency for the investigation and remediation of incidents involving agricultural chemicals (pesticides and fertilizer). This MDA IRU database includes sites with a soil or ground water contingency, deed restriction, local ordinance, restrictive covenant or deed affidavit in place. The accuracy of

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these sites can be variable. In most cases, the site boundaries should be considered as only representing the vicinity of the soil or ground water contingency area or plume.

HWSTSD Hazardous Waste Treatment Storage Disposal Sites

VERSION DATE: 12/22/14

A hazardous waste Treatment Storage and /or Disposal facility (TSD) is any business designed to treat, store and / or dispose of hazardous waste. These facilities typically collect hazardous wastes for other businesses and treat it or dispose of it properly. TSD facilities must have valid operating permits issued by the Minnesota Pollution Control Agency (MPCA). This means that they are required to develop detailed plans to train and protect their workers and the environment. This database contains active and inactive TSD facilities.

LUAST Registered Leaking Storage Tanks

VERSION DATE: 07/01/15

The Minnesota Pollution Control Agency maintains this listing of leaking aboveground and underground storage tanks. Tank owners are required to immediately report a leak or spill of more than five gallons of petroleum, or any amount of a hazardous substance, from any tank or piping. All leaks and spills from USTs and ASTs and associated piping must be cleaned up to protect the environment and public health.

PBF Petroleum Brownfields Program Sites

VERSION DATE: 10/14/15

This listing of Petroleum Brownfield sites, including those with Development Response Action Plans dated between 2008 and 2012, is provided by the Minnesota Pollution Control Agency (MPCA). The Petroleum Brownfields Program (formerly VPIC) provides the technical assistance and liability assurance needed to facilitate and expedite the development, transfer, investigation and/or cleanup of property that is contaminated with petroleum. Even after cleanup or MPCA file closure most properties will have contamination remaining. State law requires that persons properly manage contaminated soil and water they uncover or disturb - even if they are not the party responsible for the contamination. Property owners, purchasers or developers of property where contaminated soil or water might be encountered may include provisions - called "response actions" - in development plans describing how petroleum contaminated soil and water will be managed if encountered. For some properties, special construction might be needed to prevent the further spreading of the contamination and/or to prevent petroleum vapors from entering buildings or utility access shafts.

PBRLF Permitted By Rule Landfills

VERSION DATE: 10/14/15

According to the Minnesota Pollution Control Agency, a landfill that is permitted by rule is not required to obtain an individual solid waste permit if it meets certain eligibility criteria. However, it must comply with waste management rules and regulations. Landfills may be permitted by rule if they have a small capacity and/or operate for a short period of time.

Environmental Records Definitions - STATE (MN)

PVICP Potential Voluntary Investigation and Cleanup Program Sites

VERSION DATE: 05/13/15

This listing of Potential Voluntary Investigation and Cleanup Program sites is provided by the Minnesota Pollution Control Agency. These potential sites have not yet entered into the VIC Program until an application has been received at the MPCA.

RECYCLERS Recycling Markets Directory

VERSION DATE: 02/14/13

The Recycling Markets Directory is provided by the Minnesota Pollution Control Agency. The markets in this database accept large (commercial) quantities of materials.

SRS Site Response Section Database

VERSION DATE: 05/13/15

The Minnesota Pollution Control Agency (MPCA) is involved in remediation activities through various programs. Remediation is the process of cleaning up pollution in the soil, water or air. The pollution can result from an accidental spill or from activities that occur over a long time. This MPCA database includes remediation sites from the Superfund, Voluntary Investigation and Cleanup, Brownfields, Resource Conservation and Recovery Act, Tanks, Landfills, and Emergency Response Programs.

SWF Open Solid Waste Facilities

VERSION DATE: 10/14/15

Open landfills are regulated by Minnesota Rules 7001 and 7035. They actively accept, under the terms and conditions of a Minnesota Pollution Control Agency permit, certain types of wastes for disposal. They are part of a larger and integrated collection of open solid waste management facilities that process, transfer and receive waste for disposal in Minnesota. Open landfills fall into several categories, which include: demolition, industrial, mixed municipal and municipal waste combustor ash.

UNPERMDUMPS Unpermitted Dump Sites

VERSION DATE: 10/14/15

Unpermitted dump sites are landfills that never held a valid permit from the Minnesota Pollution Control Agency (MPCA). Generally, these dumps existed prior to the permitting program established with the creation of the MPCA in 1967. These dumps are not restricted to any type of waste, but were often old farm or municipal disposal sites that accepted household waste. State assessment staff have investigated many of these dump sites.

Environmental Records Definitions - STATE (MN)

VICP Voluntary Investigation and Cleanup Program Sites

VERSION DATE: 05/13/15

The Voluntary Investigation and Cleanup (VIC) Program site listing is provided by the Minnesota Pollution Control Agency. This program encourages timely property transactions by reducing potential health or environmental risks from contamination and promoting the redevelopment of these properties.

CSTF Contaminated Soil Treatment Facilities

VERSION DATE: 07/15/15

Contaminated soil treatment facilities are places that the Minnesota Pollution Control Agency (MPCA) has approved or permitted to take petroleum-contaminated soils from leak sites and provide treatment through a number of different processes. The processes include thermal treatment (usually by roasting soils at high temperatures), composting, or thin-spreading soils and allowing natural microorganisms to biodegrade the petroleum.

HWCS Hazardous Waste Cleanup Sites

VERSION DATE: 05/13/15

Soil and or groundwater cleanup under RCRA Corrective Action is conducted by the Site Remediation Division of the Minnesota Pollution Control Agency. The Hazardous Waste Treatment, Storage, or Disposal Facilities enter the RCRA corrective action program through the permitting process. Interim Status Facilities enter the RCRA Correction Action Program through a negotiated process initiated by the MPCA (these facilities at one time applied for a RCRA treatment, storage and or disposal permit, but did not complete the permitting process). Hazardous Waste Generators usually enter the RCRA remediation program through evidence of suspected releases to soil and or ground water from improper management of hazardous wastes or hazardous constituents uncovered during hazardous waste inspections conducted by state, county or city inspectors.

SAS State Assessment Sites

VERSION DATE: 10/14/15

State Assessment sites are places that Minnesota Pollution Control Agency (MPCA) Site Assessment staff have investigated because of suspected contamination. The sites investigated include abandoned industrial properties, small commercial businesses and publicly-owned land. (Note that petroleum-contaminated sites are investigated by MPCA Tanks and Leaks staff.) These sites may be referred to the Site Assessment program by the Voluntary Investigation and Cleanup (VIC) program, the Petroleum Remediation program, Minnesota Duty Officer reports or citizen complaints. Site Assessment staff do an initial assessment, and then determine if further action is needed. If a site poses a threat to human health or the environment, it is referred to CERCLIS, Superfund, RCRA Cleanup or VIC.

Environmental Records Definitions - STATE (MN)

SF Superfund Site Information Listing

VERSION DATE: 05/13/15

The Minnesota Pollution Control Agency's Superfund Program identifies, investigates and determines appropriate cleanup plans for abandoned or uncontrolled hazardous waste sites where a release or potential release of a hazardous substance poses a risk to human health or the environment. Superfund does not deal with Resource Conservation and Recovery Act (RCRA) sites or petroleum storage tank releases.

Environmental Records Definitions - TRIBAL

USTR05 Underground Storage Tanks On Tribal Lands

VERSION DATE: 04/01/15

This database, provided by the United States Environmental Protection Agency (EPA), contains underground storage tanks on Tribal lands located in EPA Region 5. Region 5 includes the following states: Illinois, Indiana, Michigan, Minnesota, Ohio, and Wisconsin.

LUSTR05 Leaking Underground Storage Tanks On Tribal Lands

VERSION DATE: 04/01/15

This database, provided by the United States Environmental Protection Agency (EPA), contains leaking underground storage tanks on Tribal lands located in EPA Region 5. Region 5 includes the following states: Illinois, Indiana, Michigan, Minnesota, Ohio, and Wisconsin.

ODINDIAN Open Dump Inventory on Tribal Lands

VERSION DATE: 11/08/06

This Indian Health Service database contains information about facilities and sites on tribal lands where solid waste is disposed of, which are not sanitary landfills or hazardous waste disposal facilities, and which meet the criteria promulgated under section 4004 of the Solid Waste Disposal Act (42 U.S.C. 6944).

INDIANRES Indian Reservations

VERSION DATE: 01/01/00

The Department of Interior and Bureau of Indian Affairs maintains this database that includes American Indian Reservations, off-reservation trust lands, public domain allotments, Alaska Native Regional Corporations and Recognized State Reservations.

APPENDIX B

AERIAL PHOTOGRAPHS



historicalinfo.com

Potlatch
Timberwood Drive
Baxter, MN



2013

HIG Project # 1523718
Client Project # 0270B0714.000
Approximate Scale 1:6000 (1"=500')





historicalinfo.com

Potlatch
Timberwood Drive
Baxter, MN



2008

HIG Project # 1523718
Client Project # 0270B0714.000
Approximate Scale 1:6000 (1"=500')





historicalinfo.com

Pottlatch
Timberwood Drive
Baxter, MN



2003

HIG Project # 1523718
Client Project # 0270B0714.000
Approximate Scale 1:6000 (1"=500')





historicalinfo.com

Potlatch
Timberwood Drive
Baxter, MN



1997

HIG Project # 1523718
Client Project # 0270B0714.000
Approximate Scale 1:- *00 (1"=, 00')





historicalinfo.com

Pottlatch
Timberwood Drive
Baxter, MN



1991

HIG Project # 1523718
Client Project # 0270B0714.000
Approximate Scale 1:6000 (1"=500')





historycalmns.com

Potlatch
Timberwood Drive
Baxter, MN



1985

HIG Project # 1523718
Client Project # 0270B0714.000
Approximate Scale 1:6000 (1"=500')





Potlatch
Timberwood Drive
Baxter, MN



1978-A

HIG Project # 1523718
Client Project # 0270B0714.000
Approximate Scale 1:6000 (1"=500')





Potlatch
Timberwood Drive
Baxter, MN



1978-B

HIG Project # 1523718
Client Project # 0270B0714.000
Approximate Scale 1:6000 (1"=500')





historicalinfo.com

Potlatch
Timberwood Drive
Baxter, MN



1973

HIG Project # 1523718
Client Project # 0270B0714.000
Approximate Scale 1:6000 (1"=500')





historicalinfo.com

Potlatch
Timberwood Drive
Baxter, MN



1966

HIG Project # 1523718
Client Project # 0270B0714.000
Approximate Scale 1:6000 (1"=500')





historicalinfo.com

Potlatch
Timberwood Drive
Baxter, MN



1954

HIG Project # 1523718
Client Project # 0270B0714.000
Approximate Scale 1:6000 (1"=500')





historicalinfo.com

Potlatch
Timberwood Drive
Baxter, MN



1939

HIG Project # 1523718
Client Project # 0270B0714.000
Approximate Scale 1:6000 (1"=500')



APPENDIX C

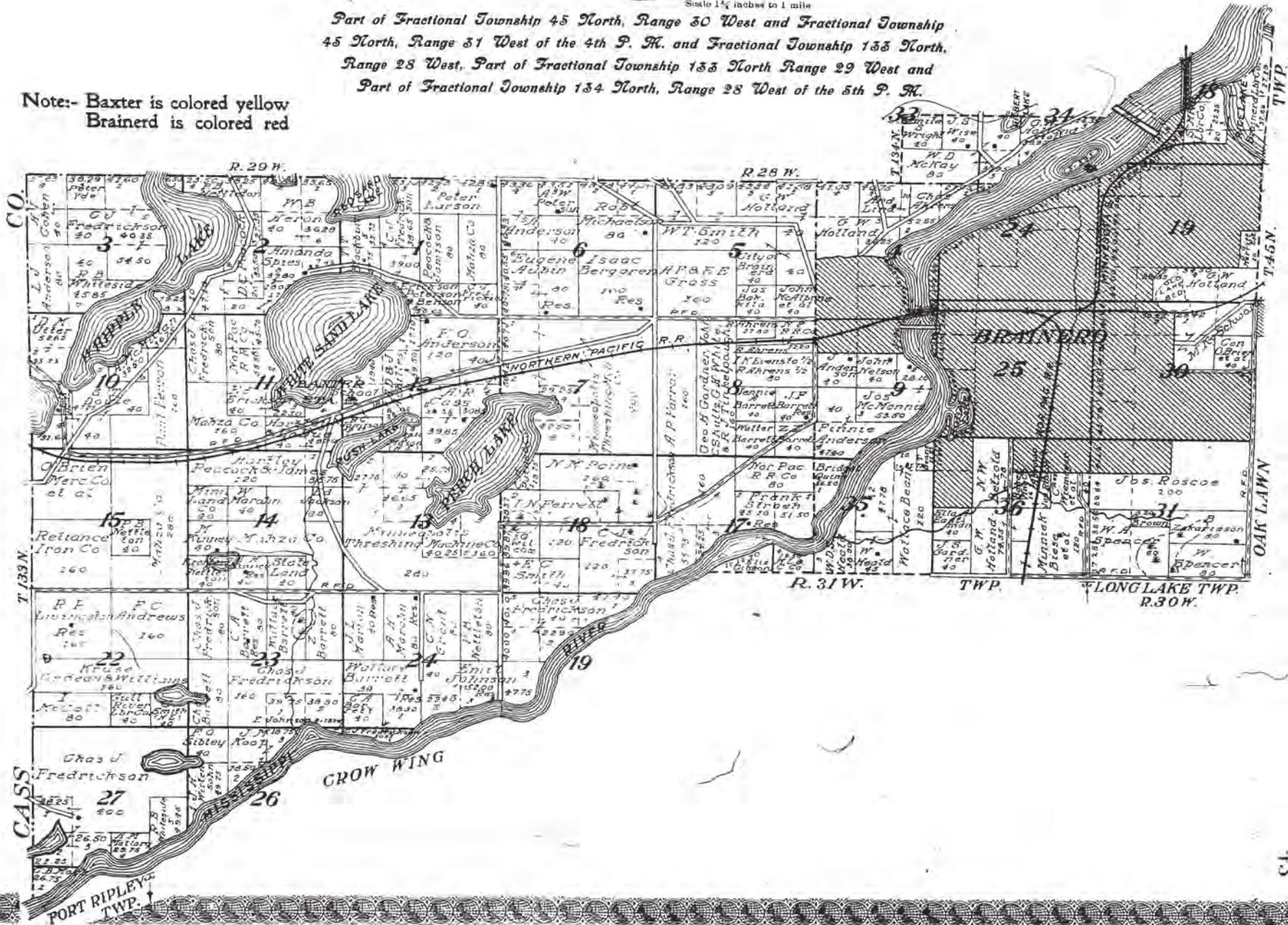
HISTORICAL AND TOPOGRAPHIC MAPS

Baxter and Brainerd

Scale 1 1/2 inches to 1 mile

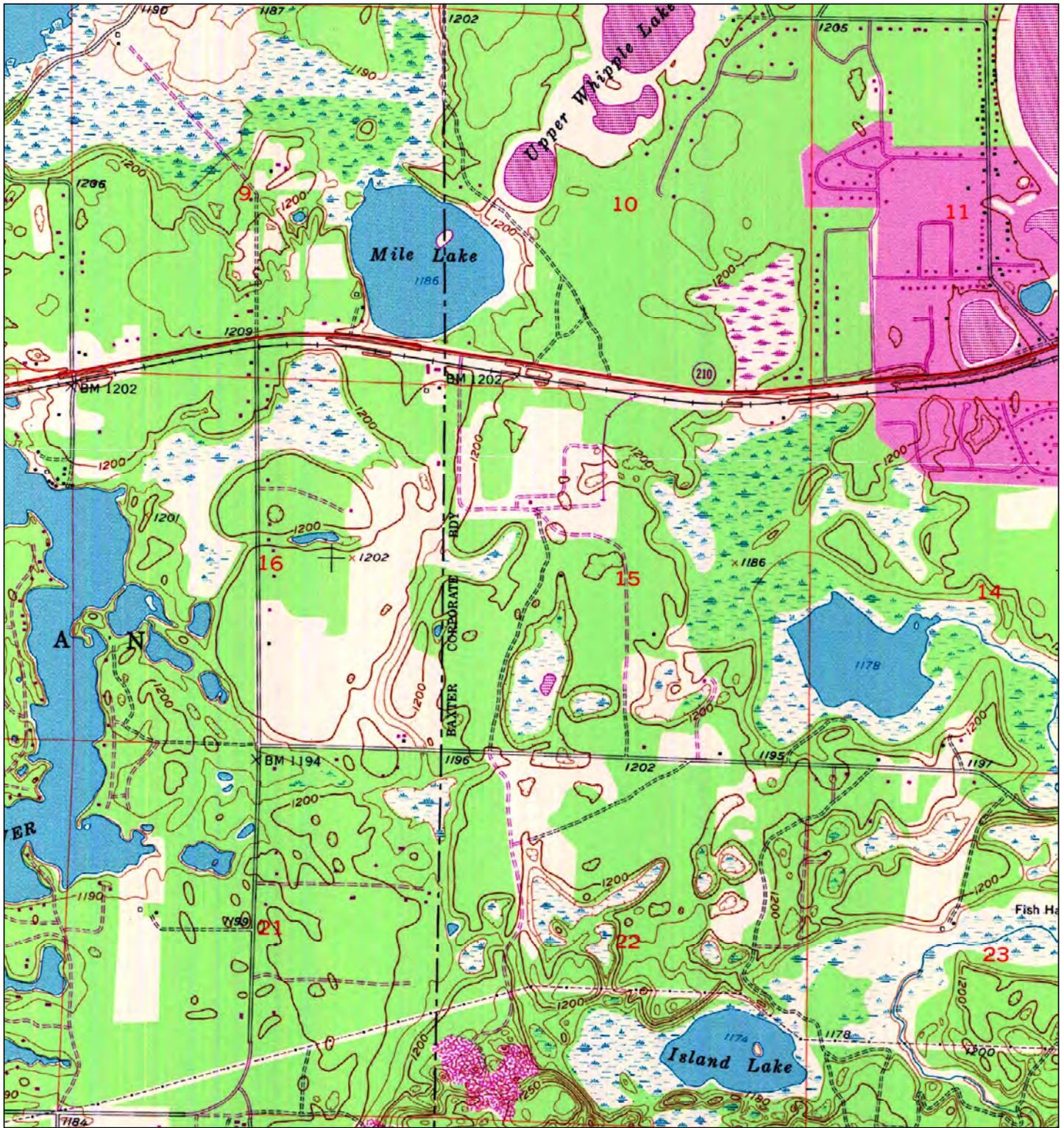
Part of Fractional Township 45 North, Range 30 West and Fractional Township
45 North, Range 31 West of the 4th P. M. and Fractional Township 133 North,
Range 28 West, Part of Fractional Township 133 North Range 29 West and
Part of Fractional Township 134 North, Range 28 West of the 5th P. M.

Note:- Baxter is colored yellow
Brainerd is colored red





2013	<p>0 Distance in Miles 1 1: 24,000 (1"=2,000') NAD 1983 UTM Zone 15N</p>	<p>Site information: Potlatch Timberwood Drive Baxter, MN 56425</p>					
<p>Unified maps show subdued modern topo features where corresponding maps of the same year were not published.</p>		<p>WSN project #0270B0714.000 HIG #1523718 completed: 11/05/2015</p>					
Zone	Topographic Map Name	Publisher	Map Size	Base Map	Aerial Photo Topo Updates		
All	Baxter, MN	USGS	7½' x 7½'	2013	Photo Year	Inspected	Revised
					--	--	--



1994

0 Distance in Miles 1
 1: 24,000 (1"=2,000') NAD 1983 UTM Zone 15N

Site information:
 Potlatch
 Timberwood Drive
 Baxter, MN 56425



Unified maps show subdued modern topo features where corresponding maps of the same year were not published.

WSN project #0270B0714.000
 HIG #1523718 completed: 11/05/2015

				Aerial Photo Topo Updates			
Zone	Topographic Map Name	Publisher	Map Size	Base Map	Photo Year	Inspected	Revised
All	Baxter, MN	USGS	7½' x 7½'	1954	1992	--	1994



1979

0 Distance in Miles 1
 1: 24,000 (1"=2,000') NAD 1983 UTM Zone 15N

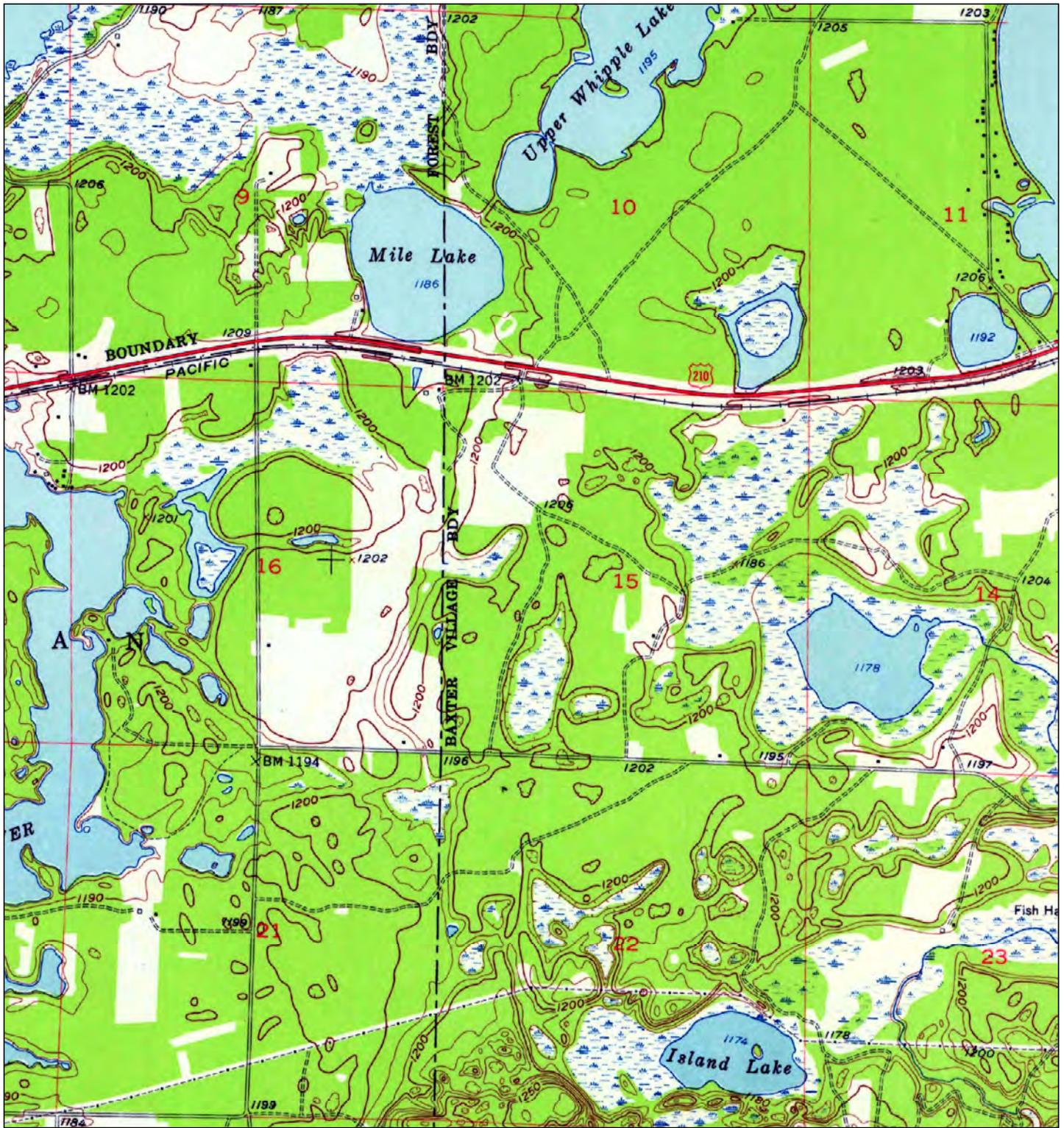
Site information:
 Potlatch
 Timberwood Drive
 Baxter, MN 56425



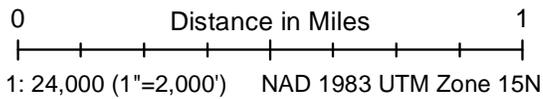
Unified maps show subdued modern topo features where corresponding maps of the same year were not published.

WSN project #0270B0714.000
 HIG #1523718 completed: 11/05/2015

			Aerial Photo Topo Updates				
Zone	Topographic Map Name	Publisher	Map Size	Base Map	Photo Year	Inspected	Revised
All	Baxter, MN	USGS	7½' x 7½'	1954	1977	--	1979



1954



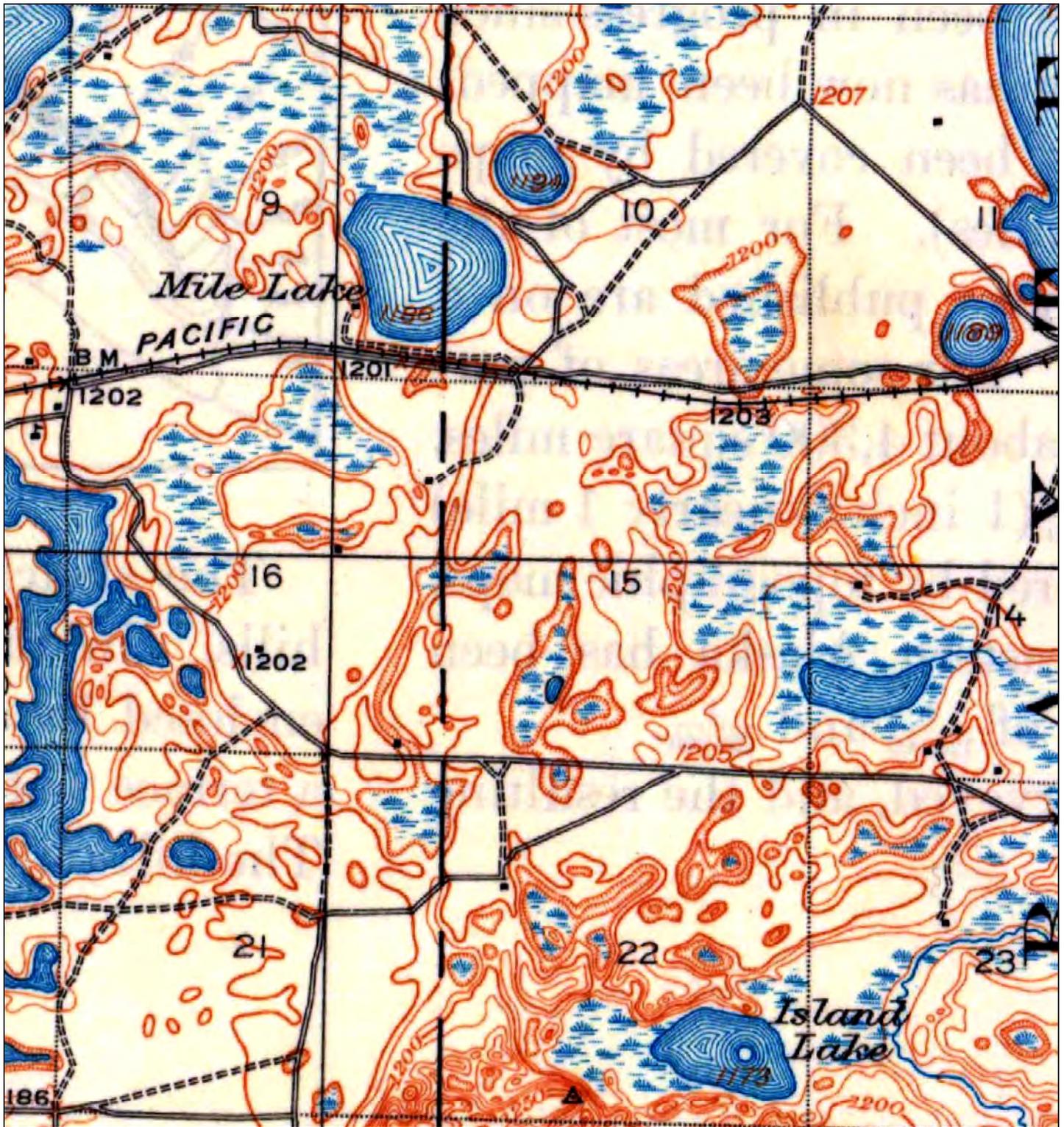
Site information:
Potlatch
Timberwood Drive
Baxter, MN 56425



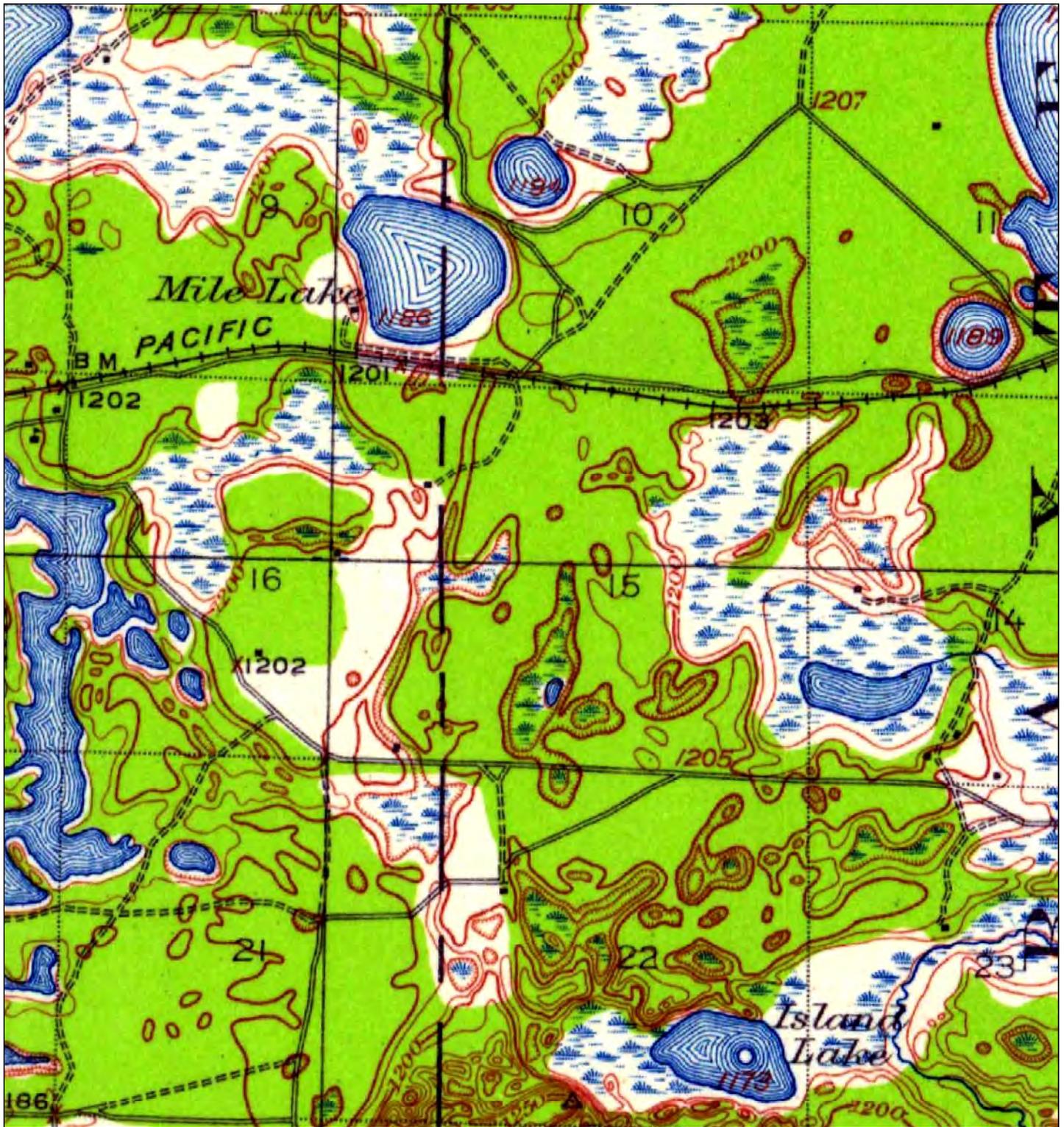
Unified maps show subdued modern topo features where corresponding maps of the same year were not published.

WSN project #0270B0714.000
HIG #1523718 completed: 11/05/2015

				Aerial Photo Topo Updates			
Zone	Topographic Map Name	Publisher	Map Size	Base Map	Photo Year	Inspected	Revised
All	Baxter, MN	USGS	7½' x 7½'	1954	1954	--	--



<p>1919</p>	<p>0 Distance in Miles 1 1: 24,000 (1"=2,000') NAD 1983 UTM Zone 15N</p>	<p>Site information: Potlatch Timberwood Drive Baxter, MN 56425</p>		
<p>Unified maps show subdued modern topo features where corresponding maps of the same year were not published.</p>		<p>WSN project #0270B0714.000 HIG #1523718 completed: 11/05/2015</p>		
<p>Zone All</p>	<p>Topographic Map Name Pillager, MN</p>	<p>Publisher USGS</p>	<p>Map Size Base Map 15' x 15' 1919</p>	<p>Aerial Photo Topo Updates Photo Year Inspected Revised -- -- --</p>



1916	0 Distance in Miles 1 1: 24,000 (1"=2,000') NAD 1983 UTM Zone 15N	Site information: Potlatch Timberwood Drive Baxter, MN 56425					
Unified maps show subdued modern topo features where corresponding maps of the same year were not published.		WSN project #0270B0714.000 HIG #1523718 completed: 11/05/2015					
Zone	Topographic Map Name	Publisher	Map Size	Base Map	Aerial Photo Topo Updates		
All	Pillager, MN	USGS	15' x 15'	1916	Photo Year	Inspected	Revised
					--	--	--

APPENDIX D
CITY DIRECTORY

HUMMINGBIRD CIR - INDIAN POINT RD

HUMMINGBIRD CIR Cont'd

1817 Dalland Chad A & Laura L ✓ ② (1977)

HOUSEHOLDS 2

HUMMINGBIRD LN (MERRIFIELD)

• ZIP CODE 56465 CAR-RT H086

13806 Collins Henry G & Shirley A ✓ ② (1975)218-765-3692

13872 Collins Joshua ✓ ② (1975)218-765-3689

Hoffman Kevin A ✓ ② (1975)

HOUSEHOLDS 3

HUMMINGBIRD TRL (DEERWOOD)

• ZIP CODE 56444 CAR-RT R001

14321 - 14413 No Current Listing (2 Hses)

HOUSEHOLDS 2

HUNT BLVD (PEQUOT LAKES)

• ZIP CODE 56472 CAR-RT H002

31311 Nelson David W & Joann C ✓ ② (1965)218-562-4188

HOUSEHOLDS 1

HUNT RD (DEERWOOD)-FROM 1635 HUNT RD NE NORTHWEST

+ KATRINE DR CONTINUES

• ZIP CODE 56444 CAR-RT R002

14860 No Current Listing

+ WARBLER LN BEGINS

+ WARBLER LN CONTINUES

14938 Erickson Robert S & Marian I ✓ ② (1967)

14970 No Current Listing

+ WARBLER LN INTERSECTS

14979 Swenson Donald J & Jeanne M ✓ ② (1967)218-678-2533

15004 Erickson Paul R & Susan ✓ ② (1970)218-678-2242

15016 Sosey D ✓ ②

15020 Waldemar Carla ✓ ②

15033 Tighe Larry & Nancy ✓ ② (1967)218-678-3985

15047 Poradek Robert L & Theresa J ✓ ② (1990)

15056 - 15064 No Current Listing (3 Hses)

15138 Hoekstra Ron & Claudia ✓ ②218-678-3321

+ HUNT RD NE BEGINS

HOUSEHOLDS 13

HUNTER CIR (BRAINERD)

• ZIP CODE 56401 CAR-RT R019

7269 No Current Listing

HOUSEHOLDS 1

HUNTER DR (BRAINERD)

• ZIP CODE 56401 CAR-RT R001

19185 Hopp Frank P & Cynthia L ✓ ② (1974)218-764-2590

19415 No Current Listing

19872 Jacobson James D & Kristine M ✓ ② (1974)

19978 Weigelt Ryan B ✓ ②

Weigelt Brandi K

HOUSEHOLDS 4

HUNTERS HVN (GARRISON)-FROM 47199 PARTRIDGE PASS SOUTHWEST

+ GONE GOLFIN CONTINUES

+ PARTRIDGE PASS ENDS

• ZIP CODE 56450 CAR-RT H002

18738 Lawrence Geoffrey S & Connie J ✓ ② (1973)

18746 Nass Craig C & Doriann L ✓ ② (1977)

+ RINGNECK ROOST ENDS

+ WESTWARD HO INTERSECTS

18907 Tereau Brent W ②

HOUSEHOLDS 3

HUNTERS LN (PEQUOT LAKES)

• ZIP CODE 56472 CAR-RT H012

9101 Westergard Dale M & Diane L ✓ ② (1979)

9106 Lindner James A & Jone L ✓ ② (1979)

9124 Ohern Bambi Z ✓ ② (1979)

HOUSEHOLDS 3

HUNTERS TRL SW (PEQUOT LAKES)

• ZIP CODE 56472 CAR-RT R002

7026 Zeipelt Robert J & Karen ✓ ② (1982)218-568-5439

7058 Zeipelt James C ✓ ② (1977)218-568-7795

7116 No Current Listing

HOUSEHOLDS 3

HUNTERS POINT RD SW (NISSWA)-FROM 2099 PERCH LN SW

+ COUNTY 77 SW BEGINS

+ COUNTY HWY 77 CONTINUES

• ZIP CODE 56468 CAR-RT R002

2209 Devane Brian T & Brittaney C ✓

Olson Curtis B ✓ ② (1981)

Olson Brittaney C

2213 No Current Listing

2223 Kelly Warren P ✓ ②218-855-1334

2234 Galassi Joseph & Diane ✓ ② (1981)218-828-9569

2236 No Current Listing

2240 Mandry John W & Susan M ✓ ② (1981)218-829-2556

2242 Greene Victoria T ✓ ②218-829-9836

2244 Herrig Charles R & Lori E ✓ ② (1981)

2249 Dumbeck Tim A & Krista K ✓ ② (1969)218-825-9120

+ BLUEBILL LN SW INTERSECTS

HOUSEHOLDS 10

HUNTERS RIDGE TRL SW (NISSWA)-FROM 10701 LOON CALL DR NORTH

+ COUNTY 77 SW INTERSECTS

• ZIP CODE 56468 CAR-RT R002

10681 Gunsbury Brent & Jennifer L ✓ ② (1973)218-822-3246

10695 No Current Listing

+ COUNTY HWY 77 BEGINS

HOUSEHOLDS 2

HURON CIR (PEQUOT LAKES)

• ZIP CODE 56472 CAR-RT H083

32045 Borson Catherine A ✓ ② (1982)

Stacy Roger J ✓ ② (1982)218-562-4822

HURON CIR Cont'd

32060 Grunzke Nicholas L & Lori A ✓ ② (1972)218-562-5459

32085 Ruud Adam A ② (1982)

Ruud Dallas B

32088 Stephens Matthew L & Heather M ✓ ② (1982)

32092 Berg Clayton R & Kathryn M ✓ ② (1982)

HOUSEHOLDS 6

HURTIG RD (PEQUOT LAKES)

• ZIP CODE 56472 CAR-RT R002

27810 Jewell Joyce I & Albert R ✓ ② (1982)218-568-4970

27980 Fiebiger Craig R & Lisa A ✓ ② (1982)

28267 Wolf Bryon S & Margaret R ✓ ② (1974)218-568-6266

+ MAYO HILLS RD BEGINS

+ MAYO HILLS RD CONTINUES

28411 Wulf James R ✓ ② (1982)218-568-5837

Wulf Kelsey218-568-5837

28455 Loven Robert R ✓ ② (1982)

Loven Eli

28499 No Current Listing

28748 Oelke Jeffrey D & Megan B ✓ ② (1982)218-568-7676

28794 Peterson Charles B & Beverly G ✓ ② (1982)218-568-4055

28890 Morris Terri L & Joseph L ✓ ② (1982)218-568-5583

+ COUNTY ROAD 168 INTERSECTS

HOUSEHOLDS 9

HUX LN (MERRIFIELD)-FROM 29257 HUXTABLE POINT RD

• ZIP CODE 56465 CAR-RT H087

13442 Snockley Louis A Jr & Nancy A ✓ ② (1969)218-765-3575

13450 Frestedt David A & Patricia J ✓ ② (1975)218-765-3144

13462 No Current Listing

13474 Erickson Dennis & Melissa ✓ ② (1975)218-765-4472

HOUSEHOLDS 4

HUXTABLE POINT RD (MERRIFIELD)

+ SW HORSESHOE LAKE RD ENDS

• ZIP CODE 56465 CAR-RT H087

29018 Kallon Robert R Jr & Rebecca R ✓ ② (1967)218-765-3779

29036 Kallon Becky ✓ ② (1975)218-765-3402

29056 Lokensgard Robert J ✓ ② (1975)218-765-3454

29072 Gruenhagen Janet C & Gerald E ✓ ② (1975)218-765-3222

29098 - 29118 No Current Listing (2 Hses)

29142 McCuskey Gretchen ✓ ② (1975)218-765-3540

29187 No Current Listing

+ HUX LN ENDS

29270 Dally Bert E & Virginia D ✓ ② (1975)218-765-4110

29312 Nezerka Lumir W ✓ ② (1967)218-765-3829

29334 Frandsen Dale N & Deanna L ✓ ② (1975)218-765-3498

29348 Jorvig Gregory ✓ ② (1967)218-765-3358

29387 Murrin Ronald R & Gail A ✓ ② (1975)218-765-3085

29397 Schmidt David F ✓ ② (1975)218-765-3037

29408 Washburn Richard & Joann ✓ ② (1975)218-765-4023

29421 Sweningson Thomas J & Lynn M ✓ ② (1975)

.....218-765-3798

29430 No Current Listing

29461 Lalliman William C & Janice M ✓ ② (1975)218-765-4465

29466 Glas William R & Jacqueline M ✓ ② (1975)218-765-4043

29495 Knight John M & Mary ✓ ② (1975)218-765-4275

29537 Howe Craig & Susan ✓ ② (1975)218-765-3842

29542 Cameron Bruce & Mary A ✓ ②

.....218-765-4384

29578 Glas Donald A & Jacqueline M ✓ ② (1975)218-765-3180

29580 - 29587 No Current Listing (2 Hses)

29598 Pielh Chad & Jo ✓ ② (1975)218-765-3185

29618 Sykora Rich & Carla ✓ ② (1969)218-765-3628

29692 Pokorny Maurice A ✓ ② (1975)218-765-3789

29709 Deyoe Charles D & Mary E ✓ ② (1975)218-765-4108

29727 Ranta Steve & Cheryl ✓ ②

.....218-765-3777

29736 Zachow Darlene M ✓ ② (1975)

29748 No Current Listing

29755 Jaeger Todd & Victoria ✓ ②218-765-3430

29765 Wirczek Diane M ✓ ② (1967)218-765-4230

29772 Olsen Allen & Nancy ✓ ② (1975)218-765-3574

29783 Ollverius Rich & Julie ✓ ②

.....218-765-3171

29813 Koch Richard C ✓ ② (1969)218-765-3209

29820 No Current Listing

29831 Sackett Marlin E ✓ ② (1975)218-765-3914

29838 No Current Listing

29846 Runberg James P & Diane E ✓ ② (1970)218-765-3851

RUNBERG REAL ESTATE APPRAISAL real estate appraisers

✓ ②218-765-3851

BUSINESSES 1

HOUSEHOLDS 41

HYLAND AVE (NISSWA)

• ZIP CODE 56468 CAR-RT R003

25528 Harrison William ✓ ② (1975)218-963-8318

25530 Brooks Julie A ✓ ② (1975)218-963-9855

Soderlund Keith M ✓ ② (1975)218-963-9855

25532 REASSURANCE PROPERTY MGMT INC real estate mgmt ✓ ②

.....218-330-4482

25535 Hemmerich Earl R ✓ ② (1975)218-963-4495

Hemmerich Jeannine E218-963-4495

25542 Macko Richard G & Joanne R ✓ ② (1975)

25548 Schroeder Ann S ✓ ② (1975)218-963-7775

Schroeder Eugene C218-963-7775

25587 Wright Keith M ✓ ② (1975)218-963-3984

Wright Virgie M218-963-3984

25655 Johnson Melanie M ✓ ② (1975)218-963-0271

25689 Mendel Jon B & Cheryl S ✓ ② (1975)218-963-2240

25699 Colman Richard ✓ ② (1975)218-963-2189

25852 No Current Listing

25887 Grovas William D ✓ ② (1975)

25884 Kraufkremer Ross T ✓ ② (1975)218-963-3325

Kraufkremer Deborah D218-963-3325

25994 Thurlow Thomas G & Susan H ✓ ② (1975)218-963-7515

25997 Starkey James W ✓ ② (1975)218-963-7879

+ UPPER RY LAKE RD INTERSECTS

26424 LIL ANGELS DAYCARE child care serv ✓ ②218-568-4666

HYLAND AVE Cont'd

Townsend Diane K ✓ ② (1967)218-568-4666

BUSINESSES 2

HOUSEHOLDS 17

(ST NE (BRAINERD)

• ZIP CODE 56401 CAR-RT C004

323 Underdahl Susan A ✓ ② (1942)

Vanhom Dale G ✓ ②

• ZIP CODE 56401 CAR-RT C010

805 Borchardt Trevor ✓ ②218-270-2192

813 Mackedanz Ehren ✓

Verkennes Henry L &

APPENDIX E
PHOTOGRAPHIC LOG



Photograph #1 – Timberwood Drive facing Highway 210.



Photograph #2 – Timberwood Drive facing northeast.



Photograph #3 – Timberwood Drive facing south towards secure access road. Cell tower is in the background.



Photograph #4 – Timberwood Drive facing south.



Photograph #5 – Fire hydrant along Timberwood Drive facing east.



Photograph #6 – Representative wooded area along Timberwood Drive. Facing south.



Photograph #7 – Low grassland south of Simonson Lumber. Facing east.



Photograph #8 - Low grassland south of Simonson Lumber. Facing southeast.



Photograph #9 – Rear of Simonsen Lumber. Facing north.



Photograph #10 – Rear of Simonsen Lumber. Facing north.



Photograph #11 – Fire hydrant and water access on Timberwood Drive. Facing east.



Photograph #12 – Fiber optic and gas line on Timberwood Drive. Facing east.



Photograph #13 – Low grassland south of Simonson Lumber. Facing northeast from Timberwood Road.



Photograph #14 – Former location of on-site buildings including the above ground storage tank. Facing east.



Photograph #15 – Cell tower access road on Timberwood Road. Facing west.



Photograph #16 – Representative image of low grassland. Facing east.



Photograph #17 – Railroad spur adjacent to Simonson Lumber. Facing north.



Photograph #18 – Low grassland south of Simonson Lumber. Facing northwest.



Photograph #19 – Wooded area along Timberwood Drive.



Photograph #20 – Adjacent businesses Simonson Lumber and Brock White Company.



Photograph #21 – Interior Brock White Company retail area



Photograph #22 – Interior Brock White Company show room.



Photograph #23 – Interior Brock White show room.



Photograph #24 – Brock White Company exterior display.



Photograph #25 – Simonson Lumber show room and retail area



Photograph #26 – Simonson Lumber outdoor storage area.



Photograph #27 – Simonson Lumber outdoor storage area.



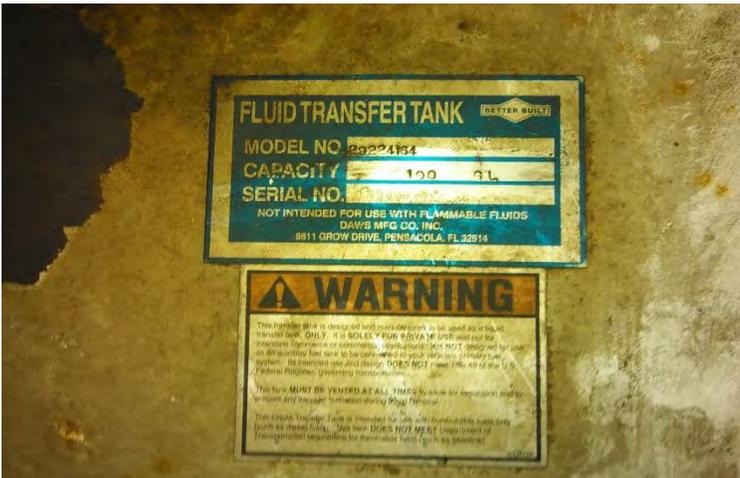
Photograph #28 – Low grassland north of Simonson Lumber. Facing northeast.



Photograph #29 – Timberwood Road and railroad crossing facing north towards Highway 210. Facing north.



Photograph #30 – 100 gallon diesel above ground storage tank in Brock White Company warehouse.

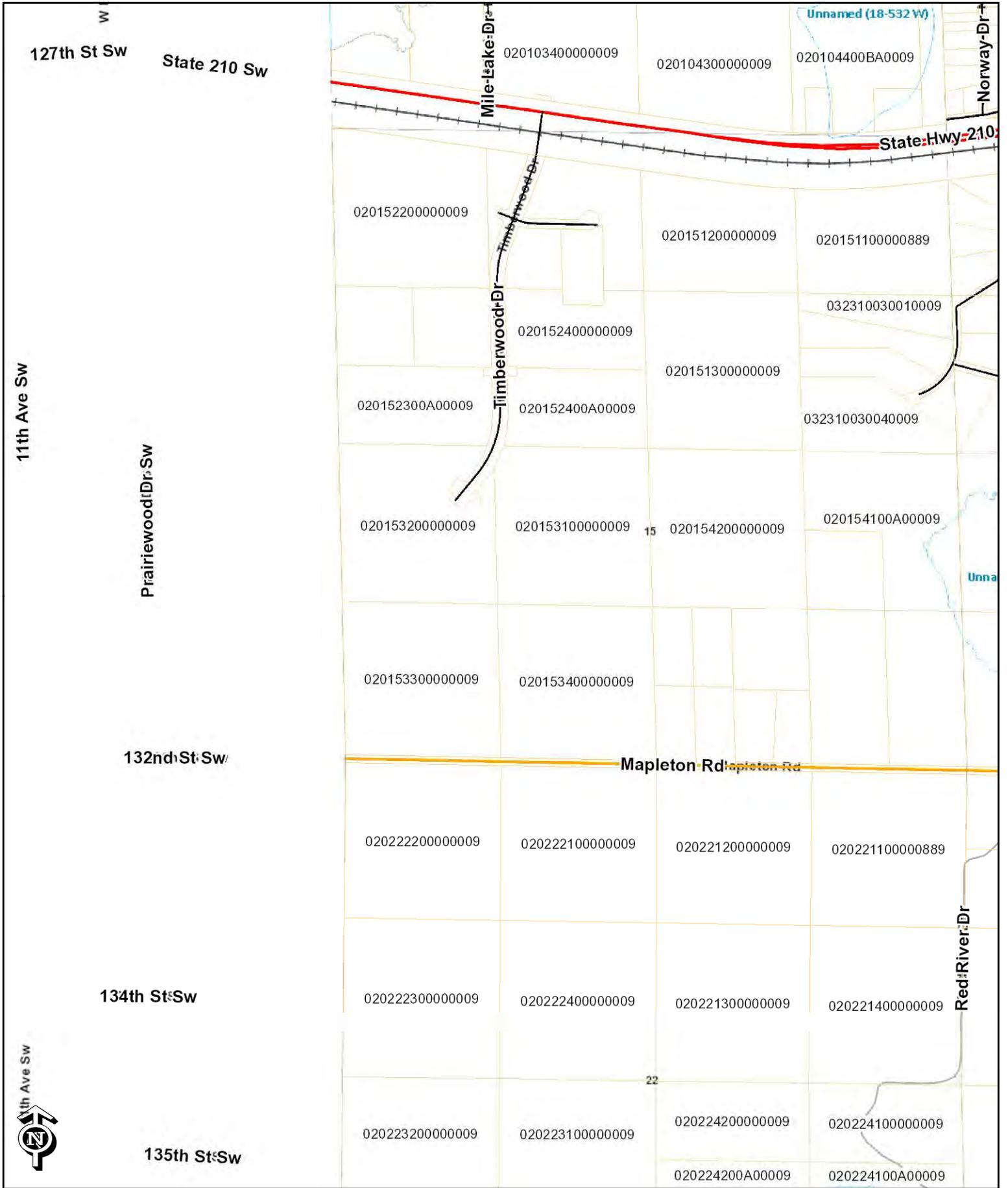


Photograph #31 – Close up of the diesel tank label at Brock White Company.



Photograph #32 – Rear entrance to property along Mapleton Road. Facing north.

APPENDIX F
PARCEL MAP



Parcel Map

These data are provided on an "AS-IS" basis, without warranty of any type, expressed or implied, including but not limited to any warranty as to their performance, merchantability, or fitness for any particular purpose.

Date: 11/5/2015 Time: 2:55:09 PM



APPENDIX G

**POTLATCH WEST BAXTER
ALTERNATIVE URBAN AREAWIDE REVIEW**

**Potlatch West Baxter
Alternative Urban Areawide Review
(AUAR)**

FINAL DOCUMENT
August 2008

Funded by the Potlatch Corporation
On behalf of the City of Baxter

Prepared By:

Hoisington Koegler Group, Inc. (HKGi),
Widseth Smith Nolting (WSN),
Wenck Associates (Wenck),
&
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Executive Summary

What is an AUAR?

An Alternative Urban Areawide Review (AUAR) is authorized under Minnesota Rules Chapter 4410.3610 as an alternative form of environmental review for development projects. Generally, the AUAR consists of one or more development scenarios, an inventory of environmental and cultural resources, an assessment of the “cumulative” impacts that the development scenarios may have on these resources as well as public infrastructure services, and a set of mitigation measures that reduce or eliminate the potential impacts generated by the development. The AUAR is intended to address the “cumulative” impacts resulting from a sequence of related development projects as opposed to an Environmental Assessment Worksheet (EAW) or Environmental Impact Statement (EIS) which simply looks at a single project’s impacts and does not attempt to outline mitigation initiatives.

Why an AUAR for this Project?

An AUAR was chosen for the Potlatch Baxter West Holdings because it will provide a better framework for:

- coordinating a number of future development projects that will occur over an extended period of time;
- identifying potential impacts on a cumulative basis;
- focusing on effective, efficient mitigation strategies; and,
- Complying with Baxter’s Comprehensive Plan which encourages small area plans and the AUAR process as part of the orderly growth and redevelopment policy.

How is an AUAR used?

An AUAR is used as a tool to help parties interested in development within the project area understand the existing environmental and cultural resources present on a site prior to initiating detailed planning and design. It is also used to identify key mitigation initiatives that must or should be undertaken to minimize negative impacts generated by proposed development.

Any proposed development in the project area would need to be reviewed for consistency with the AUAR and Mitigation Plan. If a development plan is not consistent with these documents or other statutory requirements, the developer may need to conduct additional environmental documentation or review or request an amendment to the AUAR. Natural and cultural resource inventory information in the AUAR and the Mitigation Plan will be used to guide development. Design and construction would proceed only after all approvals, permitting and appropriate agreements are complete.

Overview of the AUAR Process

The Potlatch Corporation began exploring the concept of preparing an AUAR for the project area in 2006. This was in response to a concept plan that was prepared by Hoisington Koepler Group Inc. (HKGi) in late 2005, which was reviewed by the City of Baxter's Long Range Planning Commission on September 22nd and December 1st of 2005. The recommendation from the Long Range Planning Commission and the City were to conduct further environmental review. The concept plan was in response to the land no longer serving its highest and best use due to changing land values, development and growth. The concept plan addressed an alternative land use pattern for the project area. Rather than evaluating development scenarios individually, the City desired a comprehensive look at the potential impacts to the area. The City and Potlatch agreed to follow the statutory requirements for completion of an AUAR.

The Order for Review was passed by resolution, by the Baxter City Council on March 6th, 2007 and later amended on May 15th of 2007, consistent with the requirements of Minnesota Rules Section 4410.3610, subpart 3 (**See resolutions in Appendix A**). An initial letter of introduction to the AUAR process was sent to 20 agencies to solicit relevant information to be considered in the AUAR. This letter, the list of agencies that received it and any correspondence in response to this letter is included in **Appendix B**. Letters received in response to review of the AUAR Draft are included in **Appendix C** along with the City's response to the comments. The City Council held a public hearing on September 2, 2008 and adopted the Final AUAR. The final adopting resolution is included as **Appendix D**.

Description of the Development Scenario

The AUAR document is being prepared for 465-acres located in the western part of the City of Baxter, Crow Wing County, Minnesota. The AUAR study area is currently owned by the Potlatch Corporation. The entire larger, northern portion in Section 10, T133N, R29W, is zoned for Commercial Forestry (F), while a smaller southern segment of approximately 160 acres (NW/4 Section 15) is zoned for Industrial (I) use and, though still partially wooded, also encompasses land which has been leased to a wholesale enterprise. The two segments are separated by U.S. Trunk Highway 210 (TH 210). A smaller parcel located adjacent to Moburg and Whipple Lakes (Zoned: Special Residential/Clusters) is also included in the project area.

Existing land use patterns within the project area consist of undeveloped wooded land north of TH 210 that was once used by Potlatch for timber production and lands developed (or developing) for industrial uses south of TH 210. The Potlatch AUAR analyzes two land use scenarios, one of which is consistent with the current City of Baxter Comprehensive Plan. The other land use scenario has been derived from existing plans and studies completed for the City of Baxter, Crow Wing County and the Potlatch Corporation. That scenario is based on a land use concept developed in late 2005 and reviewed by the Long Range Planning Commission. The Comprehensive Plan identifies the use of "Small Area Plans" as a tool to better define future land use scenarios. Scenario One was developed under this premise. The concept explores a variety of low to high density housing, neighborhood commercial services and industrial uses with an integrated system of passive and active open space. This scenario serves as the full build out or worse case scenario.

The City's current comprehensive plan uses existing zoning as the City's future land use plan, guiding the area R-S (Special Residential Cluster), F (Commercial Forestry) and I (Industrial Office). Therefore, specific development proposals need to be evaluated relative to the plan's polices and guidelines. Nevertheless, the following comprehensive plan polices and guidelines demonstrate consistency with Scenario One:

- The comprehensive plan's economic growth policy encourages areas for mixed use neighborhood clusters such as that illustrated in Scenario One.
- The plan promotes the strategy of working with residents, businesses, and developers to create detailed small area plans or policies for sections of the City that are likely to require redevelopment or new development in the near future, such as the Trunk Highway 210 West Corridor.
- The comprehensive plan recognizes new development and older portions of the city will, in time, need to have their current land uses evaluated to determine if those uses are meeting the needs of the community. The sites current zoning of commercial forestry, no longer best meets the needs of the community.
- The comprehensive plan encourages the use of the AUAR process to comprehensively evaluate the combined impacts of multiple new developments within a specific geographic area instead of individual reviews that fail to account for the cumulative impacts of new development.
- The comprehensive plan's residential development policy encourages development of a wide range of housing opportunities, ranging from low-density to high-density development. Scenario One demonstrates a land use pattern to achieve this range of housing options.
- The project area is currently designated as "Development Driven" in the City's 2008 Water and Sewer Capital Improvement Program. Scenario One provides a long range vision for orderly development of the area.

Scenario Two reflects a lower density land use pattern based on applying existing zoning designations and maintaining a development pattern not reliant on municipal sewer and water services for the portion of the project area north of TH 210. The portion south of TH 210 remains in a more industrial land use configuration. This scenario does not assume any future land-use changes and is considered more of a base line scenario for this AUAR.

Identification of Potential Impacts

Natural, Cultural and Physical Resources

Archaeological sites have been known to be common throughout the area, especially along the Gull River and many of the area lakes. The project area has remnants of the Old Leech Lake Road that was built in the 1850's. However, the alignment has been disturbed over the years from logging, ATV use and tree planting. The AUAR process has also identified two Native American archaeological sites. These sites have not been cleared for development and both appear to have considerable potential for yielding important information from a well preserved context.

One of the most significant natural feature within the project area is Moburg Lake. Wetlands and other natural features (woodlands and grasslands) are located throughout the area. The majority of the natural features consist of young and mature forests. Potential

development and infrastructure impacts on these resources may be mitigated through existing tools and ordinances.

A mitigation strategy is to utilize conservation design strategies such as buffers, clustering, conservation easements or other strategies to permanently protect/preserve the archaeological significant sites in the project area. An alternative to this strategy is to conduct a Phase II evaluation of cultural resources prior to final development plans if development plans include physical site alterations on the two noted archeological sites. The Phase II evaluation would be limited to those areas noted in the survey work as most likely to contain undisturbed significant cultural resources and would include an evaluation of research significance.

Municipal Infrastructure (Water and Sanitary Sewer)

Water

In 2006 the City constructed a 12-inch watermain on the north side of TH 210 to provide water service to the study area. Approximately 6,000 linear feet of watermain currently exists within the project area. The City of Baxter recently completed construction of a new water treatment facility (WTF) located at the intersection of Knollwood Drive and Mapleton Road. The facility went online in August 2007 and has a treatment capacity of 3.5 million gallons per day (MGD). Average daily water demand in 2007 is estimated to be approximately 855,000 gallon per day (gpd). With design capacity of 3.5 MGD, the available capacity during average use periods would be approximately 2.6 MGD for future development.

Sanitary Sewer

The project areas can be served with municipal wastewater collection. In 2006 the City constructed a lift station approximately 0.60 miles south of TH 210. Approximately 3,900 lineal feet of 8" and 10" PVC gravity sewer main were constructed along the proposed main access roadway alignment south of TH 210. However, at this time the wastewater collection network serves only the property south of TH 210. The existing forcemain along TH 210 was designed to handle development of the AUAR area north of TH 210. A concrete vault structure was installed on the north side of TH 210 to facilitate future forcemain connection serving the Potlatch property and other development north of TH 210.

Storm Water Management

The City of Baxter requires all new developments to retain the stormwater runoff generated by the 100-year storm event. Total estimate stormwater runoff from the 100-year storm event is 111.10 acre-ft. The runoff estimated for the existing condition is 14.32 acre-feet. The significant increase in the stormwater runoff is a direct result of increased impervious surface coverage associated with the proposed development. In order to mitigate the negative impacts associated with the increased runoff, it will be necessary to incorporate stormwater treatment facilities into the overall design.

Best Management Practices (BMPs) may also be used to handle stormwater runoff. Stormwater handling facilities and treatment alternatives acceptable to the City of Baxter include infiltration basins, wet sedimentation basins, subsurface storage and infiltration

along with swales and ditches designed in accordance with City Ordinances under its MS4 permit, NPDES regulations, and Minnesota Stormwater Manual guidelines.

Traffic Related Impacts

Based on the development scenarios and the access arrangements, it is important to address potential traffic impacts on both major roadways and local streets. In terms of major roadways, a determination was made through cooperation with Mn/DOT staff to address potential impacts at the site access intersection on TH 210 and at the intersection of TH 210 & TH 371. Given the access connections that would be made with local streets to the northeast, the following local street intersections likely would be most affected and have been identified for inclusion in the traffic analyses:

- Olivewood Drive & Cedar Scenic Road
- Memorywood Drive & Cedar Scenic Road
- Memorywood Drive & Travine Drive
- Meredith Drive & TH 210

Mitigation Initiatives

A Mitigation Plan is included at the end of the AUAR worksheet questions. The Mitigation Plan identifies key steps that the RGU will take to mitigate potential impacts identified in the AUAR. In addition to general mitigation initiatives, the mitigation plan includes strategies in the following areas:

- Land Use Management
- Surface Water Resources
- Drinking Water & Sanitary Sewer
- Storm Water Management
- Erosion Control & Sedimentation
- Cultural & Heritage Resources
- Traffic/Transportation
- Natural & Physical Resources

Alternative Urban Areawide Review (AUAR) Worksheet Form

This section consists of the Environmental Assessment Worksheet (EAW) form and response to questions as modified by Environmental Quality Board (EQB) AUAR Guidance as of April, 2005. The EAW question is shown in bold uppercase text, AUAR guidance is shown in faded italicized text, and the response to the question is shown in regular text.

AUAR Guidance as Revised by EQB staff

This guidance has been prepared by the EQB staff to assist in the preparation of AUAR documents. It is based on the directive of 4410.3610, subp. 4 that “the content and format [of an AUAR document] must be similar to that of an EAW, but must provide for a level of analysis comparable to that of an EIS for impacts typical of urban residential, commercial warehousing, and light industrial development and associated infrastructure.”

General Guidance

This guidance is based on the items of the standard EAW form (February 1999 version); the numbers listed below refer to the item numbers of that form. Except where stated otherwise, the information requested here is intended to augment (or clarify) the information asked for on the EAW form; therefore, the EAW form and the guidance booklet “EAW Guidelines” must be read along with this guidance.

The information requested must be supplied for each of the major development scenarios being analyzed, and it is important to clearly explain the differences in impacts between the various scenarios. If this guidance indicates that an EAW item is not applicable to the AUAR, the item # and its title (the text in bold print on the EAW form) should be included with an indication that the EQB guidance indicates that no response is necessary in an AUAR (as opposed to just skipping reference to that item at all).

One general rule to keep in mind throughout the preparation of the AUAR document is that whenever a certain impact may or may not occur, depending on the exact design of future developments, the AUAR should cover the possible impacts through a “worst case scenario” analysis or else prevent the impacts through the provisions of the mitigation plan. Failure to cover possible impacts by one of these means risks the invalidation of the environmental review exemption for specific development projects.

1. TITLE

Potlatch West Baxter AUAR

2. PROPOSER

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4. REASON FOR AUAR PREPARATION

This question is not applicable to the AUAR per EQB directions. However, please see the executive summary for an answer to this question.

5. LOCATION AND MAPS

- a. *The county map is not needed for an AUAR.*
- b. *The USGS map should be included.*
- c. *Instead of a site plan, include:*
 - (1) *a map clearly depicting the boundaries of the AUAR and any subdistricts used in the AUAR analysis;*
 - (2) *land use and planning and zoning maps as required in conjunction with items 9 and 27*
 - (3) *a cover type map as required for item 10. Additional maps may be included throughout the document wherever maps are useful for displaying relevant information.*

County: Crow Wing County

City: Baxter

Locations: Township 133, Range 29, Sections 10 & 15

The following figures are included within the AUAR:

Figure 5.1 - Project Location
 Figure 5.2 - AUAR Boundary
 Figure 5.3 - USGS Map
 Figure 5.4 - Zoning
 Figure 6.1 – Scenario One (Potlatch Concept Plan)
 Figure 6.2 – Scenario Two (Existing Zoning)
 Figure 9.1 – LUST & MES Sites
 Figure 10.1 – Land Cover
 Figure 10.2 – Land Cover & Scenario One
 Figure 10.3 – Land Cover & Scenario Two
 Figure 13.1 – Scenario One Watermain Improvements
 Figure 17.1 – Existing Drainage
 Figure 17.2 – Scenario One Drainage
 Figure 17.3 – Scenario One Storm Sewer
 Figure 17.4 – Scenario Two Drainage
 Figure 18.1 – Scenario One Sanitary Sewer Improvements

6. DESCRIPTION

Instead of the information called for on the form, the description section of an AUAR should include the following elements for each major development scenario included:

- anticipated types and intensity (density) of residential and commercial/warehouse/light industrial development throughout the AUAR area;*
 - infrastructure planned to serve development (roads, sewers, water, stormwater system, etc.) Roadways intended primarily to serve as adjoining land uses within an AUAR area are normally expected to be reviewed as part of an AUAR. More “arterial” types of roadways that would cross an AUAR area are an optional inclusion in the AUAR analysis; if they are included, a more intensive level of review, generally including an analysis of alternative routes, is necessary;*
 - information about the anticipated staging of various developments, to the extent known, and of the infrastructure, and how the infrastructure staging will influence the development schedule.*
- Note: the RGU must assure that the development described complies with the requirements of 4410.3610, subpart 3 (and also that it properly orders the AUAR and sets the description in that order as required by 4410.3610, subpart 3).*

The AUAR document is being prepared for 465-acres located in the western part of the City of Baxter, Crow Wing County, Minnesota. All property within the AUAR study area is currently owned by the Potlatch Forest Holdings Inc. The project area is separated into two primary segments by U.S. Trunk Highway 210 (TH 210). The larger northern portion lying north of TH 210 is currently zoned for commercial forestry and consists of lands that have been previously harvested. It also includes a residential parcel adjacent the west side of Moburg Lake zoned Special Residential Cluster. A smaller southern segment south of TH 210 is currently zoned for industrial and commercial use and, though still partially wooded, also encompasses land which has been leased to a wholesale enterprise.

It should be noted Moburg Lake is also known as Lower Whipple Lake by other agencies (i.e. the Department of Natural Resources and USGS map). From a local perspective, the lake is referred to as Moburg Lake and will be referred to as Moburg Lake throughout the AUAR.

The Potlatch West Baxter AUAR is comprised of two land use scenarios. Each land use scenario has been derived from existing plans completed for the City of Baxter, Crow Wing County and the Potlatch Corporation. This includes the City of Baxter’s Comprehensive Plan. Scenario Two is consistent with the general purpose and intent of the City of Baxter’s Comprehensive Plan.

Scenario One

Scenario one is based on a concept plan prepared by Hoisington Kogler Group Inc. (HKGi) in the Fall of 2005 (See Figure 6.1). The concept plan evolved out of several studies completed for the Baxter area for the Potlatch Corporation and under the general premise of completing a Small Area Plan as identified by the City of Baxter’s 2007 Comprehensive Plan. A starting foundation for the concept plan was to address transportation, stormwater, and park and trail needs by using policy directions established in the City’s Comprehensive Plan. Following the concept plan were two infrastructure feasibility reports that evaluated the extension of sanitary sewer, water and stormwater infrastructure to the north and southern portions of the AUAR area. The infrastructure

improvements identified in the feasibility studies envision the evolution of the project area to an urban development form with municipal utilities.

The parcel located west of Moburg Lake was not included in the original concepts prepared for the area in December of 2005. The parcel is included in the AUAR study area because it is owned by Potlatch Forest Holdings and is within proximity to the overall project area. Scenario One suggests re-guiding portions of the parcel to medium density residential (R-2). The purpose for providing medium density along the lake is to allow for greater flexibility in transferring density and development impact away from the lake shore; therefore, preserving the lakeshore ecology and aesthetics.

Scenario One guides the bulk of the northern part of TH 210 as a mixture of uses. The majority of development would consist of residential uses ranging from low density single family detached housing to medium density and higher density residential with a diversity of attached housing styles. Within the mix of residential uses would be a neighborhood scale commercial component. Typical uses could include a mixture of merchandising and non-merchandising facilities; such as small office buildings, restaurants, a post office, banks, health clubs, beauty salons and clothing apparel. This neighborhood commercial pattern is not intended to compete with the downtown or commercial core of Baxter but instead offer local services at a local neighborhood scale.

Development to the south of TH 210 would primarily consist of industrial development with an office development facing TH 210. It is assumed the majority of the proposed industrial uses would develop in an industrial park pattern. Such uses typically accommodate greater storage, warehousing and distribution area and less area devoted to employment. It is assumed office development would consist of general office uses, support services; such as, banks, savings and loan institutions, and professional offices that are of a higher typical floor area ratio and arranged in a park or campus like atmosphere. Additional related uses could include corporate headquarters, single tenant office buildings, research and development centers and businesses parks.

Scenario Two

Scenario Two is based on the City’s current zoning map designation of Commercial Forestry (See Figure 6.2). This scenario is considered consistent with the Baxter Comprehensive Plan. The land within the project area is currently zoned for three types of uses: Commercial Forestry, Special Residential Cluster and Industry Office. Each of these districts allow for a wide range of uses. In order to determine future project magnitude, several land use assumptions were made. Those assumptions are as follows:

Table 6.1. Current Zoning Standards	
Land Use	Lot Size
Commercial Forestry (CF)	1 Unit per 10 Acres (Without Public Sewer and Water)
Special Residential Cluster (RS)	1 Unit per 5 Acres (Without Public Sewer and Water)
Industry Office	20,000 Square Feet (With Public Sewer and Water) 50% lot/building coverage

- Land located north of TH 210 is zoned for commercial forestry. Under this scenario, land could develop in a residential manner at 1 unit per 10 acres with

private well and septic systems.

- On the south side of TH 210 land is zoned for industry office. Under this scenario industrial development could occur consistent with current zoning guidelines but at a lesser building coverage of 35% with city sewer and water services.

Development Staging

At this point in time, it's anticipated that development will not be fully built out for the next 30 years or more. Infrastructure improvements are currently guided by the City's 2008 Water and Sewer Capital Improvement Program and it designates the majority of this area as development driven. Consequently, it will need to be coordinated through the development review process. Regardless of when development may occur, the intent is to evaluate a full build out concept from a worse case scenario which is achieved under Scenario One. The City will consider encouraging mixed use overlay districts and Planned Use Development (PUD) as a tool to phase development. Each phase would require a conditional use permit.

Water Supply Improvements

In 2006 the City constructed a 12-inch watermain on the north side of TH 210 to provide water service to the study area. Approximately 6,000 linear feet of watermain currently exists within the project area. Additional watermains will be installed as property develops. Development of the water distribution system will follow the City's 2008 Water and Sewer Capital Improvement Program. This plan was developed by the City and is incorporated into the Comprehensive Plan to ensure adequate water supplies to future growth areas through the use of watermain looping and interconnections with existing and future watermains.

Portions of the AUAR area were studied for water improvements in 2006 by Widseth Smith Nolting (WSN). The area west of Moburg Lake was excluded from these studies. The studies, entitled "Potlatch Property Improvements South of TH 210" and "Potlatch Property Improvements North of TH 210" were accepted by the Baxter City Council on October 17, 2006.

The studies completed by the City included possible watermain layouts in conjunction with the Potlatch Concept Plan (Scenario One). Watermain and service locations will vary based on final roadway alignments utilized for future development.

Sanitary Sewer Improvements

Wastewater generated in the City of Baxter is treated at the Brainerd Public Utilities Wastewater Treatment Facility (WWTF). The City of Brainerd is currently proposing to expand the facility's capacity. At this time, it is not known when the improvements will be completed. Although the City still has 150,000 GPD in capacity, it will need to continue to evaluate capacity issues before allowing development to occur and throughout the city. In the meantime, the City is under taking extra ordinary efforts to reduce fats, oils and grease discharged into the sanitary sewer system.

Based on Scenario One, there will be the need to provide additional sanitary sewer collection lines. Approximately 27,500 lineal feet of new 8" and 10" pipes would be necessary. In order to accommodate these improvements an additional lift station and force main would be required. These improvements would entail the lift station to be

approximately 25' in depth and include approximately 2,000 lineal feet of force main. These anticipated improvements will be installed as property develops.

Electrical Service Improvements

Electrical service improvements will need to be expanded as development occurs in the project area. Crow Wing Power provides services to this area. Planning for growth is generally based on plans submitted and discussions with City staff. In general, the infrastructure needed to provide electrical services can be placed in public right-of-way. There also may be the need for small structures and electrical boxes which are usually placed within utility easements. These improvements will be part of the planning process and will be coordinated with Crow Wing Power. Early discussions with Crow Wing Power representatives will ensure that they are aware of the AUAR. As mentioned previously, there is sufficient room in the public right-of-way for electrical power improvements and other necessary improvements.

Transportation Improvements

Transportation planning in the project area is being done in collaboration with the City, Crow Wing and Cass County, Burlington Northern Rail Road and the Minnesota Department of Transportation (MN/DOT). The AUAR identifies future roadways connecting to the existing transportation system to accommodate projected development. As part of the AUAR process, traffic generation was estimated and modeled in the area to determine long term impacts on the roadway network and to identify future planning needs. As the project area develops, improvements to the transportation system will be needed to accommodate an expected increase in traffic volumes. Transportation system improvements will include acquisition of road right-of-way and construction of new roads (including a railroad crossing), reconstruction and upgrading of existing roads and development of future traffic management devices such as traffic signals and signage. Responsibility for these improvements will be dependent upon the roadway jurisdiction. For local road improvements the responsibility is the City of Baxter.

Mn/DOT's long-range plans for TH 210 envision a westerly extension of the existing four-lane divided design that presently ends just west of Memorywood Drive. This vision would involve upgrading the existing two-lane design to a four lane divided design west to Cass County Highway 18. However, based on Mn/DOT's Draft FY 2009-2018 Highway Investment Plan and current funding levels, Mn/DOT has no specific plans for this upgrading of TH 210 by 2030. Thus, traffic analyses for this AUAR are based on existing conditions for TH 210 and TH 371.

Stormwater Improvements

Stormwater improvements were determined by a 100-year storm event. The City of Baxter requires a 100-year design for all new stormwater treatment facilities. As development occurs, additional impervious surface coverage will occur with the development. In order to address the stormwater runoff, it will be necessary to incorporate storm water treatment facilities. Stormwater handling facilities and treatment alternatives acceptable to the City of Baxter include infiltration basins, wet sedimentation basins, subsurface storage and infiltration along with swales and ditches designed in accordance with NPDES regulations and Minnesota Stormwater Manual guidelines.

Development plans and detailed design will dictate the exact location of each treatment facility.

Parks and Open Space

The City's Comprehensive Plan emphasizes the amenity value and identity that parks and open spaces bring to neighborhoods and the community as a whole. In an attempt to satisfy this policy, the AUAR identified about 46 acres of land to be used for parks, open spaces, and stormwater ponding. This includes passive open spaces as well as proposed community/neighborhood parks.

7. **PROJECT MAGNITUDE DATA**

The cumulative totals of the parameters called for should be given for each major development scenario, except that information on "manufacturing," "other industrial," "institutional," and "agricultural."

Scenario One Project Magnitude

Under Scenario One, development assumptions include approximately 1,150 new housing units and approximately 1.3 million square feet of industrial development, 298,000 square feet of office space (south of TH 210) and 268,000 square feet of neighborhood commercial retail and services (north of TH 210). These estimates are based on assumptions for lot size and lot coverage as determined through applying applicable zoning designations from the current zoning code, current market forces and standard site planning criteria. These estimates assume a full build out scenario.

In determining project magnitude, a set of assumptions were applied to both scenarios to establish the total net developable area. These assumptions are as follows:

- Adequate right-of-way to accommodate future roadways (collectors and arterials) was provided.
- Adequate open space for parks and recreational opportunities was provided.
- Identified wetlands within the project area were provided.

As a result of these assumptions, land areas were extracted from the developable area resulting in the net developable area.

Table 7.1. Scenario One Land Use and Development Projections

Land Use	Net Developable Acres	Square Footage	Number of Units	Density (units per acre) or Floor Area Ratio
Low Density Residential (R-1)	127.35	-	382	3.00
Medium Density Residential (R-2)	51.74	-	362	7.00
High Density Residential (R-3)	20.17	-	403	20.00
<i>Sub Total:</i>	199.27	-	1,147	5.76
Commercial/Industrial				
Neighborhood Commercial (C-1)	30.87	268,927.24	-	0.20
Industrial (I)	87.46	1,333,428.88	-	0.35
Office (OS)	27.35	297,880.70	-	0.25
<i>Sub Total:</i>	145.68	1,900,236.83	-	-
Park/Open Space				
Park / Open Space	25.01	-	-	-
Right-Of-Way	73.56	-	-	-
Stormwater Ponding	3.43	-	-	-
Wetland	17.77	-	-	-
<i>Sub Total:</i>	119.77	-	-	-
Total:	464.72	1,900,236.83	1,147	-

*Assumptions are derived from a combination of sources including the "Potlatch Property Improvements North of TH 210 Feasibility Report" dated October 3, 2006, the City of Baxter Zoning Code, existing development projects, 2003 Traffic Plan for Baxter Industrial Park. The assumptions represent a reasonable development magnitude consistent with the Baxter Zoning Code.

Scenario Two Project Magnitude

The intent for Scenario Two is to develop in a manner that is consistent with the city's comprehensive plan and zoning regulations as they stand today. If development occurs in this fashion or in a similar manner, the project area could support approximately 30 residential lots (**See Table 7.2**). With the required 20,000 square foot lots and assuming 35% lot coverage, the concept assumes roughly 1,900,000 square feet of new industrial development. It should be noted that the zoning code allows up to a 50% lot coverage; however, achieving a 50% lot coverage is unlikely do to the need/desire for surface parking, landscaping, on-site storm water management and other site improvements. 35% lot coverage is also more reflective (if not on the high side) of typical commercial/industrial development patterns.

Table 7.2. Scenario Two Land Use and Development Projections

Land Use	Net Developable Acres	Square Footage	Number of Units	Density (units per acre) or Floor Area Ratio
Commercial Forestry (CF)	207.25	-	20	0.10
Special Residential Cluster (RS)	50.30	-	10	0.20
<i>Sub Total:</i>	257.55	-	30	-
Industrial				
Industrial	123.90	1,888,929.09	-	0.35
<i>Sub Total:</i>	123.90	1,888,929.09	-	-
Park / Open Space				
Park / Open Space	11.27	-	-	-
Right-Of-Way	54.23	-	-	-
Wetland	17.77	-	-	-
<i>Sub Total:</i>	83.27	-	-	-
Total:	464.72	1,888,929.09	30	-

* Assumptions are based on the maximum number of units allowed under the City's Zoning Ordinance for residential development and consistent with Scenario One for non-residential development.

8. PERMITS AND APPROVALS REQUIRED

A listing of major approvals and public financial assistance and infrastructure likely to be required by the anticipated types of development projects should be given. This list will help orient reviewers to framework that will protect environmental resources. The list can also serve as a starting point for the development of the implementation aspects of the mitigation plan to be developed as part of the AUAR.

Table 8.1 presents a list of known local, state, and federal permits and approvals. The specific permits and approvals needed will depend on the type and magnitude of a particular development project. Additional consultation with city and agency staff will be needed to clarify whether a permit or approval is necessary.

Table 8.1 Permits and Regulatory Review/Approvals

Unit of Government	Permit or Approval	Status
Federal		
U.S. Army Corps of Engineers	Section 404 Permit(s)	To be applied for
U.S. Army Corps of Engineers	Letter of No Wetlands Jurisdiction	To be applied for if needed
State		
MN Department of Health	Plan Review	
MN Department of Health	Sanitary Sewer Extension Permit Approval	To be applied for

Unit of Government	Permit or Approval	Status
MN Department of Health	Water Main Extension Approval	To be applied for
MN Department of Health	Approval of Well & Boring Sealing Records (if required)	To be applied for
Minnesota Department of Natural Resources	Natural Heritage Program Consultation	Complete
Minnesota Department of Natural Resources	Dewatering Permit(s)	To be applied for
Minnesota Department of Natural Resources	Water Appropriation Permit(s)	To be applied for
Minnesota Department of Natural Resources	Public Waters Work Permit(s)	To be applied for if needed
Minnesota Department of Natural Resources	Crossing Public Waters/Lands	To be applied for
MN DNR Division of Waters	Water Appropriation Permit(s)	To be applied for
MN State Historic Preservation Office	Cultural Resources Review	To be applied for
MN Office of State Archaeologist	Historic and Archaeological Clearance	To be applied for
MN Pollution Control Agency	NPDES/SDS General Permit	To be applied for
MN Pollution Control Agency	Sanitary Sewer Extension Permit	To be applied for
MN Pollution Control Agency	Section 401 Certification or waiver	To be applied for if needed
County & Local		
Crow Wing County	Contiguous Plat Review/Plan Review (for parcels adjacent to County Roads)	To be applied for
Crow Wing County	County Road Access Permit	To be applied for
Crow Wing County (SWCD)	WCA Permits/Determinations	To be applied for
City of Baxter	AUAR decision and adopt Mitigation Plan	In process
City of Baxter	Preliminary & Final Plat Approvals	To be applied for
City of Baxter	Building Permit(s) & Architectural Review for C&I's and PUDs	To be applied for
City of Baxter	Subdivision Approval(s)	To be applied for
City of Baxter	Grading Permit(s)	To be applied for

Unit of Government	Permit or Approval	Status
City of Baxter	Water Connection Permit(s)	To be applied for
City of Baxter	Sewer Extension Permit(s)	To be applied for

9. LAND USE

Describe current and recent past land use and development on the site and on adjacent lands. Discuss project compatibility with adjacent and nearby land uses. Indicate whether any potential conflicts involve environmental matters. Identify any potential environmental hazards due to past site uses, such as soil contamination or abandoned storage tanks, or proximity to nearby hazardous liquid or gas pipelines.

- *Discuss past and current land use at the project’s site.*
- *Generally, “proximity” means within a mile or so of the project; however, the distance can be greater in specific instances.*
- *If a site assessment for past contamination has been done, include a brief summary of the results.*
- *Discuss what is adjacent to the site (all directions).*
- *Note any nearby features of concern, including areas where vulnerable populations live or visit such as a nursing homes, schools, day care centers, water resources, parks, etc.*
- *Indicate the distance and direction to the nearest residential receptor. Since air and water contamination can potentially travel in any direction, please include all residential areas surrounding the site. You may need to contact the city or county in which the project is location for information.*

North of TH 210

The project area located north of TH 210 primarily consists of wooded land, open meadow areas and two wetlands. This portion of the project area has primarily served as timber production. Adjacent land uses have developed over time and primarily consist of low density residential (1-3 units per net acre) and special residential cluster uses (1 unit per 5 acres). To the east, north of TH 210 (approximately 1 mile) is the Baxter Elementary School (ISD #181). Land located to the north-east (approximately 1/2 mile) is Baxter’s public beach located on Whipple Lake.

There are no sites listed in the Minnesota Pollution Control Agency’s (MPCA) Leaking Underground Storage Tank (LUST) database on the north side of TH 210 (See **Figure 9.1**). The MPCA also maintains a historical database, the Master Entity System (MES), containing information on potential soil and ground water contamination sites in Minnesota. There are no MES sites identified on the north side of TH 210 (See **Figure 9.1**).

South of TH 210

The project area located south of TH 210 has primarily consisted of industrial uses and continues to serve those uses. Adjacent uses to the south are zoned for commercial forestry. To the east, land uses primarily consist of low density residential (1-3 units per net acre) and special residential cluster uses (1 unit per 5 acres). Land located to the east (approximately 1 mile) is the City’s Southdale Park. To the west in Cass County, adjacent uses consist of residential units (1 unit per 2.5 acres).

There are no sites listed in the Minnesota Pollution Control Agency’s (MPCA) Leaking Underground Storage Tank (LUST) database. According to the MES database, **Figure 9.1**

shows a demo land fill, the only site from the MES that was identified within the project area. The site is classified as an “Unpermitted Dump Site.” These sites can include abandoned dumps, demolition sites, tree disposal sites, industrial dumps and other dumps. Most of these sites existed prior to the creation of the MPCA in 1967, and detailed information about them is not generally available. When these sites are investigated and found to present a risk to human health or the environment, they are moved into the appropriate cleanup program. Further investigation of this site is needed to determine the risk to human health or environment and what mitigation is necessary prior to development.

10. COVER TYPES

The following information should be provided instead:

a. cover type map, at least at the scale of a USGS topographic map, depicting:

-wetlands – identified by type (Circular 39)

-watercourses – rivers, streams, creeks, ditches

-lakes – identify protected waters status and shoreland management classification

-woodlands – breakdown by classes where possible

-grassland – identify native and old field

-cropland

-current development

b. an “overlay” map showing anticipated development in relation to the cover types; this map should also depict any “protection areas,” existing or proposed, that will preserve sensitive cover types.

Separate maps for each major development scenario should generally be provided.

Figure 10.1 is cover type map of the project area. The cover types shown on the map include wetlands identified by Circular 39 Type, watercourses, lakes, woodlands, grassland/brushland, cropland, and current developments. **Figure 10.2** is an overlay map showing anticipated development from Scenario One, and **Figure 10.3** is an overlay map showing anticipated development from Scenario Two. Also shown on the figures are protection areas that designate sensitive cover type areas that will be protected.

Northwest Block of Project Area.

This portion of the Baxter AUAR project area consists of a tract of forested upland that is located adjacent to and west of Moburg Lake. It is approximately 50 acres in size. A field inspection of the site was completed on August 14, 2007 to observe existing conditions and to compile a list of plant species. This area consists almost entirely of a uniform stand of planted red pines (*Pinus resinosa*), except for a narrow buffer of mature trembling aspen (*Populus tremuloides*) and big-toothed aspen (*Populus grandidentata*) that was left unharvested along the west shoreline of Moburg Lake. The red pines are 40 to 50 feet in height and are probably 30 to 40 years in age. A few other tree species were found within the red pine stand. These species included jack pine (*Pinus banksiana*), paper birch (*Betula papyrifera*), red oak (*Quercus rubia*), bur oak (*Quercus macrocarpa*), trembling aspen, and big toothed aspen. Most of the red oaks in the stand were scrubby, multiple-trunked, and shorter than the other trees. The understory and ground layers were generally quite open throughout the stand. Subcanopy and shrub layer species included juneberry (*Amelanchier* spp.), pincherry (*Prunus pennsylvanica*), chokecherry (*Prunus virginiana*), and American hazel (*Corylus americana*). Common ground layer species included bracken fern (*Pteridium aquilinum*), wild sarsaparilla (*Aralia nudicaulis*), blackberry (*Rubus* sp.), blueberry (*Vaccinium* sp.), and common vetch (*Vicia americana*). Except for a few narrow

hiking and old vehicle trails, no forest openings were found in the stand. If any openings were once present, they were probably converted when the existing woodland was harvested and replanted.

The west shoreline of Moburg Lake forms the east boundary of the Baxter AUAR in this portion of the study area. The planted red pine stand to the west of Moburg Lake is located on a terrace that is perhaps 10 feet higher than the lake level. The slope down to the lake was fairly abrupt along most of shoreline. The shoreline, however, was level, sandy, and contained vegetated and nonvegetated areas. In some locations the shoreline was 100 feet in width and wider. It showed some disturbance due to all terrain vehicle use. Some willows (*Salix* spp.) grew in the area, but most of the vegetation was herbaceous. Common plant species included boneset (*Eupatorium perfoliatum*), flat-topped goldenrod (*Solidago* (cf) *graminifolia*), mint (*Mentha arvensis*), bugleweed (*Lycopus americanus*), sow thistle (*Sonchus arvensis*), smartweed (*Polygonum* sp.), lobelia (*Lobelia* cf *kalmii*), horsetail (*Equisetum* sp.), sedges (*Carex* spp.), and woolgrass (*Scirpus cyperinus*). A few patches of cattails (*Typha* spp.) grew in depressional areas and along beaver channels connecting the upland to the deeper portions of the basin. Except for the species documented along the shoreline, the emergent and submergent vegetation in Moburg Lake was not surveyed. MNDR lake maps show that the maximum depth of Moburg Lake is seven feet in some areas. Although the water level of the lake was low when inspected in August of 2007, the basin appeared to be a fairly typical shallow game lake with Type 3/Type 4/Type 5 wetland characteristics.

Project Area North of TH 210

The largest contiguous block of land within the Baxter AUAR is located adjacent to and north of TH 210. It is approximately 242 acres in size. A site walkover was completed on this portion of the property on August 8, 2007. The majority of this tract consisted of upland wooded or partially wooded area. The original cover type in the area was probably a mixture of jack pine, red oak, trembling aspen, and large toothed aspen. Most of the interior of this section of the study area appeared to have been harvested within the past 10 to 20 years. Unharvested buffer areas were generally left near the property boundaries and along highways, residential areas, wetlands, and along the two shallow lakes bordering the northwest portion of the area. Portions of the harvested areas were replanted with red pines, but sizable areas were left unplanted. American hazel was ubiquitous and extensive patches appeared to be thriving in the open areas. Interestingly, beaked hazel (*Corylus cornuta*), a fairly common species in the project vicinity, was not found on the site. Scattered trees and groups of trees grew throughout the cutover area. Tree species were predominantly red oak, jack pine, and trembling aspen. Some paper birch, willow, chokecherry, bur oak, and pin cherry were also found. With regard to plant species, a stronger prairie influence was noticeable in the open and semi-open areas. A number of grasses and herbaceous species were found, including big bluestem, Indian grass, switch grass (*Panicum virgatum*), leadplant (*Amorpha canescens*), wild bergamot (*Monarda fistulosa*), purple prairie clover (*Petalostemum purpureum*), and harebell (*Campanula* sp.). Herbaceous species that were observed included common mullein (*Verbascum thapsus*), common yarrow (*Achillea millifolium*), sage (*Artemisia ludoviciana*), ragweed (*Ambrosia artemisiifolia*), wild sarsaparilla, and blueberry. A small, sandy, mostly unvegetated area was present near the center of the cutover area. This area was rutted by vehicle use, probably by all terrain vehicles. The area was centrally located and may have been used as a timber landing when the site was harvested. Species in the disturbed area included

barnyard grass (*Echinochloa crus-galli*), witchgrass (*Panicum cf cappillare*), giant foxtail (*Setaria faberii*), and sow thistle (*Sonchus sp.*).

A fairly large wetland basin was located adjacent to and north of TH 210 in this portion of the project area. The wetland had mostly Type 6 scrub-shrub characteristics around the edges, but it may have been wetter near the center, especially during normal precipitation years. Common species around the upland edges included trembling aspen, speckled alder (*Alnus rugosa*), willows, and spiraea or meadow sweet (*Spiraea alba*). Other species in the area included reed canary grass (*Phalaris arundinacea*), Canada bluejoint grass (*Calamagrostis canadensis*), woolgrass, and various sedges. Herbaceous species included goldenrod (*Solidago sp.*), flat topped white aster (*Aster cf umbellata*), boneset, mint, blue flag iris (*Iris versicolor*), smartweed, lobelia, raspberry (*Ribes sp.*), sensitive fern (*Onoclea sensibilis*), marsh fern (*Thelypteris palustris*), and closed gentian (*Gentiana andrewsii*).

Project Area South of TH 210

The project area to the south of TH 210 was surveyed on August 14, 2007. This area contained a mixture of wooded and open areas and was generally more disturbed than other parts of the AUAR site. The area showed evidence of more intensive land uses that were probably related to the various historical Potlatch operations on the site. Disturbed areas included old roadbeds and wood storage areas. Common tree species in the area included bur oak, red oak, jack pine, trembling aspen, and large toothed aspen. Young dense stands of trembling aspen grew in some areas just south of the Burlington Northern railroad tracks. Patches of American hazel were common throughout the property. Some of the openings on the site contained prairie species such as big bluestem and Indian grass. A relatively undisturbed Type 6 scrub shrub wetland was present on the southwest corner of the project site.

Table 10.1 Estimated Existing Land Cover Types

Land Cover	Acres
Industrial Development	8.89
Grassland	44.92
Grassland/Brush	24.42
Mature Forest (Hardwood)	11.08
Mature Forest (Mixed)	124.14
Mature Forest (Softwood)	73.24
Railway	3.57
Roadway	13.92
Wetland (Type 6)	10.08
Young Forest (Mixed)	149.98
Total:	464.23

11. FISH, WILDLIFE, AND ECOLOGICALLY SENSITIVE RESOURCES

a. The description of wildlife and fish resources should be related to the habitat types depicted on the cover types maps (of item 10). Any differences in impacts between development scenarios should be highlighted in the discussion.

b. For an AUAR, prior consultation with the DNR Natural Heritage program for information about reports of rare plant and animal species in the vicinity is required.

If such consultation indicates the need, an on-site habitat survey for rare species in the appropriate portions of the AUAR area is required. Areas of on-site surveys should be depicted on a map, as should any "protection zones" established as a result.

Scenario One

The vegetation/wildlife habitat types present on the AUAR property consist primarily of jack pine/red oak/aspen woodlands, brushy/open areas dominated by species such as American hazelnut and various prairie grasses, and wetland areas. The majority of the wildlife species (mammals, birds, reptiles, and amphibians) that utilize these habitat types for food and cover would be the common species found in the Baxter/Brainerd area. A comprehensive list of the typical species occurring in Crow Wing County is not included here. For information regarding uncommon or rare species, please see the discussion in the following section and the MDNR Heritage Section comments.

The habitat types that would be impacted the most by the full build-out of Scenario One (1,578 housing units and 2.46 million sq. ft. of commercial/industrial/office space) would be the loss of most of the upland habitats (pine/oak/aspen woodlands and brushy/open areas) in the project area. The remaining habitat would consist of smaller and fragmented areas. This habitat loss would impact the wildlife species that utilize upland areas and would result in corresponding declines of these species. Wetland habitats would be less impacted because of the restrictions of development in wetlands areas. As a result, wildlife and fish that utilize wetland areas would be less impacted by the full development scenario. However, many species of wildlife, especially amphibians and some reptiles, utilize both upland and wetland habitat for portions of their life cycles. For example, turtles may spend the majority of their life cycle in or very close to wetland areas, but then move considerable distances through upland areas to lay eggs. Many amphibians may spend much of their life cycles in upland areas, but lay their eggs in the shallow water of wetland areas. Although full development of the AUAR property would eliminate most existing wildlife habitat on the project area, some habitat fragments and remnants would likely remain. The typical wildlife species that are able to live and persist in suburban areas would be expected to utilize these areas. Species that are not adaptable to fragmented and edge type habitats would be eliminated. The long-term result of full build out of the proposed project would be the loss of the habitats and wildlife that utilize them.

Scenario Two

The impacts on wildlife and fish from Scenario Two would be less than those caused by Scenario One. Scenario Two would result in less intensive development. Unless specific conservation design policies were established and implemented, it is expected that land use changes would eventually have significant impacts on this undeveloped forest area. Conservation design principles could be used to lessen environmental impacts of both scenarios.

MDNR Natural Heritage Database Review.

A search of the MDNR Natural Heritage Program database was requested to determine whether any rare plant or animal species or other significant natural features are known to occur within an approximate one-mile radius of the proposed project site. Data was received on October 23, 2007 (License Agreement #451) from the MDNR. In addition, the Minnesota County Biological Survey for Crow Wing County has been completed by MDNR. As shown on the MDNR website, the county map and report are not yet available. However, the survey findings are provided to the Natural Heritage Section for inclusion in the rare species and sensitive resources database.

A project review letter was also requested by the MNDR and was received on December 20, 2007 (**See Appendix G**). After reviewing the letter and the Natural Heritage database there is the potential project impacts to Blanding turtles (*Emydoidea blandingii*). The proposed project is within the Blanding's turtle priority area. The Blanding's turtle is a state listed threatened species and unlisted federal species.

With regard to the Blanding's turtle, there are numerous records within the project area, and it is possible that future development would affect this species at the population level if appropriate mitigation measures are not incorporated into the proposed project plan. Because the entire project area is within the Blanding's turtle priority area, an area of statewide importance to the species, greater protection for turtles is warranted. The most desirable mitigation measures would be the protection of habitat. Blanding's turtles typically require both upland and wetland habitats to survive. They normally lay their eggs in sandy upland areas and they may travel considerable distances to find appropriate nesting areas. They overwinter in wetland areas. The primary threat to Blanding's turtles is probably habitat loss from the conversion of undeveloped upland areas to developments and/or agricultural use.

Vehicle-caused mortality is a second major threat that results from their need to travel between wetland and upland areas. This type of mortality can be mitigated somewhat by the use of specially designed culverts under roadways, curbing that is gradual and not vertical and similar measures. However, habitat preservation is of primary importance.

There are other measures that may be helpful in the event that Blanding's turtles are encountered on or near a project site. For example, illustrational flyers, informational fact sheets, and lists of recommendations for avoiding and minimizing impacts to this rare turtle are available and can be distributed. One list contains recommendations that apply to all areas inhabited by Blanding's turtles. This information, the flyer, and the fact sheet can be given to contractors working on a project site as well as other individuals who live near or are spending time at a site. A copy of a flyer and fact sheet, along with mitigation measures have been provided by the MDNR as part of the Natural Heritage review (**See Appendix G**).

Comparison of Impacts Resulting from Scenario One and Scenario Two.

Scenario One would result in a full build out and higher loss of wildlife habitat. The full build out of Scenario Two would result in less impacts to fish and wildlife and their habitats. With regard to Blanding's turtles, a full build out under scenario one, without substantial mitigative measures including habitat protection, would likely result in the loss of most of the Blanding's turtle population in this portion of the City. In order to ensure

there is minimal or no impact to the Blanding turtle population, mitigation measures are highlighted in the Mitigation Section of the AUAR.

12. **PHYSICAL IMPACTS ON WATER RESOURCES**

The information called for on the EAW form should be supplied for any of the infrastructure associated with the AUAR development scenarios, and for any development expected to physically impact any water resources. Where it is uncertain whether water resources will be impacted depending on the exact design of future development, the AUAR should cover the possible impacts through a “worst case scenario” or else prevent impacts through the provisions of the mitigation plan.

Scenario One

No dredging, filling, stream diversion, outfall structure, diking, and impoundment of any surface waters such as a lake, pond, wetland, stream, or drainage ditch are expected. Scenario one is anticipated to have a greater degree of diminimus fill as a result of the greater intensity of development and impervious surface.

Scenario Two

No dredging, filling, stream diversion, outfall structure, diking, and impoundment of any surface waters such as a lake, pond, wetland, stream, or drainage ditch are expected.

13. **WATER USE**

If the area requires new water supply wells specific information about that appropriation and its potential impacts on groundwater levels should be given; if groundwater levels would be affected, any impacts resulting on other resources should be addressed.

Public Water Supply

The City of Baxter regulates development through the use of local regulations known as Ordinances. The “Adequate Facilities Ordinance” will not allow any property located within the AUAR boundary to be developed under Scenario One without City sewer and water service. In 2006 the City constructed a 12-inch watermain along the north side of TH 210 to provide water service to the study area. The total amount of existing watermain located within the AUAR is 6,000-feet. Additional watermains will be installed as property develops. Development of the water distribution system will follow the City’s Capital Improvement Program that is amended annually. This plan was developed by the City to ensure adequate water supplies to future growth areas through the use of watermain looping and interconnections with existing and future watermains.

Portions of the AUAR area were studied for water improvements in 2006 by Widseth Smith Nolting. Only the area located west of Moburg Lake was excluded from these studies. The studies entitled “Potlatch Property Improvements South of TH 210” and “Potlatch Property Improvements North of TH 210” were accepted by the Baxter City Council on October 17, 2006.

The studies completed by the City included possible watermain layouts as related to the Potlatch Concept Plan completed in December of 2006 by HKGi. Watermain and service locations will vary based on final roadway alignments utilized for development.

Water Treatment

The City of Baxter recently completed construction of a new water treatment facility (WTF) located at the intersection of Knollwood Drive and Mapleton Road. The facility

went online in August 2007 and has a treatment capacity of 3.5 million gallons per day (MGD). The current treatment consists of the following:

- Tray Aeration
- Detention for chemical addition and oxidation
- Rapid-Rate Filtration (Manganese Greensand, 4 units, 288 ft² each, 3 gpm / sq ft)
- Chemical Addition (Chlorine, Flouride, Phosphate)
- Finish water storage in clear well and elevated towers

Prior to construction of the new facility, the City of Baxter maintained two treatment facilities. Treatment Plant #1 is located on Industrial Park Road while Treatment Plant #2 is located at the intersection of CSAH 48 and Mountain Ash Drive. Both facilities are currently out of service and will likely be demolished. The City may reuse the building at CSAH 48 and Mountain Ash Drive.

Average daily water demand in 2007 is estimated to be approximately 855,000 gallon per day (gpd). With design capacity of 3.5 MGD, the available capacity during average use periods would be approximately 2.6 MGD for future development.

Criteria used for design of the WTF included a peaking factor of 2.3. Applying the peaking factor to the estimated average daily water demand in 2007 results in an estimated peak day of 1,967,000 gallons. With design capacity of 3.5 MGD, the available capacity during these peak days would be approximately 1.5 MGD.

Water Supply

Water for the new WTF is obtained from four groundwater wells located near the facility. Two of the wells were installed in 2006 and two were installed in 2007; each has a capacity of 700 gpm. Total capacity of all wells is 2,800 gpm with a capacity of 2,100 gpm with the largest well out of service. The City will be installing one or two additional wells in the near future to minimize concerns related to maintenance on individual wells and to increase longevity of the well pumping equipment. The following is a summary of the four wells currently utilized:

Number	Unique Well #	Diameter	Capacity (gpm)
1R	752207	12"	700
2R	741694	12"	700
3	733067	12"	700
4R	755208	12"	700

Prior to construction of the new facility and wells, the City of Baxter maintained one well near Treatment Plant #1 on Industrial Park Road and two wells near Treatment Plant #2 at the intersection of CSAH 48 and Mountain Ash Drive. These three wells are currently in the process of being abandoned.

In addition to the wells, the City of Baxter maintains two interconnections with the City of Brainerd’s water system, one of which is metered while the other is used for emergency

cases and is not metered. In emergency cases or during peak day demand periods these interconnections can be opened and water can be shared between the two communities.

Water Appropriations

Under Baxter’s 2006 DNR Water Appropriation Permit No. 1984-3178, the City is authorized to pump a total of 300 Million Gallons per Year (MGY). In 2006 the City pumped a total of 246 MG. Based on sales, water use in 2006 was comprised of the following:

- Residential 129 MG
- Commercial / Industrial 190 MG
- Other 9 MG

It should be noted that the above consumption exceeds the amount pumped. The difference is accounted for by water purchased from the City of Brainerd. No data for 2007 is currently available as Baxter is currently in the process of completing their Water Emergency and Conservation Plan and appropriations permit for 2007.

Future Water Demands – Citywide

Future water demands for the City of Baxter have been estimated as part of the “Water Treatment System Concept Study” prepared by Advanced Engineering and Environmental Services in March of 2004. Criteria used to project future water demands included:

*Note: gpd - denotes gallons per day
MGD - denotes million gallons per day*

- Population Growth Rate: 4.5%
- Average Day Demand: 120 gallons per person per day
- Peaking Factor: 2.3

Using the above criteria, Advanced Engineering and Environmental Services estimated the year 2030 average day water demand at 2.497 MGD with an estimated peak flow of 5.742 MGD

Scenario One

Estimating future water flows is difficult due to the number of assumptions necessary. Irrigation for instance, which is required by the City of Baxter’s commercial landscaping standards, poses challenges to estimating future water flows since use is weather dependant. For purposes of this AUAR document, water demands were estimated based on the same criteria used by Advanced Engineering and Environmental Services in preparation of a water system model for the City of Baxter. The following criteria were noted:

- Residential Household Density: 2.8 persons per dwelling unit
- Low Density Water Demand: 85 gallons per capita per day
- Medium Density Water Demand: 85 gallons per capita per day
- High Density Water Demand: 60 gallons per capita per day

Commercial / Office Service Water Demands:	580 gallons per acre per day
Industrial Water Demands:	500 gallons per acre per day
Peaking Factor:	2.3

Estimated average daily water demand from full development of property within the AUAR boundary utilizing Scenario One was calculated as follows:

Low-Density Residential:	382 units @ 238 gpd per unit = 90,916 gpd
Medium-Density Residential:	362 units @ 238 gpd per unit = 86,156 gpd
High-Density Residential:	403 units @ 168 gpd per unit = 67,704 gpd
Neighborhood Commercial:	30.87 acres @ 580 gpd per acre = 17,905 gpd
Office Service:	27.35 acres @ 580 gpd per acre = 15,863 gpd
Industrial:	87.24 acres @ 500 gpd per acre = 43,620 gpd
Parkland:	Negligible water use anticipated

Total estimated average daily demand at full development: 322,164 gpd = 0.322 MGD
 Total estimated peak daily demand at full development: 0.741 MGD

Based on Scenario One, the estimated amount of new 6”, 8”, 10” and 12” watermain to be installed in the AUAR is 33,600-feet (See Figure 13.1).

The Potlatch property within the AUAR boundary accounts for an average daily demand increase of 322,164 gpd with estimated daily peak use of 741,100 gpd. This calculates to approximately 12% (0.322/2.6) of the average daily available capacity and 49% (0.741/1.5) of the peak day available capacity being utilized by development of the Potlatch property using Scenario One.

Full development of the Potlatch property within the AUAR boundary using Scenario One does not create concerns related to current water supply or production capacities in the City of Baxter and no modifications to the treatment facility or additional wells will be required. Projected water use from the development is well within the current supply and production capacities and development of the area has been included in prior water use forecasting by the City of Baxter in design and development of current production and treatment facilities.

Scenario Two

As with the previous scenario, water use was based on criteria used by Advanced Engineering and Environmental Services in preparation of a water system model for the City of Baxter. Estimated water use from full development of property within the AUAR boundary utilizing Scenario Two was calculated as follows:

*Note: gpd - denotes gallons per day
 MGD - denotes million gallons per day*

Commercial Forestry:	20 units @ 238 gpd per unit = 4,760 gpd *
Special Residential Cluster:	10 units @ 238 gpd per unit = 2,380 gpd *
Industrial:	123.92 acres @ 500 gpd per acre = 61,960 gpd
Conservation Open Space:	Negligible water use anticipated

Total estimated average daily demand at full development: 69,100 gpd = 0.069 MGD
Total estimated peak daily demand at full development: 0.159 MGD
* Not planned to be connected to municipal water system.

The only municipal water service anticipated within the AUAR boundary would be to service the Industrial zoned property south of TH 210 (61,960 gpd average daily demand). Based on Scenario One, the estimated amount of new 6", 8", 10" and 12" watermain to be installed in the AUAR is 5,400 feet.

Due to the limited number of residential units allowed, installation of municipal service north of TH 210 is cost prohibitive and water will be provided via private wells. Due to the limited number of units and sparse nature of the development, no adverse impacts to the ground water quantity or quality are anticipated.

The Potlatch property within the AUAR boundary accounts for an average daily demand increase of 61,960 gpd with estimated daily peak use of 142,508 gpd. This calculates to approximately 2% (0.062/2.6) of the average daily available capacity and 10% (0.143/1.5) of the peak day available capacity being utilized by development of the Potlatch property using Scenario Two.

Full development of the Potlatch property within the AUAR boundary using Scenario Two does not create concerns related to current water supply or production capacities in the City of Baxter and no modifications to the treatment facility or additional wells will be required.

Dewatering

Ground water levels in the AUAR will drive the need to dewater for construction of new utilities. Due to the relatively high water tables experienced in Baxter, it is likely dewatering will be necessary. Contractors employed for the construction utilities will be responsible for acquisition of the necessary permits from the DNR. DNR General Permit 97-0005 for Temporary Water Appropriations will be adequate as long as the total amount of water pumped does not exceed 50 MG and last for longer than one year. Dewatering for construction purposes is expected to be a temporary in nature and the degree and duration of these activities will be minimized to the greatest extent possible. Groundwater appropriated for these purposes will be discharged in accordance with the DNR permit and all NPDES regulations will be complied with. These activities should not affect the existing groundwater levels in the project area and environmental impacts should be minimal.

No installation or abandonment of any water wells, connection to or changes in any public water supply will be necessary with either development scenario presented.

Appropriation of any ground water will likely be required on a temporary basis for dewatering necessary for construction of municipal infrastructure. These situations will be temporary in nature and will be suspended upon completion of construction.

14. WATER-RELATED LAND USE MANAGEMENT DISTRICTS

Such districts should be delineated on appropriate maps and the land use restrictions applicable in those districts should be described. If any variances or deviations from these restrictions within the AUAR area are envisioned, this should be discussed.

Very little, if any of Moburg Lake is within the 100 year flood plain. It should be noted that the Flood Insurance Rate Map (FIRM), panel # 270092-005 B dated May 15, 1991 shows that area as an AE zone meaning a base flood elevation has been determined (It should be noted the FIRM erroneously labels Moburg Lake as Whipple, similar to the USGS maps). In addition to flood plain regulations, development within this area is subject to the regulations of Title 10, Chapter 3: Zoning Districts, Article L: Shore Land Overlay District of the Baxter City Code. The City requires more restrictive requirements for the area located within shore land overlay district than throughout the rest of the City. Moburg Lake is classified as a “Recreational Development” lake and holds more restrictive standards outlined in the City Code.

15. WATER SURFACE USE

This item need only be addressed if the AUAR area would include or adjoin recreational water bodies.

Moburg Lake has been identified as a “Recreational Development” lake by the Minnesota Commissioner of Natural Resources. Development and recreational uses will need to comply with state and local regulations. Development within this area is subject to the regulations identified under the City of Baxter’s Zoning Code (Title 10, Chapter 3: Zoning Districts, Article L: Shore Land Overlay District) and Subdivision Code, Title 11.

16. EROSION AND SEDIMENTATION

The number of acres to be graded and number of cubic yards of soil to be moved need not be given; instead, a general discussion of the likely earthmoving needs for development of the area should be given, with an emphasis on unusual or problem areas. In discussing mitigation measures, both the standard requirements of the local ordinances and any special measures that would be added for AUAR purposes should be included.

Scenario One

Development affiliated with Scenario One would result in the exposure of some bare soils that would be susceptible to erosion during construction. However, areas of bare soils created during project construction would be stabilized and protected as soon as feasible using standard construction equipment and practices. Baxter restricts alterations to the topography in the shoreland by requiring engineering plans, CUPs, grading permits and Shoreland Alteration Permits. Baxter has recently applied to the MPCA for coverage under the State’s General Storm Water Permit for MS4s. The permit application describes the City’s plans to control erosion and sedimentation, including implementing a Stormwater Erosion and Sediment Control Ordinance.

Permanent and temporary erosion control techniques would be utilized to minimize soil erosion. Best Management Practices (BMPs), such as utilization of ditch checks, silt fencing, erosion control blankets, cross-slope cultivation, rapid slope stabilization, turf establishment, and riprap as outlined in Minnesota Pollution Control Agency guidance would be implemented in accordance with the NPDES permit that is required for the project. Once the construction process is complete, temporary erosion control devices would be removed and any exposed areas would be re-vegetated to control erosion on a permanent basis. A detailed erosion control plan will be included as part of the required stormwater pollution prevention plan (SWPPP).

An NPDES/SDS General Permit must be obtained from the MPCA for projects that disturb more than one acre of land. This permit requires the management of stormwater

discharge during construction, the use of Best Management Practices (BMP's) to control erosion, and the inspection of all erosion controls at least once every seven days during active construction and within 24 hours after a rainfall event greater than 0.5 inch in 24 hours. Specific requirements for construction activity under the General Stormwater Permit include:

- A. The Permittee must design and implement a Stormwater Pollution Prevention Plan (SWPPP). BMPs identified in the SWPPP must be installed in an appropriate and functional manner.
- B. Temporary Sediment Basins must be located wherever 10 or more acres of disturbed soil drain to a common location, and shall be sized for runoff from a 2-year, 24-hour storm.
- C. Permanent stormwater management systems, such as sedimentation or infiltration basins, must be constructed where at least one acre of cumulative impervious surface is created.
- D. Erosion Prevention Practices:
 1. The permittee must implement appropriate construction phasing, vegetative buffer strips, horizontal slope grading, and other construction practices that minimize erosion.
 2. Exposed soils with a continuous possible slope within 200 feet of a surface water must have temporary erosion or permanent cover established within the time period set forth under the General Permit, which ranges from 7 to 12 days, depending on the slope.
 3. The normal wetted perimeter of any drainage ditch that carries water from or around a construction site must be stabilized within 200 feet from the property edge or point of discharge to surface water. Stabilization must be completed within 24 hours of connecting to a surface water.
 4. Pipe outlets must have energy dissipation within 24 hours of connection to a surface water.
- E. Sediment Control Practices:
 1. Sediment control practices must minimize sediment entering surface waters, including curb and gutter systems and storm sewer inlets.
 2. Sediment control practices must be established on all down-gradient perimeters before any up gradient land disturbing activities begin. These practices must remain until final stabilization has been established.
 3. Sediment control practices may be adjusted to accommodate short-term activities such as clearing, grubbing, or vehicle passage. Any short-term activity must be completed as quickly as possible and the sediment control practices must be installed immediately after the activity is completed.
 4. All storm drain inlets must be protected by appropriate BMPs during construction until all sources with potential for discharging to the inlet have been stabilized.

5. Temporary soil stockpiles must have perimeter silt fence or other effective sediment controls, and cannot be placed in surface waters or stormwater conveyances such as curb and gutter systems or ditches.
6. Vehicle tracking of sediment from the construction site must be minimized by BMPs such as stone pads, wash racks, or equivalent systems. Street sweeping must be used if such BMPs are not adequate to prevent sediment from being tracked onto the street.
7. The Permittee must install temporary sedimentation basins as required in Part III.B. of the General Permit.

F. Stabilization:

Final stabilization of the site must be achieved by establishing perennial vegetative cover, or other equivalent means, to prevent soil failure under erosive conditions. For residential construction, final stabilization is achieved when the residence is transferred to the homeowner.

The City of Baxter will review and approve erosion control plans prior to the beginning of construction. Adherence to the BMPs listed above will ensure that erosion and sedimentation impacts related to project construction will be minimized, controlled, and of a short-term nature.

Scenario Two

Scenario Two impacts would be less than Scenario One impacts due to less density and installation of infrastructure.

17. WATER QUALITY-STORMWATER RUNOFF

For an AUAR the following additional guidance should be followed in addition to that in "EAW Guidelines":

- it is expected that an AUAR will have a detailed analysis of stormwater issues;*
- a map of the proposed stormwater management system and of the water bodies that will receive stormwater should be provided;*
- the description of the stormwater systems would identify on-site and "regional" detention ponding and also indicate whether the various ponds will be new water bodies or converted existing ponds or wetlands. Where on-site ponds will be used but have not yet been designed, the discussion should indicate the design standards that will be followed.*
- if present in or adjoining the AUAR area, the following types of water bodies must be given special analyses:*
 - lakes: within the Twin Cities metro area a nutrient budget analysis must be prepared for any "priority lake" identified by the Metropolitan Council. Outside of the metro area, lakes needing a nutrient budget analysis must be determined by consultation with the MPCA and DNR staffs;*
 - trout streams: if stormwater discharges will enter or affect a trout stream an evaluation of the impacts on the chemical composition and temperature regime of the stream and the consequent impacts on the trout population (and other species of concern) must be included;*

Existing Drainage and Stormwater Runoff Analysis

Figure 17.1 shows the existing drainage patterns within the AUAR boundary. Analysis of the existing topography indicates twenty eight individual drainage basins. Some basins are located entirely inside the AUAR boundary while other areas of the AUAR drain to adjacent properties. A discussion of the individual drainage basin characteristics is provided below:

- Areas E1, E16, E17 and E18 drain to wetlands that are either entirely or partially located within the AUAR boundary.
- Areas E2, E4, E5, E10, E11, E24 and E27 drain to low areas or wetlands located entirely outside of the AUAR boundary. Area E10 in particular drains to a wetland complex with a hydraulic connection to the Mississippi River.
- Areas E3, E6, E7, E8, E12, E19, E22 and E23 drain to non wetland low areas located within the AUAR boundary. If water gets high enough in some of these areas, the basins will overflow into adjacent basins as shown in **Figure 17.1**.
- Area E9 contains the Sock Lumber site that was constructed in 2006. Stormwater from this site is collected and conveyed to a stormwater treatment basin located in the northeast corner of the site. The stormwater basin was sized for the 100-year storm event with an overflow into area E10.
- Areas E13 and E14 drain to ditches located adjacent to TH 210 and the Burlington Northern Santa Fe (BNSF) railway.
- Areas E15, E20, E21, E25, E26 and E28 drain to Moburg Lake, Mile Lake or the water body located between Moburg and Whipple Lakes.

Land use and cover conditions within the existing AUAR boundary vary between developed commercial property to undeveloped woodland and wetlands. For the purposes of estimating runoff for the existing conditions, we have subdivided the areas into five categories; impervious, storm basin, wetland, open/meadow and woodland. The characteristics of each existing drainage basin are summarized in **Table 17.1**.

Drainage Area	Area (acres)					Total Area (acres)
	Impervious	Storm Basin	Wetland	Open/Meadow	Woodland	
E1	3.63		4.85	14.82	40.67	63.97
E2					1.61	1.61
E3				4.48	5.86	10.34
E4					1.55	1.55
E5	0.08				0.65	0.73
E6	1.11			6.08	17.80	24.99
E7				1.11	4.08	5.19
E8	0.63			13.17	2.96	16.76

E9	6.98	0.70		2.24		9.92
E10				3.06	5.21	8.27
E11				1.05	2.65	3.70
E12				1.64	8.08	9.72
E13	0.79			2.76	2.95	6.50
E14	0.56			2.48		3.04
E15	2.62			4.03	40.43	47.08
E16				1.13	25.91	27.04
E17	0.85		11.95	16.90	57.71	87.41
E18	0.22		0.14	2.32	13.54	16.22
E19					15.22	15.22
E20					1.65	1.65
E21					9.10	9.10
E22	0.11				14.16	14.27
E23					3.89	3.89
E24					14.74	14.74
E25					1.65	1.65
E26					7.25	7.25
E27					29.32	29.32
E28					27.09	27.09
Total Area (acres):	17.58	0.70	16.94	77.27	355.73	468.22
% of Total Area:	3.8%	0.1%	3.6%	16.5%	76.0%	100%

Runoff estimates were completed using the SCS Method as outlined in the Soil Conservation Service National Engineering Handbook (SCS, 1985), Section 4 (NEH-4). The SCS method uses a combination of soil types and land uses to assign runoff factors to individual areas. The runoff factors or curve numbers indicate the stormwater runoff potential of the area. A higher curve number indicates increased potential for stormwater runoff. Curve numbers used for estimating runoff from the existing condition are summarized in **Table 17.2**.

Table 17.2 - Existing Condition Curve Numbers	
Cover Type	Curve Number
Impervious	98
Storm Basin	100
Wetland	85
Open/Meadow	50
Woodland	30

Equations used to estimate runoff in the SCS method area as follows:

$$Q = \frac{(P - 0.2S)^2}{(P + 0.8S)} \qquad S = \frac{1000}{CN} - 10$$

- Where :
- Q = accumulated direct runoff (inches)
 - P = accumulated rainfall (inches)
 - S = potential maximum retention after runoff begins (inches)
 - CN = SCS Curve Number

Based on these equations, runoff calculations were completed for the 100-year storm event or 5.6 inches of rainfall in a 24-hour period. This storm event was chosen because the City of Baxter requires a 100-year design for all new stormwater treatment facilities. Estimated runoff calculations for the existing conditions are shown in **Table 17.3**.

Drainage Area	Total Area (acres)	Weighted Curve Number	S	Accumulated Runoff (inches)	Total Runoff Volume (acre-ft)
E1	63.97	43	13.44	0.51	2.73
E2	1.61	30	23.33	0.03	0.00
E3	10.34	39	15.86	0.32	0.27
E4	1.55	30	23.33	0.03	0.00
E5	0.73	37	16.70	0.26	0.02
E6	24.99	38	16.39	0.28	0.59
E7	5.19	34	19.17	0.15	0.06
E8	16.76	48	10.72	0.83	1.17
E9	9.92	87	1.45	4.15	3.43
E10	8.27	37	16.74	0.26	0.18
E11	3.70	36	18.03	0.19	0.06
E12	9.72	33	19.96	0.12	0.09
E13	6.50	47	11.39	0.74	0.40
E14	3.04	59	6.99	1.56	0.40
E15	47.08	35	18.17	0.19	0.74
E16	27.04	31	22.43	0.05	0.11
E17	87.41	42	13.78	0.48	3.50
E18	16.22	34	19.19	0.14	0.20
E19	15.22	30	23.33	0.03	0.04
E20	1.65	30	23.33	0.03	0.00
E21	9.10	30	23.33	0.03	0.03
E22	14.27	31	22.76	0.04	0.05
E23	3.89	30	23.33	0.03	0.01
E24	14.74	30	23.33	0.03	0.04
E25	1.65	30	23.33	0.03	0.00
E26	7.25	30	23.33	0.03	0.02
E27	29.32	30	23.33	0.03	0.08
E28	27.09	30	23.33	0.03	0.08
				Total:	14.32

Estimated stormwater runoff from the 100-year storm event based on existing land uses and cover types is 14.32 acre-feet.

Proposed Drainage and Stormwater Runoff Analysis

Scenario One

Proposed drainage and stormwater analysis was completed using proposed zoning from the Potlatch Concept Plan in conjunction with the studies completed by Widseth Smith

Nolting in 2006. The studies completed in 2006 briefly addressed stormwater issues by identifying possible locations for stormwater treatment basins in some of the higher use areas.

For the purposes of estimated stormwater runoff of the proposed condition, the area making up the AUAR was subdivided into 17 individual drainage basins (See Figure 17.2). Drainage basins in the higher use areas were delineated using the roadway and storm sewer layouts from the 2006 studies. A brief description and discussion on each proposed basin is provided below.

- Area P1 includes the wetland and adjacent upland areas in the southwest corner of the study area. The area also includes a small stormwater treatment basin for Area P4. The majority of this area will remain unchanged from its existing condition.
- Area P2 is guided for office service (OS) and industrial (I) zoned development located south of the railroad tracks. Area P1-2 also includes the major north-south roadway corridor. Storm sewer located in the north-south roadway corridor and adjacent roadways will convey stormwater to a treatment basin located adjacent to the existing wetland in the southwest corner of the study area. Two overflow options are available for this particular stormwater basin. The stormwater basin could be designed to overflow into the adjacent wetland or an outfall structure and piping could be designed to overflow into the proposed stormwater basin in Area P-3.
- Area P3 is guided for industrial zoned development in the southeast corner of the study area. Stormwater will be conveyed via storm sewer pipe to a proposed stormwater treatment basin in the southwest corner of the basin. Overflows from the basin will be directed towards a 22 acre wetland complex located directly south of the proposed basin. The 22 acre wetland complex is an isolated wetland with no apparent outlet.
- Area P4 is guided for a small area of industrial development along the westerly edge of the study area south of the railroad tracks. Drainage from this area will be transported by storm sewer pipe to a proposed treatment basin located adjacent to the wetland in Area P1. Overflows from the basin will be directed towards the existing wetland.
- Area P5 is the existing Stock Lumber site. Drainage from this area is expected to remain unchanged from its existing condition. The site includes a 100-year stormwater treatment basin located in the northeast corner of the site that overflows easterly towards an existing wetland complex.
- Area P6 is guided for industrial and office service development in the northwest portion of the study area lying south of the railroad tracks. Stormwater will be carried by storm sewer to a proposed stormwater treatment basin located in the northwest corner of the basin. Overflows, with permission from BNSF, will be directed towards the ditch located along the south side of the railroad tracks.

- Area P7 includes the area adjacent to the Klein railroad spur serving the Stock Lumber site. It is assumed this area, like Area P-1, will remain in its existing condition and will not contribute any additional stormwater runoff.
- Area P8 consists of a very small portion of the property located south of the railroad tracks. The area is located entirely within the BNSF right-of-way and will remain unchanged from its existing condition.
- Area P9 contains the north-south roadway corridor and BNSF property located south of the tracks. The only proposed improvement in this area is the roadway itself. Drainage from the roadway will be conveyed by curb and gutter north to the ditch located along the south side of TH 210.
- Area P10 and P11 comprises the south side of the TH 210 corridor and the north side of the BNSF right-of-way. Drainage from these areas will be directed towards ditches located adjacent to the roadway and railroad tracks.
- Area P12 includes a portion of the MnDOT right-of-way and proposed commercial properties located near the entrance to the property north of the TH 210. Drainage from TH 210 and a portion of the north-south corridor will be directed towards the ditch along the north side of the highway. The remaining area within the basin will drain towards a proposed stormwater basin located in the northwest corner of intersection. Overflows from the basin will be directed towards the MnDOT ditch.
- Area P14 is guided for a mix of neighborhood commercial (C1), high density residential (R3), medium density residential (R2) and park/open space development. Stormwater generated by this area will be directed towards a proposed stormwater treatment basin located in the northeast corner of the drainage basin. The treatment basin will be located on the park/open space property with an overflow directed towards the proposed treatment basin in Area P-15.
- Area P15 is guided for neighborhood commercial, high density residential and park/open space zoned development. Drainage will be directed towards a proposed stormwater treatment basin located at the north end of the drainage basin. Overflows from the basin will be directed easterly towards the existing 38 acre wetland with no apparent natural outlet.
- Area P16 and P17 are guided for medium and low density residential development. Stormwater will be handled through the use of swales and ditches located adjacent to the roadways, lot lines and lake setbacks. No storm sewer or centralized/regional ponding is proposed in this area.

In order to analyze the stormwater runoff from the proposed condition, it was necessary to break down each drainage basin into sub areas based on the underlying zoning and land use.

Table 17.4 summarizes the drainage area characteristics and corresponding areas of each drainage basin.

Table 17.4 - Scenario One Drainage Area Characteristics

Drainage Area	Area (acres)												Total Area (acres)
	R1	R2	R3	OS	C1	I	Park	Shoreland Overlay District	Storm-water Basin	IMPV	PERV	WTLD	
P1										3.53		4.85	8.38
P2				12.14		49.03			2.30				63.47
P3						22.45			2.03				24.48
P4						4.19							4.19
P5									0.70	6.98	2.24		9.92
P6				11.06		16.19			3.77				31.02
P7										6.92			6.92
P8										2.39			2.39
P9										0.68	5.50		6.18
P10										1.77	5.12		6.89
P11										0.52	2.56		3.08
P12					9.35								9.35
P13										1.13	2.29		3.42
P14		10.16	7.72		23.49		5.93	16.54					63.84
P15			14.23		10.39		4.14						28.76
P16	104.89							34.64					139.53
P17	18.64							37.76					56.40
Total Area (acres):	123.53	10.16	21.95	23.20	43.23	91.86	10.07	88.94	8.80	23.92	17.71	4.85	468.22
% of Total Area:	26.4%	2.2%	4.7%	5.0%	9.2%	19.6%	2.2%	19.0%	1.9%	5.1%	3.8%	1.0%	

Curve numbers were then assigned to each land use and zoning district based on percentage of impervious surface allowed under the Baxter City Code. Areas falling within the Shoreland Overlay District (SOD) were assigned curve numbers based on a 25% maximum allowable impervious surface. Curve numbers are summarized in **Table 17.5**.

Table 17.5 - Proposed Condition Curve Numbers

Underlying Zoning	Maximum Impervious Coverage (%)	Curve Number
R1 - Low Density Residential	40	63
R2 - Medium Density Residential	50	69
R3 - High Density Residential	50	69
OS - Office Service	88	91
C1 - Neighborhood Commercial	88	91
I - Industrial	88	91
CP - Community Park	50	69
Shoreland Overlay District (SOD)	25	54
Storm Basin (SB)	-	100
Impervious (IMPV)	-	98
Pervious (PERV)	-	39
Wetland (WTLD)	-	85

Runoff from the proposed condition was calculated using the Soil Conservation Service (SCS) method as described in the existing condition analysis. Based on the curve numbers and drainage area characteristics described above, runoff calculations were computed using the 100-year storm event as required by the City of Baxter. **Table 17.6** summarizes the estimated runoff from each proposed drainage basin.

Table 17.6 - Scenario One Runoff Volumes (100-year storm event, 5.6 inches of rain)

Drainage Area	Total Area (acres)	Weighted Curve Number	S	Accumulated Runoff (inches)	Total Runoff Volume (acre-ft)
P1	8.38	90	1.05	4.49	3.14
P2	63.47	91	0.96	4.57	24.19
P3	24.48	92	0.91	4.62	9.43
P4	4.19	91	1.00	4.54	1.58
P5	9.92	85	1.79	3.89	3.21
P6	31.02	92	0.87	4.66	12.05
P7	6.92	98	0.20	5.34	3.08
P8	2.39	98	0.20	5.34	1.06
P9	6.18	45	11.98	0.67	0.34
P10	6.89	54	8.46	1.22	0.70
P11	3.08	49	10.42	0.88	0.23
P12	9.35	91	1.00	4.54	3.54
P13	3.42	58	7.10	1.54	0.44
P14	63.84	73	3.71	2.74	14.56
P15	28.76	77	3.05	3.08	7.38
P16	139.53	60	6.56	1.68	19.58
P17	56.40	57	7.64	1.40	6.60
				Total:	111.10

Total estimated stormwater runoff from the 100-year storm event is 111.10 acre-ft. The runoff estimated for the existing condition is 14.32 acre-feet. The significant increase in the stormwater runoff is a direct result of increased impervious surface coverage associated with the proposed development. In order to mitigate the negative impacts associated with the increased runoff, it will be necessary to incorporate stormwater treatment facilities into the overall design.

The City of Baxter requires all new developments to retain the stormwater runoff generated by the 100-year storm event. Stormwater handling facilities and treatment alternatives acceptable to the City of Baxter include infiltration basins, wet sedimentation basins, subsurface storage and infiltration along with swales and ditches designed in accordance with NPDES regulations and Minnesota Stormwater Manual guidelines.

The stormwater treatment basin locations shown in **Figure 17.3** were approximated based on the Potlatch Concept Plan and 2006 studies completed by Widseth Smith Nolting. Alternative development plans and detailed design will dictate the exact location and design of each treatment facility.

Scenario Two

Proposed drainage and stormwater analysis for Scenario Two is similar to Scenario One with the exception of the area located north of TH 210 (**See Figure 17.4**). This area is

proposed to remain Commercial Forestry (F) and Special Residential Cluster (RS) as it is currently zoned. Scenario Two proposes 30 housing units in the RS zoned area located west of Moburg Lake. The allowable impervious coverage in the RS zoning district is 25%. Assuming 25% impervious coverage, the estimated curve number for the RS zone would be 51. For the remainder of the property north of TH 210 it was assumed cover types and land use would remain similar to the existing condition.

Drainage area characteristics and stormwater runoff calculations are summarized in Tables 17.7 and 17.8

Table 17.7 - Scenario Two Drainage Area Characteristics

Drainage Area	Area (acres)									Total Area (acres)
	OS	I	SB	IMPV	PERV	WTLD	Open/Meadow	Woodland	RS	
P1				3.53		4.85				8.38
P2	12.14	49.03	2.30							63.47
P3		22.45	2.03							24.48
P4		4.19								4.19
P5			0.70	6.98	2.24					9.92
P6	11.06	16.19	3.77							31.02
P7				6.92						6.92
P8				2.39						2.39
P9				0.68	5.50					6.18
P10				1.77	5.12					6.89
P11				0.52	2.56					3.08
P12				3.80		12.09	24.38	204.63		244.90
P13									56.4	56.40
Total Area (acres):	23.20	91.86	8.80	26.59	15.42	16.94	24.38	204.63	56.40	468.22
% of Total Area:	5.0%	19.6%	1.9%	5.7%	3.3%	3.6%	5.2%	43.7%	12.0%	

Table 17.8 - Scenario Two Runoff Volumes (100-year storm event, 5.6 inches of rain)

Drainage Area	Total Area (acres)	Weighted Curve Number	S	Accumulated Runoff (inches)	Total Runoff Volume (acre-ft)
P1	8.38	90	1.05	4.49	3.14
P2	63.47	91	0.96	4.57	24.19
P3	24.48	92	0.91	4.62	9.43
P4	4.19	91	1.00	4.54	1.58
P5	9.92	85	1.79	3.89	3.21
P6	31.02	92	0.87	4.66	12.05
P7	6.92	98	0.20	5.34	3.08
P8	2.39	98	0.20	5.34	1.06
P9	6.18	45	11.98	0.67	0.34
P10	6.89	54	8.46	1.22	0.70
P11	3.08	49	10.42	0.88	0.23
P12	244.90	36	17.96	0.20	4.04
P13	56.40	51	9.69	1.00	4.68
				Total:	67.74

The total estimated stormwater runoff generated by the 100-year storm event is 67.74 acre-feet. The majority of this runoff (59.02 acre-ft) is created south of TH 210. The stormwater management plan for the area south of TH 210 will be as described previously for Scenario One.

The total amount of runoff produced by the area north of TH 210 is 8.72 acre-ft. The same area under the existing conditions generates 4.91 Acre-ft of runoff. According to City of Baxter requirements, lots within the RS zone must be designed to retain the 100-year storm onsite. This can be accomplished through the use of swales and ditches with special emphasis on protecting wetlands and lakes from direct runoff from impervious surface areas. The area zoned Commercial Forestry (F) will require a less intense stormwater management plan because of the much lower development density.

18. **WATER QUALITY-WASTEWATER**

Observe the following points of guidance in an AUAR:

- only domestic wastewater should be considered in an AUAR—industrial wastewater would be coming from industrial uses that are excluded from review through an AUAR process;*
- wastewater flows should be estimated by land use subareas of the AUAR area; the basis of flow estimates should be explained;*
- the major sewer system features should be shown on a map and the expected flows should be identified;*
- if not explained under item 6, the expected staging of the sewer system construction should be described;*
- the relationship of the sewer system extension to the RGU's comprehensive sewer plan and (for metro area AUARs) to Metropolitan Council regional systems plans, including MUSA expansions, should be discussed. For non-metro area AUARs, the AUAR must discuss the capacity of the RGU's wastewater treatment system compared to the flows from the AUAR area; any necessary improvements should be described;*
- if on-site systems will serve part of the AUAR the guidance in "EAW Guidelines" (pages 16-17) should be followed.*

Wastewater Collection and Conveyance

The City of Baxter regulates development through the use of local regulations known as Ordinances. Baxter's "Adequate Facilities Ordinance" does not permit property located within the AUAR boundary to be developed with out connection to municipal sewer and water, unless the zoning district allows for this to occur.

The portion of the AUAR area located south of TH 210 can be served with municipal wastewater collection. In 2006 the City constructed Lift Station #19 approximately 0.60 mile south of TH 210 (outside AUAR boundary). Approximately 3,900 lineal feet of 8" and 10" PVC gravity sewer main were constructed along the proposed main access roadway alignment south of TH 210 to collect wastewater and convey it in a southerly direction to the lift station. Lift Station #19 pumps the collected wastewater through a 6" forcemain in a northerly direction along the proposed main roadway alignment and under TH 210. The forcemain then extends easterly along the north side of TH 210 to a point approximately 350' west of Memorywood Drive. The forcemain is approximately 10,200 feet in length and is composed of 6" PVC, HDPE and DIP pipe. The lift station, collection piping and forcemain were sized and constructed to handle wastewater flows from all areas within the AUAR south of TH 210. Additional gravity sanitary sewer collection piping will be installed as property south of TH 210 is developed.

From the forcemain connection point west of Memorywood Drive, wastewater from the AUAR study area is conveyed through a combination of gravity lines and Lift Stations #4, #3, #2, and #1 to the Brainerd Wastewater Treatment Facility (WWTF) located approximately 4.5 miles east of the AUAR area, on the south side of CSAH 48.

The existing wastewater collection network serves only property south of TH 210 and no collection piping has been installed to serve the AUAR area north of TH 210. The existing forcemain along TH 210 was designed to handle development of the AUAR area north of TH 210. A concrete vault structure was installed on the north side of TH 210 to facilitate future forcemain connection serving the Potlatch property and other development north of TH 210.

Currently Lift Station #2, located at the intersection of Cypress Drive and Excelsior Road, handles the majority of wastewater flows generated in the City of Baxter. The volume of flow and reliance on a singular station has created maintenance concerns related to the pumps and capacity of the station. To alleviate these concerns, Baxter is currently studying all lift stations in the City and preparing maintenance plans. Baxter is also reviewing construction of a mainline sanitary sewer extension westerly from the Brainerd Wastewater Treatment Facility, south of CSAH 48. Construction of the new main south of CSAH 48 will allow re-direction of flows from Lift Stations #9, #12, and #15 away from Lift Station #2. Eliminating these flows will relieve the current pressure on several lift stations in the City and in particular Lift Station #2, resulting in additional capacity to handle development of the AUAR area.

Portions of the AUAR area were studied for wastewater improvements in 2006 by Widseth Smith Nolting. Only the area located west of Moburg Lake was excluded from these studies. The studies entitled "Potlatch Property Improvements South of TH 210" and "Potlatch Property Improvements North of TH 210" was accepted by the Baxter City Council on October 17, 2006. The studies completed by the City included possible sanitary sewer collection and conveyance layouts as related to the Potlatch Concept Plan at that time. Final wastewater collection and conveyance alignments will vary based on the final roadway alignments utilized for development. Additional sanitary sewer collection and conveyance will be installed as property is developed. Development of the wastewater collection system will follow the City's Capital Improvement Program.

Wastewater Treatment

Wastewater generated in the City of Baxter is treated at the Brainerd Public Utilities Wastewater Treatment Facility (WWTF), owned by the City of Brainerd, but located in the City of Baxter. The facility was constructed in 1982 and has been modified numerous times over the years. The treatment scheme consists of:

- Aerated Grit Chamber
- Mechanical Bar Screen
- Primary Clarification (2 units, 299,200 gallons volume, 4,000 ft² surface area)
- Rotating Biological Contactors (12 units, 1,400,000 ft² surface area)
- Final Clarification (2 units, 496,420 gallons volume, 6,636 ft² surface area)
- Chlorine Contact Tanks (2 units, 70,686 gallons volume)
- Anaerobic Digesters (2 units, 660,000 gallons volume)
- Sludge Storage (1 unit, 330,000 gallons volume)

The treatment units are considered to be in good operating condition and have been in compliance with MPCA permit conditions.

In 1999, the capacity of the WWTF was re-rated from 3.16 to 3.60 MGD by reducing the maximum monthly Carbonaceous Biochemical Oxygen Demand (CBOD). In the fall of 2007, the WWTF treated approximately 2.34 MGD (12 month average daily flow) that calculates to 65% of the re-rated capacity.

Treated effluent for the WWTF discharges to the Mississippi River. The area of the river receiving the discharge is considered an Outstanding Resource Value Water (ORVW) and any new discharges to the water resulting in increased pollutant mass loadings must be approved by the MPCA. The stretch of the Mississippi River receiving the discharge is also on the MPCA's Impaired Waters list for mercury.

The discharge permit is up for renewal in 2009 and Brainerd has designed a large plant expansion utilizing Sequencing Batch Reactor (SBR) treatment technology. The expansion will increase the total capacity of the WWTF to 6.0 MGD. Currently application for a discharge permit for the proposed expansion capacity has been submitted to MPCA and is being reviewed.

Baxter Share of WWTF Capacity

Based on the original 1979 agreement between Brainerd and Baxter the following are allocated to the City of Baxter:

- Influent Flow: 0.43 MGD
- Peak Flow: 0.86 MGD
- Influent BOD5 (Average 28 days): 750 pounds / day
- Influent BOD5 (Maximum 7 days): 1,200 pounds / day
- Influent Suspended Solids (Average 28 days): 825 pounds / day
- Influent Suspended Solids (Maximum 7 days): 1,350 pounds / day

During the first eleven months of 2007 the City of Baxter averaged approximately 0.50 MGD with peak flows nearing 0.59 MGD. Baxter currently exceeds the original allocated average daily capacity and on January 17, 2006 the City approved an interim agreement with the City of Brainerd increasing maximum influent flow to 0.65 MGD. In addition to maximum flow requirements, the interim agreement with Brainerd included surcharge fees for any BOD5 or Suspended Solids loadings in excess of 300 mg/l. Currently, Baxter has approximately 0.15 MGD of influent capacity remaining before exceeding the interim agreement and surcharge fees have already been imposed for exceeding the BOD5 and Suspended Solids limits.

The City of Baxter approved the Conditional Use Permit for construction of the WWTF expansion on June 5, 2007. Baxter has also reviewed and agreed on a revised contract increasing their wastewater allocation. Following completion of the WWTF expansion the following will be allocated to the City of Baxter:

- Average Wet Weather Flow: 2.00 MGD
- Annual Average Flow: 1.60 MGD

- Peak Hour Flow: 5.60 MGD
- Peak Instantaneous Flow: 5.60 MGD
- Average Daily Flow: 2.00 MGD
- Design CBOD (Average Wet Weather): 4,000 pounds / day
- Design CBOD (Annual Average): 3,200 pounds / day
- Design Suspended Solids (Average Wet Weather): 4,000 pounds / day
- Design Suspended Solids (Annual Average): 3,200 pounds / day

Until the status of the plant expansion is known, the city of Baxter has been issuing letters to developers cautioning them that wastewater capacity may be an issue in the future and may limit the number of new hookups/extensions until expansion is completed. Based on conversations with Baxter staff, any remaining capacity will likely be reserved for commercial type developments since residential lots with sewer service available are currently in surplus. In the mean time, extensive efforts are being made to reduce fats, oils and grease (FOG) from being discharged into the sanitary sewer system. This effort hopefully will extend the existing capacity Baxter has.

Future Wastewater Flows – Citywide

Future wastewater flows for the City of Baxter have been estimated as part of the “2008 Wastewater Flow Study” prepared by Widseth Smith and Nolting in February 2008. The following information was listed in the study:

*Note: gpd - denotes gallons per day
 MGD - denotes million gallons per day*

Estimated Population in 2028:	11,000 to 16,000
Usage:	70 gallons per capita per day – trending downward
Residential Household Density:	2.75 trending downward
Average Day Peaking Factor:	1.159
Year Average Daily Flow Exceeds 0.65 MGD:	2014

Using the above criteria, Widseth, Smith and Nolting estimated the year 2028 City of Baxter average day sewer flows to be between 900,000 and 1,050,000 gallons per day. For purposes of this study we have assumed the average day sewer in the year 2030 will be approximately 1,100,000. We also used a conservative approach for estimating flows from the AUAR study area by assuming 2.75 residents per household with a daily usage of 70 gallons per day per capita. We realize both are trending downward and the use of current values was considered conservative.

Scenario One

Estimated wastewater flows from full development of property within the AUAR boundary utilizing Scenario One was calculated as follows:

Estimating future wastewater flows is difficult due to the number of assumptions necessary. Water use and wastewater generation are intertwined since a significant portion of water used in a household, results in direct wastewater discharge. For purposes of this AUAR document, wastewater flows were estimated based on data assembled using the “2008 Wastewater Flow Study” by Widseth Smith and Nolting and the water system modeling data by Advanced Engineering and Environmental Services. In general, wastewater flow was projected to be 80% of the estimated water use as listed below:

Residential Household Density:	2.75 persons per dwelling unit
Low Density Wastewater Flow:	70 gallons per capita per day
Medium Density Wastewater Flows:	70 gallons per capita per day
High Density Wastewater Flows:	50 gallons per capita per day
Commercial / Office Service Water Demands:	464 gallons per acre per day
Industrial Water Demands:	400 gallons per acre per day

Estimated average daily wastewater use from full development of property within the AUAR boundary utilizing Scenario One was calculated as follows:

*Note: gpd - denotes gallons per day
MGD - denotes million gallons per day*

Low-Density Residential:	382 units @ 193 gpd per unit = 73,726 gpd
Medium-Density Residential:	362 units @ 193 gpd per unit = 69,866 gpd
High-Density Residential:	403 units @ 138 gpd per unit = 55,614 gpd
Neighborhood Commercial:	30.87 acres @ 464 gpd per acre = 14,324 gpd
Office Service:	27.35 acres @ 464 gpd per acre = 12,690 gpd
Industrial:	87.24 acres @ 400 gpd per acre = 34,896 gpd
Parkland:	Negligible wastewater flow anticipated

Total estimated daily wastewater flow at full development: 261,116 gpd = 0.261 MGD
Total estimated peak day wastewater flow at full development: 0.302 MGD

It must be noted that only domestic type flows (residential, light commercial and light industrial) are anticipated with development of the Potlatch property. No industrial, high-volume or unique-characteristic wastewater generating developments are anticipated at this time. Industrial, high-volume or unique-characteristic wastewater flows associated with future developments will be evaluated at the time the development is being considered. In cases where excessive or potent flows are anticipated, pre-treatment or additional treatment requirements may be required by Cities of Baxter or Brainerd.

Based on Scenario One, the estimated amount of new 8” and 10” sanitary sewer collection pipe necessary to serve the AUAR area is approximately 27,500 lineal feet (See Figure 18.1). The maximum depth of pipe installation is approximately 25’ below existing grade. One additional lift station approximately 25’ in depth and approximately 2,000 lineal feet of force main will also be required.

As mentioned above, the City of Baxter is already nearing the maximum allowed daily flow of 650,000 gallons. Using the Widseth, Smith, Nolting projections the average daily flow in 2010 will be approximately 560,000 gallons, Application of the 1.159 peaking factor results in a peak daily flow of approximately 650,000 gallons and the maximum flow capacity is reached.

Based on this analysis the City of Baxter does not have available sanitary sewer flow capacity for full development of the AUAR study area without a revised agreement being reached between the two communities. A limited amount of development associated with

this study may be eligible for service if construction occurs in the near future, prior to available capacity being utilized elsewhere. Commercial development would likely have the best chance of being serviced based on comments from City staff indicating remaining sewer capacity should be reserved for commercial development.

Currently the WWTF has approximately 1.26 MGD of influent capacity available and complete development of Scenario One consumes 21% (.261/1.26) of the available influent amount during average daily flow conditions and 24% (.302/1.26) during peak daily flow conditions. However, without knowing the future of the new treatment facility, obtaining permission from Brainerd may be difficult due to projected growth in both Baxter and Brainerd. Domestic wastewater as assumed with this report would have minimal effects on the quality of treatment, since the existing and proposed WWTF have been designed to treat domestic wastewater.

Scenario Two

Estimated wastewater flow from full development of property within the AUAR boundary utilizing Scenario Two was calculated as follows:

*Note: gpd - denotes gallons per day
MGD - denotes million gallons per day*

Commercial Forestry:	20 units @ 193 gpd per unit = 3,860 gpd *
Special Residential Cluster:	10 units @ 193 gpd per unit = 1,930 gpd *
Industrial:	123.92 acres @ 400 gpd per acre = 49,568 gpd
Parkland:	Negligible wastewater flow anticipated

Total estimated daily wastewater flow at full development: 55,358 gpd = 0.055 MGD

Total estimated peak day wastewater flow at full development: 0.064 MGD

* Not planned to be connected to municipal wastewater.

As with the previous scenario, only domestic type flows (residential, light commercial and light industrial) are anticipated with development of the Potlatch property. Industrial, high-volume or unique-characteristic wastewater flows associated with future developments will be evaluated at the time the development is being considered. In cases where excessive or potent flows are anticipated, the Baxter or Brainerd may require pre-treatment or additional treatment requirements.

Due to the limited number of residential units allowed, installation of municipal service north of TH 210 is cost prohibitive and not necessary since Individual Sewage Treatment Systems (ISTS) is allowed. Sanitary sewage treatment will be provided via private ISTS, with sub-surface treated effluent discharge. High ground water tables in the area may require construction of mound systems. Due to the limited number of low-density developments and assuming proper installation no adverse effects are anticipated.

The only municipal sanitary sewer anticipated within the AUAR boundary would be to service the Industrial zoned property south of TH 210. Approximately 4,700 lineal feet of new 8" and 10" sanitary sewer mains would be necessary to service the area.

As with Scenario One, development of the AUAR study area using Scenario Two is not likely to be allowed in the near future until a revised agreement between the two communities can be reached.

Complete development of Scenario Two consumes only 4% (.055/1.26) of the available 1.26 MGD of available capacity at the WWTF during average flow periods and 5%

(.064/1.26) during peak flow conditions, indicating capacity is available if approved by the City of Brainerd. Again, without knowing the future of the proposed WWTF expansion, obtaining permission from Brainerd may be difficult due to projected growth in both cities. Domestic wastewater as assumed with this report would have minimal affects on the quality of treatment, since the existing and proposed WWTF have been designed to treat domestic wastewater.

It may be seen from the above discussion both scenarios require the City of Baxter to enter into a revised agreement with the City of Brainerd for additional capacity at the treatment facility. Without construction of the proposed expansion, complete development of the Potlatch AUAR will be subject to continued cooperation between the two cities regarding Baxter's share of any available capacity. Construction of the new expansion will be critical to not only Potlatch for the development of their property but also to the City of Baxter when considering future development throughout the City.

19. **GEOLOGIC HAZARDS AND SOIL CONDITIONS**

A map should be included to show any groundwater hazards identified. A standard soils map for the area should be included.

Geologic Hazards

No known geologic hazards such as sinkholes, shallow limestone formations, faults, or karst formations are known to occur on the project site. Therefore, no measures are proposed to avoid or minimize these environmental hazards. According to wells drilled in the project vicinity, water occurs at a depths ranging from 12 to 43 feet. Average depth from over a dozen wells was 18 feet. Depending upon the season of the year, some of the wetland areas have water present at the surface of the ground. Therefore, the minimum depth to groundwater is listed as 0 feet.

According to the Geologic Atlas of Crow Wing County, Minnesota (Minnesota Geological Survey, 2004), the depth to bedrock on most of the project site is estimated to be 151-200 feet below the grounds surface. Some areas on the project site have estimated depth to bedrock of 101-150 feet.

It is not expected that either development scenario will encounter any special or unusual problems or situations due to geologic hazards.

Soil Conditions

The Crow Wing County Soil Survey (1965) shows that the area within the AUAR contains three soil series: Menahga, Nymore, and Marsh series. According to the Survey, the Menahga series "consists of somewhat excessively drained or excessively drained, forested soils that developed from deep, loose, noncalcareous sandy outwash. These soils have very weak horizon development. The topography ranges from nearly level to strongly sloping. Nearly level areas are much more common than strongly rolling areas. The native vegetation consisted of jack pine and scattered red pine. Second-growth trees are jack pine and some aspen and white birch. A few red oaks are found. Surface runoff is slow. Permeability and internal water movement are rapid. Menahga soils are widely distributed in Crow Wing County. Little of the acreage is used for crops, but some is used as pasture. Most areas are used for growing jack pine for pulpwood and lumber." The Survey describes the Nymore series as consisting "of moderately dark colored, excessively drained, sandy soils that occur mainly on outwash plains. These soils are level to undulating in most

places and rolling in some small areas. The native vegetation consists of jack pine, red pine, and some grass. Bur oak is common in some places. Surface runoff is slow. Internal drainage and permeability are rapid.” The Soil Survey does not describe Marsh soils in detail, other than to say that they are soils found in areas that often contain shallow water and support “water tolerant” plants. The mapping contained in the 1965 Soil Survey for Crow Wing County is now in the process of being redone by NRCS soil scientists. No soil sampling to date has been collected within the Potlatch AUAR project area. However, the NRCS Soil Survey Party scientists have provided some general information. A general finding in the project vicinity is that the sampled soils in the project area were noticeably finer than they were described in the published County Soil Survey. In addition, wetland soils in the project area that was described only as Marsh soils in the Soil Survey will likely be classified as Rifle or Lougee soil types.

It is not expected that either development scenario will encounter any special or unusual problems or situations due to soil types.

20. **SOLID WASTES; HAZARDOUS WASTES; STORAGE TANKS**

For a, generally only the estimated total quantity of municipal solid waste generated and information about any recycling or source separation programs of the RGU need to be included. No response is necessary for b. For c, potential locations of storage tanks associated with commercial uses in the AUAR should be identified (e.g., gasoline tanks at service stations).

A) Solid Wastes

The project area will develop with residential, commercial, and industrial uses which will generate municipal solid waste and recycling products. The City of Baxter provides outside solid waste collection and disposal services to all businesses and residents.

In order to estimate future municipal solid waste for Scenario One, several assumptions were used. It was assumed the national average of waste generated per person could be applied throughout the project area. In 2006 the Environmental Protection Agency (EPA) reported the national Municipal Solid Waste (MSW) generation rate per person to be 4.60 pounds of municipal solid waste each day or 0.84 tons a year. These numbers are used by Crow Wing County’s Solid Waste Department.

The second assumption was to determine the average household size in the City of Baxter. According to the 2000 Census, the average household size was 2.87. **Table 20.1** has rounded this number up to 3.0 occupants per household. Medium and high-density housing used a more conservative number of 2.0 occupants per household. These numbers were multiplied by the generation rate to determine the total yearly residential MSW generation (tons).

Table 20.1 also addresses anticipated municipal solid waste for commercial and industrial uses. According to the Crow Wing County businesses waste figures a total of 1.2 tons of municipal solid waste is generated by an employee each year. The Institute of Traffic Engineers (ITE) Manual: 6th Edition was then used to determine the potential number of employees under Scenario One. This number was then multiplied by 1.2 tons to determine the total yearly commercial MSW generation (tons).

Table 20.1 Estimated Municipal Solid Waste Generation (MSW) – Scenario One

Residential	No. Units	Occupant Multiplier	Total Occupants	MSW Generation Rate	Total Yearly MSW Generation (tons)
Low Density Residential (R-1)	382.00	3.00	1,146.00	0.84	962.64
Medium Density Residential (R-2)	362.00	2.00	724.00	0.84	608.16
High Density Residential (R-3)	403.00	2.00	806.00	0.84	677.04
Sub Total:	1,147.00	-	2,676.00	-	2,247.84
Commercial	Square Footage	No. Employees per 1,000 sq. ft.	Total Employees	MSW Generation Rate	Total Yearly MSW Generation (tons)
Neighborhood Commercial (C1)	268,927.24	2.00	537.85	1.20	645.43
Industrial (I)	1,333,428.88	2.00	2,666.86	1.20	3,200.23
Office (OS)	297,880.70	3.00	893.64	1.20	1,072.37
Sub Total:	1,900,236.82	-	4,098.35	-	4,918.03
				Grand Total	7,165.87

It is anticipated 7,165 tons of municipal solid waste would be generated under the full-build scenario. The City of Baxter and Crow Wing County participate in recycling programs and encourages waste reduction throughout the community. These efforts can greatly reduce the amount of municipal solid waste generated by development. However, specific information about the composition and the recycling of municipal solid waste generation in Baxter is not available.

B) Hazardous Wastes

No response required.

C) Storage Tanks

There are no specific locations for above or below ground storage tanks known at this time. However, there is a possibility that in some of the commercial areas of identified in the scenarios a service station may need an underground storage tank for gasoline. If any business should need above or below ground storage tanks, it would need to follow MPCA and other applicable standards and procedures.

21. TRAFFIC

For most AUAR reviews a relatively detailed traffic analysis will be needed, especially if there is to be much commercial development in the AUAR area or if there are major congested roadways in the vicinity. The results of the traffic analysis must be used in the response to item 22 and to the noise aspect of item 24. Instead of responding to the information called for in item 21, the following information should be provided:

-a description and map of the existing and proposed roadway system, including state, regional, and local roads to be affected by the development of the AUAR area. This information should include existing and proposed roadway capacities and existing and projected background (i.e., without the AUAR development) traffic volumes;

—trip generation data —trip generation rates and trip totals—for each major development scenario broken down by land use zones and/or other relevant subdivisions of the area. The projected distributions onto the roadway system must be included;

—analysis of impacts of the traffic generated by the AUAR area on the roadway system, including: comparison of peak period total flows to capacities and analysis of Levels of Service and delay times at critical points (if any);

—a discussion of structural and non-structural improvements and traffic management measures that are proposed to mitigate problems;

Note: in the above analyses the geographical scope must extend outward as far as the traffic to be generated would have a significant effect on the roadway system and traffic measurements and projections should include peak days and peak hours, or other appropriate measures related to identifying congestion problems, as well as ADTs.

A detailed traffic analysis report was prepared to examine the traffic impacts of the two development scenarios. The complete traffic report is available in **Appendix F**. Six intersections, including the development access on TH 210, have been examined relative to potential impacts caused by the development. The six intersections analyzed are TH 210 and the proposed Potlatch access road, TH 210 & TH 371, and the following neighborhood intersections (**See Figure 5.1 for reference**):

- Olivewood Drive & Cedar Scenic Road
- Memorywood Drive & Cedar Scenic Road
- Memorywood Drive & Travine Drive
- Meredith Drive & TH 210

For each intersection, traffic forecasts and analyses were conducted for the weekday PM peak hour in the following scenarios:

- **2007 Existing:** Existing traffic volumes were developed for the study intersections based on recent traffic counts. Traffic counts taken earlier than 2007 were adjusted using local annual growth factors to the current year.
- **2030 No Build:** The traffic volumes developed for the 2030 No Build account for 23 years of natural background traffic growth, utilizing the annual growth factors obtained from Mn/DOT. The 2030 No Build volumes serve as the background traffic for the 2030 Scenario 1 and 2030 Scenario 2 forecasts.
- **2030 Scenario 1:** Scenario 1 incorporates the expected trip generation of the Scenario 1 development described in section 6 with the background traffic developed for the design year.
- **2030 Scenario 2:** Scenario 2 incorporates the expected trip generation of the Scenario 2 development described in section 6 with the background traffic developed for the design year.

Currently, Mn/DOT has no improvements planned for implementation before 2030 in the study area. The analysis of the study area presented in this report is based on existing conditions for TH 210 and TH 371.

Each of the study intersections was evaluated using the forecasted volumes to determine the expected level of service in the 2030 design year. A summary of the principal findings established from the analyses for the study intersections is provided below.

- TH 210 & Potlatch Property Drive:** The TH 210 & Potlatch Property Drive intersection would require the extension of the four-lane cross-section of TH 210 to the property to achieve an acceptable level of service during the PM peak hour with traffic signal control in Scenario 1. This improvement is not currently planned for implementation by Mn/DOT. For Scenario 2, signal installation would likely not be warranted. The intersection would operate at LOS F in Scenario 2 with stop control on the Potlatch Property Drive approaches. This level of operation is not unusual for stop controlled intersections at high speed roadways such as TH 210.

Channelization is recommended for the northbound to eastbound right-turn movement in both Scenario 1 and Scenario 2. The conversion of a southbound through-lane to a left-turn lane is recommended under Scenario 1. It is recommended that a single through lane be provided in both directions on Potlatch Property Drive under Scenario 2.

- TH 210 & TH 371:** Under the 2030 No Build scenario, the intersection of TH 210 & TH 371 is expected to operate at a LOS F. A principal reason for this poor LOS is that the volume growth factors obtained from Mn/DOT result in a 65% increase in all movements through this intersection from 2007 to 2030. If the rate of growth is less, the intersection volumes would be lower and the level of service would be better. Nonetheless, in the event that the projected volumes do occur by 2030, potential mitigation measures were investigated that would improve the operation to LOS D. The improvements identified to improve the level of service consist of the addition of dual left-turn lanes on each approach, free right-turn lanes on the westbound and southbound approaches and the provision of a third through lane in each direction on TH 371. Mn/DOT has no plans to implement these improvements by 2030. Further, these measures are not sufficient to achieve LOS D for the 2030 No Build scenario.

Additional mitigation measures were investigated to identify ways of improving the LOS if the forecasted volumes are met. One strong candidate mitigation measure is diversion of trips away from this intersection due to improvements planned by the City of Baxter to alternative local routes. Inglewood Drive and Cypress Drive are the prime examples of improved local routes that would provide this benefit. A PM peak hour volume reduction of 10% for the movements likely to be impacted by the alternative routes would allow this intersection to operate at LOS D with the mitigation measures and 2030 No Build volumes. A volume reduction of 35% on the identified movements would improve the LOS to D in Scenario 1. A volume reduction of 15% on the identified movements would improve the LOS to D in Scenario 2.

- Neighborhood Intersections:** *With the exception of the intersection of TH 210 and Meredith Drive, the neighborhood intersections each would operate at LOS C or better during the PM peak hour in the design year for each scenario. Thus, no significant negative impacts would be caused at these intersections and no mitigation measures would be needed. The intersection of TH 210 and Meredith Drive would operate at LOS F during the PM peak hour in each scenario due to substantial delays for left turns from the north on Meredith Drive to the east on TH 210. This difficulty would be resolved when the four-lane divided design on TH 210 extended to the west, which would restrict access at the intersection of Meredith Drive & TH 210 to right turns only. However, Mn/DOT has no plans to complete this improvement on TH 210 by 2030.*

22. VEHICLE-RELATED AIR EMISSIONS

The guidance provided in “EAW Guidelines: should also be followed for an AUAR. Mitigation proposed to eliminate any potential problems may be presented under item 21 and merely referenced here.

Pollutants to be addressed

Motor vehicle emissions are associated with vehicles traveling to and from the study area along roadways and through critical intersections. At these locations, background traffic not related to the project also contributes to the overall emissions and related concentrations. The most critical pollutant associated with vehicular traffic in the vicinity of roadways is Carbon Monoxide (CO) for which 1-hour and 8-hour ambient air quality standards have been established by the US Environmental Protection Agency (EPA) and the Minnesota Pollution Control Agency (MPCA). The MPCA 1-hour standard (30 ppm) is slightly more stringent than the EPA 1-hour standard (35 ppm) and will therefore be used in this assessment. The standards are presented in **Table 22.1**.

Table 22.1 Ambient Air Quality Standards for Carbon Monoxide

Period	MPCA	US EPA
1-hour	30 ppm	35 ppm
8-hour	9 ppm	9 ppm

Carbon Monoxide (CO) Analysis for Access Traffic

A micro-scale analysis (predicting Carbon Monoxide concentrations adjacent to intersections) has been made for two at-grade intersections which carry a major portion of traffic. The analysis has been performed for three 2030 alternatives: No-Build, Scenario 1 and Scenario 2.

The TH 210 and TH 371 intersection is signalized. The Potlatch Drive intersection is assumed signalized for Scenario 1. The intersections with their approach volumes and LOS (Level of Service) are listed in **Table 22.2**.

Table 22.2 Total Approach PM Peak Hour Volumes and Intersection LOS for 2030

Intersections	No Build		Scenario 1		Scenario 2	
	App Vol	LOS	App Vol	LOS	App Vol	LOS

TH 210 at TH 371	6,834	F	7,733	F	7,050	F
TH 210 at Potlach	2,171	--	4,013	D	2,549	B

While the LOS is F at the TH 210 and TH 371 intersection, the nearest receptors are relatively far from the roadways. The Carbon Monoxide concentrations depend not only on the Level of Service but on the volume of traffic, length of queues, emission rates and the proximity of sensitive receptor sites. A micro-scale or intersection analysis has been made at this intersection for each of the alternatives. Under the No Build alternative, no intersection will exist at the proposed Potlach Drive. However, a micro-scale analysis has been performed for Scenario 1 assuming a signalized intersection and Scenario 2 assuming a stop control on Potlach Drive but not TH 210.

The CAL3QHC dispersion model was used to estimate CO concentrations at receptor sites adjacent to these intersections in each of the four quadrants surrounding the intersection. Existing buildings were assumed to be receptor sites at the TH 210 and TH 371 intersection, which are generally 200 feet or more from the intersection. Since the four quadrants at TH 210 and the proposed Potlach Drive are undeveloped, receptor sites have been located 50 feet north and south of the right-of-way and 100 feet east and west of the intersection in each quadrant. Because of the railroad easement south of TH 210, the SE and SW receptors are almost 400 feet south of the intersection.

Carbon Monoxide Background Concentrations

Since background CO data is not readily available for Brainerd, an estimate of the background CO concentration was made using historical data from the City of St. Cloud (the only continuous CO monitoring data available for central Minnesota), and adjusting this on the basis of relative population for St. Cloud and the combined population of Brainerd and Baxter. Historical adjustments for emissions through 2005 were made to the adjusted St. Cloud data using results of the Mobile 5 emissions model, and from 2005 through 2030 using results of the Mobile 6 emissions model as provided by the MPCA. A further adjustment to the background concentration was made based upon the expected growth in population for Brainerd and Baxter. The resulting projected 1-hour CO background concentration in the Brainerd/Baxter area over time is shown on the chart in **Figure 22.1**.

Table 22.3 shows the 1-hour and 8-hour CO background concentrations assumed for this air quality analysis. The 8-hour concentration is assumed to be 0.70 of the 1-hour, the same factor used to adjust roadway concentrations.

Table 22.3 Assumed CO Background Concentrations (ppm)

Intersection	1-Hour	8-Hour)
2030	1.2	0.8

The air quality analysis is based upon PM peak hour traffic projections. Emissions are based upon the U.S. EPA MOBILE 6 emissions model for which emissions have been generated by the Minnesota Pollution Control Agency. Idle emissions were assumed for vehicle queuing and a speed of 25 mph was assumed for emissions associated with free flow during approach and departure. The CAL3QHC model has been used to estimate downwind concentrations of carbon monoxide at receptor sites adjacent to each critical intersection. Eight-hour concentrations associated with each roadway are estimated using a persistence factor of 0.70 applied to the PM peak hour emissions. The assumptions used for the dispersion model are summarized in **Table 22.4**.

Table 22.4 Assumptions used in CO Dispersion Modeling

Traffic Approach Speed:	25 mph on all roadways
Intersection Control:	Signalized
Wind Speed:	1 meter per second
Wind Direction:	Direction yielding highest concentration

Estimated 1-Hour CO Background in Brainerd

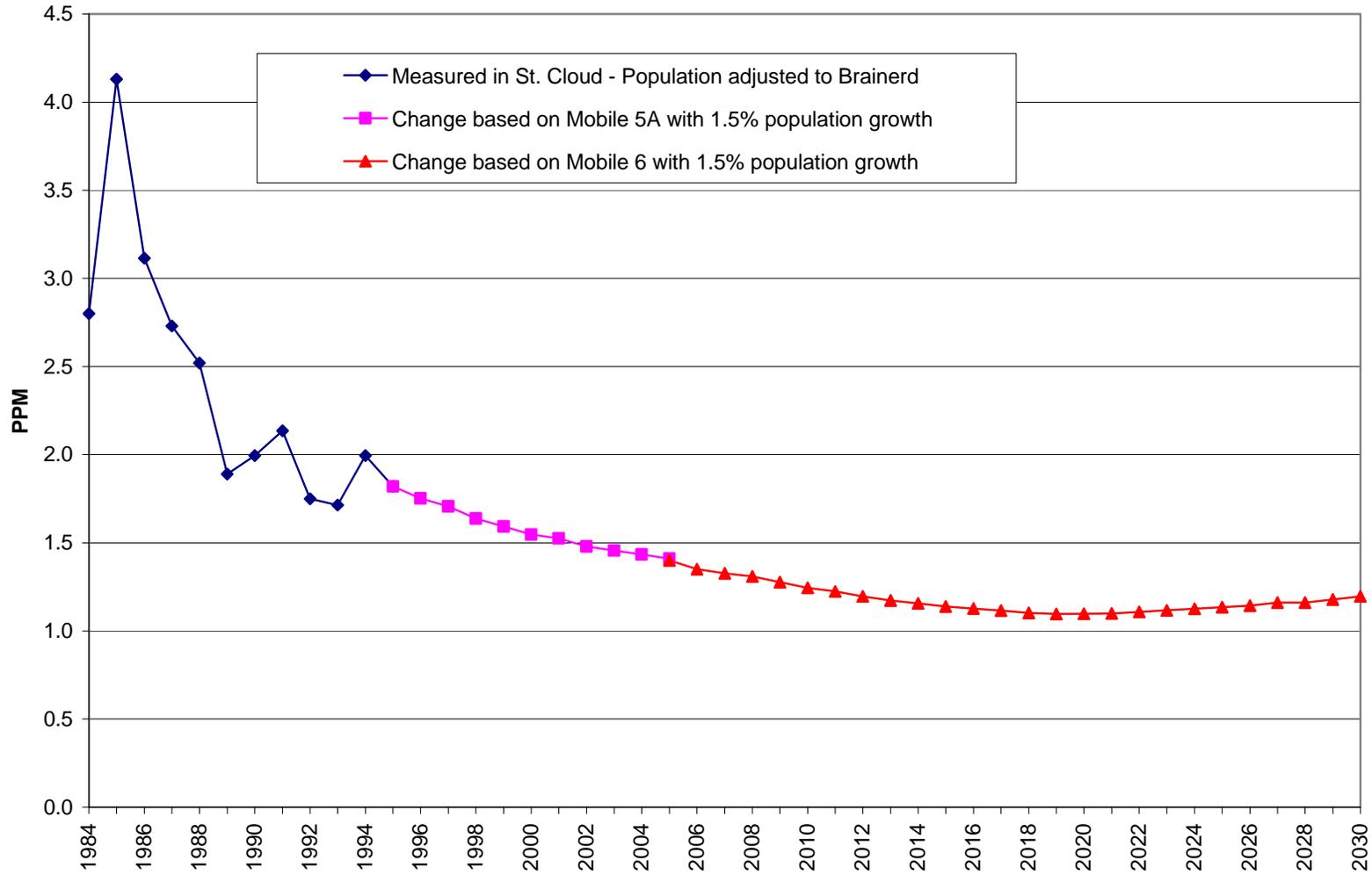


Figure 22.1 Assumed Change in CO Background Concentration over Time

Projected CO Concentrations

Based upon the approach traffic volumes and the emission assumptions noted above, carbon monoxide concentrations have been projected for each of the receptor sites identified above. Predicted 1-Hour Carbon Monoxide concentrations are presented in **Table 22.5**.

Table 22.5 Carbon Monoxide 1-Hour Concentrations (ppm)

	No Build			Scenario 1			Scenario 2		
	Roadway	Background	Total	Roadway	Background	Total	Roadway	Background	Total
TH 210 at TH 371									
Receptor 1 NE	0.4	1.2	1.6	0.4	1.2	1.6	0.4	1.2	1.6
Receptor 2 SE	0.6	1.2	1.8	0.8	1.2	2.0	0.6	1.2	1.8
Receptor 3 SW	1.3	1.2	2.5	1.3	1.2	2.5	1.3	1.2	2.5
Receptor 4 NW	0.7	1.2	1.9	0.9	1.2	2.1	0.7	1.2	1.9
TH 210 at Potlatch									
Receptor 1 NE				0.8	1.2	2.0	0.4	1.2	1.6
Receptor 2 SE				0.6	1.2	1.8	0.3	1.2	1.5
Receptor 3 SW				0.4	1.2	1.6	0.3	1.2	1.5
Receptor 4 NW				0.9	1.2	2.1	0.4	1.2	1.6
Standard (1-hour)			30.0			30.0			30.0

From the table, it can be seen that the maximum expected Carbon Monoxide 1-hour concentrations are relatively low and do not change significantly by alternative. While traffic volumes are lower at the TH 210 and Potlatch Drive intersection, the receptor sites are assumed closer to the roadway since no specific plan is currently available. The maximum 1-hour concentration of 2.5 ppm is predicted to occur in the SW quadrant of the TH 210 and TH 371 intersection under the AUAR scenario. This is approximately 8% of the 1-hour standard.

Predicted 8-Hour Carbon Monoxide concentrations are presented in **Table 22.6**.

Table 22.6 Carbon Monoxide 8-Hour Concentrations (ppm)

	No Build			Scenario 1			Scenario 2		
	Roadway	Background	Total	Roadway	Background	Total	Roadway	Background	Total
TH 210 at TH 371									
Receptor 1 NE	0.1	0.8	0.9	0.1	0.8	0.9	0.1	0.8	0.9
Receptor 2 SE	0.2	0.8	1.0	0.2	0.8	1.0	0.2	0.8	1.0
Receptor 3 SW	0.4	0.8	1.2	0.4	0.8	1.2	0.4	0.8	1.2
Receptor 4 NW	0.1	0.8	0.9	0.3	0.8	1.1	0.2	0.8	1.0
TH 210 at Potlatch									
Receptor 1 NE				0.4	0.8	1.2	0.2	0.8	1.0
Receptor 2 SE				0.3	0.8	1.1	0.1	0.8	0.9
Receptor 3 SW				0.1	0.8	0.9	0.1	0.8	0.9
Receptor 4 NW				0.4	0.8	1.2	0.2	0.8	1.0
Standard (1-hour)			9.0			9.0			9.0

From the table, it can be seen that the maximum expected Carbon Monoxide 8-hour is 1.7 ppm at the Southwest receptor at TH 210 and TH 371 and does not change with scenario since it is relatively low and less sensitive to small changes in traffic volume. This level is about 19% of the 8-hour standard. A maximum 8-hour concentration of 1.4 ppm is predicted at TH 210 and Potlatch Drive at the NE and NW receptors. This value is approximately 15% of the 8-hour standard.

Therefore, based upon an analysis of Carbon Monoxide concentrations, which are the most critical pollutant associated with vehicular traffic, no adverse impacts on air quality are anticipated adjacent to critical intersections serving the AUAR area and surrounding development.

23. STATIONARY SOURCE AIR EMISSIONS

This item is not applicable to an AUAR. Any stationary air emissions source large enough to merit environmental review requires individual review.

No response required.

24. DUST, ODORS, NOISE

Dust, odors, and construction noise need not be addressed in an AUAR, unless there is some unusual reason to do so. The RGU might want to discuss as part of the mitigation plan, however, any dust control or construction noise ordinances in effect. If the area will include or adjoin major noise sources a noise analysis is needed to determine if any noise levels in excess of standards would occur, and if so, to identify appropriate mitigation measures. With respect to traffic-generated noise, the noise analysis should be based on the traffic analysis of item 21.

Dust and noise may be associated with demolition, grading of the site and construction of roadways, buildings, driveways, and parking areas. Noise may also be associated with mechanical equipment as well as traffic accessing the site. Noise generated by the project must comply with the Minnesota noise standards, which are presented in **Table 24.1**. L10 is the level exceeded for 10% or six minutes of an hour. L50 is the level exceeded for 50% or 30 minutes of an hour.

Table 24.1 Minnesota Noise Standards

Land Use	Daytime (7 am to 10 pm)		Nighttime (10 pm to 7 am)	
	L10 (dBA)	L50 (dBA)	L10 (dBA)	L50 (dBA)
NAC-1 (residential)	65	60	55	50
NAC-2 (commercial)	70	65	70	65
NAC-3 (industrial)	80	75	80	75

Construction

The following measures to minimize noise and dust emissions will be incorporated into construction procedures:

All internal combustion motors will be fitted with mufflers and other noise control equipment as specified by the manufacturer.

Minnesota Rules 7005.0050 on the control of fugitive particulate matter from construction and hauling activities will be followed as to minimize adverse air quality impacts.

Mechanical equipment associated with the development will be installed and operated so as to comply with the Minnesota standards.

Traffic Noise

Noise from traffic in the vicinity of the AUAR area will be concentrated along those roadways with the highest traffic volumes and speeds. The assessment of traffic noise is based upon traffic volume, assumed vehicle mix, and speed. Traffic noise projections have been made along the north, east, south and west leg of each of the intersections of TH 210 with TH 371 and Potlatch Drive and along adjacent residential streets expecting to experience increases in traffic because of AUAR development.

TH 210, TH 371 and Potlatch Drive

Traffic volume assumptions for the noise analysis are based upon traffic counts and projections presented in Question 21. Approach and departure vehicle volumes for each of the two intersections along TH 210 are shown in **Table 24.2**. The assumed speed for all intersection legs was 35 mph. Traffic noise levels along TH 210 under the No Build alternative will be essentially the same near the future Potlatch Drive as those estimated west of TH 371. Therefore, only Scenario 1 and Scenario 2 are evaluated near Potlatch Drive.

Table 24.2 Vehicle Mix Assumptions at TH 210 Intersections in 2030

	TH 210 at TH 371			TH 210 at Potlatch	
	No Build	Scenario 1	Scenario 2	Scenario 1	Scenario 2
EB Approach					
Autos	876	1328	746	1029	632
Medium Trucks	41	62	35	48	29
Heavy Trucks	102	154	87	120	74
WB Approach					
Autos	1746	1915	1754	1763	1349
Medium Trucks	78	85	78	78	60
Heavy Trucks	116	128	117	118	90
NB Approach					
Autos	1650	1714	490	1657	293
Medium Trucks	52	54	15	52	9
Heavy Trucks	35	36	10	35	6
SB Approach					
Autos	2031	2144	646	2043	7
Medium Trucks	64	68	20	65	0
Heavy Trucks	43	45	14	43	0
EB Departure					
Autos	1131	1355	1282	1207	861
Medium Trucks	50	60	57	54	38
Heavy Trucks	75	90	85	80	57
WB Departure					
Autos	1375	1697	1413	1408	1295
Medium Trucks	64	79	66	65	60
Heavy Trucks	160	197	164	164	151
NB Departure					
Autos	2316	2504	762	2380	36
Medium Trucks	73	79	24	75	1
Heavy Trucks	49	53	16	50	1
SB Departure					
Autos	1463	1538	137	1489	46
Medium Trucks	46	49	4	47	1
Heavy Trucks	31	32	3	31	1

The nearest commercial receptors to the TH 210 and TH 371 intersection range from 400 to 1000 feet from the center of the intersection and 200 to 700 feet from the roadways. Predicted L10 levels at these sites in Scenario 1 are predicted to be at least 10 dBA below the L10 70 dBA standard except for the receptor in the southwest quadrant which is predicted to be 5 dBA below the L10 70 dBA standard. The increase in level from the No Build to Scenario 1 is less than 1 dBA. The noise level for Scenario 2 is expected to remain about the same as the No Build scenario.

The nearest receptors to the TH 210 and Potlatch Drive intersection are assumed to be commercial land uses in Scenario 1. These receptors range from 200 to 500 feet from the intersection and 150 to 450 feet from the roadways. Predicted L10 levels at these sites within 150 to 200 feet from TH 210 are predicted to be close to the commercial L10 70 dBA standard.

Residential Streets

Approach and departure automobile volumes for each residential intersection and alternative are shown in **Table 24.3**. No trucks are assumed along residential streets. The assumed speed for all intersection legs was 30 mph.

Table 24.3 Automobile Volumes at Residential Intersections

	N LE G	E LEG	S LE G	W LEG
No Build				
Cedar Scenic at Olivewood	0	117	32	93
Cedar Scenic at Memorywood	211	0	310	131
Travine Dr. at Memorywood	361	0	430	97
TH210 at Meredith	69	2225	0	2192
	N LE G	E LEG	S LE G	W LEG
Scenario 1				
Cedar Scenic at Olivewood	0	272	229	117
Cedar Scenic at Memorywood	437	0	380	285
Travine Dr. at Memorywood	432	0	470	208
TH210 at Meredith	86	3441	0	3391
	N LE G	E LEG	S LE G	W LEG
Scenario 2				
Cedar Scenic at Olivewood	0	136	51	93
Cedar Scenic at Memorywood	237	0	317	150
Travine Dr. at Memorywood	368	0	437	111
TH210 at Meredith	71	2512	0	2477

The expected average increases in sound level along these roadways from the No Build to Scenario 1 and Scenario 2 based only upon relative increases in traffic volume are presented in **Table 24.4**.

Table 24.4 Increases in L10 Levels (dBA) along Residential Roadways

	N LE G	E LE G	S LE G	W LE G
No Build vs Existing				
Cedar Scenic at Olivewood		3.0	3.0	3.0
Cedar Scenic at Memorywood	2.9		3.0	3.0
Travine Dr. at Memorywood	3.0		3.0	3.0
TH210 at Meredith	0.6	4.1		
Scenario 1 vs No Build				
Cedar Scenic at Olivewood		3.7	9.0	1.0
Cedar Scenic at Memorywood	3.2		0.9	3.4
Travine Dr. at Memorywood	0.8		0.4	3.3
TH210 at Meredith	1.0	1.9		1.9
Scenario 2 vs No Build				
Cedar Scenic at Olivewood		0.7	2.0	0.0
Cedar Scenic at Memorywood	0.5		0.1	0.6
Travine Dr. at Memorywood	0.1		0.1	0.6
TH210 at Meredith	0.1	0.5		0.5

From **Table 24.4**, it can be seen that the greatest potential increase in sound level (9.0 dBA) can be expected along Olivewood south of Cedar Scenic Drive under Scenario 1, with a smaller increase along other roadways.

Since the greatest impact may occur along Olivewood and Cedar Scenic, traffic noise along Olivewood and Cedar Scenic Drive was also predicted using the MinnNoise traffic noise model. The L10 for a home 100 feet from Olivewood is predicted to increase from a No-Build level of 44.0 dBA to a Build (AUAR) level of 53 dBA. The L10 of 53 is still 12 dBA below the L10 65 daytime standard but the predicted increase in sound level of 9.0 dBA could be perceived as an almost doubling of the loudness of traffic noise.

Should any new residential buildings be located within 250 feet of TH 210 as part of the proposed development, however, these will have to be designed to meet the conditions contained in Minnesota Rule 7030.0050, Subpart 3: Exceptions [to the noise standards] that allow residential land uses where noise levels are greater than L10 65 dBA. The applicable rules are stated below for completeness.

7030.0050 Subp. 3. Exceptions. The noise area classification for a land use may be changed in the following ways if the applicable conditions are met.

[For residential buildings exposed to L10 levels greater than 65 dBA but less than 70 dBA, the following exception will apply, allowing residential buildings (Noise Area Classification 1) to be exposed to levels up to 70 dBA.]

- B. The standards for a building in a noise area classification 2 [L10 = 70 dBA] shall be applied to a building in a noise area classification 1 if the following conditions are met:
- (1) the building is constructed in such a way that the exterior to interior sound level attenuation is at least 30 dB(A);
 - (2) the building has year-round climate control; and
 - (3) the building has no areas or accommodations that are intended for outdoor activities.

Findings Related to Traffic Noise Impact

Existing commercial land uses along approach and departure roadways at the TH 210 and TH 371 intersections are expected to experience increases of less than 1 dBA in Scenario 1 relative to the No Build alternative in 2030. The L10 levels for the PM peak hour are predicted to be at or below the NAC-2 or commercial noise standard (L10 70 dBA) at all receptors along these roadways.

In the vicinity of TH 210 and Potlach Drive, locations of future receptor sites were assumed near approach and departure roadways since no residential, commercial or industrial land uses currently exist. Predicted L10 levels at these assumed receptor sites are predicted to be at or below the L10 70 dBA commercial standard.

Thus, no significant adverse impacts from noise are anticipated along TH 210 and TH 371 in Scenario 1 and Scenario 2.

If any new residential land uses are located within 250 feet of TH 210, mitigation with noise berms or walls will be required to comply with the daytime noise standards. Appropriate building construction will also be needed to comply with exceptions to the rules, since nighttime noise levels will likely exceed standards.

Noise along residential roadways north of TH 210 will increase due to increased traffic. The estimated No Build L10 level during the PM Peak Hour at homes along Olivewood Drive is estimated at 44.0 dBA and expected to increase to 53 dBA under Scenario 1. This level is 12 dBA below the L10 standard. No significant impacts from noise are anticipated along any of the other residential streets affected in Scenario 1 or Scenario 2.

25. SENSITIVE RESOURCES

Archeological, historic, and architectural resources. For an AUAR, contact with the State Historic Preservation Office is required to determine whether there are areas of potential impacts to these resources. If any exist, an appropriate site survey of high probability areas is needed to address the issue in more detail. The mitigation plan must include mitigation for any impacts identified.

Prime or unique farmlands. The extent of conversion of existing farmlands anticipated in the AUAR should be described. If any farmland will be preserved by special protection programs, this should be discussed.

Designated parks, recreation areas, or trails. If development of the AUAR will interfere or change the use of any existing such resource, this should be described in the AUAR. The RGU may also want to discuss under this item any proposed parks, recreation areas, or trails to be developed in conjunction with development of the AUAR area.

Scenic views and vistas. Any impacts on such resources present in the AUAR should be addressed. This would include both direct physical impacts and impacts on visual quality or integrity. "EAW Guidelines: contains a list of possible scenic resources (page 20).

In order to document any cultural resources present within the AUAR boundaries, Archaeological Research Services (ARS) was retained to conduct a cultural resources reconnaissance survey. Following records and literature searches at the Office of the State Archaeologist (OSA) and the State Historic Preservation Office (SHPO), a field review was completed during the months of May and June, 2007, with Christina Harrison as principal investigator and field director. The field survey methodology followed State of Minnesota guidelines. The investigation was also conducted in a manner which meets the requirements of Section 106 of the National Historic Preservation Act of 1966 and 36FR800, the procedures of the Advisory Council on Historic Preservation for the protection of historic properties.

A detailed cultural resource report conducted by Archaeological Research Services titled "Report on Cultural Resource Reconnaissance Survey," dated November 2007 is included as **Appendix H**.

26. ADVERSE VISUAL IMPACTS

If any non-routine visual impacts would occur from the anticipated development, this should be discussed here along with appropriate mitigation.

The AUAR anticipates a development pattern similar to those uses in the surrounding area and does not anticipate any adverse visual impacts as a result of the development scenario. However, development may result in significant loss of trees and forested areas. Buffer strips could be maintained / managed along TH 210 to mitigate. Also the use of conservation design could preserve significant vegetation.

27. COMPATIBILITY WITH PLANS

The AUAR must include a statement of certification from the RGU that its comprehensive plan complies with the requirements set out at 4410.3610, subpart 1. The AUAR document should discuss the proposed AUAR area development in the context of the comprehensive plan. If this has not been done as part of the responses to items 6,9,18,21, and others, it must be addressed here; a brief synopsis should be presented here if the material has been presented in detail under other items. Necessary amendments to comprehensive plan elements to allow for any of the development scenarios should be noted. If there are any management plans of any other local,

state, or federal agencies applicable to the AUAR area, the document must discuss the compatibility of the plan with the various development scenarios studied, with emphasis on any incompatible elements.

City of Baxter Comprehensive Plan

The City of Baxter amended its Comprehensive Plan in 2007. This Comprehensive Plan lacks some of the elements set forth in 4410.3610 Sub Part 1. However, the City has other adopted policy plans that satisfied the intent of 4410.3610 Sub Part 1. This was approved by the EQB chair on February 26, 2007 (See letter dated 2-26-07 from Gene Hugoson).

The City has elected to study two scenarios of anticipated development. One Scenario is consistent with the Comprehensive Plan while the other is consistent with the Potlatch development plan. The intent is to evaluate each development scenario for consistency with the City's Comprehensive Plan and zoning regulations as they stand today. It should be noted the City's Comprehensive Plan does not provide a clear future land use plan but instead relies on its zoning district designations; therefore, land use changes would need to be made and adopted by the City to implement Scenario One. Furthermore, Scenario One should be adopted as a small area plan. The following comprehensive plan polices and guidelines are in support of Scenario One:

- The comprehensive plan's economic growth policy encourages areas for mixed use neighborhood clusters such as suggested north of TH 210.
- The plan promotes the strategy of working with residents, businesses, and developers to create detailed small area plans or policies for sections of the City that are likely to require redevelopment or new development in the near future, such as the Highway 210 West Corridor.
- The comprehensive plan recognizes new development and older portions of the city will, in time; need to have their current land uses evaluated to determine if those uses are meeting the needs of the community.
- The comprehensive plan encourages the use of the AUAR process to comprehensively evaluate the combined impacts of multiple new developments within a specific geographic area instead of individual reviews that fail to account for the cumulative impacts of new development.
- The comprehensive plan's residential development policy encourages development of a wide range of housing opportunities, ranging from low-density to high-density development. Scenario One best meets this policy direction with the full range of housing opportunities.
- The project area is currently designated as "Development Driven" in the City's 2008 Water and Sewer Capital Improvement Program.

North & South Potlatch Property Improvement Study

Portions of the AUAR area were studied for water improvements in 2006 by Widseth Smith Nolting. The studies, entitled "Potlatch Property Improvements South of TH 210" and "Potlatch Property Improvements North of TH 210" were accepted by the Baxter City Council on October 17, 2006. The studies completed by the City have been incorporated as part of the AUAR process.

Parks & Trails

The City's Comprehensive Plan, Baxter Park Plan and the Potlatch West Baxter AUAR emphasize the amenity value and identity that parks and open spaces bring to neighborhoods and the

community as a whole. The AUAR identifies about 46 acres of land to be used for parks, open spaces, and stormwater ponding. This includes passive open spaces as well as neighborhood parks.

The Baxter Park Plan was prepared back in 2002 and needs updating. However, the plan still contains policies that are valid. Development concepts for Scenario One took into consideration the various park and trail policies and initiatives identified in that plan. In response to those policies and initiatives, areas of the AUAR have included future parks, pedestrian/bike trails and open spaces. Scenario Two could also incorporate these improvements; however, the financial feasibility and benefit of such improvements are greater under Scenario One.

28. **IMPACT ON INFRASTRUCTURE AND PUBLIC SERVICES**

This item should first of all summarize information on physical infrastructure presented under items (such 6, 17, 18 and 21). Other major infrastructure or public services not covered under other items should be discussed as well — this includes major social services such as schools, police, fire, etc. The RGU must be careful to include project-associated infrastructure as an explicit part of the AUAR review if it is to exempt from project-specific review in the future.

Water

Infrastructure improvements are anticipated to occur under the scenarios. Based on the total projected water use for Scenario One, the estimated amount on new 6", 8", 10" and 12" watermain to be installed in the AUAR is 33,600 feet. Projected water use from the AUAR area is well within the current supply and production capacities. However, combined with additional growth anticipated in the City the current supply and treatment capacities will likely be exceeded during peak day periods prior to achieving full build out of the AUAR project area. The City of Baxter will need to coordinate future development growth and infrastructure improvements to ensure adequate water supply and treatment.

Sewer

Based on Scenario One, the estimated amount of new 8" and 10" sanitary sewer collection pipe necessary to serve the AUAR area is approximately 27,500 lineal feet. The maximum depth of pipe installation is approximately 25' below existing grade. One additional lift station approximately 25' in depth and approximately 2,000 lineal feet of force main will also be required.

Projected wastewater from the AUAR and with anticipated growth in the area would exceed the 650,000 gallons of wastewater flow to the Brainerd Wastewater Treatment Facility (WWTF) in 2014. At that time, the City will need to revise an agreement to accommodate additional wastewater flows to the facility. However, the WWTF is in the process of exploring future facility needs. Without knowing potential improvements, the City of Baxter will need to continue to coordinate with the City of Brainerd WWTF.

Electricity

Electric utilities will be provided by local electric utility companies as guided by current codes and ordinances. Where possible, electric utility will be buried under ground. Easements will be integrated into the system of open space networks and road right-of-way.

Storm Water Management

Storm water runoff is anticipated to increase as development occurs in the AUAR and a system of detention facilities will be needed. Stormwater handling facilities and treatment alternatives acceptable to the City of Baxter include infiltration basins, wet sedimentation basins, subsurface storage and infiltration along with swales and ditches designed in accordance with NPDES regulations and Minnesota Stormwater Manual guidelines. Development plans and detailed design

will dictate the exact location of each treatment facility. The City of Baxter will work with property owners and developers to construct and manage the storm water system.

Transportation

The City of Baxter coordinates with Crow Wing County and the Minnesota Department of Transportation on transportation initiatives. The City, County and MN Dot have been coordinating in response to anticipated traffic increase and infrastructure improvements within the area. Scenario One's proposed roadway network has been identified in the City's Comprehensive Plan under the Long Range Transportation Plan. These alignments may change as development occurs; however, development will include additional roadway networks to facilitate traffic movement.

Transit

It is unlikely transit services would be provided within the AUAR area. At this time transit service is provided on a limited basis by Crow Wing County.

Police and Fire Services

New development will require the response of additional police and fire service protection customary with urban development. Police service is provided by the Baxter Police Department and fire services are coordinated with the Brainerd Fire Department by a cooperative agreement. Services in the near term should be adequate to serve development in the project area; however, as development occurs over the long term, additional staffing and resource needs may be necessary. The projected development of scenario one of 1,147 new households will result in a population increase of 2,300 to 4,000 depending on what assumptions are made for persons per household. The City has been pursuing the development of a new Fire Sub-Station and has secured land in two locations that could be used as a fire substation.

School District

The project site is located in the Brainerd School District (ISD 181). Three schools service the Baxter area: Baxter Elementary, Forestview Middle School and Brainerd High School. It is assumed approximately 0.3 students per unit would be added to the district in general terms. This would result in approximately 345 students over the full build out assumption. For determining school district enrollment impacts, we can assume that future development will require a minimum of 20 years to reach full build out. A reasonable assumption could be that the project area produces 50 units per year starting in 2009 or 2010 and that the distribution of those units will be approximately 40-50% single family detached 25-30% attached (townhome/rowhome) and 25-30% stacked (apartment/condo). Applying the basic 0.3 student per unit ratio, we could project roughly 15 students per year distributed to the three schools, added to the system over the next 22 years.

Baxter Elementary is currently at capacity. There is currently sufficient capacity to accommodate middle and high school students that would be generated by the development project.

The City and School district will need to closely collaborate to align future growth with school capacity needs. Short term strategies might include redistricting, while long term needs may be the need for a new elementary school.

Telephone and Cable

As with other infrastructure, telephone and cable infrastructure will need to be expanded as development occurs in the project area. Planning for growth is generally based on plans submitted and discussions with City staff. In general, the infrastructure needed to provide telephone and cable services can be placed into the right-of-way. There is also a need for essential service structures

which are usually placed within easements. Discussions with company representatives will ensure that they are aware of the AUAR, there is sufficient room in the right-of-way for infrastructure, and plans for other needed structures are made.

29. CUMULATIVE IMPACTS

This item does not require a response for an AUAR with respect to cumulative impacts of potential developments within the AUAR boundaries, since the entire AUAR process is intended to deal with cumulative impacts from related developments within the AUAR area; it is presumed that the responses to all items on the EAW form encompass the impacts from all anticipated developments within the AUAR area. However, the questions of this item should be answered with respect to the cumulative impacts of development within the AUAR boundaries combined with past, present, and reasonably foreseeable future projects outside of the AUAR area, where such cumulative impacts may be potentially significant. (As stated on the EAW form, these cumulative impact descriptions may be provided as part of the responses to other appropriate EAW items, or in response to this item).

No response required.

30. OTHER POTENTIAL ENVIRONMENTAL IMPACTS

If applicable, this item should be answered as requested by the EAW form.

The development scenarios described in Question 6 will not generate any environmental impacts beyond those described in this AUAR.

31. SUMMARY OF ISSUES

The RGU may answer this question as asked by the form, or instead may choose to provide an Executive Summary to the document that basically covers the same information. Either way, the major emphasis should be on: potentially significant impacts, the differences in impacts between major development scenarios, and the proposed mitigation.

See Executive Summary.

Mitigation Initiatives

Mitigation Plan. The final AUAR document must include an explicit mitigation plan. At the RGU's option, a draft plan may be included in the draft AUAR document; of course, whether or not there is a separate item for a draft mitigation plan, proposed mitigation must be addressed throughout the document.

It must be understood that the mitigation plan in the final document takes on the nature of a commitment by the RGU to prevent potentially significant impacts from occurring from specific projects. It is more than just a list a ways to reduce impacts – it must include information about how the mitigation will be applied and assurances that it will. Otherwise, the AUAR may not be adequate, and/or specific projects may lose their exemption from individual review. The RGU's final action on the AUAR must specifically adopt the mitigation plan; therefore, the plan has a “political” as well as technical dimension.

This Mitigation Plan identifies initiatives that address potential impacts resulting from future development within the AUAR project area. This mitigation plan specifies the controls, procedures, and other steps that may be implemented to protect or minimize potential negative impacts. In order to mitigate the potential environmental impacts identified in the Potlatch West Baxter AUAR, the City of Baxter will commit to implementing the mitigation initiatives identified in this plan.

Intent of Mitigation Plan

The development of the AUAR project area will have impacts on the environment and existing development. This plan identifies the responsibilities of the City of Baxter and other jurisdictions to mitigate potential impacts. The plan also identifies the tools, polices and initiatives the various jurisdictions have in place to mitigate impacts. There are multiple ways in which Mitigation Initiatives may be implemented such as:

- Enforcing existing zoning and subdivision ordinances and other development regulations at the time of development concept submittals, preliminary and final platting, and during construction monitoring activities.
- Referencing and implementing policy directions provided in the Baxter Comprehensive Plan during the review and approvals of development projects.
- Planning and staging the construction of public infrastructure (local roads, parks, trunk sewer and water systems) in conjunction with private development projects.
- Maintaining and updating existing plans and studies for the community and region.
- Requiring additional field work/investigation as part of pre-development planning where potential environmental and/or cultural resources may exist but have not been verified or where more detailed air quality testing or noise monitoring may be needed.
- Implementing Best Management Practices, Low Impact Development or Conservation Design techniques
- Working with other jurisdictions to ensure compliance with local, state and county regulations including *Minimum Statewide Shoreland Management Standards, Minnesota Rules part 6120 and potential modifications to such rules.*

Responsible Party Terminology

The responsible party(s) listed for the various mitigation measures indicates the party(s) that may be responsible for the implementation and/or financial responsibility for implementing the specific mitigation measures. The financial component is indicated in the Mitigation Actions Matrix as indicated by dollar signs (\$- Low Cost, \$\$ - Medium Cost and \$\$\$ - High Cost). The intent of the scale is to give a general idea of what it would take to carryout the initiatives from a cost, staffing and resources standpoint.

The level of responsibility for each party has not yet been determined. Responsibility for the various mitigation measures may change throughout the life of the AUAR.

<u>Term</u>	<u>Meaning</u>
Local Jurisdictions	Appropriate local government agencies. This may include multiple agencies when the mitigation measure affects multiple jurisdictions. This may or may not include the City of Baxter.
County	Crow Wing County & the Soil and Water Conservation District
Developing Property Owner	A property owner is assigned responsibility through the act of developing property that is located within the AUAR boundary.
Regional Agency	The appropriate state or federal agency. This may include multiple agencies when the mitigation measure affects multiple jurisdictions. This may or may not include agencies such as the Minnesota Department of Transportation, Minnesota Department of Natural Resources or Watershed Districts.

General Mitigation Initiatives

- This section identifies a series of mitigation initiatives that are general in nature and apply to all public and private development within the AUAR.
- All permits identified in the AUAR (see Question 8), as well as other necessary permits that may be required will be secured by private parties, or the City as appropriate, for all development activities within the project area.
- The City will enforce all local regulations, ordinances, plans, and policies currently in place in the review and approval of all development activities within the project area. These items include the *Baxter Comprehensive Plan*, the *City zoning code* and *subdivision regulations*. In addition, the *Crow Wing County Comprehensive Plan and Inventory and Assessment of Natural Resources in Crow*

Wing County will be used as technical resources in reviewing development activities and developing associated public infrastructure.

Focused Mitigation Initiatives

Mitigation initiatives that are explicitly intended to mitigate or minimize impacts on a particular resource or action are outlined by topic in this section.

Land Use Management

The City’s Comprehensive Plan and zoning regulations are in place to guide development within the project area. The AUAR articulates two different land use scenarios: 1) Scenario One that is consistent with the 2005 Potlatch Development Plan and; 2) Scenario Two that is consistent with the Comprehensive Plan. The City’s Comprehensive Plan uses the existing zoning as the future land use plan; therefore, land use changes would need to be made and adopted by the City to implement Scenario One. It is also anticipated that Scenario One will be adopted as a small area plan. Development under Scenario One may require new zoning districts if the City wants to allow for the mix of uses.

The following are key land use mitigation initiatives:

Land Use Mitigation Actions	Responsibility	Time Frame	Cost
1. Amend Baxter’s Comprehensive Plan to reflect the land use changes as described in the AUAR as Scenario One.	Local Jurisdiction	2008 -2009	\$
2. Establish zoning and subdivision mechanisms to ensure future development is consistent with land use patterns described in the AUAR.	Local Jurisdiction	2009	\$
<u>3. Ensure all future development is done consistent with adopted shoreland regulations.</u>	<u>Local Jurisdiction</u>	<u>On-going</u>	<u>\$</u>
<u>4. Encourage conservation design strategies such as preservation of lake shore areas in their natural state (buffers of 50 to 100 feet depending on resource significance), clustering development to keep large contiguous open space corridors open for habitat and stormwater management functions, LID strategies that minimize hard surface cover and stormwater runoff and design that reduces energy consumption.</u>	<u>Developer/Local Jurisdiction</u>	<u>On-going</u>	<u>\$-\$\$\$</u>

Water Resources

One of the most significant water resources located within the AUAR boundary is Moburg Lake. A residential parcel to the west of Moburg Lake has been guided for medium density under Scenario One. The purpose for providing medium density along the lake is to allow for greater flexibility in transferring density and development impacts away from the lake shore; therefore, preserving the lakeshore ecology and aesthetics. In order for development to occur in this manner, the City will need to establish official controls and/or programs to allow density to be transferred away from the lake shore. Development within this area will need to comply with Minimum Statewide Shoreland Management Standards, Minnesota Rules pat 6120. Development within this area should be designed to fully contain runoff, preventing excessive nutrient and sediment loads from reaching lake water. Conservation design strategies will also be applied to development within this area in efforts to minimize impacts. These strategies might include clustering units away from sensitive areas and shoreline areas, identifying and preserving buffers along the lake shore where activities are limited to native habitat restoration, low impact development strategies for infrastructure improvements and stormwater best management practices.

Moburg Lake has also been identified as a “Recreational Development” lake by the Minnesota Commissioner of Natural Resources. Development and recreational uses will need to comply with state and local regulations. Development within the area is subject to the regulations identified under the City of Baxter’s Zoning Code.

Moburg Lake may be the most identifiable water resource in the area; however, the AUAR boundary also consists of several wetlands. If any wetlands are impacted during development they will be replaced/mitigated in compliance with the Minnesota Wetland Conservation Act (WCA) and the Federal Clean Water Act. Potential impacts to wetlands and other water resources may be influenced by storm water runoff from impervious surfaces. Additional mitigation measures on this matter are discussed in the Storm Water Management section.

The following are key water resource mitigation initiatives:

Water Resource Mitigation Actions	Responsibility	Time Frame	Cost
1. Enforce existing codes and regulations.	Local Jurisdiction, County, Regional Agency	On- going	\$
2. Amend regulatory tools to establish critical buffers around wetlands <u>and along lake shores using the Alternative Shoreland Management Standards (Version 1.0 Dated December 12, 2005) as a guide. This strategy should also include evaluating existing shoreland regulations and consideration for reclassifying Moburg Lake.</u>	Local Jurisdiction	2009	\$
3. Establish zoning mechanisms and/or programs to transfer density and development impacts away from the lakeshore <u>while ensuring stormwater management systems that fully contain runoff, thus preventing excessive nutrient and sediment loads from reaching water bodies.</u>	Local Jurisdiction	On- going	\$

Water Resource Mitigation Actions	Responsibility	Time Frame	Cost
<i>4. Consider water quality monitoring on Lake Moburg. The Moburg Lake Nutrient Budget is attached as an appendix.</i>	<i>Local Jurisdiction</i>	<i>On-going</i>	<i>\$</i>

Water & Sewer

Water Supply

The project area has been served by private wells until recent infrastructure improvements were made by the City in 2006. As development occurs, existing wells on site will need to be capped or further studied to determine their locations and if any will be impacted by construction activities. New development within the AUAR boundary will be required to hook up to City sewer and water services under the City's "Adequate Facilities Ordinance." By doing so, additional infrastructure improvements may be required and will need to follow the City's long-range sewer and water capital improvement program (CIP).

At this time, the AUAR does not foresee any concerns related to current water supply or production capacities issues under either scenario.

The following are key water supply mitigation initiatives:

Water Mitigation Actions	Responsibility	Time Frame	Cost
1. Wells will be properly sealed by a licensed well driller in accordance with codes administered by the Minnesota Department of Health.	Local Jurisdictions, Developing Property Owners, Regional Agency	On-going	\$\$
2. Establish watermain and service locations based on final roadway alignments utilized for development.	Local Jurisdictions, Developing Property Owners	On-going	\$
3. Construction of additional watermains as development occurs.	Developing Property Owners	On-going	\$\$
4. Establish water conservation measures to reduce the demand for water usage.	Local Jurisdictions	2009	\$
5. Revise development irrigation standards.	Local Jurisdictions	2009	\$

Sanitary Sewer

Based on Scenario One, the estimated amount of new sanitary sewer collection pipe necessary to serve the AUAR area is approximately 27,500 lineal feet. An additional lift station and approximately 2,000 lineal feet of force main will also be required. Projected wastewater from general development in the City (not specifically related to development of the AUAR property) is expected to exceed Baxter's interim agreement with the Brainerd Wastewater Treatment Facility of 650,000 gallons of wastewater flow in the year 2010. Development of either scenario will

require the City of Baxter to enter into a revised agreement with the City of Brainerd for additional capacity at the treatment facility. Plans to expand the capacity of the Brainerd Wastewater Treatment Facility are in progress. In the meantime, efforts are underway to reduce the discharge of Fats, Oils and Grease (FOG) into the sanitary sewer system to extend capacity until the plan expansion is completed.

Another possible interim solution is the use of a clustered package plant treatment system. The system could be private or municipally owned and operated, depending on the wishes of the City. A system of this nature, would likely service only a limited portion of the AUAR study area. When considering package treatment plants, the following must be noted:

- ✓ System treating over 10,000 gpd average day flow require an NPDES Discharge Permit
- ✓ Systems treating over 100,000 gpd average day flow become costly due to design requirements to provide redundancy
- ✓ Monitoring, reporting and maintenance of these systems requires technically trained staff

The use of a package plant system should only be viewed as temporary until current treatment capacity issues are resolved and service can be provided by the City. Approval of these systems would need to be obtained from the City and the systems should be constructed to allow for future connections to the municipal system.

In order to meet long-term needs and further phasing of development, wastewater demands will need to be monitored by the City and addressed in the City’s Sewer and Water Capital Improvement Program that is amended annually. The City will also need to continue to coordinate with the Brainerd Wastewater Treatment Facility and the City of Brainerd to address future development and wastewater treatment needs.

The following are key sewer mitigation initiatives.

Sewer Mitigation Actions	Responsibility	Time Frame	Cost
1. Continue to coordinate future wastewater treatment facility needs with the City of Baxter, Brainerd and the Brainerd Wastewater Treatment Facility.	Local Jurisdiction	2010	\$\$\$

Storm Water Management

Stormwater runoff is likely to occur at some level under either scenario. A primary goal in the AUAR is to address these levels of runoff through Best Management Practices (BMPs). BMPs techniques are intended to reduce the amount of surface water runoff and be treated in a appropriate fashion. The City will work to ensure BMPs are being used throughout the development review process. Additional local mechanisms may also be incorporated into the City’s Zoning Code and Erosion and Sediment Control Ordinance to minimize surface water runoff. The City will continue to use or consider using the following tools:

1. Flexibility in parking regulations
2. Storm water utility – credit given for on site treatment

3. Drip irrigation methods.
4. Pervious surfaces (pavers, rain gardens, bio-swales) as part of new development construction.
5. Regional ponding and on-site stormwater retention.

Surface water runoff may also impact water recourses (wetlands, lakes, creeks, etc.). There will be a need to address all surface water runoff impacts from new development on wetlands and potential areas prone to flooding. Although Moburg Lake is entirely within the 100 year flood plain, very little of the developable area is impacted by the 100 year flood plain. However, development will still need to pay close attention to potential impacts to the floodplain and shoreland area.

Coordination will need to continue with regional agencies to ensure the appropriate mitigation measures are applied. If any wetlands are impacted during development they will be replaced/mitigated in compliance with the Minnesota Wetland Conservation Act (WCA) and the Federal Clean Water Act. The following are key storm water mitigation initiatives:

Storm Water Mitigation Actions	Responsibility	Time Frame	Cost
1. Adopt Best Management Practices (BMPs) as part of the development review process.	Local Jurisdiction, County, Developing Property Owners	2009	\$
2. Incorporate stormwater treatment facilities (Infiltration basins, wet sedimentation basins, subsurface storage and infiltration, etc.).	Local Jurisdiction	2009	\$\$
3. Require individual development projects to provide site design and low-impact development storm water management techniques which treat run-off prior to leaving the site and which minimize and slow the rate of run-off by considering alternative approaches such as grass swales, rainwater gardens and pervious pavers as possible storm water management options.	Local Jurisdiction, County, Developing Property Owners	On-going	\$\$

Erosion Control and Sedimentation

New development will disturb the land and result in the some bares soils that would be susceptible to erosion. As a result, bare soils created during project construction will need to be stabilized and protected as soon as feasible using standard construction practices. To help minimize erosion and sedimentation issues during construction, grading plans will need to be compliant with city, county and state regulations. In addition, construction and grading plans should incorporate Best Management Practices (BMPs) as part of the development review process. BMPs may include the following, but are not limited to these techniques/features:

- Ditch checks
- Silt line fencing

- Erosion control blankets
- Cross-slope cultivation
- Rapid slope stabilization
- Turf establishment
- Riprap

Once the construction process is complete, temporary erosion control devices would be removed and any exposed areas would be re-vegetated to control erosion on a permanent basis. A detailed erosion control plan will be included as part of the required stormwater pollution prevention plan (SWPPP).

Specific requirements for construction activity under the General Stormwater Permit to prevent erosion are addressed under Section 16 of the AUAR. The following are key erosion control and sedimentation mitigation initiatives:

Erosion Control & Sedimentation Mitigation Actions	Responsibility	Time Frame	Cost
1. Enforce existing codes and regulations.	Local Jurisdiction, County (SWCD), State Agency	On-going	\$
2. Apply BMPs as part of construction and grading plans.	Developing Property Owners	On-going	\$

Cultural & Heritage Resources

The project area has primarily been forested for timber production over the years. In that respect, portions of the area have been disturbed by forest production methods.

Two Native-American archaeological sites have been identified within the AUAR boundary. The areas have not been cleared for development and both sites appear to have considerable potential for yielding important information as they are well preserved. Further study of each site will need to be conducted to determine their historical significance and ensure they are not disturbed during construction. *While a Phase II evaluation of research significance is highly recommended before development plans are finalized for the two knolls referenced in the AUAR, an alternative strategy is proposed to protect the integrity of these sites. Future development should identify a buffer around the sites, generally following the suggested guideline of 100 to 133 feet from the lake shore. The sites and the buffer should be permanently protect form any disturbance through conservation easements, land dedication or other land preservation mechanism, either public or privately held. Should the sites be part of public park land, it should preserved as a passive site with interpretation noting the significance of the site.*

In addition, segments of an old woods trail, which cuts diagonally across the study area appears to be remnants of the Leech Lake Road which was built in the mid-1850’s. Portions of the road have been damaged over the years by logging, tree planting, road construction and land use disturbances.

With the exception of the Native American archaeological sites and the Leech Lake Road, there were no other cultural or historical significant sites within the AUAR boundary. However, this does not mean development will not encounter cultural artifacts. Construction projects should proceed with a plan to address cultural and historical artifacts that are turned up during the construction process. Such resources should be preserved and documented for further investigation prior to continuing construction in the area where the resources are discovered. The following are key cultural and heritage resource mitigation initiatives:

Cultural & Heritage Resource Mitigation Actions	Responsibility	Time Frame	Cost
1. Work with neighborhood groups, local historical societies and the State Historic Preservation Office (SHPO) to preserve significant cultural resources. Use of federal funds may trigger more detailed review for compliance with Section 106 of the National Historic Preservation Act.	Local Jurisdiction, Regional Agency	On-going	\$
2. Work to interpret the history of the Leech Lake Heritage trail within the future parks of the development area.	Local Jurisdiction, Developing Property Owners	2008	\$
<u>3. Utilize conservation design strategies (i.e. buffers, conservation easements, clustering, etc. . .) to permanently protect suspected archeological sites from disturbance. Should private or public development be proposed on the site a Phase II should be prepared as part of the development review.</u>	<u>Developer and Local Jurisdiction</u>	<u>At time of development</u>	<u>\$</u>

Traffic/Transportation

The traffic analysis presented in the AUAR studied both development scenarios from a traffic impact standpoint. Six intersections, including the development access on TH 210 were included as part of this analysis. Each study intersection was evaluated using the forecasted volumes to determine the expected level of service in the 2030 design year based on the existing conditions. The following findings were concluded as part of the traffic analysis:

- TH 210 & Potlatch Property Drive:*** *The TH 210 & Potlatch Property Drive intersection would operate at level of service F during the PM peak hour with traffic signal control in Scenario 1. To achieve an acceptable level of service, the four-lane cross-section of TH 210 would need to be extended to the Potlatch property. This improvement to TH 210 is not currently planned to be implemented by Mn/DOT by the 2030 design year. A signal installation would likely not be warranted in Scenario 2, and the intersection would operate at LOS F with two way stop control. This level of operation is not unusual for stop controlled intersections at roadways such as TH 210.*

Channelization is recommended for the northbound to eastbound right-turn movement in both Scenario 1 and Scenario 2. The conversion of a southbound through lane to a left-turn lane is recommended if Scenario 1 is selected. It is recommended that a single through lane be provided in both directions on Potlatch Property Drive if Scenario 2 is selected.

- **TH 210 & TH 371:** In the 2030 No Build scenario, the intersection of TH 210 & TH 371 is expected to operate at a LOS F. A principal reason for this poor LOS is that the volume growth factors obtained from Mn/DOT result in a 65% increase in all movements through this intersection from 2007 to 2030. If the rate of growth is less, the intersection volumes would be lower and the level of service would be better. Nonetheless, in the event that the projected volumes do occur by 2030, mitigation measures were developed in an attempt to improve the expected level of service to D. These improvements include the addition of dual left-turn lanes on each approach, free right-turn lanes on the westbound and southbound approaches and the provision of a third through lane in each direction on TH 371. These measures are not sufficient to achieve LOS D for the 2030 No Build scenario. Currently, no geometric improvements at the intersection are planned by Mn/DOT.

Additional mitigation measures were investigated to identify ways of improving the LOS. One strong candidate mitigation measure is diversion of some trips away from this intersection due to improvements planned by the City of Baxter to alternative local routes. Inglewood Drive and Cypress Drive are the prime examples of improved local routes that will provide this benefit. A PM peak hour volume reduction of 10% for the movements likely to be impacted by the alternative routes would allow this intersection to operate at LOS D with the mitigation measures and 2030 No Build volumes. A volume reduction of 35% on the identified movements would improve the LOS to D in Scenario 1. A volume reduction of 15% on the identified movements would improve the LOS to D in Scenario 2.

- **Neighborhood Intersections:** With the exception of the intersection of TH 210 and Meredith Drive, the neighborhood intersections each would operate at LOS C or better during the PM peak hour in the design year for each scenario. Thus, no significant negative impacts would be caused at these intersections, and no mitigation measures would be needed. The intersection of TH 210 and Meredith Drive would operate at LOS F during the PM peak hour in each scenario. If the four-lane cross-section were extended west, this intersection would be restricted to right-in, right-out. This change would result in LOS C operation at this intersection. However, this extension of the four-lane cross-section on TH 210 is not currently planned to be implemented by Mn/DOT by 2030.

As a result of the traffic analysis, several mitigation measures will be needed to address future traffic volumes. However, these mitigation measures may vary between each development scenario. The City will need to monitor development closely to ensure improvements are phased in accordingly and are incorporated into the City's Capital Improvement Program. Transportation improvements will need to be coordinated with the local roadway jurisdiction and the Minnesota Department of Transportation (MN/DOT). In addition, development plans will need to demonstrate that they will not exceed the projected traffic volumes or level of services discussed in the traffic analysis. If so, the developer or responsible property owner will be responsible for additional mitigation measures.

The phasing of improvements will also need to be aware of future planning efforts or studies in the area. At this time a Regional Transportation Study is being prepared on behalf of Crow Wing County, Cass County and the Cities of Brainerd and Baxter to address future regional needs. Transportation Plans of this nature should continue to be used as a guide to determine future transportation needs in the area.

The following are key transportation mitigation initiatives:

Transportation Mitigation Actions	Responsibility	Time Frame	Cost
<i>1. TH 210 & Potlatch Property Drive – Full construction of the south leg of Potlatch Property Drive, including left and right turn lanes on TH 210, with stop sign control.</i>	<i>Local Jurisdictions, Developing Property Owners, Regional Agency</i>	<i>2008-2010</i>	<i>\$\$\$</i>
<i>2. TH 210 & Potlatch Property Drive – Full construction of the north leg of Potlatch Property Drive, including left and right turn lanes on TH 210, with stop sign control.</i>	<i>Local Jurisdictions, Developing Property Owners, Regional Agency</i>	<i>2010-2030</i>	<i>\$\$\$</i>
3. TH 210 & Potlatch Property Drive – Installation of a traffic control signal.	Local Jurisdictions, County, Developing Property Owners, Regional Agency	<i>When Warranted</i>	\$\$\$

Natural & Physical Resources

A primary goal under the Scenario One planning process was to preserve, to the best extent as possible, the natural features in the area. As a result, the land use plan reflects the preservation of open space, wetlands and stormwater retention sites. The preservation of these sites will provide a substantial amount of protection for natural wildlife.

The MNDR Natural Heritage Database review identified one wildlife species within the project area; that being the Blanding’s turtle. The City will follow the appropriate recommendations for avoiding and minimizing impacts to the Blanding’s turtle. The City will work to ensure the appropriate information is provided to developers and contractors to avoid any impacts to the species. In addition, the City will ensure Best Management Practices (BMPs) are used to avoid any impacts to the Blanding turtles during and after construction, such as roadway design to facilitate crossings of turtles. The City may also consider implementing conservation design as a tool to preserve natural features. *Attached as an appendix are both lists for avoiding and minimizing impacts to the Blandings Turtle species.*

Since there was only one natural heritage species identified in the project area, does not mean there isn’t the opportunity to preserve other natural and physical resources within the AUAR boundary. Other mechanism can be put into place to preserve wooded areas, natural vegetation and other nesting grounds for species.

The following are key natural and physical resources mitigation initiatives:

Natural & Physical Resource Mitigation Actions <i>(also see Land Use and Water Resources Mitigation Actions)</i>	Responsibility	Time Frame	Cost
1. Enforce existing codes and ordinances.	Local Jurisdiction	On-going	\$
2. Amend regulatory tools to establish critical buffers around natural and physical resources.	Local Jurisdictions	2008/09	\$
3. Encourage a conservation design PUD approach to development in areas where Blandings Turtle habitat may be impacted.	Local Jurisdiction	On-going	\$
4. Explore incentives for the preservation of the existing natural qualities of the shorelines within the development area.	Local Jurisdiction, Regional Agency	2008/09	\$
5. Evaluate policies and ordinances that incorporate Forest Management BMPs including such techniques as Variable Retention, Variable Density Thinning, or other Minnesota Voluntary Forest Management Guidelines addressing wildlife and riparian areas.	Local Jurisdiction	2008/09	\$

Figures

Figure 5.1 - Project Location

Figure 5.2 - AUAR Boundary

Figure 5.3 - USGS Map

Figure 5.4 - Zoning

Figure 6.1 – Scenario One

Figure 6.2 – Scenario Two

Figure 9.1 – LUST & MES Sites

Figure 10.1 – Land Cover

Figure 10.2 – Land Cover & Scenario One

Figure 10.3 – Land Cover & Scenario Two

Figure 13.1 – Scenario One Watermain Improvements

Figure 17.1 – Existing Drainage

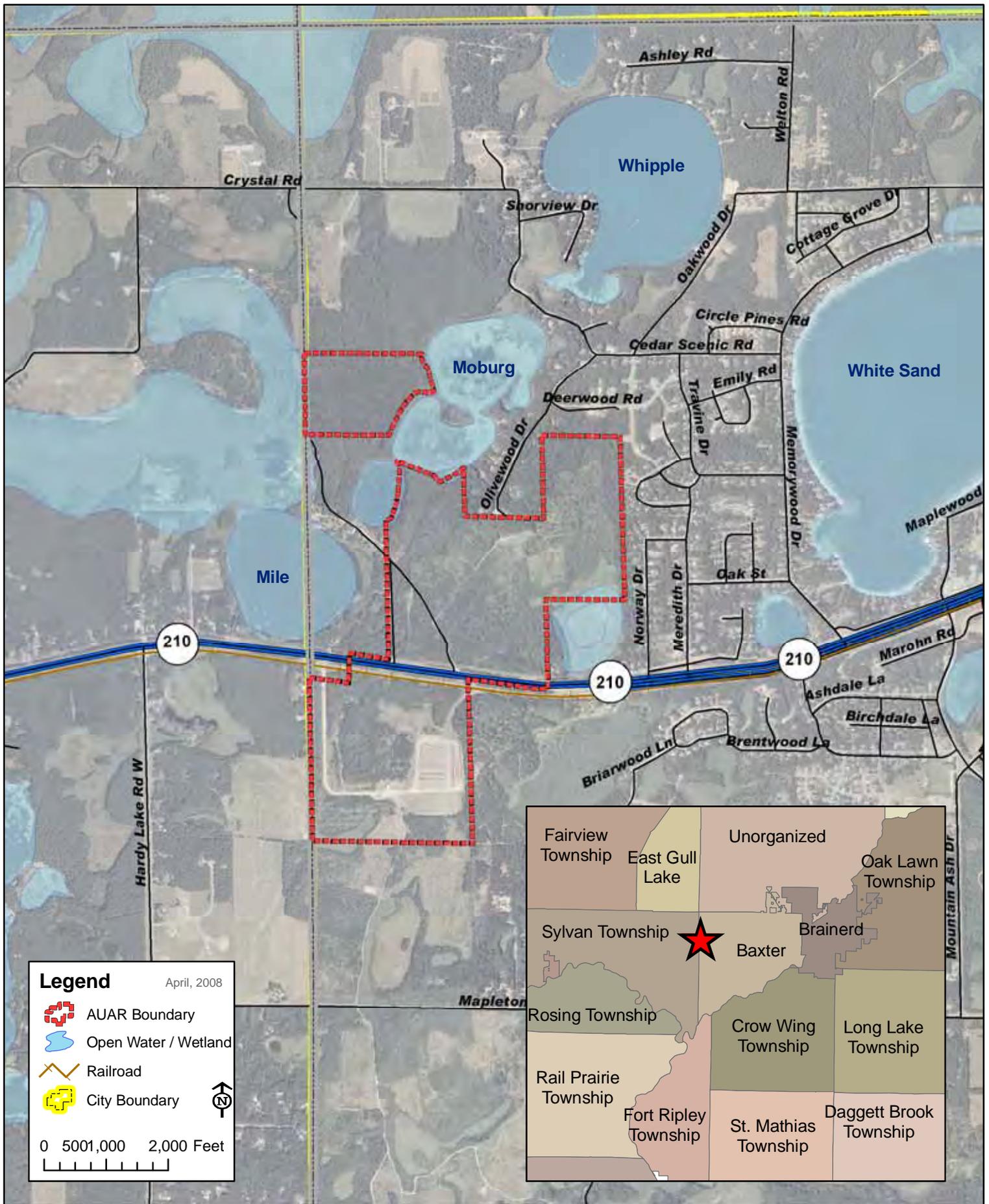
Figure 17.2 – Scenario One Drainage

Figure 17.3 – Scenario One Storm Sewer

Figure 17.4 – Scenario Two Drainage

Figure 18.1 – Scenario One Sanitary Sewer Improvements

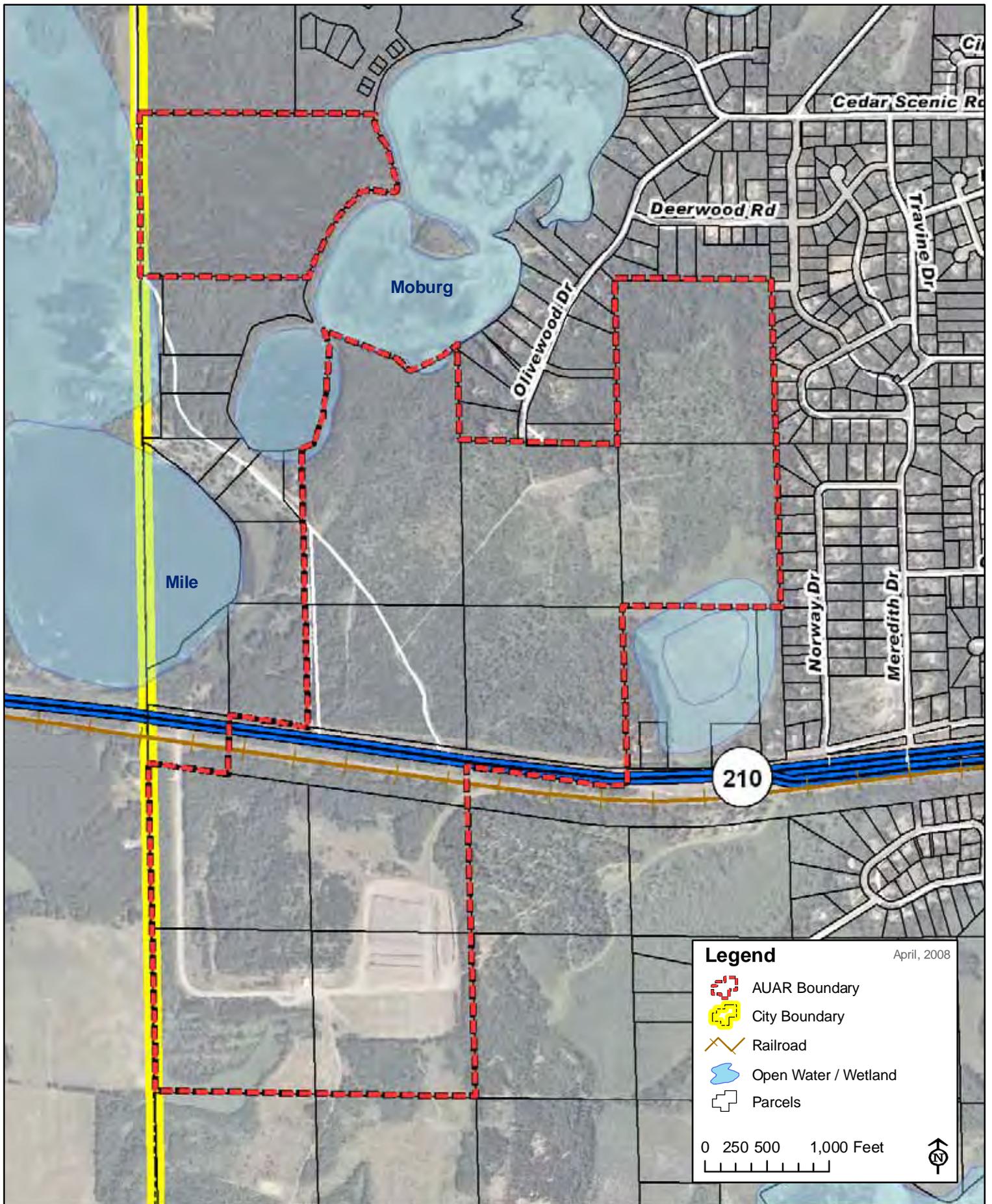
Figure 22.1—Assumed Change in CO Background Concentration Over Time (Figure 22.1 is a chart and is included within the main text of the document under question #22)

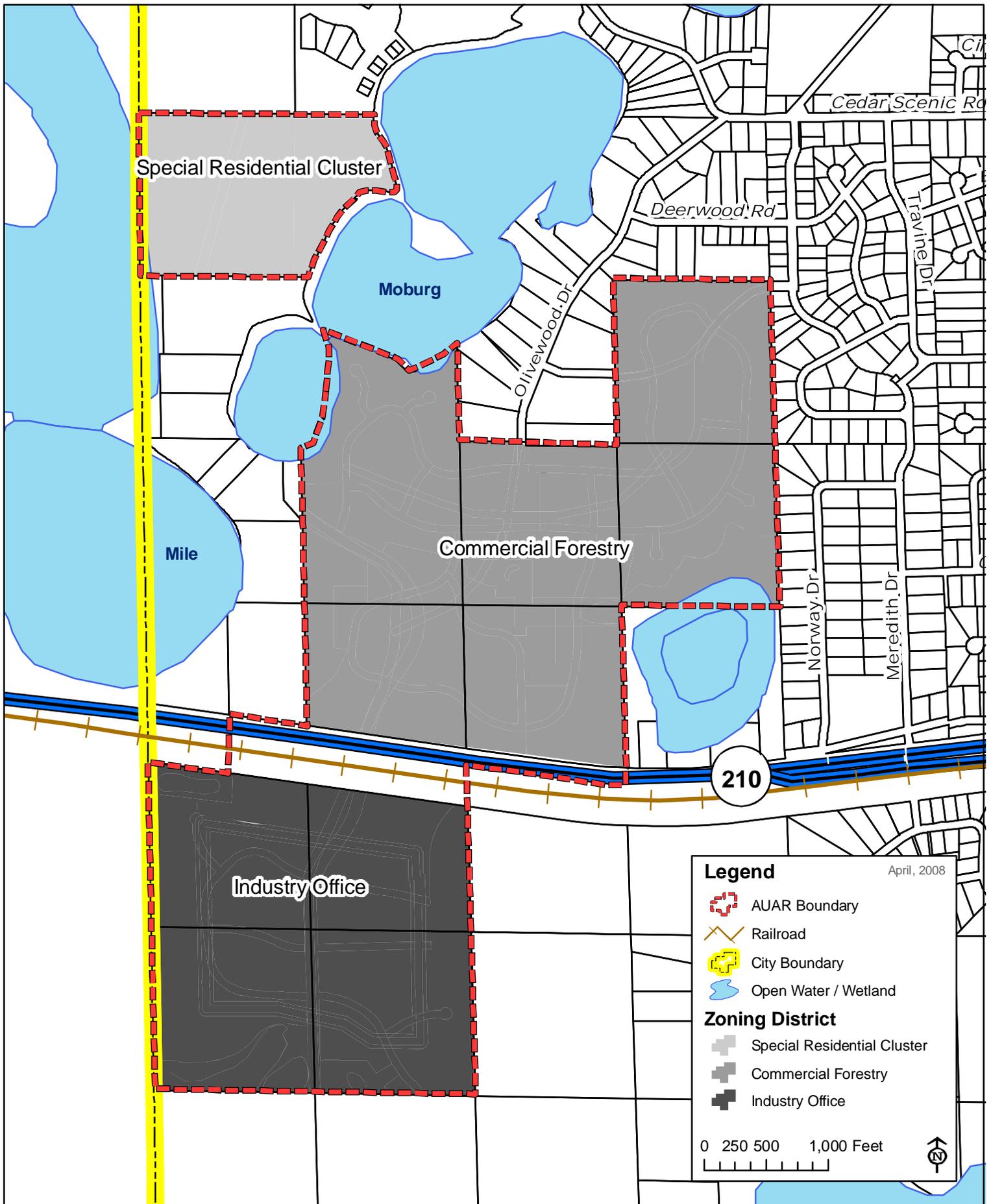


Potlatch Project Location - Figure 5.1
 Potlatch West Baxter AUAR

Source: City of Baxter, MnDOT, Crow Wing County, DNR, USDA, WSN



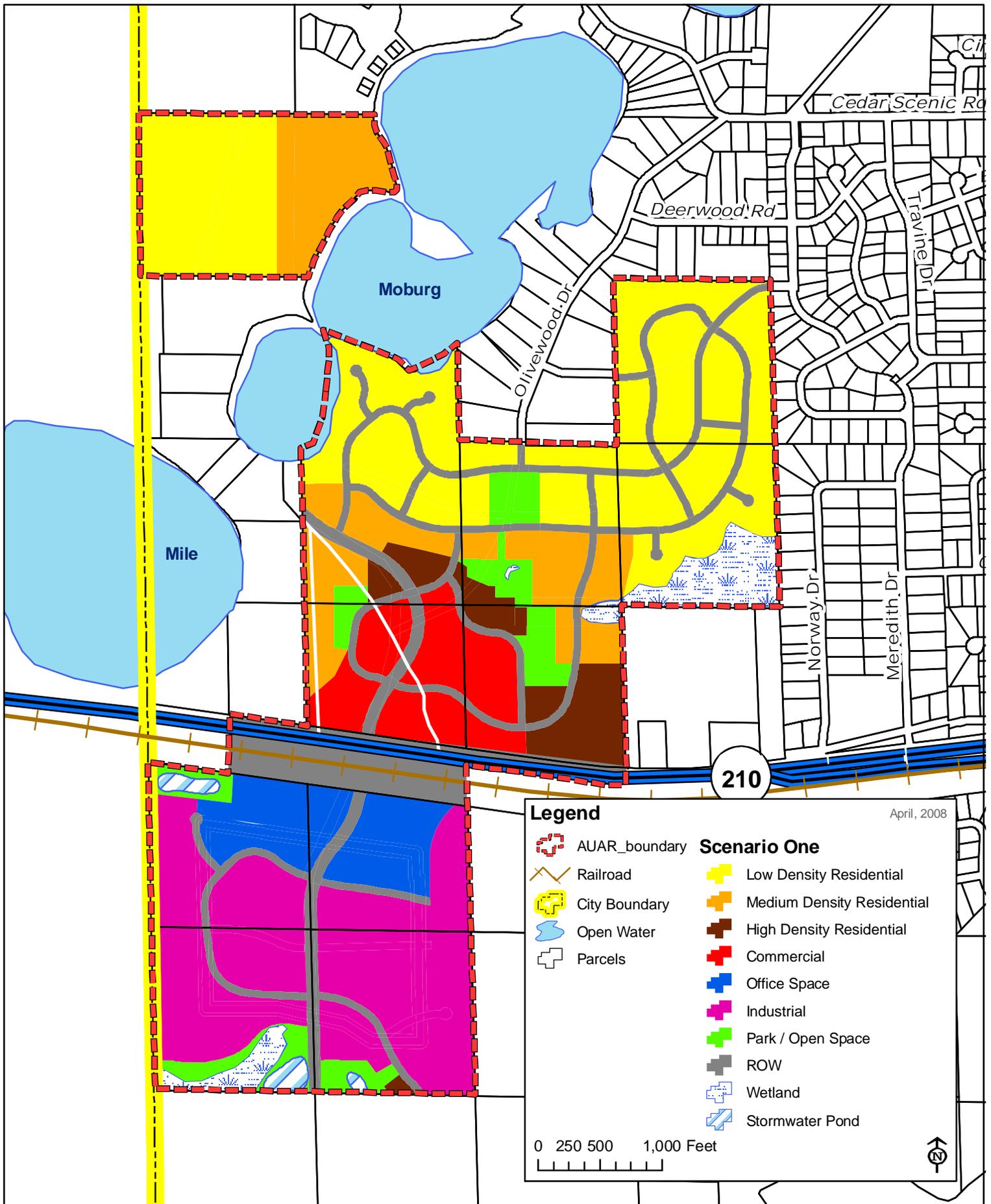




Potlatch Zoning District - Figure 5.4
 Potlatch West Baxter AUAR

Source: City of Baxter,
 MnDOT, Crow Wing County,
 DNR, USDA, WSN

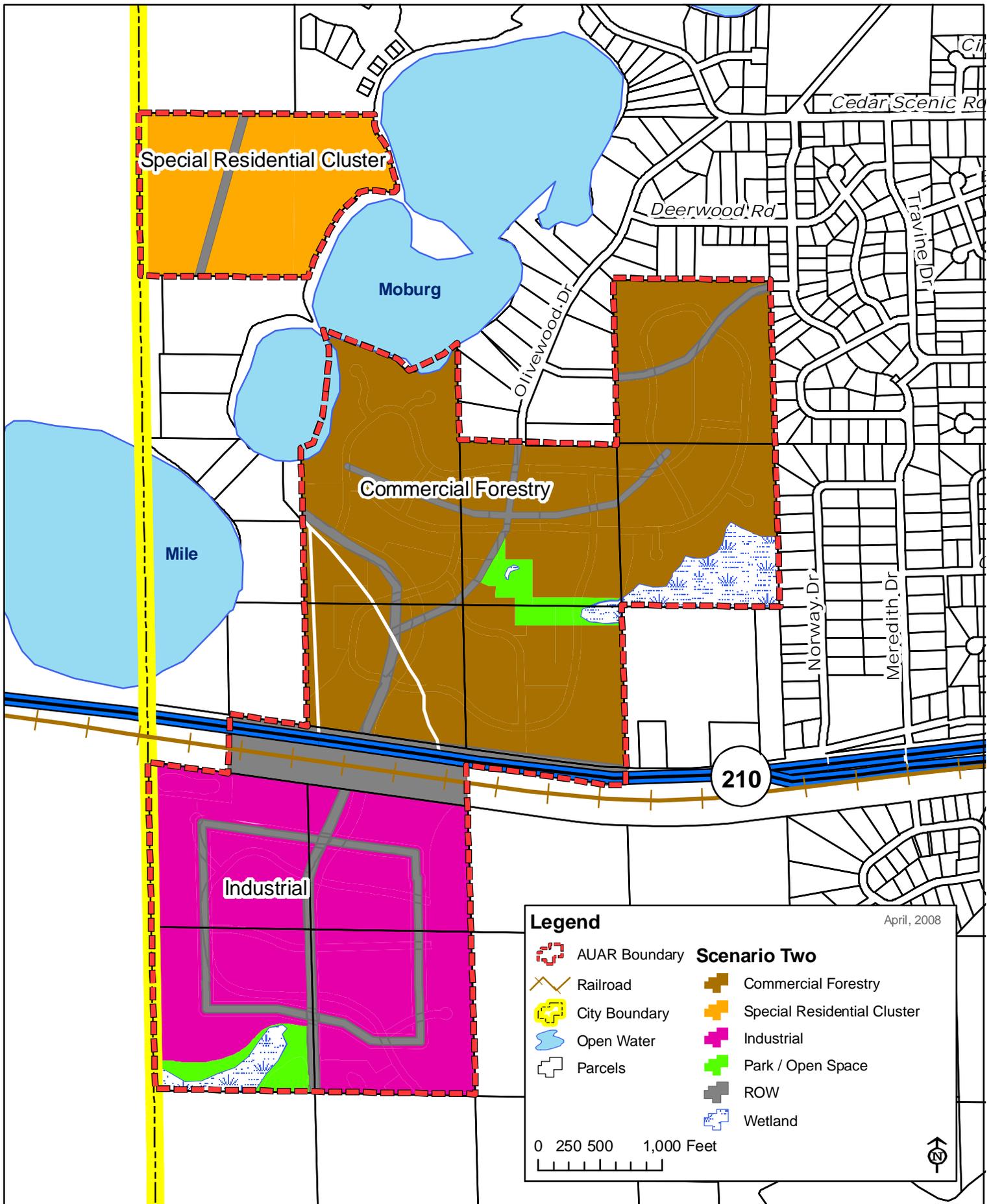


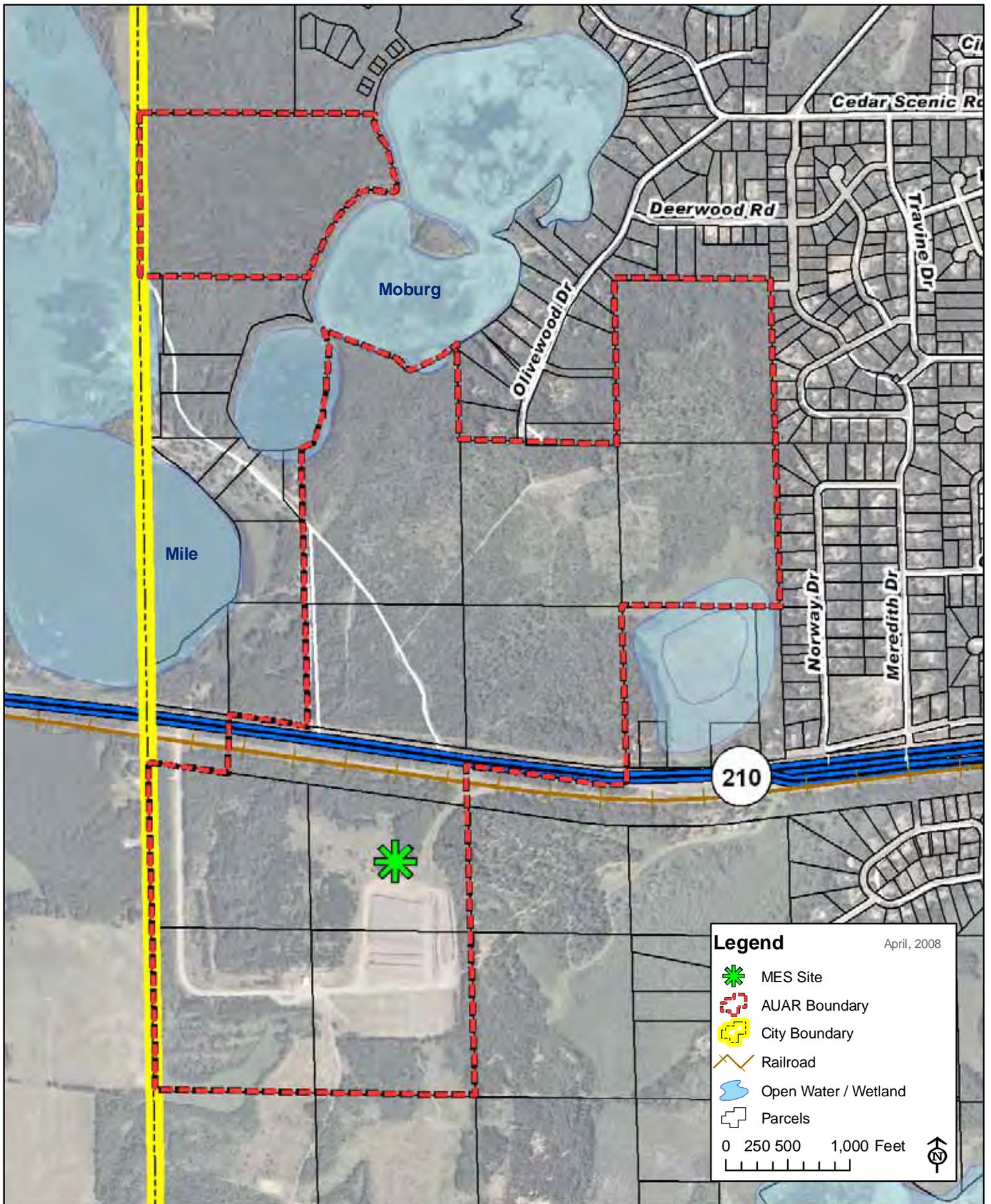


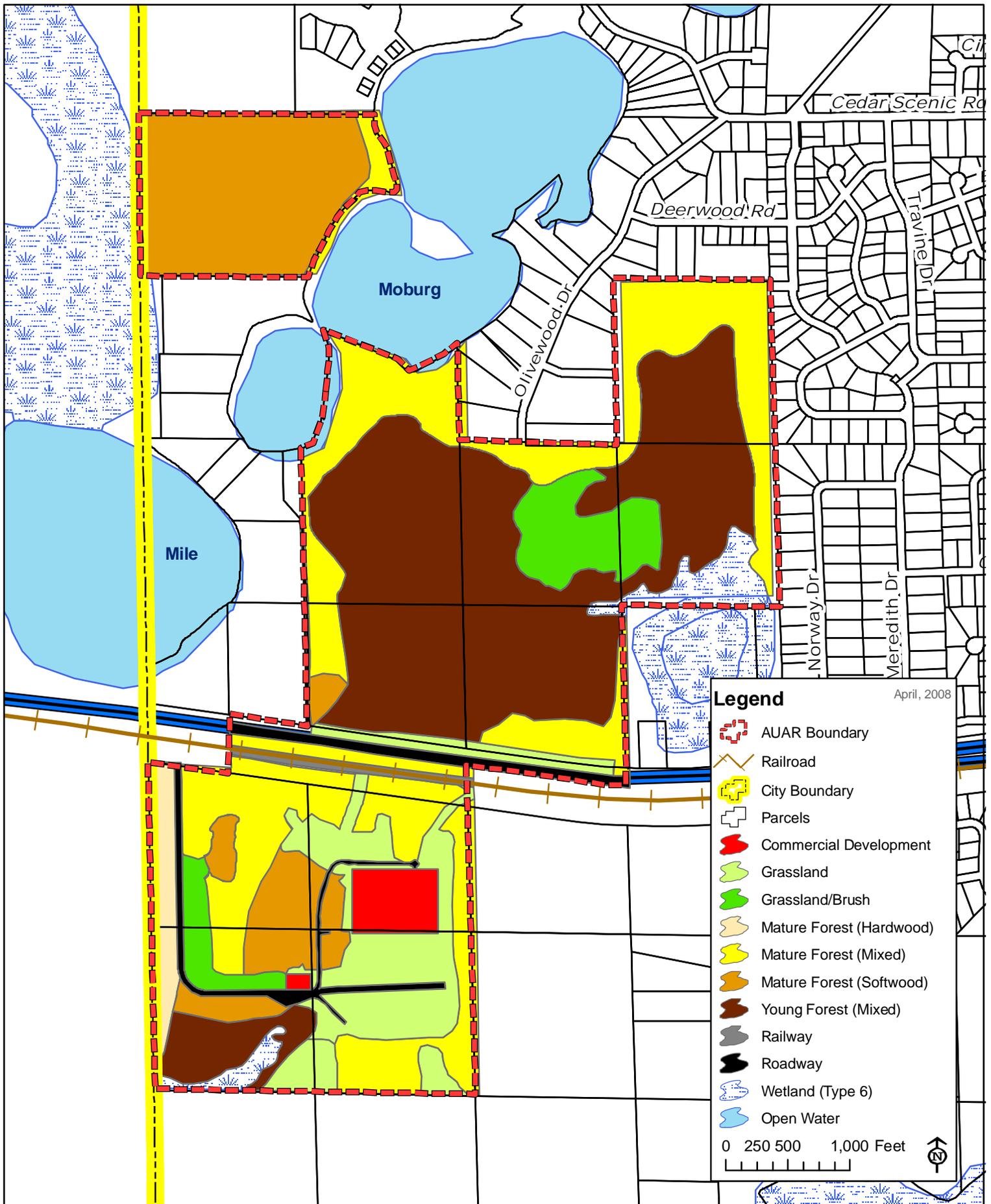
Potlatch Scenario One - Figure 6.1
Potlatch West Baxter AUAR

Source: City of Baxter,
MnDOT, Crow Wing County,
DNR, USDA, WSN





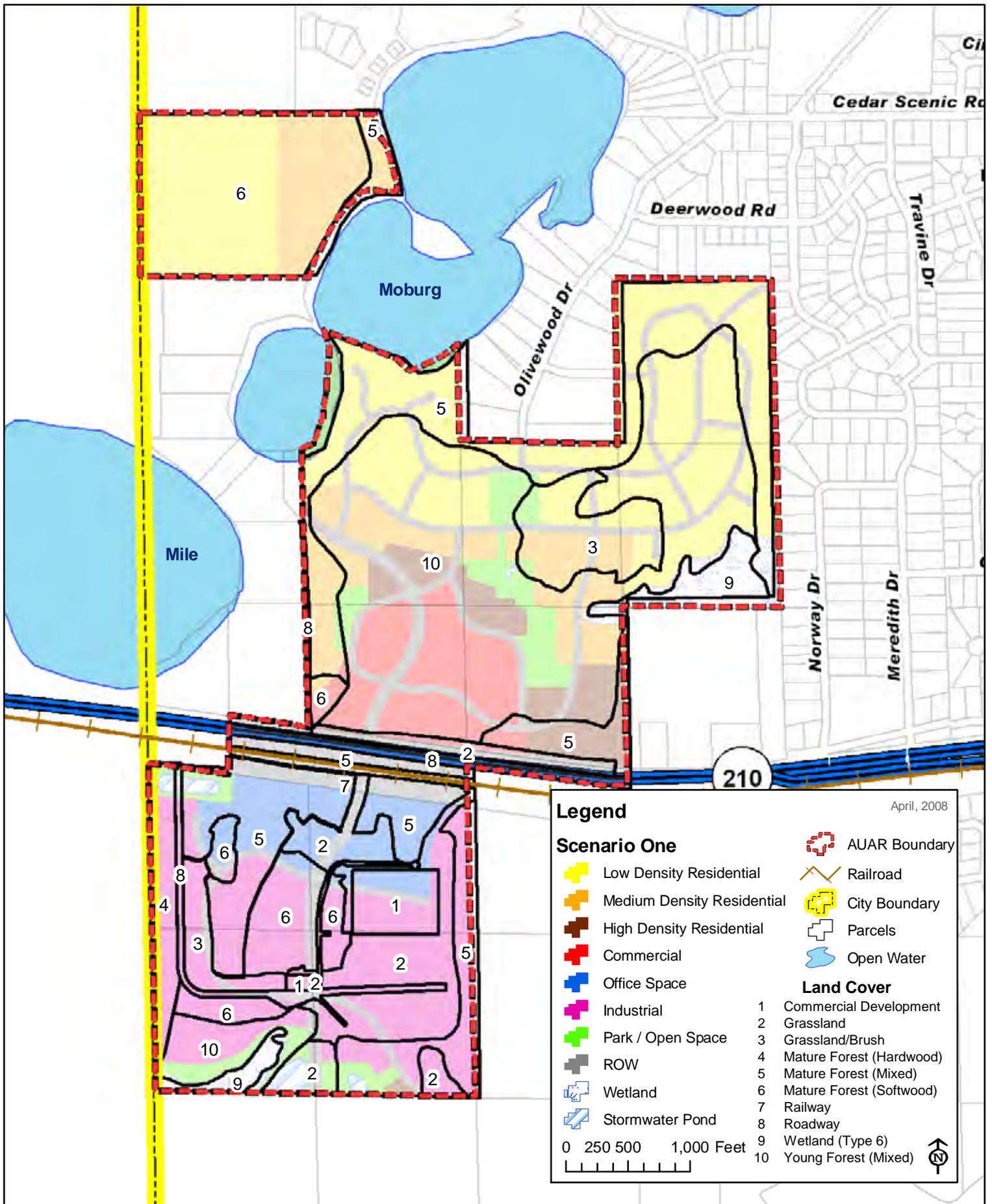




Potlatch Land Cover - Figure 10.1
Potlatch West Baxter AUAR

Source: City of Baxter,
MnDOT, Crow Wing County,
DNR, USDA, WSN

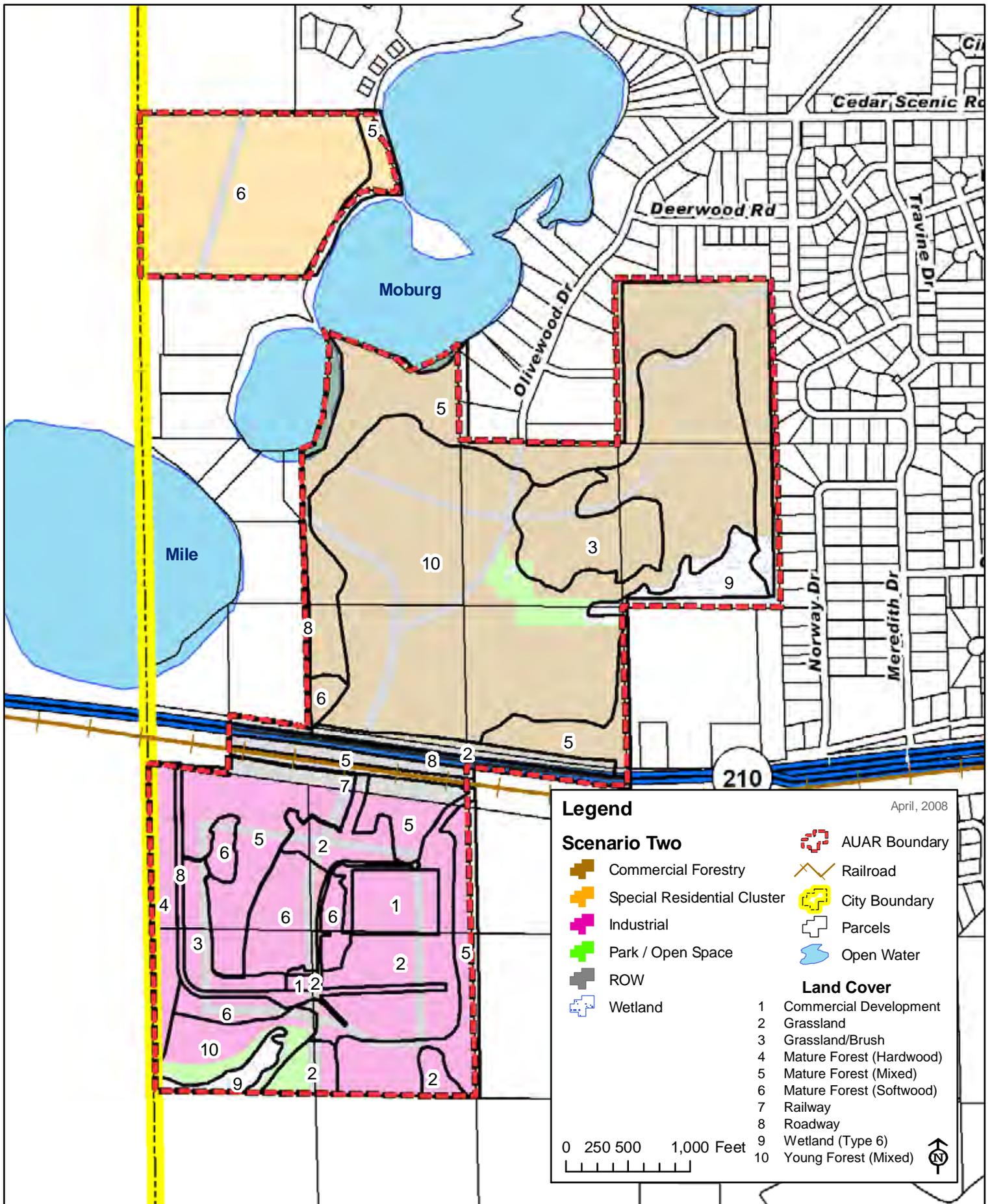




Potlatch Land Cover (Scenario One)
 Potlatch West Baxter AUAR - Figure 10.2

Source: City of Baxter,
 MnDOT, Crow Wing County,
 DNR, USDA, WSN

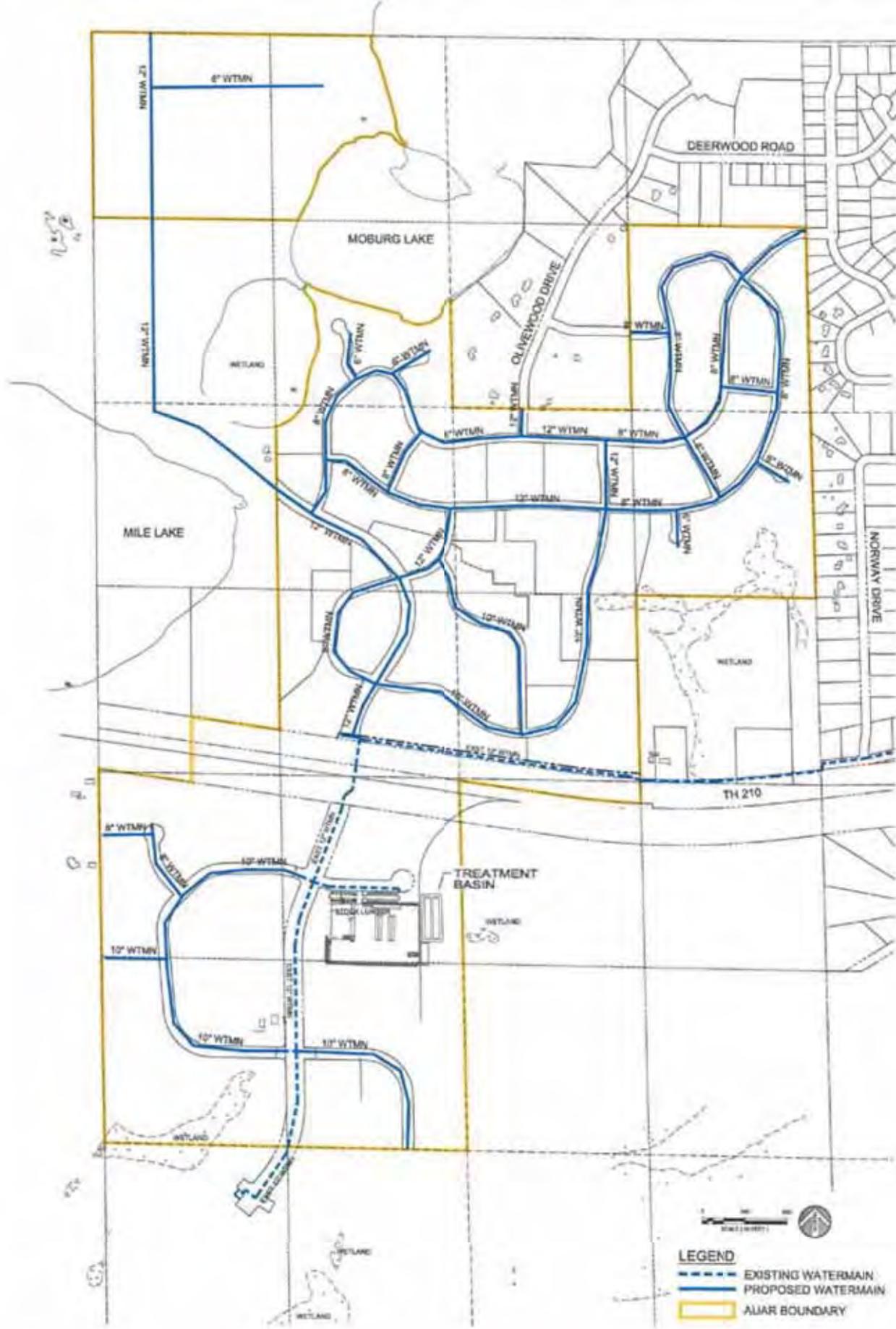




Potlatch Land Cover (Scenario Two)
 Potlatch West Baxter AUAR - Figure 10.3

Source: City of Baxter,
 MnDOT, Crow Wing County,
 DNR, USDA, WSN









Potlatch Scenario One Drainage - Figure 17.2

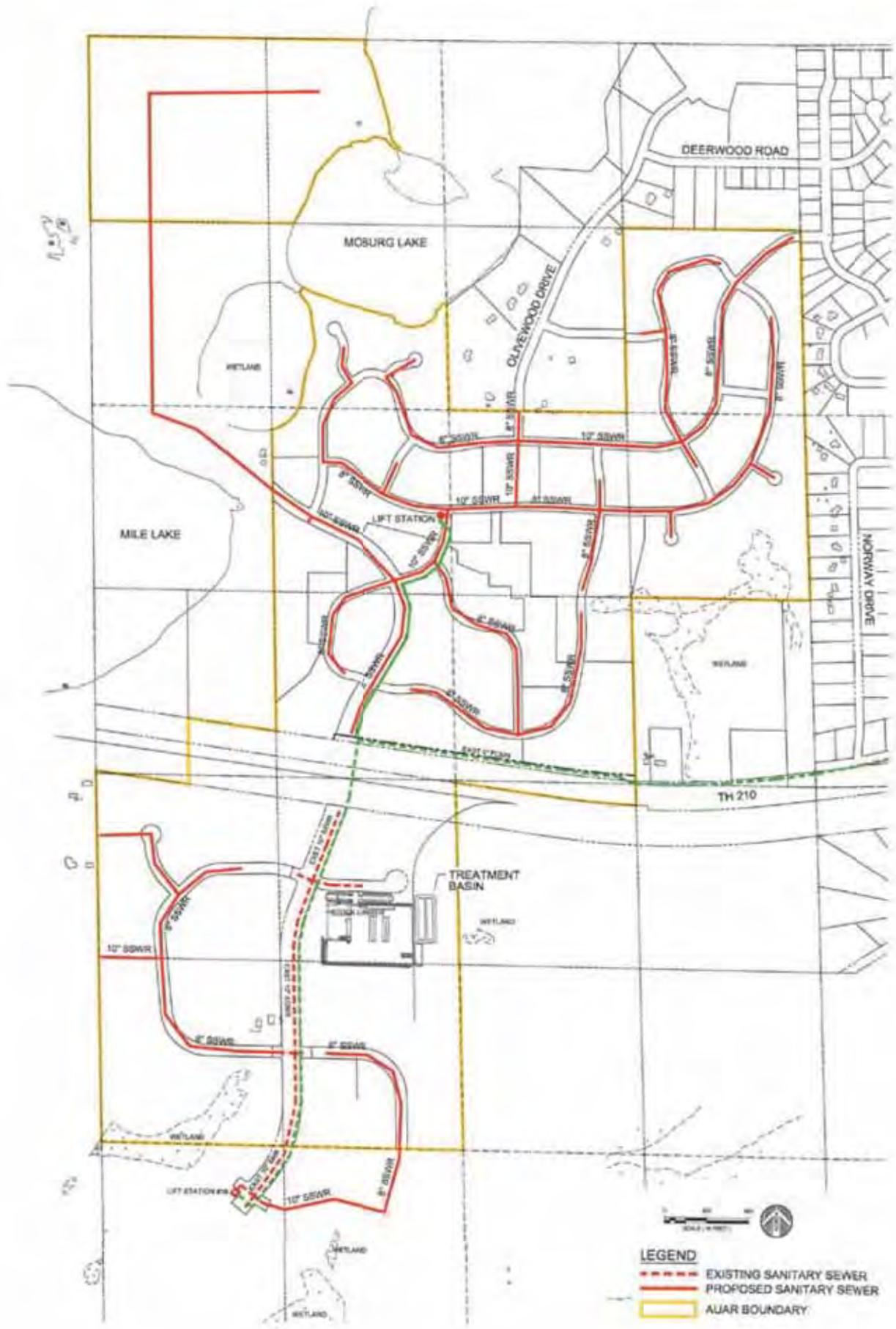
Potlatch West Baxter AUAR

Source: City of Baxter, MnDOT, Crow Wing County, DNR, USDA, WSN









Appendix A – Resolution Ordering AUAR

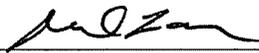
RESOLUTION NO. 07-5/2-3

A RESOLUTION AMENDING THE ORDER FOR AN
ALTERNATIVE URBAN AREA WIDE REVIEW (AUAR)
FOR THE POTLATCH WEST BAXTER AREA

- WHEREAS** The City Council adopted resolution 07-3/1-4 on March 6, 2007 ordering the Potlatch West Baxter AUAR.
- WHEREAS** The purpose of the AUAR was to determine the potential environmental impacts of development of land lying both on the north and south of Highway 210 in the west Baxter as shown in **attachment 1**;
- WHEREAS** The authorization was for two scenarios: one scenario that was consistent with the current adopted comprehensive plan, which would allow residential development at densities allowed under the F (Commercial Forest District) north of TH 210 and industrial development at densities allowed under the I (Industrial Office District) south of TH 210; and another scenario that was consistent with the Potlatch development plan shown in **attachment 2**, which would allow residential development at densities as allowed under the R-1 (Low Density Residential District), R-2 (Medium Residential District) and R-3 (High Density Residential District), and commercial development at densities as allowed under the C-1 (Neighborhood Commercial District) north of TH 210; and commercial and industrial development at densities as allowed under the Office Service and Industrial Office Districts south of TH 210, thereby fulfilling the requirements of the State Environmental Review Program.; and
- WHEREAS** The map in **attachment 1** included non-Potlatch land that would be included in the AUAR; and
- WHEREAS** Since ordering the AUAR, the City Council has determined the need to amend the order for the AUAR by deleting non-Potlatch land included in the original order.

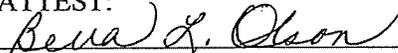
NOW THEREFORE BE IT RESOLVED that the City Council of the City of Baxter hereby amends the order for the Potlatch West AUAR by deleting all non Potlatch land from the area to be reviewed.

This resolution adopted by recorded vote of the Baxter City Council in open session on the 15th day of May, 2007.



Darrel Olson, Mayor

ATTEST:



Beva L. Olson, City Clerk

Appendix B – Agency Notification Letter

Potlatch SW Baxter AUAR -- Project Memorandum – Meeting Invite

Date: 16 April 2007

**RE: Potlatch SW Baxter AUAR -- Agency Kick-Off Informational Meeting
Thursday April 26th 2007 -- 3:00 to 4:30 pm at Baxter City Hall**

To whom it may concern:

Potlatch Corporation in collaboration with the City of Baxter is beginning the preparation of an Alternative Urban Areawide Review (AUAR) for an area of approximately 520 acres in southwest Baxter, a significant portion of which is owned by Potlatch Corporation. A project location map is included for your reference. Potlatch has assembled a team of consultants led by Hoisington Koegler Group Inc. with offices in Minneapolis to facilitate the completion of the AUAR on behalf of the City of Baxter, the Responsible Governmental Unit (RGU). In addition to HKGi the consulting team includes:

- WSN & Associates—municipal engineering and environmental resource investigation (offices located in Baxter)
- Wenck and Associates—traffic, air and noise (offices located in Maple Plain)
- Archaeological Resource Services—historical and cultural resources (offices located in Minneapolis)

We are just beginning what is anticipated to be an approximately 6 to 8 month project. As the consultant team leading the project, and with the concurrence from the RGU, it is our desire to hold an informational meeting with agencies that may be impacted by or have an interest in future development in this area. The purpose of holding this meeting at the onset of the project is to inform the agencies of the project and seek to understand up front what potential issues are of concern that can be better understood, avoided and/or mitigated through the AUAR process and resultant mitigation plan.

If you have any information that will assist the consultant team in the completion of the environmental review, we respectfully request that you bring copies of this information to the kick off meeting (either electronic or hard copy, although electronic copy is preferred.) If you are unable to attend this meeting, or you wish to simply forward information comments to the consultant team, you may do so by emailing Brad Scheib, HKGi's project manager at bscheib@hkgi.com. You may also call me at 612.252.7122.

Thank you for your interest in this important project and we hope that you or an assigned staff person can attend this kick-off meeting. Please RSVP to bscheib@hkgi.com.

Sincerely,



Brad Scheib, AICP
Hoisington Koegler Group Inc.

CC: Bill Deblon and Trevor Walter, City of Baxter, Dept. of Ag, Dept of Commerce, EQB, Dept of Health, MnHS, MnDNR, MPCA, Crow Wing County SWCD and Planning and Zoning, Cass County, BWSR, US Army Corp of Engineers, US EPA, US Fish and Wildlife, Region Five RDC, School District 181, US Army Camp Ripley, Sylvan Township

ATTACHMENTS

- 1) Project Schedule 2) Project Map

Appendix C – Letters Received in Response to AUAR

Appendix D – Resolution adopting final AUAR by the City of Baxter

Appendix E – Place Holder

Appendix F – Traffic Impact Report for AUAR

Traffic Impact Report for AUAR Potlatch West Baxter Property

City of Baxter, Minnesota

Wenck File #1614-02

Prepared for:

Hoisington Koegler Group, Inc.

Prepared by:

WENCK ASSOCIATES, INC.
1800 Pioneer Creek Center
P.O. Box 249
Maple Plain, Minnesota 55359-0249
(763) 479-4200

April 2008



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1.0 Purpose and Background

1.1 PURPOSE

The purpose of this report is to present the results of a traffic study completed for the proposed Potlatch development located on Trunk Highway 210 in the City of Baxter, Minnesota. This report is to fulfill the traffic component of the Alternative Urban Areawide Review (AUAR) prepared for this project.

1.2 PROJECT LOCATION

The Potlatch property is located in western Baxter, Minnesota, approximately four miles west of Trunk Highway (TH) 371 on TH 210. The development location is shown in Figure 1-1.

1.3 PROPOSED DEVELOPMENT

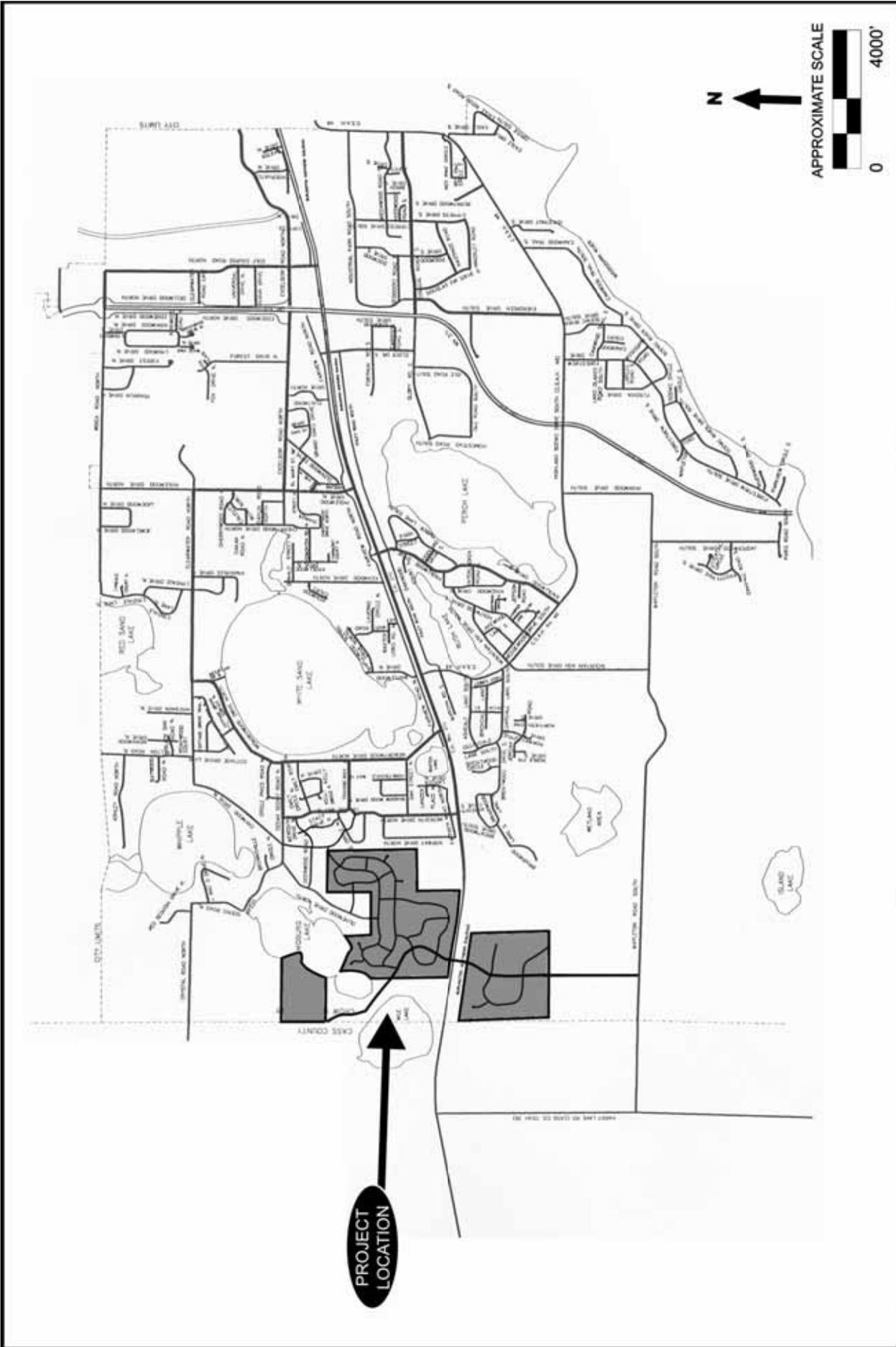
The City of Baxter has directed that this AUAR should address two alternative development scenarios for the Potlatch property. Scenario 1 is consistent with the Potlatch Concept Plan created for the development. Scenario 2 is consistent with the City of Baxter Comprehensive Plan 2007. Full build out of the development is expected to occur by the year 2030.

1.3.1 Scenario 1 Land Use Plan

Scenario 1, as provided in the Potlatch Concept Plan, includes industrial (I) and office (OS) zones to the south of TH 210, and residential (R-1, R-2, R-3) and commercial (C-1) zones to the north. Table 1-1 provides detailed land use statistics for Scenario 1. The dwelling unit density for the residential zones is the maximum allowed by the comprehensive plan. The floor area ratios assumed for the development are based on similar developments in the Baxter area. A map of the proposed land uses for Scenario is shown in Figure 1-2.

1.3.2 Scenario 2 Land Use Plan

The land uses assumed in Scenario 2 are consistent with the zoning outlined in the Comprehensive Plan. The development south of TH 210 is zoned as industrial. North of TH 210 contains commercial forestry (CF) and special residential cluster (RC) zones. Table 1-2 provides detailed land use statistics for Scenario 2. A map of the proposed land uses for Scenario is shown in Figure 1-3.



**TRAFFIC IMPACT REPORT FOR
AUAR - POTLACH WEST BAXTER
PROPERTY**

**FIGURE 1-1
PROJECT LOCATION**



Table 1-1: Scenario 1 Land Use Statistics

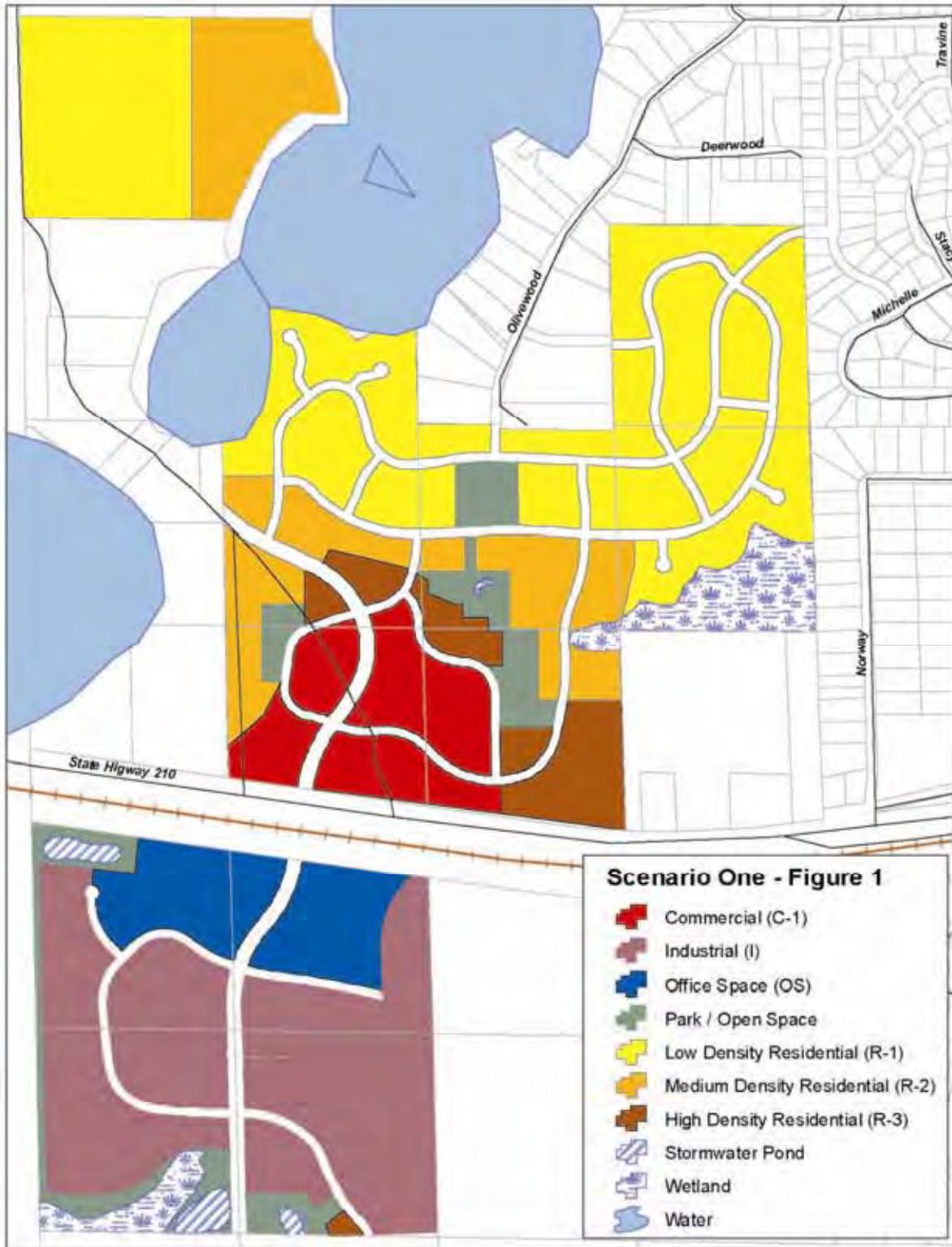
Land Use	Net Developable Acres	Square Footage	Number of Units	Density (units per acre) or Floor Area Ratio
Low Density Residential (R-1)	127.35	-	382	3.00
Medium Density Residential (R-2)	51.74	-	362	7.00
High Density Residential (R-3)	20.17	-	403	20.00
<i>Sub Total:</i>	199.27	-	1,147	5.76
Commercial (C-1)	30.87	268,927.24	-	0.20
Industrial (I)	87.46	1,333,428.88	-	0.35
Office (OS)	27.35	297,880.70	-	0.25
<i>Sub Total:</i>	145.68	1,900,236.83	-	-
Park / Open Space	25.01	-	-	-
Right-Of-Way	47.90	-	-	-
Stormwater Ponding	3.43	-	-	-
Wetland	17.77	-	-	-
<i>Sub Total:</i>	94.11	-	-	-
Total:	439.06	1,900,236.83	1,147	-

*Assumptions are derived from a combination of sources including the "Potlatch Property Improvements North of TH 210 Feasibility Report" dated October 3, 2006, the City of Baxter Zoning Ordinance, an understanding of existing development, 2003 Traffic Plan for Baxter Industrial Park. The assumptions represent a reasonable development magnitude consistent with the Baxter Zoning Code.

Table 1-2: Scenario 2 Land Use Statistics

Land Use	Net Developable Acres	Square Footage	Number of Units	Density (units per acre) or Floor Area Ratio
Commercial Forestry	207.25	-	20	0.10
Special Residential Cluster	50.30	-	10	0.20
<i>Sub Total:</i>	257.55	-	30	-
Industrial	123.90	1,888,929.09	-	0.35
<i>Sub Total:</i>	123.90	1,888,929.09	-	-
Park / Open Space	11.27	-	-	-
Right-Of-Way	28.57	-	-	-
Wetland	17.77	-	-	-
<i>Sub Total:</i>	57.61	-	-	-
Total:	439.06	1,888,929.09	30	-

* Assumptions are based on the maximum number of units allowed under the City's Zoning Ordinance for residential development and consistent with Scenario One for non-residential development.

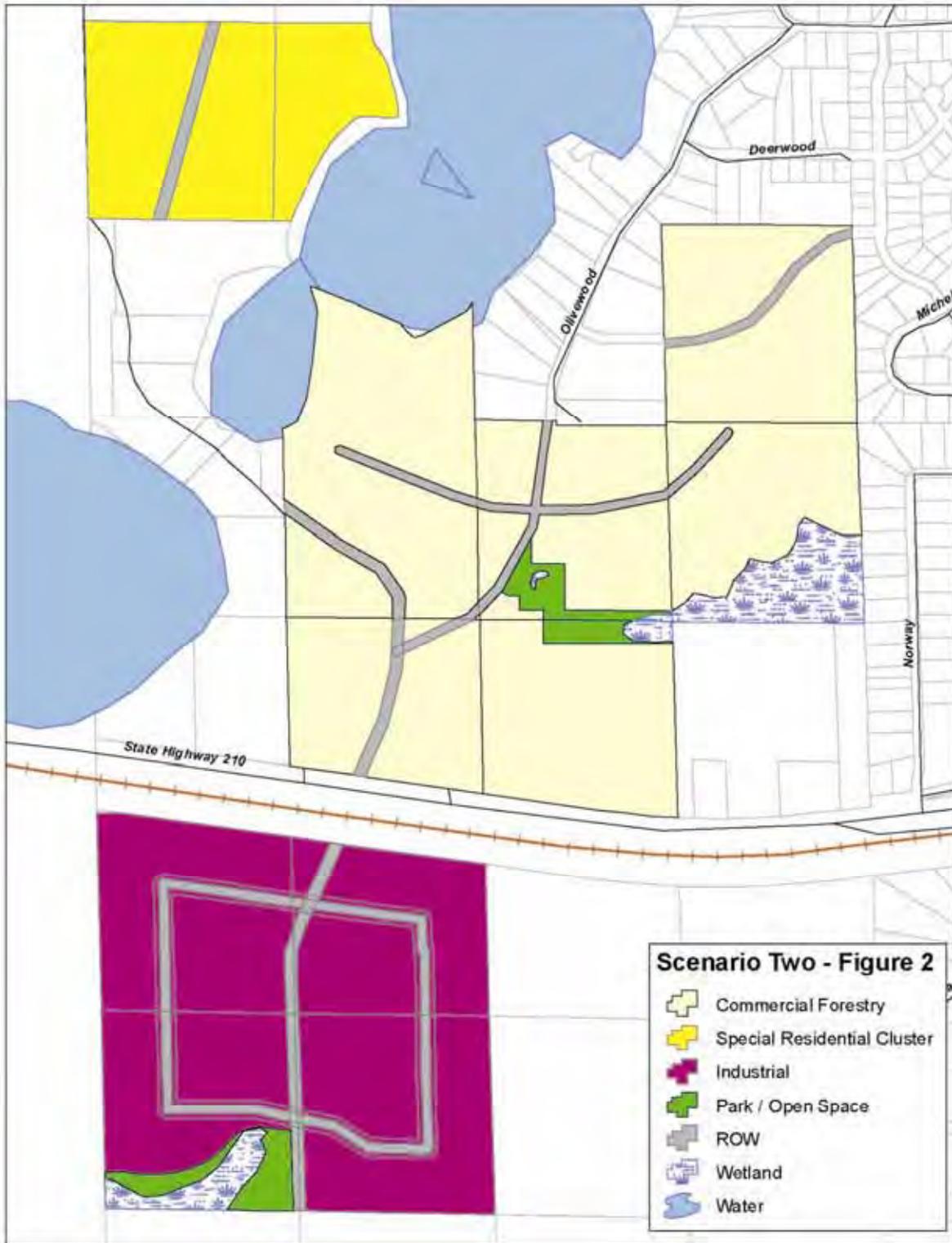


NOT TO SCALE



TRAFFIC IMPACT REPORT FOR
 AUAR - POTLACH WEST BAXTER
 PROPERTY

FIGURE 1-2
SCENARIO 1
LAND USE PLAN



N
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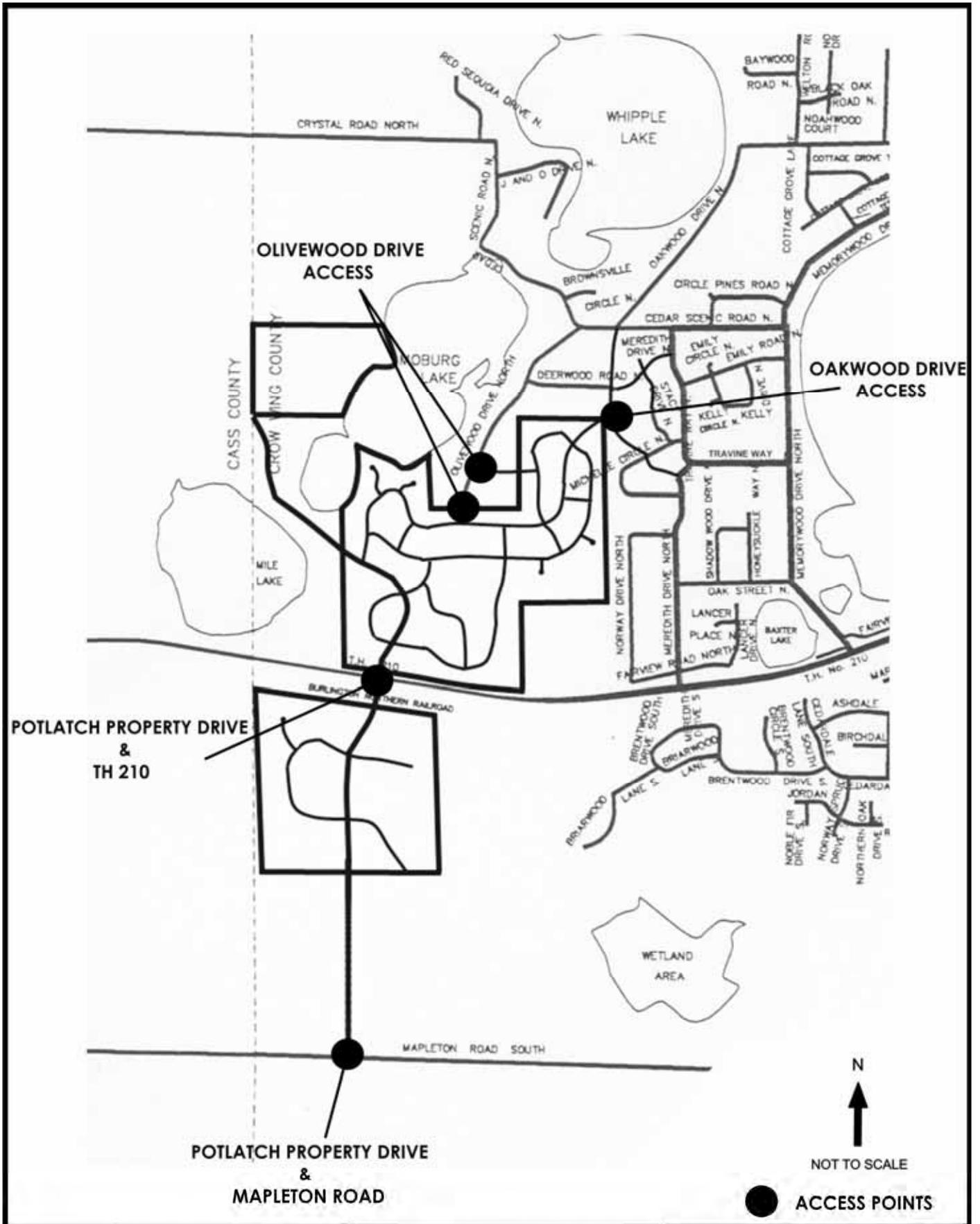


TRAFFIC IMPACT REPORT FOR
 AUAR - POTLACH WEST BAXTER
 PROPERTY

FIGURE 1-3
SCENARIO 2
LAND USE PLAN

1.3.3 Proposed Access

Access to and from the subject property would be the same with the two alternative development scenarios. The main access to the site would be provided with a full-access intersection with TH 210. Access would be provided via a connection to the south on Mapleton Road, two connections to the north with Olivewood Drive, and a connection to the northeast to Oakwood Drive. The location of the proposed access points for the two scenarios can be seen in Figure 1-4. The main road of the proposed development shall be referred to as “Potlatch Property Drive” for the purposes of this report.



TRAFFIC IMPACT REPORT FOR
 AUAR - POTLACH WEST BAXTER
 PROPERTY

FIGURE 1-4
PROPOSED ACCESS POINTS

2.0 Existing Conditions

2.1 DETERMINATION OF STUDY INTERSECTIONS

Based on the development scenarios and the access arrangements, it is important to address potential traffic impacts on both major roadways and local streets. In terms of major roadways, a determination was made through cooperation with Mn/DOT staff to address potential impacts at the site access intersection on TH 210 and at the intersection of TH 210 & TH 371. Given the access connections that would be made with local streets to the northeast, the following local street intersections likely would be most affected and have been identified for inclusion in the traffic analyses:

- Olivewood Drive & Cedar Scenic Road
- Memorywood Drive & Cedar Scenic Road
- Memorywood Drive & Travine Drive
- Meredith Drive & TH 210

2.2 EXISTING GEOMETRY

The existing geometrics and traffic control at the study intersections are as follows.

- **TH 371 & TH 210:** This intersection is a four-legged, full-access signalized intersection. Each approach has a channelized right-turn lane and two through lanes. The southbound approach includes dual left-turn lanes, and the remaining approaches each have one exclusive left turn lane.
- **Potlatch Property & TH 210:** There is no existing intersection on TH 210 at the Potlatch property. TH 210 currently has a two-lane cross section (one lane in each direction) adjacent to the proposed development.
- **Cedar Scenic Road & Olivewood Drive:** Olivewood Drive connects to Cedar Scenic Road from the south to form a “T” intersection. Olivewood Drive is stop controlled and has one lane in each direction. Cedar Scenic Road has a single shared lane in each direction at the intersection.
- **Memorywood Drive & Cedar Scenic Road:** Cedar Scenic Road connects to Memorywood Drive from the west to form a “T” intersection. Cedar Scenic Road is stop controlled and has one lane in each direction. Memorywood Drive has a single shared lane in each direction at the intersection.

- **Memorywood Drive & Travine Drive:** Travine Drive connects to Memorywood Drive from the west to form a “T” intersection. Travine Drive is stop controlled and has one lane in each direction. Memorywood Drive has a single shared lane in each direction at the intersection.
- **Meredith Drive & TH 210:** Meredith Drive connects to TH 210 from the north to form a “T” intersection. Meredith Drive is stop controlled and has one lane in each direction. An exclusive right-turn lane is provided on the westbound approach of TH 210, and an exclusive left-turn lane is provided on the eastbound approach. TH 210 has a single through lane in each direction at the intersection.

2.3 EXISTING TRAFFIC DATA

Available traffic data for the identified study intersections was obtained from the appropriate agencies and recent documents. Additional traffic counts were performed to supplement the available data. Below is a summary of the existing data at each of the study intersections.

- **TH 371 & TH 210:** Peak hour turning movement counts from 2005 were obtained from the North Baxter AUAR prepared by Westwood Professional Services, Inc. in July 2005. Average annual daily traffic and heavy vehicle volumes near the intersection were obtained from Mn/DOT.
- **Potlatch Property & TH 210:** Average annual daily traffic and heavy vehicle volumes near the intersection were obtained from Mn/DOT.
- **Cedar Scenic Road & Olivewood Drive:** PM peak hour turning movement counts were recorded in November 2007 for this report.
- **Memorywood Drive & Cedar Scenic Road:** PM peak hour turning movement counts were recorded in November 2007 for this report.
- **Memorywood Drive & Travine Drive:** PM peak hour turning movement counts were recorded in November 2007 for this report.
- **Meredith Drive & TH 210:** PM peak hour turning movement counts were recorded in November 2007 for this report.

3.0 Analysis Framework

3.1 DETERMINATION OF PEAK PERIOD

After an examination of the existing traffic conditions in the area, the characteristics of the proposed development, and discussions with City of Baxter and Mn/DOT staff, the weekday PM peak hour was chosen as the study period for this analysis. This is typically from 4:30 to 5:30 PM. The selection of the PM peak hour was based on two reasons:

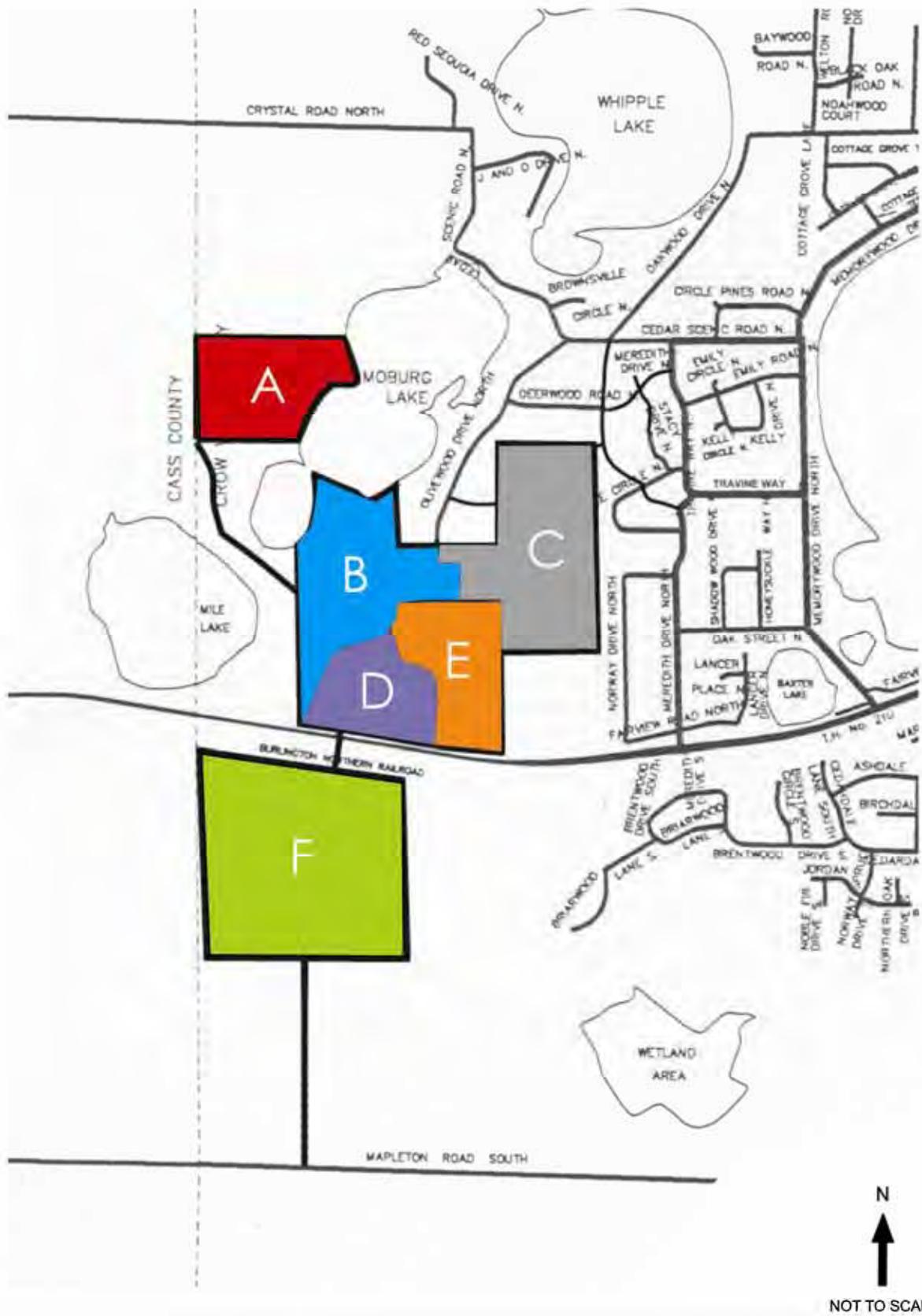
- Existing traffic counts at the junction of TH 210 & TH 371 showed that traffic volumes are more than 35% greater during the PM peak hour than the AM peak hour.
- Due to the large commercial area proposed in Scenario 1 and the nature of the industrial, office, and residential land uses, it is expected that the development's peak period of trip generation would also be the PM peak hour.

3.2 DESIGN YEAR

Given that full build-out of the proposed development is expected to occur by 2030, 2030 has been selected as the design year for this traffic analysis. Based on Mn/DOT plans and expected needs, two changes to the existing roadways were incorporated into the design year analysis for this report; an extension of the four-lane cross section on TH 210 to the development location and the restriction of the intersection of Meredith Drive & TH 210 to right-in, right-out access.

3.3 TRAFFIC ANALYSIS ZONES

Traffic analysis zones (TAZs) were developed to provide a detailed basis for the routing of internal and external trips generated by the proposed development. The TAZ boundaries were established to combine areas which are similar in land use and which are likely to be attracted to the available access points in a comparable proportion. The TAZ boundaries are shown in Figure 3-1.



TRAFFIC IMPACT REPORT FOR
 AUAR - POTLACH WEST BAXTER
 PROPERTY

FIGURE 3-1
TRAFFIC ANALYSIS ZONES

3.4 TRAFFIC PARAMETERS

This section provides information regarding the parameters used in the traffic forecasting and analysis for this report.

3.4.1 Growth Factors

Planning level annual growth factors were obtained from Mn/DOT for TH 210 near the Potlatch property and at the intersection with TH 371. An annual growth factor of 3.3% was obtained for TH 210 near the subject property. The growth rates on TH 210 east and west of TH 371 were averaged, and the resultant 2.2% growth factor was applied to all approaches at the intersection of TH 210 & TH 371. A conservative growth factor of 3% was assumed for the neighborhood intersections.

3.4.2 Other Traffic Data

In order to complete the traffic analyses, it is necessary to identify additional parameters to describe the properties of traffic flow through the subject intersections:

- **Heavy Vehicle Factor:** Heavy vehicle factors were obtained from Mn/DOT heavy commercial average daily traffic (HCADT) maps. Heavy vehicle factors of 3.4% and 6.3% were obtained for TH 210 at the Potlatch property and the intersection with TH 371, respectively. These factors were applied to each scenario.
- **Peak Hour Factor:** A peak hour factor (PHF) of 0.92 is expected for the Baxter area during the PM peak hour.
- **Peak Hour Percentage:** A peak hour percentage (K) of 9.8% for the study area was calculated from peak hour turning movement counts at TH 210 & TH 371 and AADT counts west of the intersection on TH 210.
- **Directional Distribution:** The directional distribution (D) for the PM peak hour on TH 210 adjacent to the Potlatch property was calculated from peak hour turning movement counts at TH 210 & TH 371. It was calculated that 67% of traffic on TH 210 travels westbound during the PM peak hour, with 33% traveling in the eastbound direction.

3.5 ANALYSIS SCENARIOS

To fulfill the AUAR requirements, four traffic analysis scenarios have been established: 2007 Existing, 2030 No Build, 2030 Scenario 1, and 2030 Scenario 2. A summary of each scenario is provided below:

- **2007 Existing:** Existing traffic volumes were developed for the study intersections based on recent traffic counts. Traffic counts taken earlier than 2007 were adjusted with the annual growth factors identified earlier to the current year.

- **2030 No Build:** The traffic volumes developed for the 2030 No Build account for 23 years of natural background traffic growth, utilizing the annual growth factors identified earlier. The 2030 No Build volumes serve as the background traffic for the 2030 Scenario 1 and 2030 Scenario 2 forecasts.
- **2030 Scenario 1:** Scenario 1 incorporates the expected trip generation of the development shown in Figure 1-2 with the background traffic developed for the design year.
- **2030 Scenario 2:** Scenario 2 incorporates the expected trip generation of the development shown in Figure 1-3 with the background traffic developed for the design year.

4.0 Traffic Forecasts

4.1 FORECAST PROCESS

Traffic forecasts for the 2030 development scenarios were produced to analyze the potential impacts of the generated trips on the surrounding road network. The expected generated trips were assigned to the roadway network and added to the background traffic to form the Scenario 1 and Scenario 2 traffic forecasts.

4.2 TRIP GENERATION

Trip generation estimates for the land uses proposed in Scenario 1 and Scenario 2 were developed using Institute of Transportation Engineers (ITE) *Trip Generation*, 7th Edition, and trip generation observed at a similar development in Minnesota.

4.2.1 Land Uses

The trip generation for the various land uses proposed in the development scenarios were calculated using the following sources:

- **Residential (R-1, R-2, R-3, RC, CF):** The trip generation for the residential zones in the proposed development was calculated from ITE *Trip Generation* rates. The expected generation for R-1, Special Residential Cluster, and Commercial Forestry land uses was calculated using the average rates for Single Family Detached Housing. The rates used for R-2 and R-3 zones were calculated using the average rates for Residential Townhouse/Condominium and Apartment, respectively.
- **Office (OS):** The trip generation for the office zone in the proposed development was calculated from ITE *Trip Generation* Office Park rates.
- **Commercial (C-1):** The trip generation for the commercial zone in the proposed development was calculated from ITE *Trip Generation* Shopping Center rates.
- **Industrial (I):** In discussion with City of Baxter staff, it was determined that low intensity industrial land uses, including manufacturing and warehousing, most likely would occur on the portion of the property planned for industrial development. To account for the expected nature of the industrial development, an average of trip generation rates observed by Wenck Associates, Inc. in Fridley, Minnesota for similar developments was calculated and applied to the industrial area.

4.2.2 Net Trip Generation

The trip generation rates were applied to the land use statistics in Table 1-1 and Table 1-2 to calculate the gross trip generation for each TAZ. Due to the multi-use nature of the scenarios, a reduction factor for internal and multi-purpose trips of 10% was used, based on traffic studies in the Minneapolis/St. Paul area. The internal trips were separated from the gross trip generation to produce the net trip generation.

4.2.3 New and Pass-By Trips

The net trip generation incorporates both new trips and pass-by trips. Pass-by trips are through trips that will make a stop at the development on the way to their destination. Pass-by trips are expected to be attracted by the commercial development in Scenario 1; however no pass-by trips are expected in Scenario 2. For the commercial area in Scenario 1, a pass-by trip percentage of 29.4% was calculated from a regression equation the ITE *Trip Generation Handbook* based on data collected from other shopping center developments during the PM peak hour. This percentage was applied to the total net trips generated by the commercial zone in Scenario 1 in order to distinguish the number of pass-by trips from new trips.

The entering and exiting trips during the PM peak hour for the two development scenarios are shown in Table 4-1 by TAZ.

Table 4-1: PM Peak Hour Trip Generation for Scenarios 1 and 2

Description	TAZ A		TAZ B		TAZ C		TAZ D		TAZ E		TAZ F		Total	
	EN	EX	EN	EX	EN	EX	EN	EX	EN	EX	EN	EX	EN	EX
Scenario 1														
Gross Trip Ends	111	60	132	75	118	69	484	524	170	103	127	745	1,142	1,576
Internal Trip Ends	11	6	13	8	12	7	48	52	17	10	13	74	114	157
Net Trip Ends	100	54	119	67	106	62	436	472	153	93	114	671	1,028	1,419
Pass By Trips	0	0	0	0	0	0	128	138	0	0	0	0	128	138
New Trips	100	54	119	67	106	62	308	334	153	93	114	671	900	1,281
Scenario 2														
Gross Trip Ends	6	4	4	2	4	3	3	1	3	1	82	484	102	495
Internal Trip Ends	0	0	0	0	0	0	0	0	0	0	4	24	4	24
New Trips	6	4	4	2	4	3	3	1	3	1	78	460	98	471

Note: EN = Entering, EX = Exiting

4.3 TRIP DISTRIBUTION AND TRAFFIC ASSIGNMENT

The trips generated by the new development were distributed to their likely destinations and routes. The following sections describe the methodology used to distribute and assign the new, internal and pass-by trips to the roadway network.

4.3.1 New Trips

New trips were distributed among available routes to and from the east and west. Given that most development in the Baxter-Brainerd area is located east of the subject Potlatch property, it is expected that 80% of the new development trips will be oriented to/from the east and 20% to/from the west.

The new trips were assigned to the existing roadway network through the five access points shown in Figure 1-4. The trips were distributed to the proposed access points by TAZ according to the route's expected attractiveness. The distribution of new trips by TAZ is shown in Table 4-2.

The distributions were applied to each TAZ to produce the generated traffic volumes for each route. Accounting for new trips to and from all TAZs, the overall distribution of new traffic generated by the site is shown in Figure 4-1.

It is expected that 75% of the new trips assigned to/from the east on TH 210 utilize the intersection of TH 210 & TH 371. The remaining 25% of these trips would dissipate onto local roads between the Potlatch property and TH 371. The vehicles expected to travel through the intersection of TH 210 & TH 371 were distributed to the applicable movements in proportion to the existing movement volumes.

Table 4-2: Traffic Assignment to Access Points by TAZ

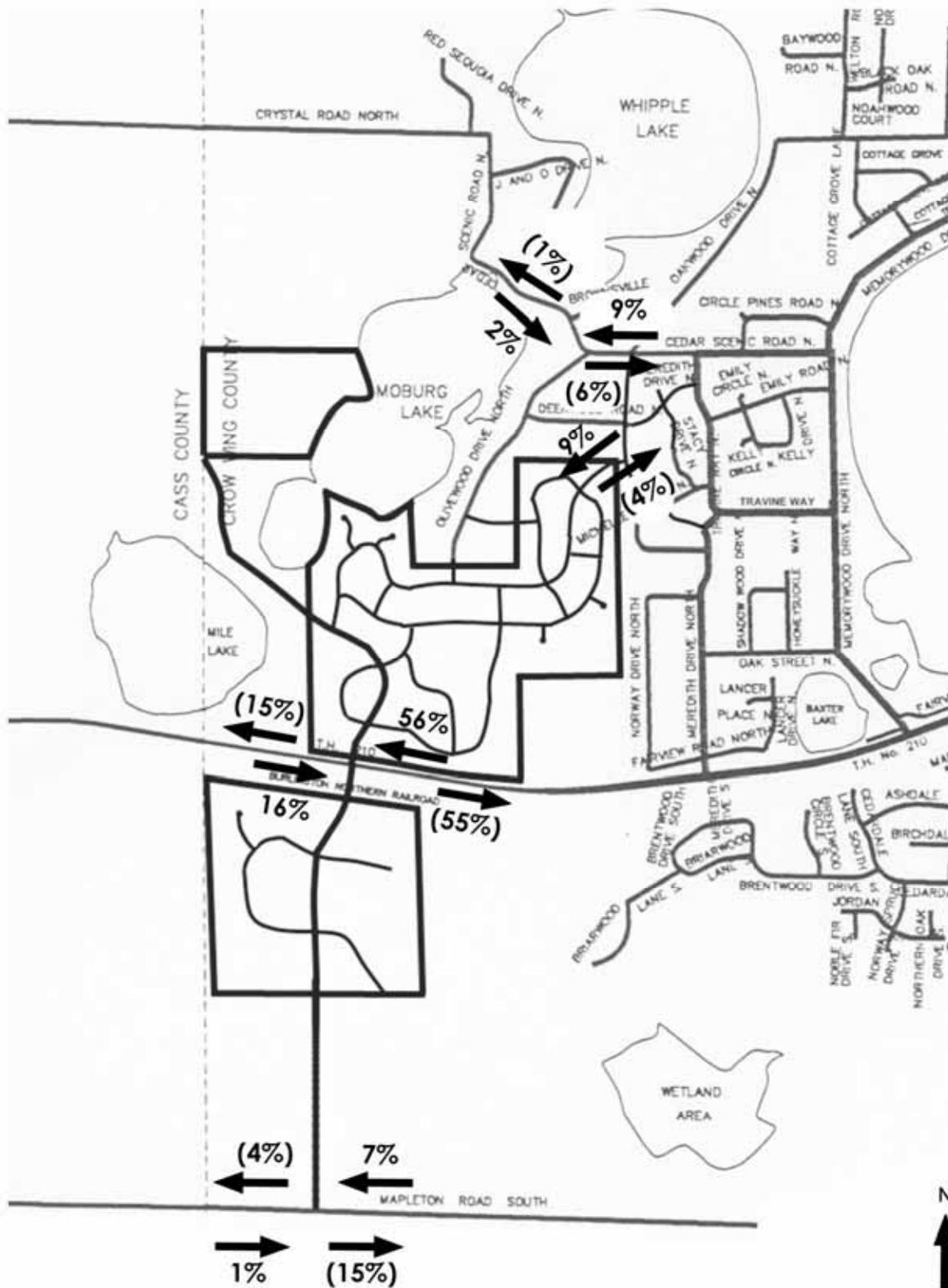
TAZ	TH210 & Potlatch Property Drive		Northbound to Olivewood Drive		Oakwood Drive		Westbound to Olivewood Drive		Mapleton Road	
	To/From		To/From		To/From		To/From		To/From	
	East	West	East	West	East	West	East	West	East	West
A	52%	17%	13%	3%	12%	0%	0%	0%	3%	0%
B	52%	16%	13%	4%	12%	0%	0%	0%	3%	0%
C	42%/30%	15%	5%	2%	15%/30%	0%	15%/12%	3%	3%	0%
D	65%	18%	6%	2%	3%	0%	0%	0%	6%	0%
E	62%	17%	9%	3%	5%	0%	0%	0%	4%	0%
F	50%	12%	3%	0%	2%	0%	0%	0%	25%	8%

Note: Entering and exiting percentages for TAZ C vary due to expected limited access at Merdith Drive & TH 210

4.3.2 Internal Trip Assignment

The study intersection of TH 210 & Potlatch Property Drive is contained within the trip generation area and serves as the main connection between the north and south areas of the proposed development. Internal trips traveling between the south area and the north area must be accounted for to accurately assess this intersection.

For this analysis, the internal exiting trips were assigned to destination TAZs proportionate to the volume of that TAZ's internal entering trips. All trips that were produced across TH 210 from their destination were accounted for and added to the north and south through movements at the intersection.



Note: As traffic patterns vary between TAZs, entering and exiting percentages are unbalanced.

Entering - XX%
 Exiting - (XX%)



TRAFFIC IMPACT REPORT FOR
 AUAR - POTLACH WEST BAXTER
 PROPERTY

FIGURE 4-1
 DISTRIBUTION OF NEW TRIPS

4.3.3 Pass-By Trip Assignment

Pass-by trips generated by the commercial area in Scenario 1 were assigned to the intersection of TH 210 & Potlatch Property Drive. Due to the ease of the right-in, right-out maneuver and the greater traffic volumes traveling westbound, 75% of the pass-by trips were assumed to arrive from the east. The remaining 25% are expected to arrive from the west.

4.4 FORECASTED VOLUMES

The projected new, internal and pass-by trips were added to the 2030 background (No Build) traffic forecast to produce 2030 traffic forecasts for Scenario 1 and Scenario 2. The forecasted traffic volumes for the 2007 Existing, 2030 No Build, 2030 Scenario 1 and 2030 Scenario 2 are shown in Figure 4-2.

5.0 Traffic Analysis

5.1 CAPACITY ANALYSES AT STUDY INTERSECTIONS

Capacity analyses were completed for the study intersections for the existing, 2030 No Build, 2030 Scenario 1 and 2030 Scenario 2 conditions during the PM peak hour using the software package Synchro¹, a common tool used for intersection capacity analyses.

Capacity analysis results are presented in terms of level of service, which is defined in terms of traffic delay at the intersection, and ranges from an A to an F letter grade. LOS A represents the best intersection operation, with little delay for each vehicle using the intersection. LOS F represents the worst intersection operation with excessive delay. The following is a detailed description of the conditions described by each LOS designation:

- Level of service A corresponds to a free flow condition with motorists virtually unaffected by the intersection control mechanism. For a signalized or an unsignalized intersection, the average delay per vehicle would be approximately 10 seconds or less.
- Level of service B represents stable flow with a high degree of freedom, but with some influence from the intersection control device and the traffic volumes. For a signalized intersection, the average delay ranges from 10 to 20 seconds. An unsignalized intersection would have delays ranging from 10 to 15 seconds for this level.
- Level of service C depicts a restricted flow which remains stable, but with significant influence from the intersection control device and the traffic volumes. The general level of comfort and convenience changes noticeably at this level. The delay ranges from 20 to 35 seconds for a signalized intersection and from 15 to 25 seconds for an unsignalized intersection at this level.
- Level of service D corresponds to high-density flow in which speed and freedom are significantly restricted. Though traffic flow remains stable, reductions in comfort and convenience are experienced. The control delay for this level is 35 to 55 seconds for a signalized intersection and 25 to 35 seconds for an unsignalized intersection. For most agencies in Minnesota, level of service D represents the minimal acceptable level of service for regular daily operations.

¹ Synchro 7, Trafficware, Ltd.

- Level of service E represents unstable flow of traffic at or near the capacity of the intersection with poor levels of comfort and convenience. The delay ranges from 55 to 80 seconds for a signalized intersection and from 35 to 50 seconds for an unsignalized intersection at this level.
- Level of service F represents forced flow in which the volume of traffic approaching the intersection exceeds the volume that can be served. Characteristics often experienced include long queues, stop-and-go waves, poor travel times, low comfort and convenience, and increased accident exposure. Delays over 80 seconds for a signalized intersection and over 50 seconds for an unsignalized intersection correspond to this level of service.

5.2 2007 EXISTING LEVELS OF SERVICE

Existing traffic operations for the five existing study intersections were analyzed for the PM peak hour using existing geometries and the 2007 traffic volumes presented earlier in this report. The existing PM peak hour level of service (LOS) for each of the study intersections is shown in Table 5-1 and summarized below.

Table 5-1: Existing PM Peak Hour Delays and Levels of Service

Intersection	Traffic Control	Average Delay (s/veh)	Level of Service
TH 210 & TH 371	Signalized	44.3	D
Olivewood Drive & Cedar Scenic Road	Unsignalized	8.4	A
Cedar Scenic Road & Memorywood Drive	Unsignalized	8.9	A
Travine Drive & Memorywood Drive	Unsignalized	9.0	A
Meredith Drive & TH 210	Unsignalized	15.7	C

Note: Delay and LOS for unsignalized intersections are for stop-controlled approaches only.

- **TH 210 & TH 371:** The intersection of TH 210 & TH 371 was analyzed using the existing signal timings for the PM peak hour obtained from Mn/DOT. The overall intersection LOS was calculated as D. The westbound left turn has a calculated LOS of F. The northbound and eastbound left turns and the westbound through movements have a calculated LOS of E. The LOS of the remaining movements is D or better.
- **Olivewood Drive & Cedar Scenic Road:** The stop-controlled northbound approach of Olivewood Drive has a calculated LOS of A during the PM peak hour.
- **Cedar Scenic Road & Memorywood Drive:** The stop-controlled eastbound approach of Cedar Scenic Road operates at LOS A during the PM peak hour.
- **Travine Drive & Memorywood Drive-:** The stop-controlled eastbound approach of Olivewood Drive operates at LOS A during the PM peak hour.
- **Meredith Drive & TH 210:** The intersection of Meredith Drive & TH 210 is currently full-access. The southbound approach operates at LOS C during the PM peak hour.

5.3 2030 NO BUILD LEVELS OF SERVICE

The five existing study intersections were analyzed using the expected 2030 geometry and 2030 No Build volumes. Expected changes impact the intersection of Meredith Drive & TH 210, as the left-turn movements at the intersection are assumed to be prohibited, and an additional through lane on TH 210 in each direction is anticipated. The intersection of TH 210 & TH 371 was analyzed using the existing geometry and signal timings. The 2030 No Build PM peak hour LOS for each of the study intersections is shown in Table 5-2, and summarized below:

Table 5-2: 2030 No Build PM Peak Hour Delays and Levels of Service

Intersection	Traffic Control	Average Delay (s/veh)	Level of Service
TH 210 & TH 371	Signalized	212.7	F
Olivewood Drive & Cedar Scenic Road	Unsignalized	8.5	A
Cedar Scenic Road & Memorywood Drive	Unsignalized	9.5	A
Travine Drive & Memorywood Drive	Unsignalized	9.8	A
Meredith Drive & TH 210	Unsignalized	16.5	C

Note: Delay and LOS for unsignalized intersections are for stop-controlled approaches only.

- TH 210 & TH 371:** The intersection of TH 210 & TH 371 was analyzed using the existing signal timings for the PM peak hour. The overall intersection LOS was calculated as F in the No Build scenario. Applying a 2.2% growth factor over 23 years results in background traffic volumes approximately 65% greater than the existing volumes. This is a very large increase and results in significant congestion at this intersection. If the background growth tapers off and does not reach the forecasted volumes, the LOS at the intersection would be improved.

Potential mitigation measures for the intersection were analyzed to determine whether the intersection could function at LOS D or better if the forecasted volumes were met. The intersection was analyzed with the addition of free westbound to northbound and southbound to westbound right-turns and dual left-turn lanes on all approaches. These improvements did not result in an improved LOS. The addition of a third through lane on TH 371 in the analysis resulted in LOS E at the intersection of TH 210 & TH 371

To achieve LOS D in the 2030 No Build scenario, additional mitigation measures are necessary. The strongest candidate mitigation measure is the improvement of the local roadway network to provide alternative routes to divert some traffic from the intersection of TH 210 & TH 371.

The City of Baxter has undertaken steps to provide additional north-south routes to reduce traffic volumes at the intersection of TH 210 & TH 371. One such improvement would be the creation of a four-way signalized intersection at Inglewood Drive & TH 210. Another example would be extension of Cypress Drive north and south of TH 210 with traffic signal control at the intersection of these two roadways.

These two improvements likely will reduce the volume of the following movements through the intersection of TH 210 & TH 371:

- Southbound to westbound right-turn
- Southbound through
- Southbound to eastbound left-turn
- Northbound through
- Westbound to northbound right-turn
- Eastbound to northbound left-turn

The intersection would be expected to operate at LOS D with the mitigation measures identified above if the alternative routes attracted 10% of the 2030 volumes for these movements.

- **Olivewood Drive & Cedar Scenic Road:** The stop controlled northbound approach of Olivewood Drive would be expected to operate at LOS A during the PM peak hour.
- **Cedar Scenic Road & Memorywood Drive:** The stop controlled eastbound approach of Cedar Scenic Road would be expected to operate at LOS A during the PM peak hour.
- **Travine Drive & Memorywood Drive:** The stop controlled eastbound approach of Olivewood Drive would be expected to operate at LOS A during the PM peak hour.
- **Meredith Drive & TH 210:** Meredith Drive is expected to be restricted to right-in, right-out access in 2030. This provides an improvement in the LOS shown for the existing conditions due to the elimination of the higher-delay left-turn. The southbound approach would be expected to operate at LOS C during the PM peak hour.

5.4 2030 SCENARIO 1 LEVELS OF SERVICE

The analysis of Scenario 1 includes each of the six study intersections and the geometries and timings used in the No Build analysis. The geometry of the intersection of TH 210 & Potlatch Property Drive used for the analysis was obtained from a concept plan developed by the Widseth, Smith and Nolting firm. This concept plan provides two through lanes and an exclusive left-turn and right-turn lane on each approach. The forecasted PM peak hour volumes developed for TH 210 & Potlatch Property Drive in Scenario 1 greatly exceed the peak hour traffic signal warrant provided in the *Minnesota Manual on Uniform Traffic Control Devices* (MNMUTCD). For the purposes of this report, the intersection was only analyzed with traffic signal control in Scenario 1.

The 2030 Scenario 1 PM peak hour LOS for each of the study intersections is shown in Table 5-3 and summarized below:

Table 5-3: 2030 Scenario 1 PM Peak Hour Delays and Levels of Service

Intersection	Traffic Control	Average Delay (s/veh)	Level of Service
TH 210 & TH 371	Signalized	261.2	F
TH 210 & Potlatch Property Drive	Signalized	41.7	D
Olivewood Drive & Cedar Scenic Road	Unsignalized	9.5	A
Cedar Scenic Road & Memorywood Drive	Unsignalized	13.4	B
Travine Drive & Memorywood Drive	Unsignalized	11.9	B
Meredith Drive & TH 210	Unsignalized	23.1	C

Note: Delay and LOS for unsignalized intersections are for stop-controlled approaches only.

- **TH 210 & TH 371:** The intersection of TH 210 & TH 371 was analyzed using the existing signal timings for the PM peak hour. The overall intersection LOS was calculated as F in Scenario 1.

If the 2030 No Build volumes reach the levels shown in Figure 4-2 and if the Scenario 1 development trips cause the incremental increase shown in this figure, additional mitigation would be needed beyond measures presented for the 2030 No Build scenario. Specifically, to achieve LOS D, the intersection would require the geometric improvements identified in the 2030 No Build scenario and a volume reduction of 35% in the identified movements caused by diversion of traffic to alternate routes.

- **TH 210 & Potlatch Property Drive:** The proposed intersection was analyzed using optimized signal timings and a cycle length of 120 seconds. The intersection would operate with an overall LOS of D.

Despite the overall satisfactory intersection operation, potential for congestion was identified for three high volume movements: southbound to eastbound left-turns, eastbound to northbound left-turns and northbound to eastbound right-turns. If Scenario 1 is selected, two refinements to the current concept plan for this intersection are recommended to resolve these issues: a) conversion of one southbound through lane to a second left-turn lane and b) channelizing the northbound to eastbound right-turn. These changes would result in improved level of service on the potentially congested movements in the PM peak hour.

The heavy potential PM peak hour northbound to eastbound right-turn volumes forecasted raises a question regarding the adequacy of the single westbound to southbound left-turn lane on TH 210 to accommodate the projected AM peak hour volumes. A rough estimate of the AM peak hour volumes was obtained by reversing the volumes from the PM peak hour forecast, and reducing the volumes by the ratio of AM

peak hour volumes to PM peak hour volumes at TH 210 & TH 371. A capacity analysis using the estimated volumes indicated that the single left-turn lane on the westbound approach would be sufficient during the AM peak hour.

- **Olivewood Drive & Cedar Scenic Road:** The stop controlled northbound approach of Olivewood Drive would be expected to operate at LOS A during the PM peak hour.
- **Cedar Scenic Road & Memorywood Drive:** The stop controlled eastbound approach of Cedar Scenic Road would be expected to operate at LOS B during the PM peak hour.
- **Travine Drive & Memorywood Drive:** The stop controlled eastbound approach of Olivewood Drive would be expected to operate at LOS B during the PM peak hour.
- **Meredith Drive & TH 210:** The stop controlled southbound approach of Meredith Drive would be expected to operate at LOS C during the PM peak hour

5.5 2030 SCENARIO 2

The 2030 Scenario 2 volumes were analyzed using the same geometry and signal timings used in Scenario 1. Due to the reduced trip generation caused by the reduced intensity north of TH 210, the TH 210 & Potlatch Property Drive intersection does not meet the signal warrant criteria provided in the MNMUTCD. The intersection was analyzed with two-way stop control for this report. The 2030 Scenario 2 LOS for each of the study intersections is shown in Table 5-4 and summarized below:

Table 5-4: 2030 Scenario 2 PM Peak Hour Delays and Levels of Service

Intersection	Traffic Control	Average Delay (s/veh)	Level of Service
TH 210 & TH 371	Signalized	226.0	F
TH 210 & Potlatch Property Drive	Unsignalized	124.0	F
Olivewood Drive & Cedar Scenic Road	Unsignalized	8.5	A
Cedar Scenic Road & Memorywood Drive	Unsignalized	10.3	B
Travine Drive & Memorywood Drive	Unsignalized	10.2	B
Meredith Drive & TH 210	Unsignalized	17.1	C

Note: Delay and LOS for unsignalized intersections are for stop-controlled approaches only.

- **TH 210 & TH 371:** The intersection of TH 210 & TH 371 was analyzed using the existing signal timings for the PM peak hour. The overall intersection LOS was calculated as F in Scenario 2.

If the 2030 No Build volumes shown in Figure 4-2 are reached and if the Scenario 2 development causes the increase shown in this figure, additional mitigation would be needed beyond measures presented for the 2030 No Build scenario. Specifically,

to achieve LOS D, the intersection would require the geometric improvements identified in the 2030 No Build scenario and a volume reduction of 15% in the identified movements caused by diversion of traffic to alternate routes.

- **TH 210 & Potlatch Property Drive:** As the forecasted traffic volumes for Scenario 2 are not expected to meet traffic signal warrants in 2030, the proposed intersection was analyzed with stop control on the northbound and southbound approaches. The northbound and southbound approaches would operate at LOS F due to delays for left turn movements from the north to the east. Though not ideal, it is not unusual for stop controlled approaches at a busy roadway, such as TH 210, to operate at such a level of service.

Given the capacity analysis results for this situation, the following two refinements would be desired to the current concept plan for this intersection if Scenario 2 is selected: a) single through lane, instead of two through lanes, on the north and south approaches, and b) channelized design for the northbound to eastbound right-turn movement.

- **Olivewood Drive & Cedar Scenic Road:** The stop controlled northbound approach of Olivewood Drive would be expected to operate at LOS A during the PM peak hour.
- **Cedar Scenic Road & Memorywood Drive:** The stop controlled eastbound approach of Cedar Scenic Road would be expected to operate at LOS B during the PM peak hour.
- **Travine Drive & Memorywood Drive:** The stop controlled eastbound approach of Olivewood Drive would be expected to operate at LOS B during the PM peak hour.
- **Meredith Drive & TH 210:** The stop controlled southbound approach of Meredith Drive would be expected to operate at LOS C during the PM peak hour

6.0 Conclusions

Each of the study intersections was evaluated using the forecasted volumes to determine the expected level of service in the 2030 design year. A summary of the principal findings of this report for each study intersection is provided below.

- **TH 210 & Potlatch Property Drive:** The TH 210 & Potlatch Property Drive intersection would operate with an acceptable level of service during the PM peak hour with traffic signal control in Scenario 1. For Scenario 2, a signal installation would likely not be warranted. The intersection would operate at LOS F in Scenario 2. This level of operation is not unusual for stop controlled intersections at roadways such as TH 210.

Channelization is recommended for the northbound to eastbound right-turn movement in both Scenario 1 and Scenario 2. The conversion of a southbound through-lane to a left-turn lane is recommended if Scenario 1 is selected. It is recommended that a single through lane be provided in both directions on Potlatch Property Drive if Scenario 2 is selected.

- **TH 210 & TH 371:** In the 2030 No Build scenario, the intersection of TH 210 & TH 371 is expected to operate at a LOS F. A principal reason for this poor LOS is that the volume growth factors obtained from Mn/DOT result in a 65% increase in all movements through this intersection from 2007 to 2030. If the rate of growth is less, the intersection volumes would be lower and the level of service would be better. Nonetheless, in the event that the projected volumes do occur by 2030, mitigation measures were developed in an attempt to improve the expected level of service to D. These improvements include the addition of dual left-turn lanes on each approach, free right-turn lanes on the westbound and southbound approaches and the provision of a third through lane in each direction on TH 371. These measures are not sufficient to achieve LOS D for the 2030 No Build scenario.

Additional mitigation measures were investigated to identify ways of improving the LOS. One strong candidate mitigation measure is diversion of some trips away from this intersection due to improvements planned by the City of Baxter to alternative local routes. Inglewood Drive and Cypress Drive are the prime examples of improved local routes that will provide this benefit. A PM peak hour volume reduction of 10% for the movements likely to be impacted by the alternative routes would allow this intersection to operate at LOS D with the mitigation measures and 2030 No Build volumes. A volume reduction of 35% on the identified movements would improve the LOS to D in Scenario 1. A volume reduction of 15% on the identified movements would improve the LOS to D in Scenario 2.

- **Neighborhood Intersections:** The four neighborhood intersections each would operate at LOS C or better during the PM peak hour in the design year for each scenario. Thus, no significant negative impacts would be caused at these intersections, and no mitigation measures would be needed.

Appendix G – Minnesota Department of Natural Resources Review Letter
(Natural Heritage Program)



Minnesota Department of Natural Resources

Natural Heritage and Nongame Research Program, Box 25

500 Lafayette Road

St. Paul, Minnesota 55155-4025

Phone: (651) 259-5107 Fax: (651) 296-1811 E-mail: krista.larson@dnr.state.mn.us

December 20, 2007

Mr. Lance Bernard
Hoisington Koegler Group, Inc.
123 North Third Street
Minneapolis, MN 55401

Re: Request for Natural Heritage information for vicinity of proposed Potlatch AUAR, T133N R29W Sections 3, 4, 9, 10, 11, 15, & 16, Cass and Crow Wing Counties
NHNRP Contact #: ERDB 20080393

Dear Mr. Bernard,

The Minnesota Natural Heritage database has been reviewed to determine if any rare plant or animal species or other significant natural features are known to occur within an approximate one-mile radius of the area indicated on the map enclosed with your information request. Based on this review, there are 28 known occurrences of rare species or native plant communities in the area searched (for details, please see the enclosed database printouts and the explanation of selected fields). Following are specific comments for **only those elements that *may be impacted*** by the proposed project. Rare feature occurrences not listed below are not anticipated to be affected by the proposed project.

- The proposed project is within an area of state-wide importance to the Blanding's turtle (*Emydoidea blandingii*), a state-listed threatened species. There are 15 such areas in the state. These areas are relied upon to maintain the species' security within Minnesota, and the DNR considers them of the highest priority for Blanding's turtle research and management activities. Blanding's turtles spend much of their time in shallow wetlands (1-3 feet deep), but they nest in open, sandy uplands up to 1 mile from wetlands. Nesting is in June and eggs hatch in September, at which time young turtles enter deep wetlands where they over-winter in soft sediments. Factors believed to contribute to the decline of this species include wetland drainage and degradation, and the development of upland nesting areas. In addition, because of the tendency for Blanding's turtles to travel long distances over land, they are often forced to cross roads in developed areas. Many of the records we have of Blanding's turtles are from turtles killed while crossing roads.

For your information, I have attached a Blanding's turtle fact sheet that describes the habitat use and life history of this species. The fact sheet also provides two lists of recommendations for avoiding and minimizing impacts to this rare turtle. The first list is relevant for all areas inhabited by Blanding's turtles while the second list contains additional protective measures for areas known to be of state-wide importance to this species. Because your project is within one of these areas, please refer to both lists of recommendations. The attached flyer should be given to all contractors working in the area.

The Natural Heritage database is maintained by the Natural Heritage and Nongame Research Program, a unit within the Division of Ecological Resources, Department of Natural Resources. It is continually updated as new information becomes available, and is the most complete source of data on

Minnesota's rare or otherwise significant species, native plant communities, and other natural features. Its purpose is to foster better understanding and protection of these features.

Because our information is not based on a comprehensive inventory, there may be rare or otherwise significant natural features in the state that are not represented in the database. A county-by-county survey of rare natural features is now underway, and has been completed for Cass and Crow Wing Counties. Our information about native plant communities is, therefore, quite thorough for that county. However, because survey work for rare plants and animals is less exhaustive, and because there has not been an on-site survey of all areas of the county, ecologically significant features for which we have no records may exist on the project area.

The enclosed results of the database search are provided in two formats: short record report and long record report. To control the release of locational information, which might result in the damage or destruction of a rare element, both printout formats are copyrighted.

The short record report provides rare feature locations only to the nearest section, and may be reprinted, unaltered, in an Environmental Assessment Worksheet, municipal natural resource plan, or report compiled by your company for the project listed above. If you wish to reproduce the short record report for any other purpose, please contact me to request written permission. **The long record report includes more detailed locational information, and is for your personal use only. If you wish to reprint the long record report for any purpose, please contact me to request written permission.**

Please be aware that review by the Natural Heritage and Nongame Research Program focuses only on *rare natural features*. It does not constitute review or approval by the Department of Natural Resources as a whole. If you require further information on the environmental review process for other natural resource-related issues, you may contact your Regional Environmental Assessment Ecologist, Paul Stolen at (218) 308-2672 (Cass County) and Dave Holmbeck at (218) 999-7805 (Crow Wing County).

An invoice in the amount of \$84.77 will be mailed to you under separate cover within two weeks of the date of this letter. You are being billed for the database search and printouts, and staff scientist review. Thank you for consulting us on this matter, and for your interest in preserving Minnesota's rare natural resources.

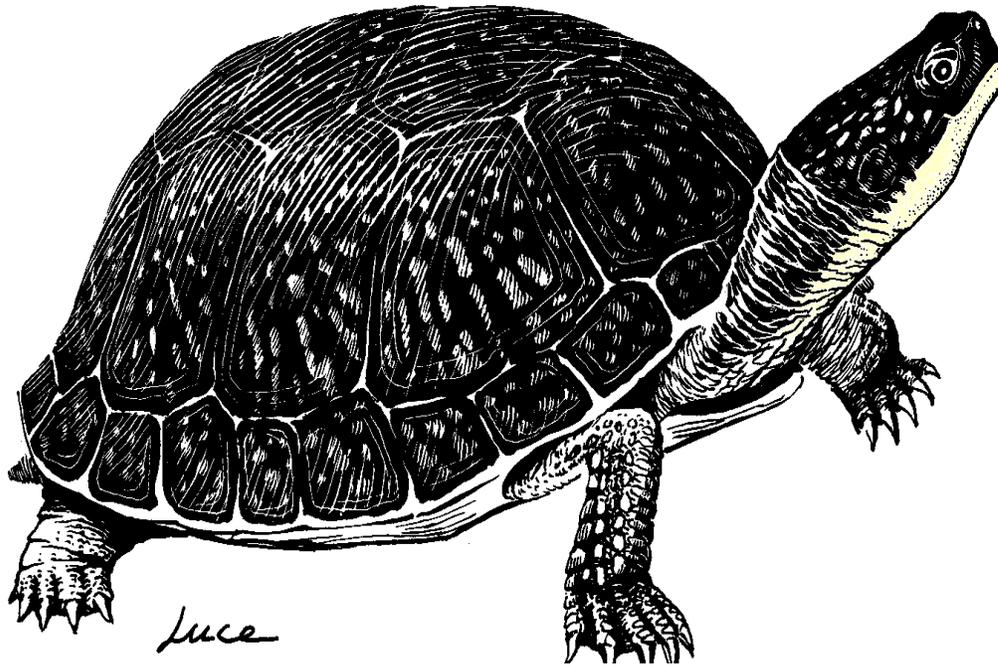
Sincerely,



Krista Larson
Endangered Species Environmental Review Technician

encl: Database search results
Rare Feature Database Print-Outs: An Explanation of Fields
Fact sheets: Blanding's Turtle

CAUTION



BLANDING'S TURTLES MAY BE ENCOUNTERED IN THIS AREA

The unique and rare Blanding's turtle has been found in this area. Blanding's turtles are a State Threatened species and are protected under Minnesota Statute 84.095, Protection of Threatened and Endangered Species. Please be careful of turtles on roads and in construction sites. For additional information on turtles, or to report a Blanding's turtle sighting, contact the DNR Nongame Specialist nearest you: Bemidji (218-308-2641); Grand Rapids (218-327-4518); New Ulm (507-359-6033); Rochester (507-280-5070); or St. Paul (651-259-5764).

DESCRIPTION: The Blanding's turtle is a medium to large turtle (5 to 10 inches) with a black or dark blue, dome-shaped shell with muted yellow spots and bars. The bottom of the shell is hinged across the front third, enabling the turtle to pull the front edge of the lower shell firmly against the top shell to provide additional protection when threatened. The head, legs, and tail are dark brown or blue-gray with small dots of light brown or yellow. A distinctive field mark is the bright yellow chin and neck.

Endangered, Threatened, and Special Concern Species of Minnesota

Blanding's Turtle
(Emydoidea blandingii)

Minnesota Status: Threatened
Federal Status: none

State Rank¹: S2
Global Rank¹: G4

HABITAT USE

Blanding's turtles need both wetland and upland habitats to complete their life cycle. The types of wetlands used include ponds, marshes, shrub swamps, bogs, and ditches and streams with slow-moving water. In Minnesota, Blanding's turtles are primarily marsh and pond inhabitants. Calm, shallow water bodies (Type 1-3 wetlands) with mud bottoms and abundant aquatic vegetation (cattails, water lilies, etc.) are preferred, and extensive marshes bordering rivers provide excellent habitat. Small temporary wetlands (those that dry up in the late summer or fall) are frequently used in spring and summer -- these fishless pools are amphibian and invertebrate breeding habitat, which provides an important food source for Blanding's turtles. Also, the warmer water of these shallower areas probably aids in the development of eggs within the female turtle. Nesting occurs in open (grassy or brushy) sandy uplands, often some distance from water bodies. Frequently, nesting occurs in traditional nesting grounds on undeveloped land. Blanding's turtles have also been known to nest successfully on residential property (especially in low density housing situations), and to utilize disturbed areas such as farm fields, gardens, under power lines, and road shoulders (especially of dirt roads). Although Blanding's turtles may travel through woodlots during their seasonal movements, shady areas (including forests and lawns with shade trees) are not used for nesting. Wetlands with deeper water are needed in times of drought, and during the winter. Blanding's turtles overwinter in the muddy bottoms of deeper marshes and ponds, or other water bodies where they are protected from freezing.

LIFE HISTORY

Individuals emerge from overwintering and begin basking in late March or early April on warm, sunny days. The increase in body temperature which occurs during basking is necessary for egg development within the female turtle. Nesting in Minnesota typically occurs during June, and females are most active in late afternoon and at dusk. Nesting can occur as much as a mile from wetlands. The nest is dug by the female in an open sandy area and 6-15 eggs are laid. The female turtle returns to the marsh within 24 hours of laying eggs. After a development period of approximately two months, hatchlings leave the nest from mid-August through early-October. Nesting females and hatchlings are often at risk of being killed while crossing roads between wetlands and nesting areas. In addition to movements associated with nesting, all ages and both sexes move between wetlands from April through November. These movements peak in June and July and again in September and October as turtles move to and from overwintering sites. In late autumn (typically November), Blanding's turtles bury themselves in the substrate (the mud at the bottom) of deeper wetlands to overwinter.

IMPACTS / THREATS / CAUSES OF DECLINE

- loss of wetland habitat through drainage or flooding (converting wetlands into ponds or lakes)
- loss of upland habitat through development or conversion to agriculture
- human disturbance, including collection for the pet trade* and road kills during seasonal movements
- increase in predator populations (skunks, racoons, etc.) which prey on nests and young

*It is illegal to possess this threatened species.

SUMMARY OF RECOMMENDATIONS FOR AVOIDING AND MINIMIZING IMPACTS TO BLANDING'S TURTLE POPULATIONS

(see Environmental Review Fact Sheet Series for full recommendations)

- A flyer with an illustration of an adult Blanding's turtle should be given to all contractors working in the area. Homeowners should also be informed of the presence of Blanding's turtles in the area.
- Turtles which are in imminent danger should be moved, by hand, out of harms way. Turtles which are not in imminent danger should be left undisturbed to continue their travel among wetlands and/or nest sites.
- If a Blanding's turtle nests in your yard, do not disturb the nest, and do not allow pets near the nest.
- Blanding's turtles do not make good pets. It is illegal to keep this threatened species in captivity.
- Silt fencing should be set up to keep turtles out of construction areas. It is critical that silt fencing be removed after the area has been revegetated.
- Small, vegetated temporary wetlands should not be dredged, deepened, or filled.
- All wetlands should be protected from pollution; use of fertilizers and pesticides should be avoided, and run-off from lawns and streets should be controlled. Erosion should be prevented to keep sediment from reaching wetlands and lakes.
- Roads should be kept to minimum standards on widths and lanes.
- Roads should be ditched, not curbed or below grade. If curbs must be used, 4" high curbs at a 3:1 slope are preferred.
- Culverts under roads crossing wetland areas, between wetland areas, or between wetland and nesting areas should be at least 36 in. diameter and flat-bottomed or elliptical.
- Culverts under roads crossing streams should be oversized (at least twice as wide as the normal width of open water) and flat-bottomed or elliptical.
- Utility access and maintenance roads should be kept to a minimum.
- Below-ground utility construction sites should be returned to original grade.
- Terrain should be left with as much natural contour as possible.
- Graded areas should be revegetated with native grasses and forbs.
- Vegetation management in infrequently mowed areas -- such as in ditches, along utility access roads, and under power lines -- should be done mechanically (chemicals should not be used). Work should occur fall through spring (after October 1st and before June 1st).

RECOMMENDATIONS FOR AVOIDING AND MINIMIZING IMPACTS

These recommendations apply to typical construction projects and general land use within Blanding's turtle habitat, and are provided to help local governments, developers, contractors, and homeowners minimize or avoid detrimental impacts to Blanding's turtle populations. **List 1** describes minimum measures which we recommend to prevent harm to Blanding's turtles during construction or other work within Blanding's turtle habitat. **List 2** contains recommendations which offer even greater protection for Blanding's turtles populations; this list should be used *in addition to the first list* in areas which are known to be of state-wide importance to Blanding's turtles (contact the DNR's Natural Heritage and Nongame Research Program if you wish to determine if your project or home is in one of these areas), or in any other area where greater protection for Blanding's turtles is desired.

List 1. Recommendations for all areas inhabited by Blanding's turtles.	List 2. Additional recommendations for areas known to be of state-wide importance to Blanding's turtles.
GENERAL	
A flyer with an illustration of a Blanding's turtle should be given to all contractors working in the area. Homeowners should also be informed of the presence of Blanding's turtles in the area.	Turtle crossing signs can be installed adjacent to road-crossing areas used by Blanding's turtles to increase public awareness and reduce road kills.
Turtles which are in imminent danger should be moved, by hand, out of harms way. Turtles which are not in imminent danger should be left undisturbed.	Workers in the area should be aware that Blanding's turtles nest in June, generally after 4pm, and should be advised to minimize disturbance if turtles are seen.
If a Blanding's turtle nests in your yard, do not disturb the nest.	If you would like to provide more protection for a Blanding's turtle nest on your property, see "Protecting Blanding's Turtle Nests" on page 3 of this fact sheet.
Silt fencing should be set up to keep turtles out of construction areas. It is <u>critical</u> that silt fencing be removed after the area has been revegetated.	Construction in potential nesting areas should be limited to the period between September 15 and June 1 (this is the time when activity of adults and hatchlings in upland areas is at a minimum).
WETLANDS	
Small, vegetated temporary wetlands (Types 2 & 3) should not be dredged, deepened, filled, or converted to storm water retention basins (these wetlands provide important habitat during spring and summer).	Shallow portions of wetlands should not be disturbed during prime basking time (mid morning to mid-afternoon in May and June). A wide buffer should be left along the shore to minimize human activity near wetlands (basking Blanding's turtles are more easily disturbed than other turtle species).
Wetlands should be protected from pollution; use of fertilizers and pesticides should be avoided, and run-off from lawns and streets should be controlled. Erosion should be prevented to keep sediment from reaching wetlands and lakes.	Wetlands should be protected from road, lawn, and other chemical run-off by a vegetated buffer strip at least 50' wide. This area should be left unmowed and in a natural condition.
ROADS	
Roads should be kept to minimum standards on widths and lanes (this reduces road kills by slowing traffic and reducing the distance turtles need to cross).	Tunnels should be considered in areas with concentrations of turtle crossings (more than 10 turtles per year per 100 meters of road), and in areas of lower density if the level of road use would make a safe crossing impossible for turtles. Contact your DNR Regional Nongame Specialist for further information on wildlife tunnels.
Roads should be ditched, not curbed or below grade. If curbs must be used, 4 inch high curbs at a 3:1 slope are preferred (Blanding's turtles have great difficulty climbing traditional curbs; curbs and below grade roads trap turtles on the road and can cause road kills).	Roads should be ditched, not curbed or below grade.

ROADS cont.	
Culverts between wetland areas, or between wetland areas and nesting areas, should be 36 inches or greater in diameter, and elliptical or flat-bottomed.	Road placement should avoid separating wetlands from adjacent upland nesting sites, or these roads should be fenced to prevent turtles from attempting to cross them (contact your DNR Nongame Specialist for details).
Wetland crossings should be bridged, or include raised roadways with culverts which are 36 in or greater in diameter and flat-bottomed or elliptical (raised roadways discourage turtles from leaving the wetland to bask on roads).	Road placement should avoid bisecting wetlands, or these roads should be fenced to prevent turtles from attempting to cross them (contact your DNR Nongame Specialist for details). This is especially important for roads with more than 2 lanes.
Culverts under roads crossing streams should be oversized (at least twice as wide as the normal width of open water) and flat-bottomed or elliptical.	Roads crossing streams should be bridged.
UTILITIES	
Utility access and maintenance roads should be kept to a minimum (this reduces road-kill potential).	
Below-ground utility construction sites should be returned to original grade (trenches can trap turtles).	
LANDSCAPING AND VEGETATION MANAGEMENT	
Terrain should be left with as much natural contour as possible.	As much natural landscape as possible should be preserved (installation of sod or wood chips, paving, and planting of trees within nesting habitat can make that habitat unusable to nesting Blanding's turtles).
Graded areas should be revegetated with native grasses and forbs (some non-natives form dense patches through which it is difficult for turtles to travel).	Open space should include some areas at higher elevations for nesting. These areas should be retained in native vegetation, and should be connected to wetlands by a wide corridor of native vegetation.
Vegetation management in infrequently mowed areas -- such as in ditches, along utility access roads, and under power lines -- should be done mechanically (chemicals should not be used). Work should occur fall through spring (after October 1 st and before June 1 st).	Ditches and utility access roads should not be mowed or managed through use of chemicals. If vegetation management is required, it should be done mechanically, as infrequently as possible, and fall through spring (mowing can kill turtles present during mowing, and makes it easier for predators to locate turtles crossing roads).

Protecting Blanding's Turtle Nests: Most predation on turtle nests occurs within 48 hours after the eggs are laid. After this time, the scent is gone from the nest and it is more difficult for predators to locate the nest. Nests more than a week old probably do not need additional protection, unless they are in a particularly vulnerable spot, such as a yard where pets may disturb the nest. Turtle nests can be protected from predators and other disturbance by covering them with a piece of wire fencing (such as chicken wire), secured to the ground with stakes or rocks. The piece of fencing should measure at least 2 ft. x 2 ft., and should be of medium sized mesh (openings should be about 2 in. x 2 in.). It is *very important* that the fencing be **removed before August 1st** so the young turtles can escape from the nest when they hatch!

REFERENCES

- ¹Association for Biodiversity Information. "Heritage Status: Global, National, and Subnational Conservation Status Ranks." NatureServe. Version 1.3 (9 April 2001). <http://www.natureserve.org/ranking.htm> (15 April 2001).
- Coffin, B., and L. Pfannmuller. 1988. Minnesota's Endangered Flora and Fauna. University of Minnesota Press, Minneapolis, 473 pp.

REFERENCES cont.

- Moriarty, J. J., and M. Linck. 1994. Suggested guidelines for projects occurring in Blanding's turtle habitat. Unpublished report to the Minnesota DNR. 8 pp.
- Oldfield, B., and J. J. Moriarty. 1994. Amphibians and Reptiles Native to Minnesota. University of Minnesota Press, Minneapolis, 237 pp.
- Sajwaj, T. D., and J. W. Lang. 2000. Thermal ecology of Blanding's turtle in central Minnesota. *Chelonian Conservation and Biology* 3(4):626-636.

Appendix H – Report of Cultural Resource Reconnaissance Survey

REPORT ON CULTURAL RESOURCE RECONNAISSANCE SURVEY
CONDUCTED FOR THE POTLATCH WEST BAXTER AUAR
(ALTERNATIVE URBAN AREAWIDE REVIEW)
CITY OF BAXTER, CROW WING COUNTY, MINNESOTA

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MANAGEMENT SUMMARY

An Alternative Urban Areawide Review (AUAR) document is being prepared for a 440-acre parcel that is located in the western part of the City of Baxter, Crow Wing County, Minnesota (Figures 1 and 2). The AUAR study area is currently owned by the Potlatch Corporation. All of the larger, northern portion, in Section 10, T133N, R29W, is zoned for commercial forestry, while a smaller southern segment of approximately 160 acres -- NW/4 Section 15 -- is zoned for industrial and commercial use and, though still partially wooded, also encompasses land which has been leased to a commercial enterprise. The two segments are separated by U.S. Trunk Highway 210.

As shown in Figure 2, the forested northern portion includes lands that directly abut Upper Whipple Lake (also called Moburg Lake), the middle segment of a chain of lakes which drain into the Gull River approximately a mile to the west. Half a mile to the east is White Sand Lake. Smaller, unnamed wetlands surround the southern portion of the study area.

Although no Native American or early historic Euro-American archaeological sites had been recorded within the Potlatch property limits prior to this investigation, such sites were known to be common both along the Gull River and around many of the area lakes. In addition, a government survey map from 1870 shows that the AUAR area by then was traversed by one of the oldest roads in the region, indicated as the *Leech Lake Road* in Figure 3. The use of that road, along with lumbering in the Gull River area from the 1850s on and the construction of the Northern Pacific Railroad in the 1870s -- shown on the same map -- were all events that may have left archaeological and above-ground historic evidence within the study area.

In order to document any cultural resources present within the AUAR boundaries, Archaeological Research Services (ARS) was retained by the Hoisington Koepler Group, Inc., prime consultants for this study, to conduct a cultural resources reconnaissance survey. Following records and literature searches at the Office of the State Archaeologist (OSA) and the State Historic Preservation Office (SHPO), a field review was completed during the months of May and June, 2007, with Christina Harrison as principal investigator and field director. The field survey methodology followed State of Minnesota guidelines. As future development within the AUAR area may require federal involvement, the investigation was also conducted in a manner which meets the requirements of Section 106 of the National Historic Preservation Act of 1966 and 36FR800, the procedures of the Advisory Council on Historic Preservation for the protection of historic properties.

Results of the records and literature search are discussed below in Section 2.0. while Section 3.0 describes the methodology and results of the field review.

Field work was preceded by a review of the Minnesota Archaeological Inventory as maintained by the Office of the State Archaeologist. ARS also reviewed miscellaneous Cass County and Crow Wing County files at the Minnesota Historical Society as well as our own database from previous projects near the study area. The results have been summarized in Section 2.0.

A field review was then completed during the months of May and June, 2007, with Christina Harrison as principal investigator and field director. A preliminary surface inspection of the AUAR study area was conducted at intervals close enough to ensure complete visual coverage. As it was undertaken in May, before leaves were fully out, lateral visibility was excellent. There were no indications of any Native American mounds and generally few signs of man-made surface features other than fairly recent roads and trails, the exception being some well preserved segments of what appears to be the old Leech Lake road.

During the week of June 18, ARS staff conducted a second walkover inspection across all areas deemed to have archaeological potential, i.e. all uplands within approximately 150 meters (m) or 500 feet (ft) of water as well as a 50 m wide zone along both sides of the presumed location of the old Leech Lake Road. These areas were covered along transects spaced at intervals varying between five and ten meters. All existing subsoil exposures -- deeply rutted vehicle trails, animal burrows, windfalls and machinery scars caused by logging equipment -- were visually inspected. As described further below, no Native American or historic Euro-American cultural evidence was found.

Following the walkover, ARS then focused on the areas which lacked good subsoil exposure but, because of their proximity to water, all seemed likely to have invited historic use. All were subjected to systematic shovel testing. Each test measured approximately 35-40 centimeters (cm) in diameter and was taken down, by 10 cm levels, into sterile mineral soil. All soils were screened through quarter-inch hardware cloth and then backfilled once the soil profiles had been noted. In the absence of staked datum points, test locations were tied to recognizable topographic features and recorded using paced distances and a hand-held compass (the foliage being too dense to allow for reliable GPS readings). All locations were noted on the test record sheets (Appendix A).

For ease of reference, observations and test results were recorded by smaller subareas, which are indicated in Figure 4, and referred to in Section 3.0, as Areas A through D.

Two Native American archaeological sites were identified and have been reported as **Upper Whipple Lake I and II (21 CW 267 and 268)**. Their cultural affiliation has not been determined but appears to be early, as suggested by the lack of ceramic evidence. Both are located on wooded, high and level ridge crests within approximately 30 to 40 meters (100 to 133 feet) from the eastern shore of the southwesternmost part of Upper Whipple Lake. Although

both sites have suffered considerable root/animal/logging disturbance of the sandy soil, the areas have not been cleared for farming and both sites appear to have considerable potential for yielding important information from a well preserved context. Phase II evaluation of research significance is highly recommended before development plans are finalized for the area.

Prior to the field review, the information provided by government surveyors (Figure 3) was used to plot the presumed alignment of the Leech Lake Road on a current aerial photograph and it soon became evident that some segments of this reconstruction actually coincided with trails that still were visible on the aerial. Unfortunately, those segments, when field checked, proved to be quite altered by recent use as logging and ATV trails, but there were also segments, in the more brushy or wooded areas, which compared very closely to other historic roads in this region, e.g. the fairly contemporary Woods Trail that still can be seen near the old Chippewa Agency site on the Gull River.

The best preserved segments of the Leech Lake Road are found in Section 10, primarily in the western half of SE/4 SW/4, the northern half of NW/4 SE/4, the southeastern part of SW/4 NE/4 (not owned by Potlatch), and the SE/4 NE/4. A typical segment of this kind measures close to eight feet across the flat trail bed, as often recorded from base to base of low, cut banks. Other segments are more diffuse and at times completely obliterated by past logging and tree planting. ARS also inspected a 50 m wide zone along both sides of the presumed alignment of the old road but did not identify any remnants of old structures or any other traces of 19th century activity.

While parts of the road now have been damaged by logging, tree planting, road construction and other 19th/20th century land use, there are still sections -- all within naturally wooded areas -- that retain considerable historic integrity and therefore seem to warrant protection within their natural setting.

Elsewhere in the study area, survey results proved negative, indicating that future development would not endanger any significant cultural resource.

1.0 INTRODUCTION

An Alternative Urban Areawide Review (AUAR) document is being prepared for a 440-acre parcel that is located in the western part of the City of Baxter, Crow Wing County, Minnesota (Figures 1 and 2).

The AUAR study area is currently owned by the Potlatch Corporation. All of the larger, northern portion, in Section 10, T133N, R29W, is zoned for commercial forestry, while a smaller southern segment of approximately 160 acres -- NW/4 Section 15 -- is zoned for industrial and commercial use and, though still partially wooded, also encompasses land which has been leased to a commercial enterprise. The two segments are separated by U.S. Trunk Highway 210.

As shown in Figure 2, the forested northern portion includes lands that directly abut Upper Whipple Lake¹ -- the middle segment of a chain of lakes which drain into the Gull River approximately a mile to the west. Half a mile to the east is White Sand Lake. Smaller, unnamed wetlands surround the southern portion of the study area.

Although no Native American or early historic Euro-American archaeological sites had been recorded within the Potlatch property limits prior to this investigation, such sites were known to be common both along the Gull River and around many of the area lakes. In addition, a government survey map from 1870 shows that the AUAR area by then was traversed by one of the oldest roads in the region, shown as the *Leech Lake Road* in Figure 3. The use of that road, along with lumbering in the Gull River area from the 1850s on and the construction of the Northern Pacific Railroad in the 1870s -- shown on the same map -- were all events that may have left archaeological and above-ground historic evidence within the study area.

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¹Also called Moburg Lake.

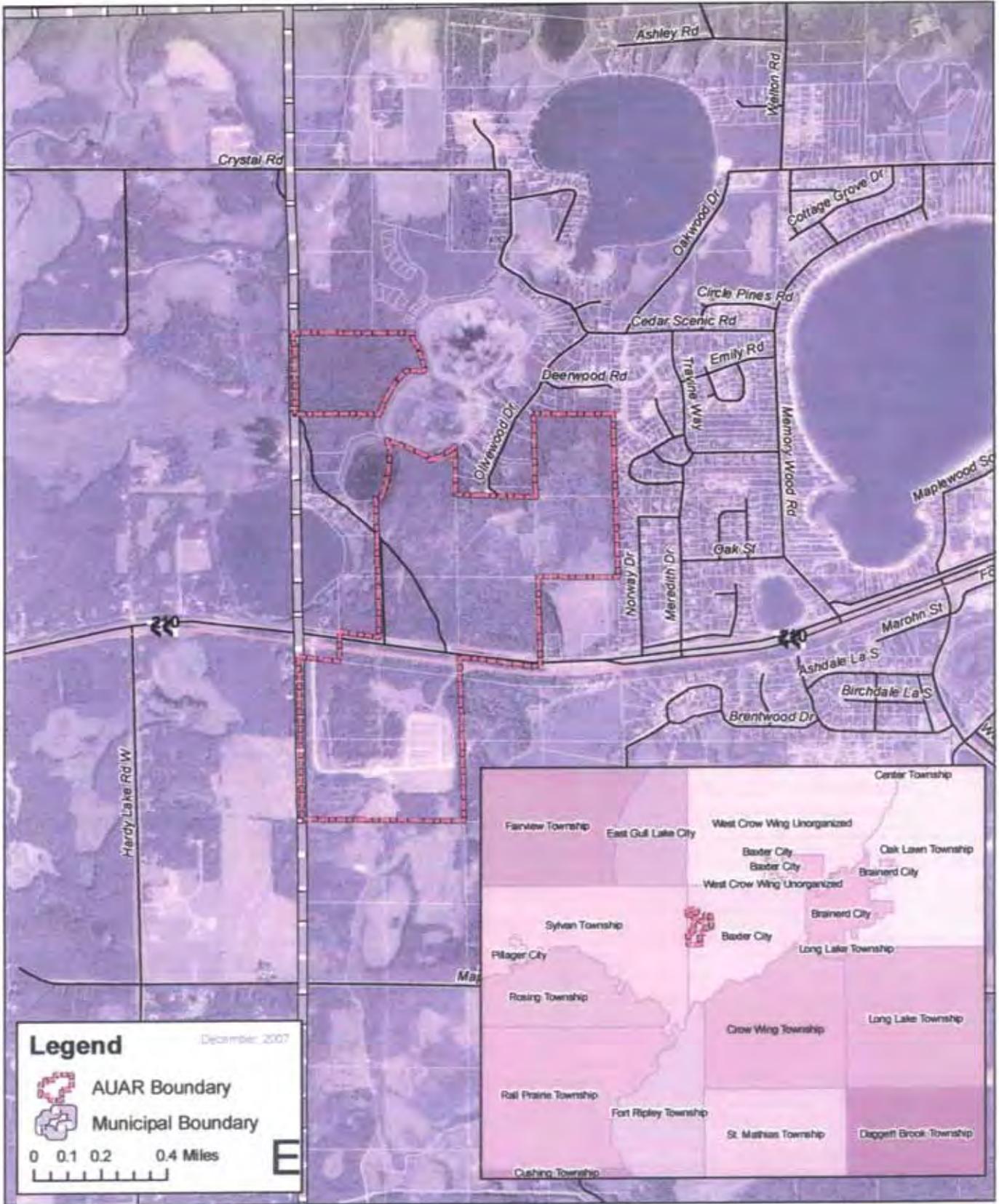


FIGURE 1.

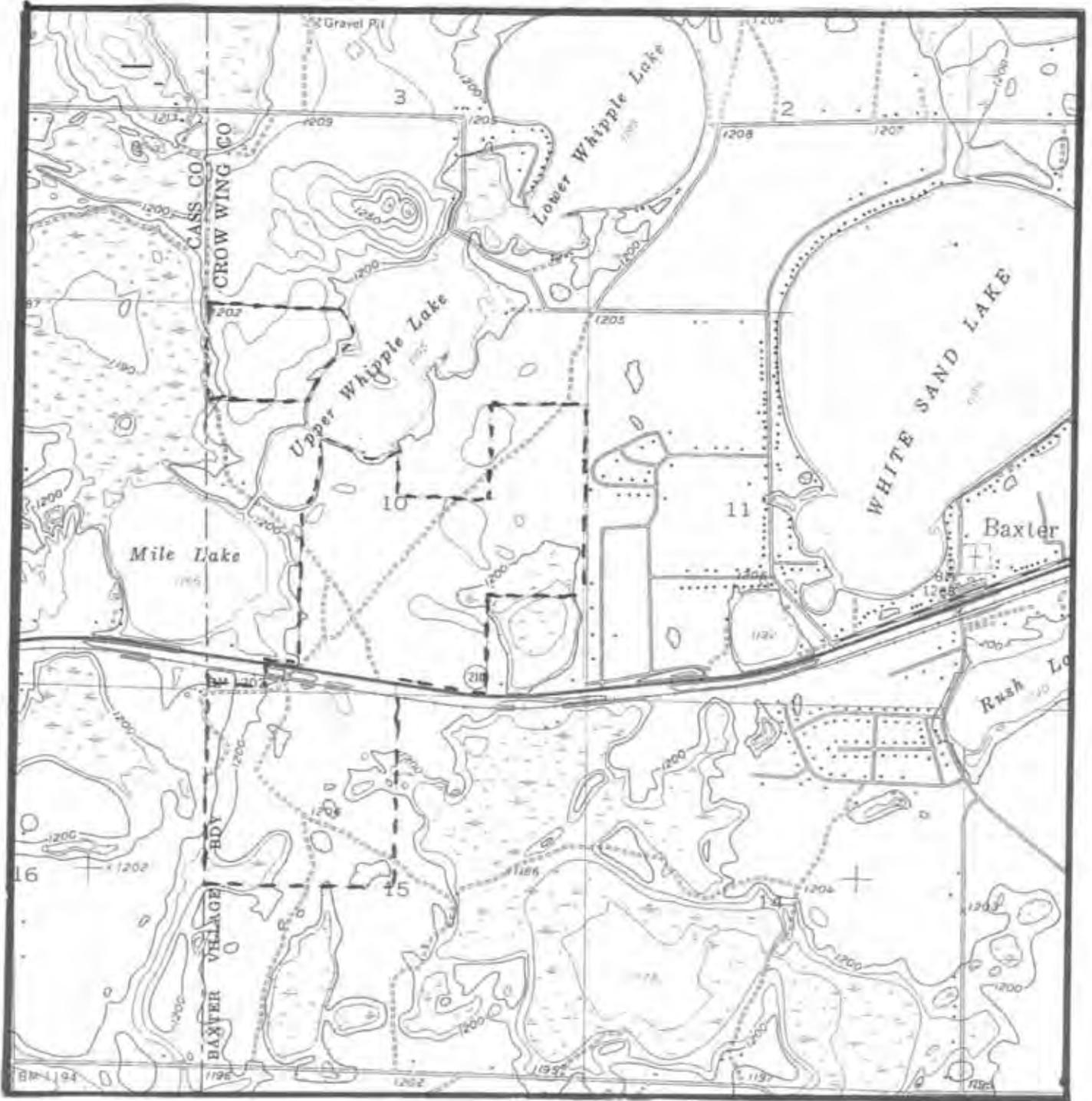


FIGURE 2

Topographic Setting.
(USGS Quadrangle for Baxter, Minn.)

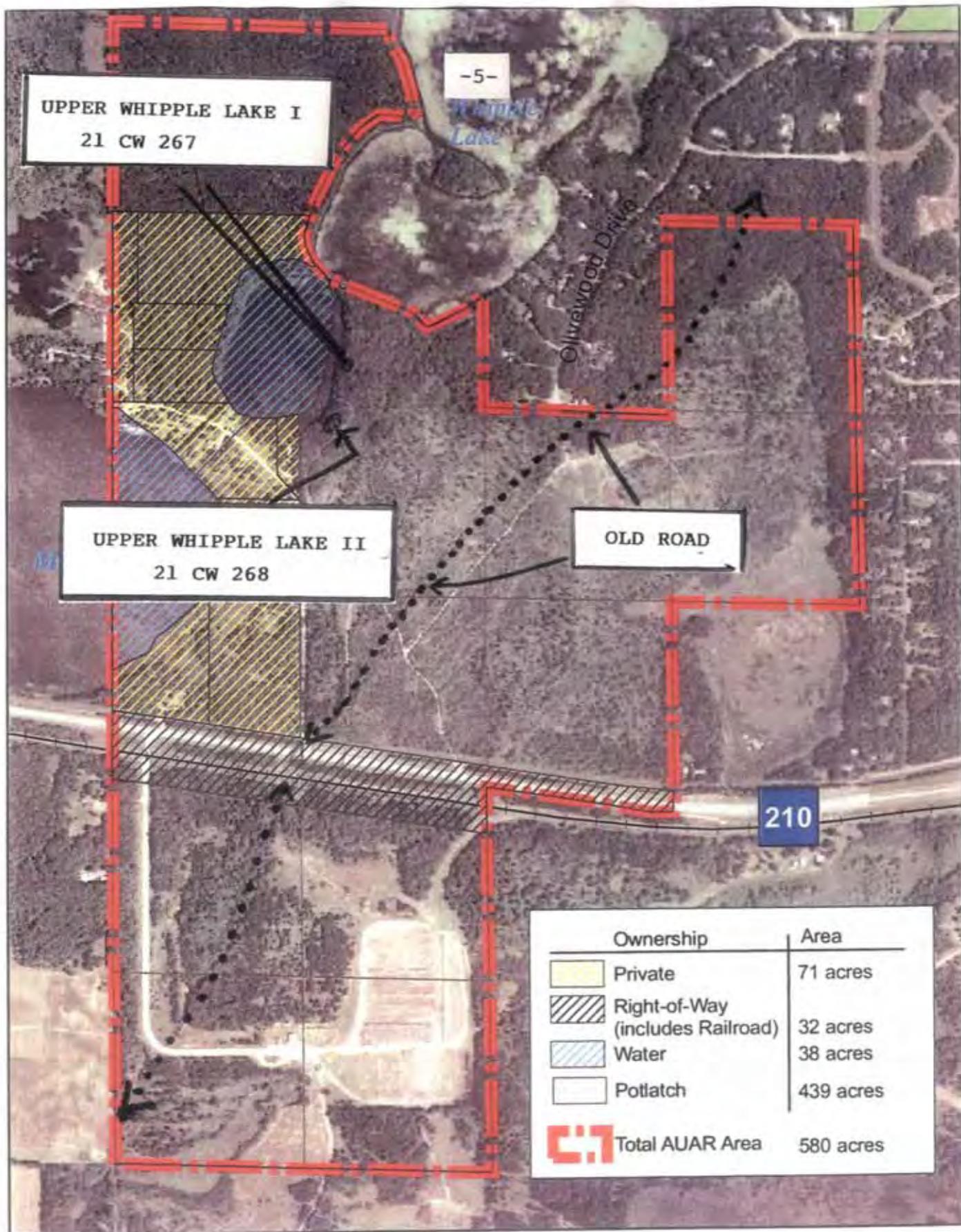


FIGURE 4. Aerial View of Project Area.

Results of the records and literature search are discussed below in Section 2.0. while Section 3.0 describes the methodology and results of the field review.

2.0 ENVIRONMENTAL SETTING AND CULTURAL CONTEXT

2.1 Environmental Setting

Geomorphologically, the project area is part of the Crow Wing Outwash Plain -- an extensive region which encompasses large segments of the Mississippi, Crow Wing and Pine River drainages and covers a major portion of Crow Wing County including most of the Brainerd Lakes area. The topography, largely formed during the later part of the Wisconsin glaciation, is generally fairly level but with pockets of more rolling terrain and a number of water-filled depressions left by melted remnants of glacial ice (Mooers, 1991). The predominant soils are well drained sandy loams over sand and gravel (University of Minnesota Agricultural Experiment Station [UMAES] 1969:27).

Initial Euro-American descriptions of this region refer to the predominance of jack pine barrens with scattered oak and aspen on the uplands, while lowlands along the Mississippi and Gull - Crow Wing Rivers supported either river bottom forest or wet prairie and marsh vegetation (Marschner 1974).

2.2 Cultural Context

The study area also falls within the Central Deciduous Lakes Region -- one of nine archaeological regions delineated for Minnesota (Anfinson 1990). Rich in plant and animal resources as well as interconnected waterways, this region was very attractive to Native American groups throughout most of the postglacial period.

Archaeological research in the Upper Mississippi region began in the late 1800s with Jacob V. Brower and Theodore H. Lewis who primarily concerned themselves with the identification and mapping of burial mounds. During the 1930s-1950s, more comprehensive research by professor Lloyd Wilford was designed to inventory and classify prehistoric cultural materials and traits in this area and across the state. Under his successor, Elden Johnson, the University of Minnesota archaeology program continued to focus on the Mille Lacs and Upper Mississippi headwaters. In the late 1970s, Johnson also directed a cultural resource survey completed for the Corps of Engineers of all the Mississippi headwaters reservoirs (Johnson et. al. 1979).

In recent years, legislated emphasis on the state and federal protection of cultural resources has triggered a number of smaller scale compliance reviews of archaeological and historic resources.

West and south of the project area, for example, where the Crow Wing and Gull Rivers both are regulated by the Sylvan hydro facility, archaeological investigations have been conducted for Minnesota Power around the shores of the reservoir (Birk 1991, Breakey et. al 1992). A number of historic resources were identified within a few miles of the Potlatch property including: 21 CA 196 -- an extensive site in the northern half of Section 17, with both Native American evidence and remnants of the Village of Gull River (a lumbering boom town platted in 1879); 21 CA 199 in NE 1/4 Section 19 -- a possible remnant of the Woods Trail, a Red River oxcart trail opened in 1844 (Birk 1991:22; Trygg 1966); 21 CA 195, in NW 1/4 Section 4, as well as 21 CA 202 and 230, in the N 1/2 of Section 20 -- Native American habitation sites on the Gull River.

A few miles to the north of the AUAR area, a number of archaeological sites have been recorded on the Gull River and around southern Gull Lake. Some have been quite intensively studied, e.g. the 21 CA 37 (the Gull Lake Dam Site) -- a mound and habitation complex on the east side of Gull River -- and 21 CA 58 (the Langer Site). Both produced a stratified sequence of prehistoric materials (Johnson 1971; Neumann 1975).

To the west, dotted across the outwash plain south and east of Lake Sylvan and north of the Crow Wing River, numerous circular and linear mounds were recorded in the late 1800s (21 CA 3).

Several Native American habitation sites were identified during more recent surveys conducted for construction projects such as the southern segment of a proposed wastewater collection and treatment system for the Cities of East Gull Lake, Nisswa and Lakeshore (Harrison 1986, 1990 and 1992) and the Legacy Golf Course built by Craguns Resort east of Lower Gull Lake (Harrison 1998 and 1999). Two of these sites, 21 CA 157 (Island View) and 21 CA 213 (Dade Lake South) were subjected to more intensive excavation which proved that both had been used repeatedly over several thousand years and therefore contained a sequence of cultural components.

A cultural resources survey of more limited scope, conducted by ARS less than a mile southeast of the Potlatch parcel, identified two Native American habitation sites, 21 CW 249 and 250, on an upland almost completely surrounded by an unnamed wetland (Harrison 2002).

By now, the state inventory of archaeological resources includes a relatively large number of sites for the Brainerd Lakes area and the general Mississippi headwaters region. It is clear, from the number and diverse range of these sites, that human use of this area spans millennia, even though relatively few of the sites have been studied well enough to produce much diagnostic evidence regarding their date and cultural affiliation.

As discussed in Section 3.0, the survey within the Potlatch parcel produced some archaeological and historic evidence that may need evaluation within a wider framework. What follows is a brief, descriptive listing of major cultural traditions and historic developments known to be represented in the cultural record of the Upper Mississippi region. It is based on data generated by a number of cultural resource investigations conducted in this area, most of them described and listed in the above-referenced ARS reports.

The sequence begins with the *Paleoindian tradition* (ca. 9500-6000 B.C.), in the upper Great Lakes region known mainly from its later expressions as most of that area was ice covered until fairly late. With the last glaciers gone from the area, grassland-adapted groups of bison hunters roamed the west while others, gradually adapting to forested environments and subsisting on more diversified hunting and fishing, seem to have occupied the wooded east/northeast. Camp and quarry sites suggest the presence of human groups on the Canadian Shield before 7000 B.C. A late Paleoindian component with distinctive, large, lanceolate Plano points and other refined bifaces was present in the Reservoir Lakes area northwest of Duluth and a related complex is known from the Thunder Bay area and the Boundary Waters region. Late Paleoindian evidence has also been reported from the Mississippi Headwaters region and east central Minnesota.

Throughout this period, the climate became warmer and drier and the early postglacial boreal spruce forest was gradually replaced by pine and birch. Moose, woodland caribou, hare and beaver were predominant amongst the species hunted. During the late Paleoindian and then the *Early Archaic period* (ca. 6000-3000 B.C.), the dry and warm climate of the postglacial altithermal furthered the spread of pine forests and, in what is now central Minnesota, the eastward shift of open grasslands. A bison kill site at Lake Itasca, near the source of the Mississippi, dates from approximately 7000-5000 B.C. and gives an indication of late Paleoindian/early Archaic lifeways near the prairie-woodland border -- a rather diversified big game/small game hunting and gathering economy relying on seasonal movements and careful scheduling of subsistence activities.

As small and scattered groups of Archaic hunters and fishermen became increasingly reliant on broad spectrum exploitation of a wide range of habitats, they developed a diversified tool kit for hunting, trapping, fishing, wood-working, and foraging/plant processing. Chipped stone tools and waste flakes still predominate in the archaeological record but pecked and ground stone tools are increasingly common. Softer stone (shale, catlinite) was carved into atlatl weights, pipes and ornaments. There are also occasional finds of carved bone and antler objects. Frequent use of non-local lithic raw materials suggests either seasonal quarrying expeditions or some other form of fairly organized procurement.

From about 3000 B.C., a cooling trend and a moister climate encouraged the return and predominance of mixed conifer forest. *Late Archaic* groups continued to hunt, fish and forage but seem to have become even more focused and seasonal in their subsistence activities with evidence of winter hunting and summer fishing camps as well as of increasingly specialized and scheduled use of wild plants. Tools and weapons became more varied and specialized: adzes, celts, gouges, grooved mauls, abraders, awls, knives, choppers, different types of scrapers, punches, chisels, drills, wedges, net and line sinkers were made by grinding or flaking a variety of metamorphic/igneous or cryptocrystalline siliceous rocks. Bone and antler were used to make points, needles and harpoons. Native copper, found as nodules in the glacial drift, was hammered into tools and ornaments.

A number of Archaic sites have been identified within the Mississippi Headwaters region. The more substantial ones are generally located on reasonably high and well-drained ground overlooking lakes, inlets/outlets and stream junctions. Such sites were probably quite intensively used base camps. There are also many smaller, aceramic sites characterized by a thin scatter of lithics, some fire-cracked rock and a location further from the major water-ways -- sites which may represent intermittently used camps associated with seasonal activities or simply with travel.

By the middle of the first millennium B.C., climate and vegetation patterns were relatively similar to those of recent times. Early archaeological manifestations of the *Woodland tradition* (500 B.C.-A.D.1650) are characterized by several new traits: the use of burial mounds, the appearance of pottery and the introduction of bow and arrow weaponry as well as an increasing reliance on wild rice and cultigens.

In north central Minnesota, from Mille Lacs west/northwest to the southern Mississippi headwaters, there have been numerous finds of grit-tempered sherds with a smooth surface and, at times, decoration in the form of bosses, punctates and incised lines. Loosely defined as the *Malmo-Kern* series, these ceramics appear to relate to the Havana wares of Ohio and Illinois, where the contemporary Hopewell culture was characterized by large-scale mound building, by large, more permanent settlements focused on incipient horticulture, and by imaginative art work which, in part, must have been produced by specialized artisans, often using quite exotic raw materials that appear to have been procured through a vast trade network including areas as remote as the Rocky Mountains and the Mexican Gulf Coast. Such a degree of socio-economic and ceremonial complexity is not evident among northern Woodland groups but there are indications of either intermittent, possibly seasonal movement of Hopewellian groups to northern areas or, at least, of some exchange of goods and ideas between local Woodland groups and the Hopewellian centers. Finds of Hopewellian artifacts such as well crafted, probably ceremonial, projectile points, knives and platform pipes in

Woodland contexts of northeastern and east-central Minnesota may reflect Hopewellian interest in western Great Lakes sources of native copper.

Habitation sites of this period (circa 200 B.C. - AD. 500) are usually located on low ridges overlooking lakes and permanent streams and often in the vicinity of one or several large, circular mounds.

Between approximately A.D. 500 and A.D. 800, a transitional Middle-Late Woodland period was characterized by distinctive, stamp-decorated St. Croix ceramics and by an equally distinctive ceremonial use of linear and circular burial mounds with elaborate grave goods. Most of the sites of this period are situated in locations that would be ideal for wild rice harvesting -- a fact which, together with the apparent increase in numbers and density of sites (and presumably also population size), suggests a growing reliance on wild rice as a food staple. As suggested by smaller size projectile points, the efficiency of hunting would have increased with the adoption of bow and arrow technology.

Reminiscent of but later than St. Croix ceramics is *Onamia Ware*. Another distinctive type of ceramics -- net-impressed *Brainerd Ware*, first identified at the outlet of Gull Lake -- has been found with St. Croix ceramics in the southern headwaters area but generally has a more northerly distribution. Net-impressed ceramics have also been found in association with early Woodland projectile point types and in habitation contexts dated by radiocarbon to that period. In addition to the net-impressions on the exterior, many of the vessels also feature cord-wrapped stick impressions, incisions, linear stamp impressions or punctates.

The later Woodland period (circa A.D. 800-1200/1500) is characterized by a stylistic/cultural continuum of related traditions: *Blackduck* in the north, *Kathio-Clam River* in east-central Minnesota and north-western Wisconsin. The former seems to have developed out of Laurel, featuring the same geographic distribution as well as considerable continuity in artifacts and burial modes. Characteristic traits included distinctive ceramics, the appearance of wild rice utilization throughout all of northern Minnesota and, with that, also a semi-sedentary way of life. The ceramics are generally globular vessels with a rounded base and a slightly constricted neck and flaring rim decorated with cord-wrapped stick impressions and punctates applied over a cord-roughened, smoothed, combed or brushed surface.

The makers of the very similar Kathio ceramics continued the St. Croix subsistence pattern of wild ricing, hunting, and gathering, and did so with a degree of efficiency that apparently encouraged both further population increase and the adoption of a semi-sedentary life style -- sites are not only more common but also more substantial with several examples of well developed house floors. These late Woodland complexes are also characterized by

continued mound construction; the ceramics are often found with small, triangular, side-notched or plain projectile points.

In north- and east-central Minnesota, the *Late Woodland-Early European Contact Period* (from approximately A.D.1200/1500 to A.D.1750) is represented, in the archaeological record, by Sandy Lake and Ogechie ceramics and also, from 1680 on, by indigenous materials found in association with early French trade goods. *Sandy Lake* vessels, generally accepted as made by the *Dakota*, are found on sites with evidence of quite intensive wild rice use; some have the character of permanent, palisaded villages. Contemporary with late Sandy Lake ceramics, *Ogechie* ware -- shell-tempered, globular vessels with trailed decoration and punctates on a smoothed exterior -- seem to be a blend of late Woodland and more westerly and southerly Plains Village and Mississippian/Oneota ceramic traits.

The *Dakota* presence in the region ended by the mid-1700s. From the 1600s on, the woodland-adapted Siouan speaking *Dakota* of the western Great Lakes region had began to be pushed towards the west and south by Algonquin speaking *Ojibwe* groups. The latter were closely allied with the French fur traders and therefore bolstered by a better supply of fire arms as well as a rewarding involvement in the fur trade. The lifestyle of the *Ojibwe* was characterized by a seasonal subsistence cycle based on the gathering of wild rice, maple sugar and other plant products, on fishing along Lake Superior as well as the inland waterways, and on hunting and trapping in the interior. The coniferous region, in prelogging days, did not offer the same abundance of subsistence resources as the mixed conifer-deciduous forest to the west and south -- deer, in particular, was less common before the harvesting of pines increased the stands of deciduous trees and expanded the brush lands. The number of *Ojibwe* was therefore probably not very large. Their involvement in the fur trade still caused a fairly rapid depletion of fur bearing animals, particularly beaver -- a situation quite noticeable already by the late 1700s. With the exception of winter hunting camps (located in sheltered, wooded areas) and maple sugar groves, traditional *Ojibwe* sites seem to have been situated near water, especially at stream and lake junctions, or on islands. By the early 1800s, most of the population was concentrated in small villages on the larger lakes.

Ojibwe components have been identified on many sites in the Mississippi Headwaters area -- historic artifacts as well as parching pits and other features associated with wild rice harvesting and processing.

The efforts of the French fur trade (circa 1680 to 1760) were concentrated mainly on the Boundary Waters region and areas to the north but there is intermittent evidence of their presence also further south in Minnesota, particularly along the Upper Mississippi River and around the southwestern part of Lake Superior.

The *British and American fur trade* (1765-1860s) was more extensive and competitive and a number of trading posts were established around the Boundary Waters and along the north shore of Lake Superior, as well as in the interior of northern Minnesota and Wisconsin. Three factors determined the location of such trading posts: the fact that the fur traders depended on the same natural resources as the Indians and usually bartered with the Indians for them; their dependence on the Indians for skins and furs; their need to be connected to the network of waterways and portages leading to centers like Fond du Lac and Grand Portage. Therefore, the posts were always located by water routes and usually in the vicinity of Indian camp sites, on dry and elevated ground near stream junctions or on islands. A number of trading post sites have been recorded or reported to exist within the upper Mississippi drainage area and the Gull and Crow Wing Rivers were both well known canoe routes (Birk 1991:20).

Missions, another aspect of 19th century *Ojibwe and Euro-American contact*, sprung up throughout the upper Mississippi region. The St. Columba Episcopal Mission on the eastern side of Gull Lake, along with the Chippewa Agency that was established by the United States government near the confluence of the Crow Wing and Gull Rivers, were both important centers of activity within the Gull Lake Indian Reservation that had been created in the mid-1850s (and included the current study area). The agency was located along the Woods Trail -- a government road and Red River oxcart trail which opened in 1844 and, by 1855, was being further improved. At that time, government contractors, employing Ojibwe men trained at the mission, also began to build a new road between Crow Wing and Leech Lake (Figure 3; Birk 1972).

Fur trade and other interaction with the Native American community, early military expansion, and incipient *Euro-American settlement and commerce* soon spawned a number of small communities along the Mississippi with tributaries, e.g. the above-mentioned Village of Gull River in the northern half of Section 17, with both Native American evidence and remnants. Crow Wing County was established in 1857 but not organized until 1870. The portion west of the Mississippi River was annexed in 1887 (Upham 1969).

The upper Mississippi region was subjected to intensive *logging* from the late 19th century on. Old railroad grades, logging dams, saw mill sites and related structural remains are common all around the headwaters area. Extensive railroads were built in order to speed up the harvesting. By the early 1900s, however, the large pine forests had been harvested throughout the entire region, leaving vast tracts of cut-over stump land.

Once logging had opened up lands for *homesteading* and all Indian lands in the area had been ceded, the upper Mississippi region was settled at a rapid pace. There is little evidence, however, that farming related settlement was much of a success on the sandy, dry soils of the outwash plain. Because of the poor soils and a short growing season, many of the homesteads appear to have been

abandoned by the 1920s. What emerged instead at that time was the *resort and tourism* industry as recreational use of the rivers and lakes became a dependable economic factor of this region.

3.0 SURVEY METHODOLOGY AND RESULTS

Field work was preceded by a review of the Minnesota Archaeological Inventory as maintained by the Office of the State Archaeologist. ARS also reviewed miscellaneous Cass County and Crow Wing County files at the Minnesota Historical Society as well as our own database from previous projects near the study area. The results have been summarized above in Section 2.0.

A field review was then completed during the months of May and June, 2007, with Christina Harrison as principal investigator and field director. A preliminary surface inspection of the AUAR study area was conducted at intervals close enough to ensure complete visual coverage. As it was undertaken in May, before leaves were fully out, lateral visibility was excellent. There were no indications of any Native American mounds and generally few signs of man-made surface features other than fairly recent roads and trails, the exception being some well preserved segments of what appears to be the old Leech Lake road that was built in the 1850s.

During the week of June 18, ARS staff conducted a second walkover inspection across all areas deemed to have archaeological potential, i.e. all uplands within approximately 150 meters (m) or 500 feet (ft) of water as well as a 50 m wide zone along both sides of the presumed location of the old Leech Lake Road. These areas were covered along transects spaced at intervals varying between five and ten meters. All existing subsoil exposures -- deeply rutted vehicle trails, animal burrows, windfalls and machinery scars caused by logging equipment -- were visually inspected. As described further below, no Native American or historic Euro-American cultural evidence was found.

Following the walkover, ARS then focused on the areas which lacked good subsoil exposure but, because of their proximity to water, all seemed likely to have invited historic use. All were subjected to systematic shovel testing. Each test measured approximately 35-40 centimeters (cm) in diameter and was taken down, by 10 cm levels, into sterile mineral soil. All soils were screened through quarter-inch hardware cloth and then backfilled once the soil profiles had been noted. In the absence of staked datum points, test locations were tied to recognizable topographic features and recorded using paced distances and a hand-held compass (the foliage being too dense to allow for reliable GPS readings). All locations were noted on the test record sheets (Appendix A).

For ease of reference, observations and test results were recorded by smaller subareas, which are indicated in the following and in Figure 4 as Areas A through D.

Area A, in the northwestern part of the study area, encompasses a wooded parcel west of Upper Whipple Lake and north of property not owned by Potlatch. Where the shoreline trends east to form a narrow peninsula which, at low water, almost connects the mainland with an island in the lake, a small, wedge-shaped area of higher ground appeared to have moderate archaeological potential but visual inspection of cut banks and animal burrows dug into the very sandy soil proved negative. To the west, this area is separated from the main shoreline by swamp as shown in Figure 2.

Following the shore northwest from this point, the terrain is fairly uneven near the lake. Further in, the areas that are higher and more level have been deeply disturbed by past logging and the planting of red pine. Visual inspection proved negative.

Following the shore approximately 200 m southwest from the point and past the wetland, a wide stretch of sandy flats and the eroded banks of a sandy beach ridge all offered good exposure. Inland, the terrain proved fairly uneven and low in archaeological potential. At 210-20 m, the terrain leveled off as a higher area planted with pines. Subsoil exposure was provided by extensive disturbance around a large deer stand, along a vehicle trail and the eroded slope down to the beach as well as in areas disturbed by logging and planting, but a series of shovel tests was still placed at 7 to 10 m intervals near the lakeward edge of the area, with negative results (Appendix A).

The beach below the tested area, and also along the shoreline that skirts the private property to the southwest, was also inspected.

Area B encompasses the wooded area south of the main portion of Upper Whipple Lake and east of a smaller basin which, for the most part, is separated from the main lake by a sandy isthmus but still remains connected to it by a fairly narrow channel. As the terrain becomes higher again, some 15 m east of the channel, it supports a mature hardwood forest. A well used trail some distance in from the shore provided good but negative subsoil exposure. In addition, three tests, all negative, were placed at 6-7 m intervals along the trail, until increasingly predominant and uneven northward slope suggested even less archaeological potential (Appendix A).

Turning south to parallel the eastern lakeshore, but staying on higher ground, testing at 10-12 m intervals continued to prove negative until Shovel Tests (ST) 9, 9N, 9E and 9S as well as ST 10 all produced a scatter of lithics: a biface fragment and 27 pieces of chipping debris (debitage) representing all stages of lithic reduction and all but one of the same material (Tongue River Silica), which suggests that the evidence dates from the same brief use period (Appendix B). The fact that the find depths ranged all the way between the 10-20 cm and 60-70 cm levels may simply reflect massive root disturbance and animal burrowing

within the very sandy soil. The find area extends across an approximately 15 by 15 m wide portion of a level-crested knoll some 20 m in from the lake. The site has been entered into the Minnesota Archaeological Inventory as **Upper Whipple Lake I (21 CW 267)** and its location and extent are shown in Figures 4 and 5. Apparently aceramic, it may be quite early and is tentatively interpreted as a briefly used Native American camp site, possibly dating back to the Archaic.

Having placed three more tests towards the south, all sterile, and then crossed a stretch of uneven terrain without cultural use potential, ARS staff examined a substantial, deeply worn and much eroded snowmobile trail which cuts through the crest of the higher area towards the lake (Figure 5). Results were negative, as were two tests placed on higher, but quite sloping ground south of the trail.

Finally, on higher, more level ground between approximately 50 m and 70 m south of the center of the snowmobile trail (just a short distance north of the AUAR boundary), ST 17 to 19 produced another scatter of Native American lithics, this time quite sparse, yielding four flakes of jasper taconite, Swan River Chert and Knife River Flint, one found between 10 and 20 cm below the surface, the rest between 40 and 50 cm. The circa 25 by 30 m large area is wooded and appears fairly undisturbed. The site has been entered into the Minnesota Archaeological Inventory as **Upper Whipple Lake II (21 CW 268)** and its location and extent are shown in Figures 4 and 5. Again, apparently aceramic, it is tentatively interpreted as a briefly used Native American camp site, possibly dating back to the Archaic.

Area C encompasses the remainder of the Potlatch property north of TH 210 -- an area too far removed from the lakeshore to have attracted much if any Native American use. As mentioned earlier, the preliminary surface inspection in May, with optimal lateral visibility, proved largely negative in terms of historic evidence, the exception being some well preserved segments of what appears to be the old **Leech Lake Road** which is indicated by a dotted line in Figure 4.

Prior to the field review, the information provided by government surveyors (Figure 3) was used to plot the presumed alignment on a current aerial photograph and it soon became evident that some segments of this reconstruction actually coincided with trails that still were visible on the aerial. Unfortunately, those segments, when field checked, proved to be quite altered by recent use as logging and ATV trails, but there were also segments, in the more brushy or wooded areas, which compared very closely to other historic roads in this region, e.g. the fairly contemporary Woods Trail that still can be seen near the old agency site. The best preserved segments of the Leech Lake Road are found in Section 10, primarily in the western half of SE/4 SW/4, the northern half of NW/4 SE/4, the southeastern part of SW/4 NE/4

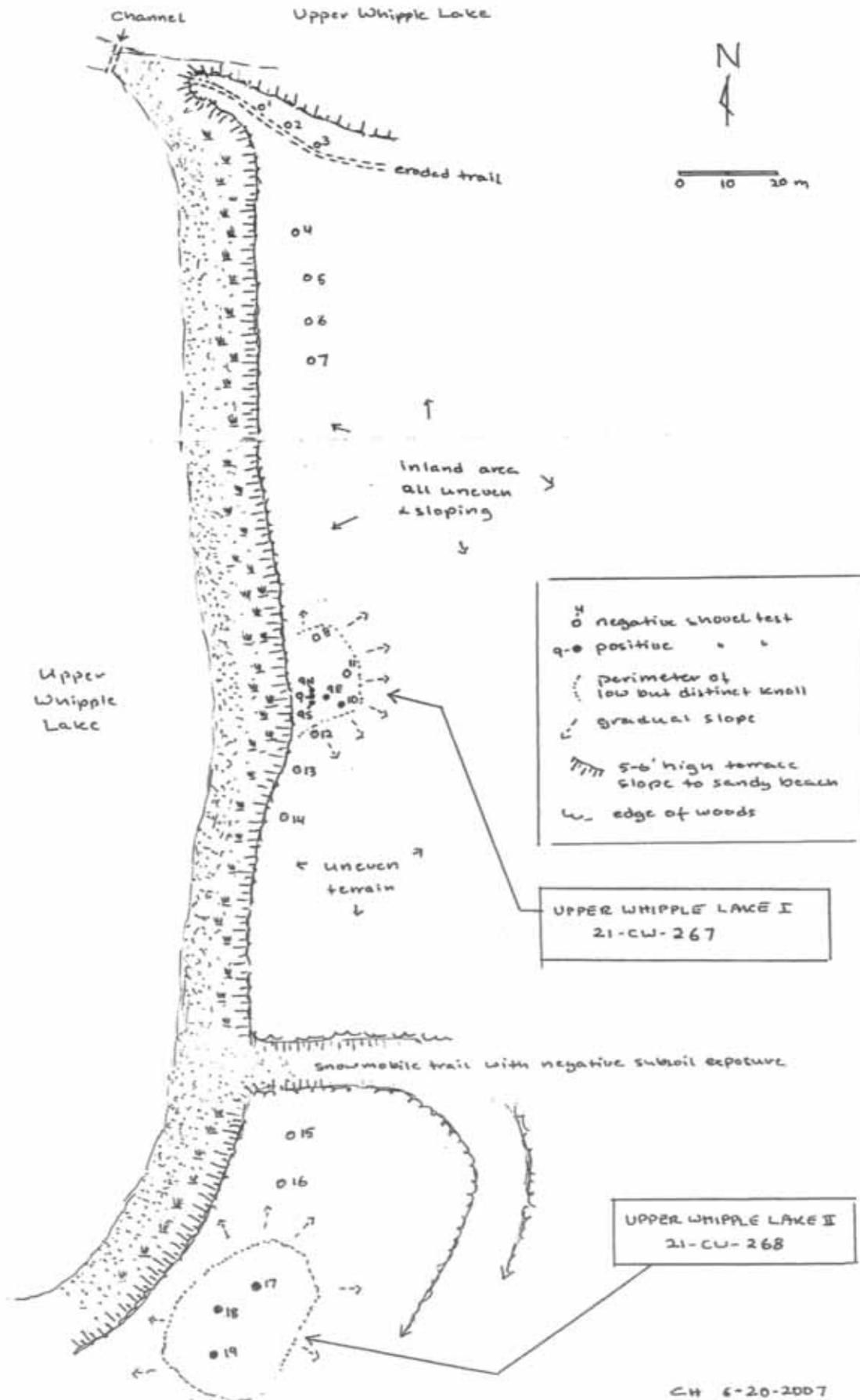


FIGURE 5.

(not owned by Potlatch), and the SE/4 NE/4. A typical segment of this nature measures close to eight feet across the flat trail bed, as often recorded from base to base of low, cut banks. Other segments are more diffuse and at times completely obliterated by past logging and tree planting.

As also mentioned earlier, ARS also inspected a 50 m wide zone along both sides of the presumed alignment of the old road but did not identify any remnants of old structures or any other traces of 19th century activity.

Area D encompasses the Potlatch property south of TH 210 and the railroad, again an area which appears too far removed from any significant waterways to have attracted much if any Native American use. As mentioned earlier, the preliminary surface inspection in May, with optimal lateral visibility, proved largely negative in terms of historic evidence except for a few remnants be the old Leech Lake road which here are poorly preserved due to more far-reaching recent disturbance caused by road construction, logging and the construction and use of a large business enterprise in the eastern half of the area.

4.0 CONCLUSION AND RECOMMENDATIONS

Two Native American archaeological sites have now been identified within the Potlatch West Baxter AUAR study area and have been reported as **Upper Whipple Lake I and II (21 CW 267 and 268)**. Their cultural affiliation has not been determined but appears to be early, possibly Archaic, as suggested by the lack of ceramic evidence. Both are located on wooded, high and level ridge crests within approximately 30 to 40 meters (100 to 133 feet) from the eastern shore of the southwesternmost part of Upper Whipple Lake. Although both sites have suffered considerable root/animal/logging disturbance of the sandy soil, the areas have not been cleared for farming and both sites appear to have considerable potential for yielding important information from a well preserved context. Phase II evaluation of research significance is highly recommended before development plans are drawn up for the area.

Segments of an old woods trail, which cut diagonally across the study area, appears to be remnants of the **Leech Lake Road** which was built in the mid-1850s by government surveyors and trained Native American manpower. While parts of the road now have been damaged by logging, tree planting, road construction and other 19th/20th century land use, there are still sections -- all within naturally wooded areas -- that retain considerable historic integrity and therefore seem to warrant protection within their natural setting.

Elsewhere in the study area, survey results proved negative, indicating that future development would not endanger any significant cultural resource.

5.0 REFERENCES

- Birk, Douglas A.
1991 *A Place of Mingling Waters: A Literature Review of Archaeological Properties at the Sylvan Hydro Reservoir, Cass and Morrison Counties, Minnesota.* Institute for Minnesota: Reports of Investigations Number 101. Minneapolis.
- 1972 "A Revised Preliminary Report on the Chippewa Agency Sites, Cass County, Minnesota." Unpublished report, Minnesota Historical Society, St. Paul.
- Breakey, Kim C., Jerry Oothoudt and Douglas A. Birk
1992 *Stage II and III Investigations of Archaeological Properties at the Sylvan Hydro Reservoir, Cass, Crow Wing and Morrison Counties, Minnesota.* In *Reports of Investigation Number 188*, The Institute for Minnesota Archaeology, Minneapolis, Minnesota.
- Harrison, Christina
1998 *Report on Supplementary Cultural Resource Survey Conducted within the Proposed Craguns Golf Course, East Gull Lake, Cass County and Adjacent Portion of Crow Wing County, Minnesota.* Archaeological Research Services, Minneapolis, Minnesota.
- 1999 *Addendum to the above.*
- 1992 *Report of Phase III Archaeological Data Recovery at Three Sites within the City of East Gull Lake, Cass County, Minnesota (Squaw Point, Island View and Dade Lake South).* Archaeological Research Services.
- 1986 *Report on Cultural Resources Survey of Proposed Wastewater Collection and Treatment System, City of East Gull Lake, Cass County, and City of Nisswa, Crow Wing County.* Archaeological Research Services.
- 1990 *Addendum to the above-referenced 1986 report.*
- 2002 *Report on Cultural Resource Reconnaissance Survey for the Jasper Heights Residential Development, City of Baxter, Crow Wing County, Minnesota.* Archaeological Research Services.
- Johnson, Elden, Principal Author/Investigator
1979 *Cultural Resources Investigation of the Reservoir Shorelines: Gull Lake, Leech Lake, Pine River and Lake Pokegama.* Report prepared for the U.S. Army Corps of Engineers, St. Paul District. Archaeology Laboratory, University of Minnesota, Minneapolis.

- 1971 Excavations at the Gull Lake Dam. In *Minnesota Archaeologist* 31:44-69.
- Marschner, Francis J.
1974 *The Original Vegetation of Minnesota*. USDA-Forest Service, North Central Forest Experiment Station, St. Paul, Minnesota.
- Mooers, Howard
1991 "Glaciation and the Natural Environment" in *A Place of Mingling Waters: A Literature Review of Archaeological Properties at the Sylvan Hydro Reservoir, Cass and Morrison Counties, Minnesota*. Institute for Minnesota Archaeology: Reports of Investigations Number 101. Minneapolis.
- Neumann, Thomas W.
1975 *A Study of 21-CA-58: An Analysis of a Multi-Component Middle Woodland Site on the Shores of Prehistoric Lake Gayashi*. M.A. Thesis, University of Minnesota.
- Trygg, J.W.
1966 *Composite Map of U.S. Land Surveyor's Original Plats and Field Notes, Sheet #13*. Ely, Minnesota.
- University of Minnesota, Agricultural Experiment Station
1969 *Minnesota Soil Atlas: Brainerd Sheet*. (Miscellaneous Report 90.) St. Paul.

APPENDIX A

Test Records

APPENDIX B

Description of Cultural Evidence

Appendix I – Public Comments Received and Responses Provided

Appendix J – List of Acronyms

Acronym	Title
AUAR	Alternative Urban Areawide Review
BMPs	Best Management Practices
C-1	Commercial
C-2	Regional Commercial
CBOD	Carbonaceous Biochemical Oxygen Demand
CIP	Capital Improvement Program
CO	Carbon Monoxide
CP	Community Park
CUP	Conditional Use Permit
DNR	Department of Natural Resources
EAW	Environmental Assessment Worksheet
EIS	Environmental Impact Statement
EPA	Environmental Protection Agency
EQB	Environmental Quality Board
F	Commercial Forestry
FAR	Floor Area Ratio
FT	Foot/Feet
GPM	Gallons Per Minute
I	Industrial
IMPV	Impervious
ISD	Independent School District
ISTS	Individual Sewage Treatment Systems
ITE	Institute of Traffic Engineers
LOS	Level of Service
LUST	Leaking Underground Storage Tank
MES	Master Entity System
MG	Million Gallons
MGD	Million Gallons Per Day
MGY	Million Gallons Per Year
MNDOT	Minnesota Department of Transportation
MSW	Municipal Solid Waste
MPCA	Minnesota Pollution Control Agency
NAC	Noise Area Classification
NEH	National Engineering Handbook
NPDES	National Pollution Discharge Environmental System
ORVW	Outstanding Resource Value Water

Acronym	Title
OS	Office Space
OSA	Office of the State Archaeologist
PERV	Pervious
PPM	Parts Per Million
R-1	Low Density Residential
R-2	Medium Density Residential
R-3	High Density Residential
RGU	Responsible Governmental Unit
RS	Special Residential Cluster
SB	Storm Basin
SBP	Sequencing Batch Reactors
SCS	Soil Conservation Services
SHPO	State Historic Preservation Office
SOD	Shoreland Overlay District
SQ FT	Square Feet
SWPP	Stormwater Pollution Prevention Plan
TH	Trunk Highway
USGS	United States Geological Survey
WTF	Water Treatment Facility
WTLD	Wetland
WWTF	Wastewater Treatment Facility