Chukuni Communities Development Corporation

Municipality of Red Lake
Community Capacity Study

CHUKUNI
Communities Development Corporation

RED LAKE
Opportunity...it's our Nature

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GLOSSARY AND ABBREVIATIONS

Term	Details
BCMI	Balmertown, Cochenour, and McKenzie Island
BGA	Business Gap Analysis
°C	Celsius
CCDC	Chukuni Communities Development Corporation
CCS	Community Capacity Study
CFU	Colony forming units
cm	Centimetres
CMHC	Canadian Mortgage and Housing Corporation
DWQS	Drinking Water Quality Standards
GPM	Gallons per minute
ha	Hectare
HDPE	High density polyethylene
HP	Horsepower
Kenora CD	A Census Division is the general term for a geographic area between the province/territory level and the municipal level. Throughout the report the Kenora District Census Division is referred to as the Kenora CD.
KDSB	The Kenora District Services Board
km	Kilometre
kPa	Kilopascals
kW	Kilowatt
L/min	Litres per minute
L/s	Litres per second
LS	Lift station
m	Metres
MECP	Ministry of the Environment, Conservation, and Parks
mg/L	Milligrams per litre
mL	Millilitres
mm	Millimetres
MPN	Most probable number
MPAC	Municipal Property Assessment Corporation
The Municipality	The Municipality of Red Lake
m^3	Metres cubed
m^3/day	Metres cubed per day
NAICS	North American Industry Classification System
NOHFC	Northern Ontario Heritage Fund Corporation
NTU	Nephelometric Turbidity Unit
NWI	Northern Waterworks Inc.
O.Reg	Ontario Regulation
RPS	Reservoir pumping station
SCADA	Supervisory Control and Data Acquisition
µg/L	Micrograms per litre
WPCP	Water pollution control plant
WTP	Water treatment plant

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LAND ACKNOWLEDGEMENT

We, the Municipality of Red Lake, acknowledge that our foundation and the spaces in which we live and maintain are on the lands of the Anishinaapek of Red Lake; the traditional lands of Lac Seul and Wabauskang First Nations, and Treaty 3 territory. As we are all Treaty people, we will continue to cherish the reciprocity of all the relationships on these scared Lands and Waters.

EXECUTIVE SUMMARY

The Municipality of Red Lake (the Municipality) is a key service and infrastructure hub in northwestern Ontario, serving approximately 4,100 residents across the communities of Red Lake, Balmertown, Cochenour, McKenzie Island, Madsen, and Starratt Olsen. With several major mining and infrastructure developments underway or planned—including Evolution Mining, West Red Lake Gold's Madsen Mine, Kinross Gold's Great Bear Project, the Frontier Lithium PAK Project, and the Berens River Bridge and Roads Project—the Municipality is expected to experience increased demand for housing, services, and infrastructure. In response, the Municipality and Chukuni Communities Development Corporation (CCDC) commissioned this Community Capacity Study (CCS) to evaluate whether the Municipality is positioned to accommodate the projected growth and to identify strategies for ensuring long-term community readiness and sustainability.

Situational and Capacity Analysis

The CCS establishes a comprehensive understanding of Red Lake's current demographic, social, and physical infrastructure conditions. As of 2024, housing stock is primarily single-detached dwellings (over 80%), with limited rental or medium-density options, posing challenges for seniors, temporary workers, and young families. While average household income levels are relatively high—driven by strong employment in the mining sector—labour shortages persist across sectors such as healthcare, education, retail, and trades. These constraints, coupled with a rising senior population and growing Indigenous population, underscore the need for inclusive service planning. An inventory of community facilities, municipal services, and vacant lands also reveals existing infrastructure limitations, especially in the availability of serviced land and aging water and wastewater systems. Although core municipal infrastructure is generally in good condition, the assessment identified specific water and wastewater system upgrades that should be prioritized to ensure reliability, redundancy, and fire protection capabilities.

Planning for Growth

Population projections indicate that the Municipality could grow to a peak of approximately 5,860 residents by 2037 under a potential growth scenario. This would represent an increase of nearly 1,800 residents compared to 2021, driven primarily by the labour demands of mining and infrastructure projects. To support this growth, the Municipality will require approximately 320 hectares of developed land, mainly for residential and industrial uses. While existing municipal infrastructure, including water and wastewater systems, is generally in good condition, capacity enhancements may be required in areas expecting higher growth. The CCS also identifies the need to expand childcare, seniors' housing, health services, and serviced land supply to ensure the Municipality remains livable and well-prepared for development pressures. Regardless of the identified implementation timeframe, it should be noted that urgent action is needed for the Municipality of Red Lake to be ready for, and to maximize its growth and related benefits from the anticipated activity in the region.

Recommendations

The CCS identifies a range of recommendations to help the Municipality address service and infrastructure gaps, unlock land for development, and prepare for long-term growth. These

recommendations were informed by community engagement, land and service capacity assessments, and alignment with projected population growth. Recommendations have been categorized by implementation timeline and financial consideration, and are categorized across municipal services, land development, and water and wastewater infrastructure. While not exhaustive, the following provides a summary of short- and medium-term recommendations. Additional recommendations are outlined in the full report.

Short-term recommendations (1 to 4 year timeframe):

- Expand serviced residential and industrial land supply;
- Increase residential density and diversify housing stock to improve housing attainability and expand the rental market;
- Support labour attraction and retention through housing availability and workforce supports;
- Foster a supportive environment for economic development through zoning, site readiness, and business supports;
- Extend Municipal infrastructure to underserviced areas to enable growth;
- Initiate priority infrastructure upgrades and maintenance in Red Lake, Balmertown, Madsen, and Cochenour; and
- Improve infrastructure redundancy and enhance fire protection across the Municipality.

Medium-term recommendations (5 to 8 year timeframe):

- Expand access to healthcare, education, and community wellness services;
- Improve regional transportation access and connectivity;
- Monitor and respond to seniors' housing and service needs to support aging in place;
- Beautify and enhance the public realm; and
- Evaluate and plan for future infrastructure expansion in Madsen.

Together, these actions provide a strategic roadmap to guide infrastructure investment, service expansion, and land development in support of the Municipality's evolving role as a regional hub. The CCS is intended to ensure that the Municipality is positioned to manage future growth while maintaining a high quality of life for its residents and neighbouring communities.

1.0 INTRODUCTION

The Municipality of Red Lake (the "Municipality") is a regional hub that provides services for a broad area that includes the Municipality, nearby communities, Indigenous communities, and unorganized territories and infrastructure for its Municipal residents and visitors. The Municipality has a population of approximately 4,100 and encompasses the communities of Red Lake, Balmertown, Cochenour, McKenzie Island, Madsen, and Starratt Olsen. The Municipality's economy is tied to the natural resources sector, including mining, and forestry as well as tourism, in northwestern Ontario.

A series of current and planned developments—including Evolution Mines gold operations in Balmertown, West Red Lake Gold's redevelopment of the Madsen Mine, Kinross Gold's Great Bear Project (located between the Municipality and the Township of Ear Falls), and the Berens River Bridge and Roads Project—are expected to generate substantial employment, population growth, and regional connectivity. Red Lake is also anticipated to serve as the primary access point and service hub for the PAK Lithium Project (over 175 km north of Red Lake).

In response to the anticipated growth, the Chukuni Communities Development Corporation (CCDC) and the Municipality commissioned two complementary studies: a Community Capacity Study (CCS) and a Business Gap Analysis (BGA). Together, these studies provide a coordinated foundation for long-term municipal planning, infrastructure investment, and economic development. The following report describes the Community Capacity Study.

1.1 COMMUNITY CAPACITY STUDY CONTEXT AND OBJECTIVES

The CCS was undertaken to assess whether the Municipality is prepared to accommodate projected population growth associated with mining, road development to the north of the Community, and broader regional changes. This includes evaluating the capacity and condition of infrastructure and services such as land-based needs, water and wastewater systems, housing, municipal services, among others.

Emphasis has been placed on understanding the potential impacts of peak construction periods and long-term operational employment from the current and anticipated mining projects resulting in population growth in the Municipality. Emphasis has also been placed on the Municipality's evolving role as a key access point for northern First Nations with the development of the Berens River Bridge and Roads Project. The CCS is intended to serve as a long-term planning framework to help the Municipality respond proactively to growth and ensure community readiness.

The CCS report includes a situational analysis of the Municipality, how to plan for growth, and recommendations and next steps:

- **Situational analysis:** The situational analysis establishes a comprehensive understanding of the Municipality of Red Lake's current conditions—its physical infrastructure, social and community assets, and available development lands. This provides the foundation for

identifying existing capacity and constraints in meeting both current and anticipated growth-related needs. Through a review of municipal planning documents, an inventory of infrastructure and services, land needs projections, and input from key stakeholders, the analysis aims to define “where the community is today” to better inform long-term planning decisions and investment strategies.

- **Planning for growth:** Building on the situational analysis, this phase identifies the infrastructure, facilities, and services needed to support anticipated population growth and maintain a high quality of life in the Municipality of Red Lake. Planning for growth establishes baseline service levels, identifies service gaps, and explores land development options. It results in a prioritized list of capital projects and servicing strategies to guide future investment. The work also includes stakeholder engagement and implementation planning to ensure readiness for growth and alignment with community needs.
- **Recommendations and next steps:** The findings from the situational analysis and growth planning phases provide the foundation for the recommendations and next steps, which aim to support the Municipality in managing and planning for growth and guiding future infrastructure and service investments.

1.1.1 Business Gap Analysis

The BGA compliments the CCS by evaluating the Municipality’s economic and retail-commercial readiness. The BGA assessed how population and labour force growth—driven by the same mining and road developments—could impact the Municipality’s economy, including market demand, business inventory, and target businesses and business priorities.

The BGA focused on identifying alignment and gaps between existing market offerings and projected demand across the region. It also informed strategies for business attraction and development. The CCS provided key assumptions and context for this analysis, including population projections, housing growth, and infrastructure and land needs.

1.2 APPROACH

1.2.1 Spatial Boundaries

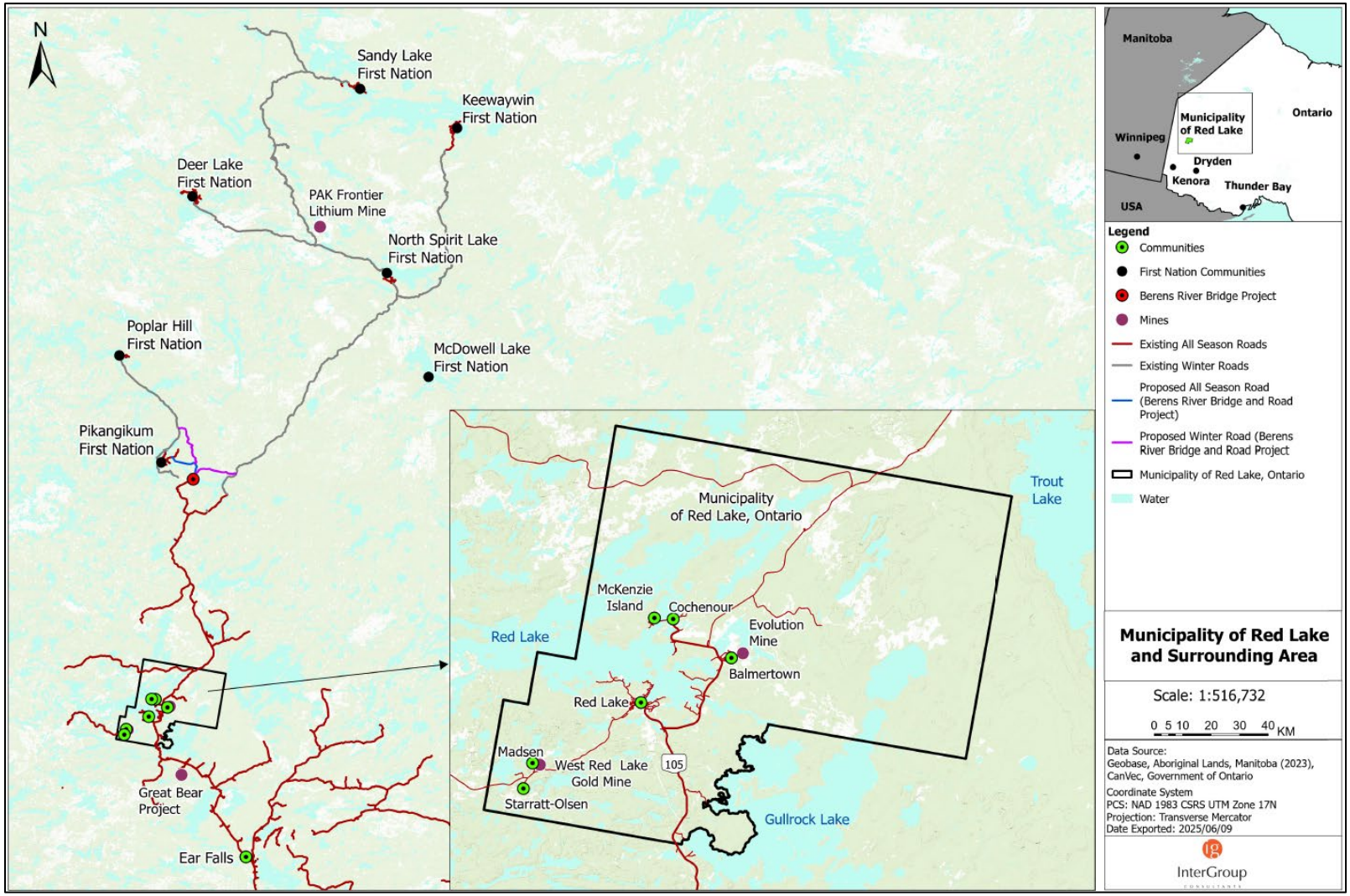
The CCS focuses on the Municipality of Red Lake and its communities. The analysis focuses on the lands, infrastructure, and services governed by the Municipality.

The spatial boundaries for this study are the Municipality of Red Lake, including the communities of Red Lake, Balmertown, Cochenour, McKenzie Island, Madsen, and Starratt Olsen.

All projections, assessments, and evaluations—including those related to land development, infrastructure capacity, housing, and municipal services—are confined to this geographic extent. This focus allows for a detailed understanding of the Municipality’s ability to support anticipated population growth, service demand, and infrastructure needs.

Figure 1.2-1 presents a map of the Municipality.

Figure 1.2-1: Municipality of Red Lake and the Surrounding Area



1.2.2 Temporal Boundaries

The CCS is based on currently available data and is intended to inform long-term municipal planning in response to projected population and infrastructure demands associated with current and future mining and road development projects. The temporal boundaries of the study are guided by the availability of data. For example, population and household projections are based on the 2021 Census and supplemented by 2024 inter-Census estimates.

The forward-looking projections of the CCS covers a 20-year planning horizon from 2025 to 2045. This timeframe was selected to align with the expected life cycle and peak employment periods of major mining and road developments. Key infrastructure and service capacity assessments, including water and wastewater infrastructure and land-based needs, were evaluated considering projected population growth scenarios, with 2037 selected as a key reference year corresponding to peak population growth and employment across the major developments.

1.2.3 Data Collection

The characterization of the CCS relied on both primary and secondary data sources.

1.2.3.1 Secondary Data Collection

Secondary data collection involved a review of relevant reports and literature, websites, and databases. The review of literature and databases included the following key sources:

- Statistical data sources, for example, Statistics Canada Census of Population and Environics inter-Census data;
- Federal, provincial, and municipal government reports and data;
- Regional reports, including community profiles, community capacity studies, provincial population projections, strategic plans, and official plans;
- Publicly available reports and profiles; and
- Online sources, such as community websites.

1.2.3.1.1 Secondary Data Limitations

Secondary data collection relied on publicly available sources to incorporate the best information available at the time of writing. However, some studies may be dated or reflect the perspectives and interpretations of the source authors and publishers.

Statistics Canada

Statistics Canada enumerates the Municipality of Red Lake but not does provide data for the individual communities: Red Lake, Balmertown, Cochenour, McKenzie Island, Madsen, and Starratt Olsen.

Statistics Canada Census of Population data should be interpreted with caution due to issues of comparability across years, confidentiality, data quality, and response error. Limitations relative to specific indicators are provided as notes to tables and figures.

The Census of Population suppresses data for confidentiality or data quality. Data suppression for confidentiality reasons is meant to prevent the disclosure of data that could be used to identify individuals, particularly in small communities like McDowell Lake First Nation. Data suppression due to data quality is done for a variety of reasons, including incompletely enumerated communities (such as Pikangikum First Nation). The Census of Population also relies on a random rounding procedure, where actual values are randomly rounded up or down to the nearest integer of five or ten to enhance confidentiality. This can impact very small populations but is not believed to have a material impact on the analysis in this report.

Some concerns were raised by community members about the accuracy of certain data reported by Statistics Canada. For example, participants felt that the reported unemployment rates in the Municipality of Red Lake may be higher than the actual rates, and that population counts in rural and Indigenous communities may be underreported. However, these concerns are not expected to impact the analysis presented in this report. Statistics Canada Census data continues to represent the most reliable and comprehensive dataset currently available.

Environics Inter-census Data

Inter-census data for 2024 was purchased from Environics which uses a variety of data sources, including historical Census data, current economic indicators, post-census estimates from federal and provincial governments, and economic data such as building permits to forecast demographic information as of July 1, 2024 (Environics 2025). The modelling process may fill in gaps of missing data where Statistics Canada has supressed information and adjusts for random rounding.

1.2.3.2 Primary Data Collection

Primary data was used to support the inclusion of community knowledge and local perspectives, confirm the reasonableness and relevance of secondary information, and qualitatively fill gaps in literature review. Primary data collection was undertaken through an in-community infrastructure assessment, vacant land analysis workshop (**12** participants), municipal service baseline workshop (**10** participants), a CCS interview program (**8** participants), and stakeholder engagement (**37+** participants).

Between 2024 and 2025 an in-community assessment, 8 distinct interviews, 2 workshops, and a targeted CCS stakeholder engagement session, were implemented to support the CCS. The in-community assessment, workshops and stakeholder engagement sessions are referred to as ‘Stakeholder Engagement’ and the interview program is referred to as ‘Stakeholder Interview Program’ and referenced herein as:

- Stakeholder Engagement. 2025. Business Gap Analysis and Community Capacity Study Targeted Engagement Sessions, Open Public House, In-Community Infrastructure Assessment, Vacant Land Analysis Workshop, and Municipal Services Workshop.
- Stakeholder Interview Program. 2025. Business Gap Analysis and Community Capacity Study Interview Program.

In-Community Infrastructure Assessment

From December 2 to 5, 2024, JRCC conducted an on-site review of all water and wastewater facilities to assess current conditions. The trip was coordinated with the Red Lake Director of Operations and the lead operator with Northern Waterworks Inc. (NWI) who oversees the operation of all facilities and operators. During the inspection of each facility, JRCC reviewed the existing conditions and met with the individual NWI operators at each facility to discuss any operational issues or concerns with each system. Operating records including water use and wastewater production as well as available design and as-built drawings were provided for review and analysis.

Vacant Land Analysis Workshop

On December 5, 2024, a virtual vacant land analysis workshop was held with Municipal administration and stakeholders to review Municipally owned lands. The purpose of the workshop was to identify specific Municipal infrastructure and facility needs that could be accommodated on Municipal lands and which ones are surplus and may be disposed.

Municipal Service Baseline Workshop

A virtual Municipal service baseline workshop was held on April 30, 2025, with Municipal administration and stakeholders. The purpose of the workshop was to share existing findings, gain insight from stakeholders on the availability and capacity of existing services, determine suitable levels of services and identify gaps, as well as discuss priorities for future investments.

Community Capacity Study Interview Program

In order to inform the Community Capacity Study, interviews were conducted with a range of key stakeholders from industry, community institutions, and service providers. Over 24 participants were contacted for an interview, and eight stakeholders chose to participate in the interviews. Additional identified stakeholders participated in other ways, such as attending the Municipal service baseline workshop (described above) and the stakeholder engagement sessions. The comments and feedback from the interview program were compiled and consolidated into the service baseline and gap analysis.

Stakeholder Engagement

The CCS and BGA Targeted Stakeholder Engagement Sessions and Open Public House took place on June 17, 2025, at the Red Lake Regional Heritage Centre in Red Lake, Ontario. Targeted engagement sessions and a public open house were used to confirm, test, and validate the analysis and preliminary findings associated with the studies. There were 12 participants at the targeted session for the CCS and 12 participants at the targeted session for the BGA, in addition to at least 25 people who attended the open house. People were also invited to complete a short five-question survey to share any feedback or offer a local perspective on the stakeholder engagement events. A total of **two** responses were received for the CCS session, **five** at the BGA session, and **seven** responses at the open house. The surveys remained open for over a week (until June 27, 2025) to allow sufficient time for community members to participate.

1.2.3.2.1 Limitations to Primary Data Collection

Limitations for stakeholder engagement and surveys include that the information reflects the lived experiences and perspectives of the participants. This qualitative information could not always be validated through triangulation of data sources but is still considered as valid and an important contribution to local perspectives.

Additional limitations include that the feedback gathered during stakeholder engagement was influenced by the willingness of participants to share their perspectives. As a result, the input may reflect the views of individuals or groups who are more vocal or actively engaged, rather than being fully representative of the broader community. Additionally, some stakeholders may have chosen to withhold feedback or limit their participation, which could have led to gaps or biases in the insights collected.

1.2.4 Population and Land-based Needs Projections

1.2.4.1 Approach to Population Projections

Population projections were completed for the Municipality of Red Lake for a 20-year period from 2025-2045. A population projection is a forecast of potential future population growth. It is not an accurate prediction, but rather a series of estimates that provide context for understanding how a community may change over time. Population projections were developed for the Municipality of Red Lake for two different growth scenarios.

1. The **baseline** scenario considered existing operations (Evolution Mine) but no additional population growth from the upcoming mining and road development projects in the area.
2. The **potential growth** scenario assumed there would be additional migration because of the upcoming mining and road development projects in the area; which include existing operations (Evolution Mine) and planned operations (West Red Lake Gold's Madsen Mine,[1] Kinross Gold’s Great Bear Project, the Frontier Lithium PAK Project, and the Berens River Bridge and Roads Project).

The projections were developed using the age cohort survival method, which models population change year by year based on age, gender, fertility, mortality, and migration rates (Ontario Ministry of Finance 2024; Statistics Canada 2024). These rates were taken from the Ontario Ministry of Finance’s projections for the Kenora CD and applied to the Municipality, though actual local trends may differ.

Population change is driven by three key factors: births, deaths, and migration. These are affected by the community’s age structure, government policies, and local economic conditions. For the potential growth scenario, two multipliers were used to account for added growth:

- **Family multiplier**: To account for household migration, it was assumed that 50% of migrants arrive alone, 25% in pairs, and 25% in four-person households, yielding a total multiplier of 2.0.

[1] As of June 2025, the West Red Lake Gold mine has restarted operations.

- **Economic multiplier**: Job creation in supporting sectors (e.g., retail, healthcare) was captured using project-specific employment multipliers: 1.87 for general mining/road projects, 1.73 for gold mining, 2.49 for road development, and 1.59 for lithium mining (Statistics Canada 2023b).

The population projections only consider permanent residents and do not consider the impacts on infrastructure and services due to the presence of temporary workers, such as during construction. Although there are other mining operations in the region, such as the Springpole Gold Project (First Mining Gold) which is located 110 km northeast of the Municipality, they are excluded from the projections because the projects will not rely on the Municipality for transportation or services and is unlikely to attract new residents (WSP 2025).

Population projections were further disaggregated by community for the Municipality of Red Lake for illustrative purposes. This was completed by reviewing vacant land parcels by community to determine the developmental potential for each community to help identify potential capacity constraints at the community-level.

Further information on the methods and approach used for the population projections are discussed in detail in **Appendix A**.

1.2.4.1.1 Limitations to Population Projections

The population projection modelling for the Municipality of Red Lake used the age cohort survival method to develop the baseline growth scenario. This approach forecasts year-over-year population change, projecting births, deaths, and migration by age and gender. This started with population data by single year of age and gender, based on the 2021 Census and uses fertility, mortality, and net migration rates—disaggregated by age and gender—from Ontario Ministry of Finance projections for the Kenora CD. These regional rates were assumed to reflect trends in the Municipality over the 20-year projection period, though actual local rates may differ. Since fertility rate varies by age for women, the number of births projected may be under- or over-estimated.

The potential growth scenario builds on the baseline by adding assumptions about economic growth from new projects. This scenario used two types of multipliers:

- The **family multiplier**, which accounts for workers bringing family members; and
- The **economic multiplier**, which accounts for additional jobs created indirectly due to economic growth.

For small geographies like the Municipality of Red Lake, economic multipliers are typically lower. It was assumed that only 50% of Ontario's indirect and induced employment multipliers would occur within the Municipality. These multipliers are estimates and may not reflect actual future outcomes or how they change over time.

The family multiplier assumed a total multiplier of 2.0. This is slightly lower than the Municipality's current average household size of 2.4 in 2024 (Environics 2024).

The economic and family multipliers are assumed to interact, meaning that both the direct worker and their family members are subject to the economic multiplier. This assumes all new

jobs created from economic growth will be by people moving to the Municipality, which could lead to an overestimate of population growth. However, this cautious approach is used to avoid underestimating future infrastructure and service needs.

The potential growth scenario also assumed that some workers from the referenced mining and road development projects would migrate to the Municipality. For the Kinross Gold's Great Bear Project, the Frontier Lithium PAK Project, and the Berens River Bridge and Roads Project, it was estimated that between 10% to 30% would migrate to the Municipality. For West Red Lake Gold it was assumed this figure was 63%. After these projects end, it was estimated 15% to 25% of the migrants would move away, except for the PAK Lithium Project which is expected to operate until after 2051—beyond the projection period—so no out-migration was assumed.

1.2.4.2 Approach to Land-based Needs Projections

The Municipality of Red Lake land-based needs projections focus on the needs for 2037, aligning with the peak population projections, and 2045, the end of the projection period. These were developed using household and employment projections, both of which, were based on the population projections. Household projections were used to estimate the demand for residential lands, while the employment projections were used to calculate the demand for commercial, industrial, and institutional lands. The two population projection scenarios include:

1. The **baseline** scenario considered existing operations (Evolution Mine) but no additional population growth from the upcoming mining and road development projects in the area.
2. The **potential growth** scenario assumed there would be additional migration because of the upcoming mining and road development projects in the area, which include existing operations (Evolution Mine) and planned operations (West Red Lake Gold's Madsen Mine,[2] Kinross Gold's Great Bear Project, the Frontier Lithium PAK Project, and the Berens River Bridge and Roads Project).

Residential Land-Based Projections

The projected number of households is based on an average household size of 2.0 persons, consistent with the family multiplier used in the population projections.

InterGroup examined various land parcels to determine the average number of households for low-, medium-, and high-density parcels to calculate the residential land-based demand. Parcels were examined to determine the average number of households per hectare by housing type:

- Low-density – 7.000 households per hectare.
- Medium-density – 17.888 households per hectare.
- High-density – 26.397 households per hectare.

It was assumed that 90% of developed residential land is occupied (based on 2021 Statistics Canada data). The distribution for future housing was assumed to be 70% low-density, 20% medium-density, and 10% high-density.

[2] As of June 2025, the West Red Lake Gold mine has restarted operations.

Institutional, Industrial, and Commercial Land-Based Projections

Employment land needs were based on the number of jobs in 2021 (2,060 people) and projected changes in the working age population (ages of 25-64) under both scenarios. The baseline scenario accounts for a reduction in employees from the expected Evolution Mine closure in 2040. The potential growth scenario adds employment from future mining and infrastructure projects.

It was assumed that the proportion of employment by industry would remain constant, except direct employment related to the referenced proposed mining and road development projects. Some future jobs are expected to be home-based and not require additional land. Mining related employment was excluded from the analysis given that some of the anticipated mining projects would occur outside of the Municipality. Although Evolution Mine is located within municipal boundaries, there are no plans for land expansion related to mining operations.

To estimate how much land is needed to accommodate employment growth, InterGroup analyzed developed land parcels and assumed that 70% of institutional, commercial, and industrial land is actively in use. This assumption was used to calculate the number of jobs that could be supported per hectare of occupied land.

Recreational Land-Based Projections

Recreational land needs were based on the Municipality's requirement—outlined in the Official Plan and mandated by the Planning Act—that 5% of new residential subdivisions be set aside for parks or public use. This 5% was applied to projected new residential land for both 2037 and 2045.

Further information on the methods and approach used for the land-based needs projections are discussed in detail in **Appendix B**.

1.2.4.2.1 Limitations to Land-based Needs Projections

Population projections informed household projections which were needed to develop the residential land projections. The employment projections were used to develop the commercial, industrial, and institutional land projections. The land-based projections are closely connected to the population projections, and if the population projections are not met then there will likely be a lower demand for land.

The Municipality of Red Lake had an average of 2.4 persons per household in 2024, whereas the projection assumed an average of 2.0 persons per household for new residential dwellings. InterGroup examined various land parcels to determine the average number of households for low-, medium-, and high-density parcels to calculate the residential land-based demand. It was assumed that new developments would have the same densities as the existing medium- and high-density parcels. For low-density areas, a sample of 79 parcels across five roads were examined. This analysis found an average of approximately 7.000 households per hectare. This figure is slightly higher than the average for all existing low-density parcels, suggesting that actual land demand may be greater than originally forecasted.

Employment projections were disaggregated by institutional, industrial, and commercial industries using data on employment by industry sectors from the 2021 Census. It was assumed

that the proportion of employment by industry would remain constant for the baseline projection period and for all new employment, other than the direct employment related to the referenced mining and road development projects. As the Municipality grows, some sectors may grow at a higher rate than others. This could result in a lower or higher demand for employment land. The projections also assumed that some job growth will come from home-based businesses, which do not require commercial, institutional, and industrial lands. If more jobs are home-based than expected demand for employment land will be lower. On the other hand, if fewer jobs are home-based, more land may be needed.

InterGroup examined the developed institutional, commercial, and industrial land parcels to determine the actual hectares of land for each classification in the Municipality of Red Lake. InterGroup assumed 70% of the developed institutional, commercial, and industrial land parcels were occupied by operating businesses, to determine the number of employments per hectare of occupied employment lands. This assumption may have resulted in a higher or lower demand for employment lands.

2.0 SITUATIONAL AND CAPACITY ANALYSIS

The situational analysis establishes a comprehensive understanding of the Municipality of Red Lake's current conditions—its socio-economic profile, physical infrastructure, social and community assets, and available development lands. This provides the foundation for identifying existing capacity and constraints in meeting both current and anticipated growth-related needs. Through a review of municipal planning documents, an inventory of infrastructure and services, land needs projections, and input from key stakeholders, the analysis aims to define "where the community is today" to better inform long-term planning decisions and investment strategies.

2.1 SOCIO-ECONOMIC PROFILE

Understanding the socio-economic demographics of the Municipality of Red Lake is essential to evaluating whether current infrastructure and services are adequate to support the community. This information also helps identify existing community characteristics and how population and employment growth—driven by mining and road development projects—may impact housing needs, service demand, and overall quality of life.

This section provides an overview of demographics to support the characterization of the Municipality of Red Lake including:

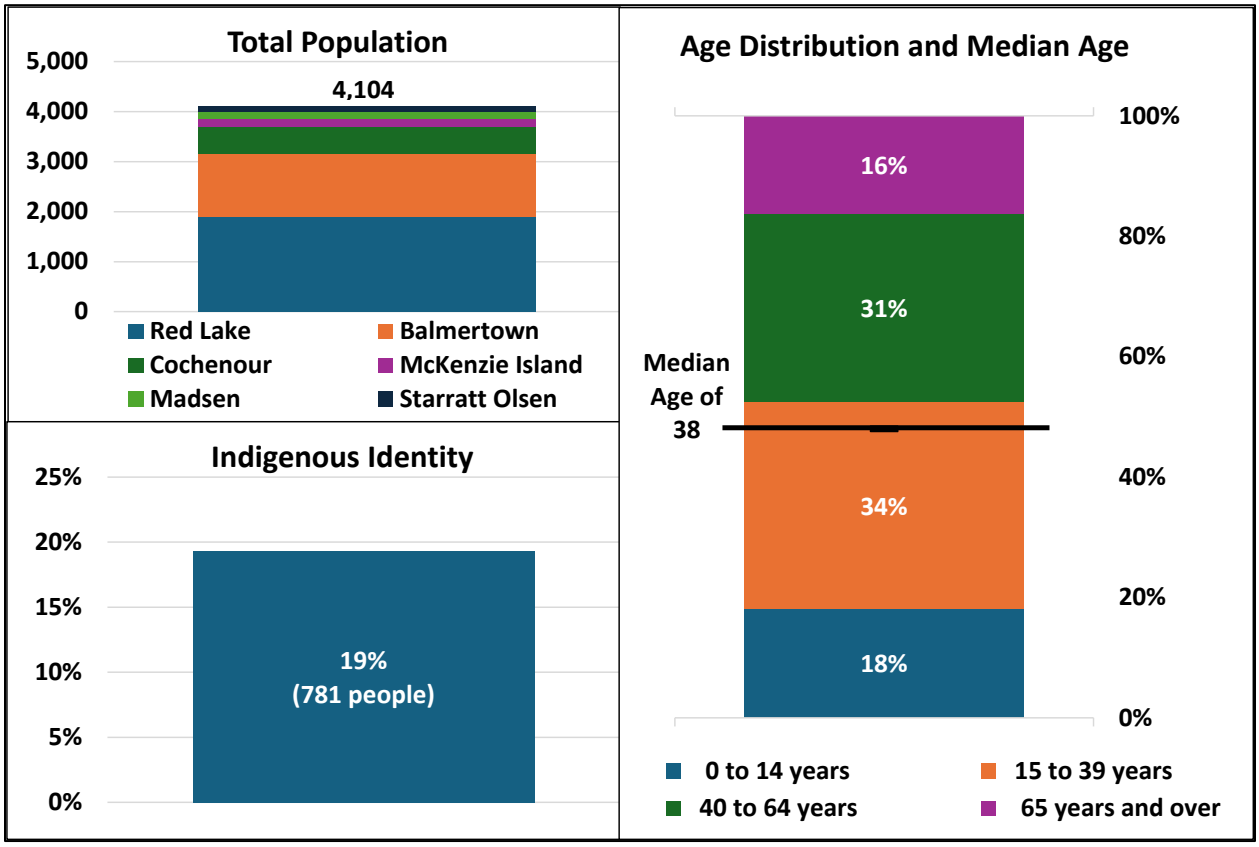
- Total population;
- Indigenous population;
- Age distribution and median age;
- Occupied dwellings by structural types;
- Tenure status;
- Household types (e.g., one person households, census couples);
- Labour force characteristics and major industries;
- Educational attainment; and
- Household and personal income.

Comparisons are also provided to the Kenora CD and Ontario, where relevant.

2.1.1 Population and Demographics

Understanding the population and demographics of the Municipality helps assess current and future demands on municipal services, infrastructure, and available land. **Figure 2.1-1** shows the population characteristics for the Municipality of Red Lake, including total population, Indigenous identity, age distribution, and median age in 2024. In 2024, the Municipality's population was projected at 4,105, with 19% (or 780 people) identifying as Indigenous. The working age population (i.e., ages 15-64 years) accounted for 65% of the total population. Additionally, the median age was 38 years old, which is comparable to both the Kenora CD and the provincial average (Environics 2024).

Figure 2.1-1: Municipality of Red Lake Population Characteristics, 2024



Source: Environics 2024; CCDC n.d.a

Notes:

1. Statistics Canada reported a population of 153 for Madsen and 1,263 for the Red Lake population centre in 2021. The population centre does not include the entire Red Lake community or the surrounding dwellings outside of municipal boundaries which are included in the Municipality of Red Lake population total. To account for this discrepancy, it was assumed that the actual population is 50% higher than reported.
2. The population counts for McKenzie Island and Cochenour were sourced from the CCDC website.
3. Population counts were derived for Balmertown and Starratt Olsen through the review of municipal zoning maps.

Between 2011 and 2024, the population of the Municipality decreased from 4,366 to 4,104 (or an average annual decrease of -0.5%). Meanwhile, the proportion of the population identifying as Indigenous increased over the same period (Environics 2024; Statistics Canada 2013). Within the Municipality, Red Lake (1,899) and Balmertown (1,249) are the two largest population centres, followed by Cochenour (551), Madsen (153), McKenzie Island (150), and Starratt Olsen (100).

The proportion of the population aged 14 years and under (18% of the Municipality's population) is slightly lower than the Kenora CD (21%), but higher than the provincial average (15%) (Environics 2024). This age group's share of the population has remained relatively stable since 2011, while the proportion of those aged 65 years and older has steadily increased (Statistics Canada 2013; Environics 2024). Stakeholders noted challenges related to housing, with minimal

housing development and a lack of attainable options, which poses challenges to seniors looking to downsize (Stakeholder Interview Program 2025).

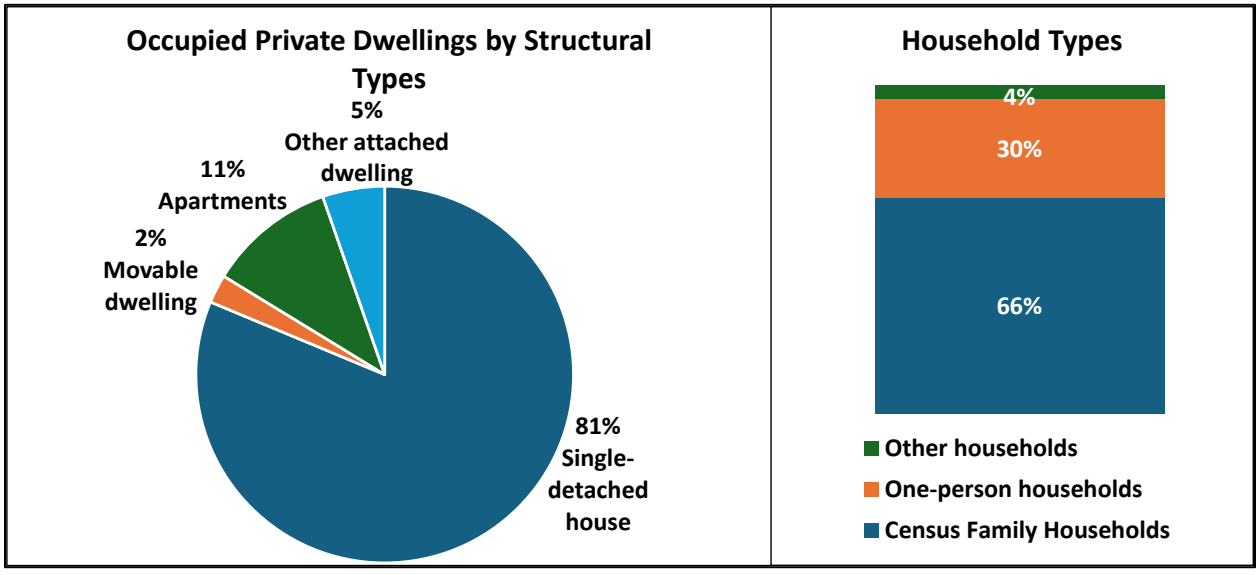
The population and demographic trends highlight a need for targeted planning to address an aging population, support a growing Indigenous community, and ensure housing and services are sufficient to meet current and emerging needs.

2.1.2 Household Characteristics

Understanding private dwellings by structural type helps assess the diversity, suitability, and capacity of the existing housing stock. It informs land use planning, infrastructure needs, and housing policy by identifying whether current housing types align with population demographics, affordability levels, and future growth. This is critical for planning serviced land and ensuring the availability of appropriate housing options for all residents.

Figure 2.1-2 shows the household characteristics for the Municipality, including the occupied private dwellings by structural types and household types in 2024. In 2024 there were a total of 1,710 dwellings in the Municipality, 80% of dwellings were single-detached houses and 11% were apartments. This shows a substantial proportion of dwellings in the Municipality are low-density and around 10% are considered higher-density (Environics 2024).

Figure 2.1-2: Municipality of Red Lake Household Characteristics, 2024



Source: Environics 2024.

Notes:

1. A census family is defined as a married couple, common-law couple, or a lone-parent family with at least one child living in the same dwelling (Statistics Canada 2023a).
2. Other households include multigenerational households, multiple-census family households, and two or more-person non-census family households.

Most residents own their home in the Municipality (75%), which is higher than the provincial average (67%). Stakeholders shared that there is a lack of rental housing which poses challenges for future growth by constraining the diversity of existing housing options and poses

a challenge for attracting and accommodating new residents (Stakeholder Engagement 2025). The proportion of single-detached houses in the Municipality (81%) is like the Kenora CD (81%), and much higher than the provincial average (53%). On the other hand, the proportion of apartments (11%) is also like the Kenora CD (10%), but much lower than the provincial average (32%) which is influenced by larger urban centres (such as Toronto and Ottawa). To achieve the population projection targets, a diversity of housing options for development should be considered, which could include medium- and high-density developments such as apartments and movable dwellings, which will also help to alleviate affordability challenges.

The proportion of census family[3] (66%) and one-person households (30%) was like both the Kenora CD and the provincial average. Over 50% of census families in the Municipality have children living at home, which was slightly lower than the Kenora CD (64%) and the provincial average (62%). Despite the lower proportion of families with children living at home, the youth population remains high and concerns over childcare capacity was raised at the Stakeholder Engagement Sessions (2025).

These trends highlight a need for greater housing diversity and improved access to rental and family-oriented units to support population retention and growth, attract new residents, and meet the needs of a growing workforce. Addressing gaps in childcare and housing options will be critical to ensuring that Red Lake can accommodate anticipated growth while maintaining quality of life for current and future residents.

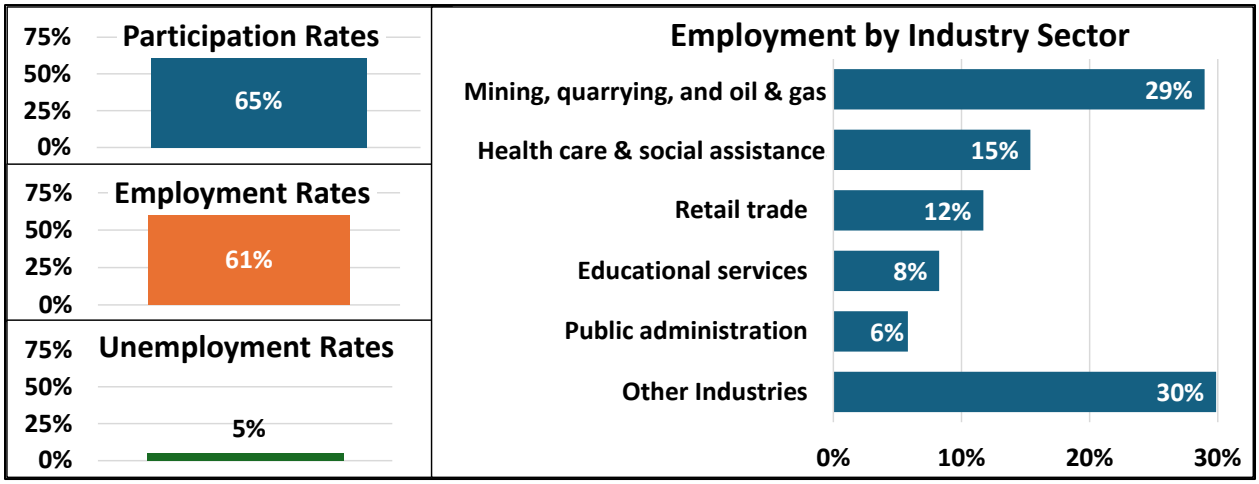
2.1.3 Labour Force and Employment by Industry Sector

Understanding labour force characteristics and the major industries in the Municipality provides insight into the working-age population, employment patterns, and local skills base of the Municipality. This information helps supports planning for commercial, institutional, and industrial development and identify potential gaps in services, such as transportation, training, or childcare, that may affect labour market participation.

Figure 2.1-3 shows the labour force characteristics and employment by industry sector in the Municipality in 2024. Both participation and employment rates in the Municipality are above 60%, exceeding those of both the Kenora CD (58% participation rate and 53% employment rate) and the provincial averages (63% participation rate and 57% employment rate). Unemployment rates in the Municipality are low and remain below those of both the Kenora CD and the province as a whole (Environics 2024). The major industries in the Municipality are mining, healthcare and social assistance, and retail.

[3] A census family is defined as a married couple, common-law couple, or a lone-parent family with at least one child living in the same dwelling (Statistics Canada 2023a).

Figure 2.1-3: Municipality of Red Lake Labour Force Characteristics and Employment by Industry Sector, 2024



Source: Environics 2024.

The labour force in the Municipality was projected to be 2,145 people in 2024 and has steadily decreased from 2,725 in 2011. The decline aligns with trends seen in the Kenora CD and in the province as a whole and can be partially attributed to an aging population (Environics 2024; Statistics Canada 2013). Over the same period, the unemployment rate has remained stable at around 5% in the Municipality and has stayed below those of both the Kenora CD and the province as a whole. There were 2,030 employed people in the Municipality (61% employment rate). The employment rate was higher than those of both the Kenora CD (53%) and the provincial average (57%). Within the Municipality the three largest industries by employment in 2024 include mining and quarrying (29% of employed), healthcare and social assistance (15%), and retail trade (12%).

High participation and low unemployment rates have made it difficult for businesses to fill job vacancies. These challenges are felt across industry sectors within the Municipality including for educational services, health and social services, and retail and service industries, among others (Stakeholder Engagement 2025; Stakeholder Interview Program 2025). Community members have noted that they felt the unemployment rate could be even lower than the reported 5% due to the consistent high number of job vacancies and seemingly limited available workers.

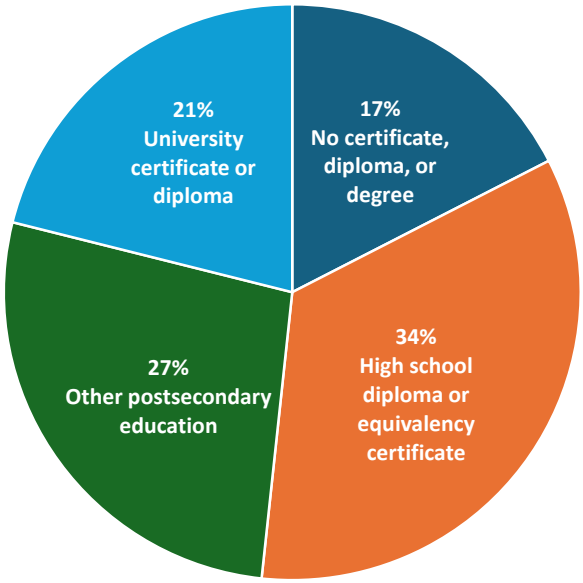
These labour force trends suggest that while the Municipality currently benefits from a strong employment base, challenges with a limited available workforce, and ongoing recruitment and employment retention may constrain future growth. As the Municipality prepares for new economic activity tied to mining and infrastructure projects, targeted investments in workforce development, housing, and supportive services will be essential. These investments are crucial to attract and retain workers, support community members, and sustain the economy.

2.1.4 Educational Level

Understanding educational attainment helps provide context on the Municipality's current and future workforce capacity, informs the types of employment and training services needed, and helps identify potential barriers to economic participation.

Figure 2.1-4 shows the educational attainment rates for the Municipality in 2024. Educational attainment is the highest certificate, diploma, or degree a person has obtained. Over 80% of the population aged 15 years and over in the Municipality have completed high school and almost 50% have completed a post-secondary education (Environics 2024).

Figure 2.1-4: Municipality of Red Lake Educational Attainment, 2024



Source: Environics 2024.
Note:
1. Other postsecondary education includes an apprenticeship, trades certificate or diploma, and a College, CEGEP, or other non-university certificate or diploma.

The proportion of the population who have completed high school or equivalent has steadily increased from 77% in 2011 to 82% in 2024 (Environics 2024; Statistics Canada 2013). However, over the same period, the proportion of the population who have completed a post-secondary education has steadily decreased from 54% in 2011 to 48% in 2024. For post-secondary education, the largest decrease occurred in the proportion of the population with an apprenticeship, trades certificate or diploma, while a steady increase occurred for the population with a bachelor's degree or higher.

The decline in the proportion of the population who have completed an apprenticeship or trades certificate, or diploma aligns with both provincial and national trends (Environics 2024; Statistics Canada 2013). There is a shortage of skilled trades in and around the Municipality, where contractors prioritize work with the mines and general contractors in the Municipality are at capacity (Stakeholder Interview Program 2025). One challenge with attracting skilled labourers to the region is the lack of available housing and temporary accommodations. One mining

company noted that there are 300 contractors from Australia with no available accommodations (Stakeholder Engagement 2025). This highlights the need for more housing and temporary accommodations to help with the attraction and retention of skilled trades workers (Missing Middle Initiative 2025; Von Bergmann and Lauster 2025).

2.1.5 Income

Understanding income levels provides insight into the Municipality's economic well-being and its residents' ability to pay for housing, utilities, and municipal services. Income data supports planning for infrastructure, attainable housing, and social supports by identifying areas where residents may be under financial pressure or where economic development efforts could improve quality of life. As of 2024, the average personal income in the Municipality was $76,800 and the average household income was $148,000, both higher than the provincial average (average personal income of $59,200 and average household income of $132,600) (Environics 2024).

Since 2011, the average personal and household incomes in the Municipality have steadily increased and have consistently exceed those of the Kenora CD and the province (Environics 2024; Statistics Canada 2013, 2023a). Stakeholders shared that the high incomes in the Municipality are partially due to the large number of people employed in the mining sector; which had the 4th highest average wage across industries at $46/hour in 2024 (Stakeholder Interview Program 2025; Statistics Canada 2025).

Despite relatively high incomes, households spent an average of 25% of their annual consumption on shelter, highlighting the need for attainable housing options (Environics 2024). The Canada Mortgage and Housing Corporation (CMHC) defines acceptable housing as dwellings that are affordable (costs less than 30% of a household's income), adequate (have enough bedrooms for the household size), and suitable (is not in need of any major repairs) (CMHC 2025). In 2021, 22% of dwellings in the Municipality did not meet at least one of these criteria (Statistics Canada 2023a). Further, 4% of households (or 75 homes) were in core housing need—meaning they live in housing that does not meet at least one standard, and they lack the financial means to access acceptable alternatives.

These findings highlight the need for more attainable housing in the community, including housing options across the housing continuum. This would include a greater diversity of building types in the housing stock to accommodate residents who would upsize or downsize if appropriate options were available.

2.2 ASSET INVENTORY

A community facilities inventory was created that identified 137 unique existing facilities in the Municipality across six categories:

- Culture (12);
- Economy (30);
- Health (11);

- Services (31);
- Well-being (13); and
- Recreation (40).

The findings for each category of facilities are summarized below. **Appendix C** contains the full list of community facilities in the Municipality of Red Lake.

Culture

Cultural assets are highlighted by the Red Lake Regional Heritage Centre, a historical museum with multi-media exhibits and displays on Indigenous history, gold mining, the fur trade, immigration, as well as art displays, a gift shop, tourist information, and other temporary exhibitions. Otherwise, this category is primarily filled by churches, including seven in Red Lake and three in Balmertown. Though not included in the inventory, the following annual events and festivals occur year-round in Red Lake and are a big part of the cultural experience:

- Winter Carnival – February;
- Gyro Ice Fishing Tournament – March;
- Red Lake Community Pow Wow – June;
- Canada Day Celebrations – July 1st;
- Norseman Festival – July;
- Angler Young Angler Fishing Tournament – August;
- Red Lake Triathlon – August;
- Red Lake Classic Walleye Fishing Tournament – September; and
- Santa Claus Parade – December.

Economy

Economic assets include facilities and services that support the region's primary industries including mining and tourism. For example, there are 11 hotels listed. This category also includes services such as outdoor supply outfitters, banks, and insurance providers. The Red Lake Career and Employment Services, and Apatisiwin (inside the Red Lake Indian Friendship Centre) both provide access to employment and training programs.

Health

The primary health asset is the Red Lake Margaret Cochenour Memorial Hospital, which serves the healthcare needs of residents and visitors to the Red Lake and Ear Falls communities. Other important health assets include health clinics, a pharmacy, a dental clinic, and other specialized organizations and services.

Services

The services category includes a wide range of institutional and municipal community services, including but not limited to services related to transportation, adult education, emergency services, and storage.

Well-being

The well-being category includes supportive facilities and services such as daycare, shelters and assisted living, long-term care, and other supports for families, adults, seniors, and persons with disabilities. Founded in 1964, the Red Lake Indian Friendship Centre provides a wide range of services to the Indigenous and non-Indigenous community, business, and government agencies.

Recreation

The Municipality is well known for its many excellent recreational assets, including both indoor and outdoor facilities, outposts, parks, beaches, and public spaces. In Balmertown, the Red Lake Golf and Country Club is the most northernly 18-hole golf course in Ontario. Cochenour features a community hall, sports fields and courts, a playground, the beach and boat launch, and the Cochenour arena. In the centre of Red Lake, Phillip Thomas Vinet Centennial Park is a recreational hub that features numerous amenities including a skatepark, splash pad, pavilion, outdoor rink, basketball nets, playground equipment, multi-use paths, and the Dan Kucheran Memorial Baseball Field. Located on Red Lake, Norseman Park showcases a full-size float plane overlooking Howey Bay that is surrounded by landscaped seating and picnic areas.

2.3 20-YEAR POPULATION AND LAND-BASED NEEDS PROJECTIONS

2.3.1 Population Projections

Understanding the population and demographics of an area is important for a CCS because it helps assess current and future demand on municipal services, infrastructure, and available land. Population projections were completed for the Municipality of Red Lake for a 20-year period from 2025-2045. InterGroup reviewed existing population projections for the Province of Ontario, northwest Ontario, and other communities within northern Ontario to understand comparable assumptions. Details on these other population projections and the underlying assumptions for the population projections are provided in **Section 1.2.4**, with additional details in **Appendix A**.

The population projections document potential population changes with and without the referenced mining and road development projects, which include existing operations (Evolution Mine) and planned operations (West Red Lake Gold's Madsen Mine,[4] Kinross Gold's Great Bear Project, the Frontier Lithium PAK Project, and the Berens River Bridge and Roads Project). The baseline population projection scenario includes existing mining and road development projects (i.e., Evolution Mine), and the potential growth population projection scenario includes the referenced existing and planned mining and road development projects.

[4] As of June 2025, the West Red Lake Gold mine has restarted operations.

These developments are located within or near the Municipality, rely on it for transportation access and services, and are anticipated to increase local employment and in-migration.

The population projections only consider permanent residents and do not consider the impacts on infrastructure and services due to the presence of temporary fly-in-fly-out workers, such as during construction. For example, The Great Bear Project is expected to have over 2,000 workers around 2027 to 2028 during construction, which could place pressures on infrastructure and services capacities within the Municipality (Stakeholder Engagement Session 2025).

A total of 974 people are expected to migrate to the Municipality over the projection period. Most of this migration is anticipated between 2025 to 2030, as major projects begin operations. This includes West Red Lake Gold, Great Bear Project – Kinross Gold, PAK Lithium Project - Frontier Lithium, and the Berens River Bridge and Roads Project. It is assumed that over 10% of the total workforce for each project will relocate to the Municipality. However, up to 25% of the new residents will leave once the projects are completed. The estimated operational timelines and average direct workforce[5] for each project are as follows:

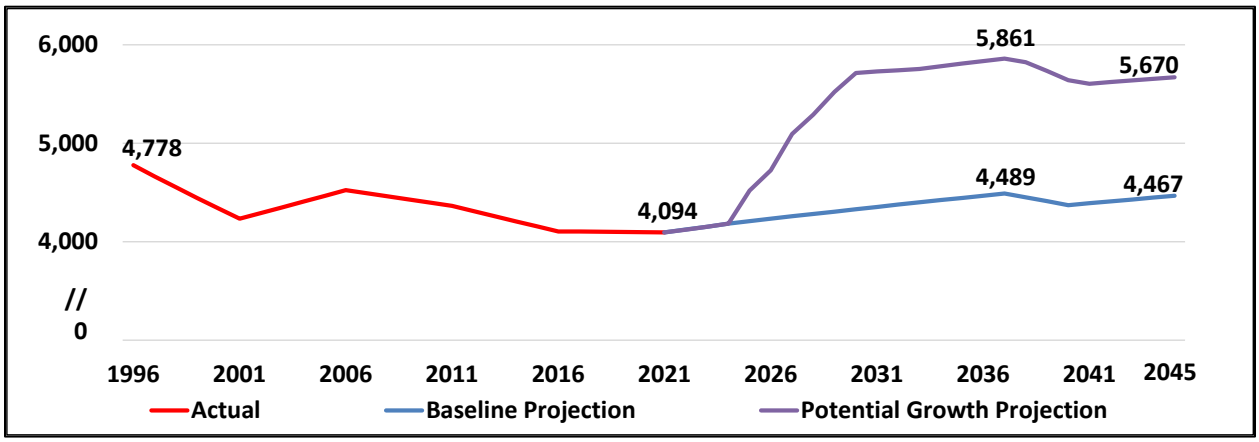
- Evolution Mine (until 2040): 610 employees;
- Berens River Bridge and Roads Project (2025-2027): 300 employees;
- West Red Lake Gold (2025-2032): 245 employees;
- Kinross Gold – Great Bear Project (2029-2041): 900 employees; and
- PAK Frontier Lithium (2027-2051): 600 employees.

It is recognized that there are several other mining operations in the region. While other projects, such as the Springpole Gold Project (First Mining Gold), may benefit the broader region, it was excluded from the projections due to limited expected in-migration to the Municipality (WSP 2025). The Springpole Gold Project is located approximately 110 km northeast of Red Lake, will be accessed via air or the Wenasaga Forest Road south of Ear Falls, and is not expected to use the Municipality as a service hub or transportation route.

Figure 2.3-1 shows the results for the baseline and potential growth projection from 2022 to 2045 and the historical population for the Municipality of Red Lake from 1996 to 2021. The population decreased from 4,778 in 1996 to 4,094 in 2021 (or by 684 people at an average annual rate of change of -0.62%) (Statistics Canada 2002, 2023a) and is projected to increase to between 4,467 to 5,670 people by 2045.

[5] The direct workforce excludes construction-phase workers and operational contractors. It also does not include indirect or induced employment.

Figure 2.3-1: Municipality of Red Lake Baseline and Potential Growth Projections from 2022-2045



Sources: Ontario Ministry of Finance 2024; Statistics Canada 2002, 2007, 2012, 2017, 2023a, 2024.
Notes:
1. Projections for the Municipality of Red Lake were prepared by InterGroup Consultants Ltd.

In summary, the results show:

- **Baseline projection scenario**: the population is projected to increase from 4,094 in 2021 to 4,467 by 2045 (or average annual growth rate of 0.35%); and
- **Potential growth projection scenario**: the population is projected to increase from 4,094 in 2021 to 5,670 by 2045 (or average annual growth rate of 1.37%). Given the closure of some of the referenced mining projects between 2036-2041, the population of the Municipality of Red Lake is projected to peak at 5,861 in 2037 for the potential growth projection.

To reach a 2045 population between the baseline projection of 4,467 people and the potential growth projection of 5,670 people, in-migration to the Municipality of Red Lake will need to exceed the baseline rates. Achieving this growth depends on the realization of the referenced mining and road development projects, which would create employment opportunities that attract new residents to the Municipality. However, this growth also requires sufficient serviced housing as well as infrastructure and service capacity to support the current population and new growth.

Population projections were further disaggregated by community for the Municipality of Red Lake for illustrative purposes. This was completed by reviewing vacant land parcels by community to determine the developmental potential for each community to help identify potential capacity constraints at the community-level. Most of the growth by 2037 is expected to occur in Red Lake (3,337 people) over the projection period. Balmertown (1,486 people) and Cochenour (605 people) are projected to experience growth, while Madsen (168 people), McKenzie Island (165 people), and Starratt Olsen (100 people) are projected to experience slight increases or no change in the population by 2037.

2.3.2 Land-based Needs Projections

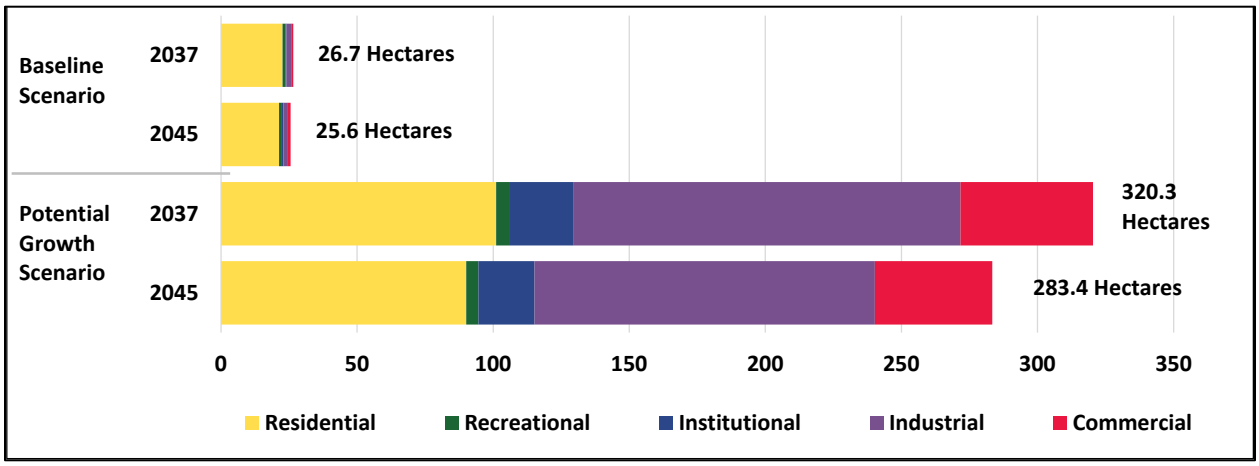
Understanding land-based needs is essential for ensuring the Municipality has enough designated and serviced land to support current and future growth. These projections can be used to inform infrastructure planning, zoning decisions, and land development strategies. Land-based projections were completed for the Municipality for a 20-year period from 2025-2045. InterGroup reviewed existing land-based and household projections for the Province of Ontario, Kenora CD, and other communities within northern Ontario (e.g., Red Lake, and Ignace) to understand comparable assumptions. Details on the approach to the land-based projections and their underlying assumptions are provided in **Section 1.2.4** with additional details in **Appendix B**.

The land-based projections used the population projections to estimate future demand for new dwellings and employment projections. The demand for residential land was forecasted using the household projections and the employment projections were used to forecast the demand for commercial, institutional, and industrial lands. The demand for recreational lands were projected as a proportion of the residential land-based projections based on the Municipality of Red Lake Official Plan requirement for dedicating 5% of lands for park or public recreation purposes as required under the Planning Act (Government of Ontario 2024; Municipality of Red Lake 2015).

Figure 2.3-2 shows the land-based needs projections for the Municipality of Red Lake in 2037 and 2045. Projections were completed for 2037 as this is when population and employment are expected to peak and for 2045, the end of the projection period. For the baseline scenario, residential lands account for over 80% of land-based demand in 2037 and 2045. For the potential growth scenario, there is a need for over 90 hectares (ha) of residential lands and over 120 ha of industrial demands in 2037 and 2045. Together, the demand for residential and industrial lands accounts for over 75% of land-based demand in 2037 and 2045.

Vacant residential, commercial, and recreational land can support the potential growth scenario but there is not enough industrial and institutional land to support growth. See **Section 2.4** for more information on the vacant land analysis.

Figure 2.3-2: Municipality of Red Lake Projected Land-Based Demand for 2037 and 2045



Notes:
1. Projections for the Municipality of Red Lake were prepared by InterGroup Consultants Ltd.
2. Projections are not cumulative; the demand in 2045 does not add to the land-based demand projected for 2037.

In summary, the results show:

- **Baseline projection**: there is a projected demand for 27 ha of developed land by 2037, falling to 26 ha by 2045. The demand for new residential land accounts for most of the land-based demand for the baseline projection scenario.
- **Potential growth projection**: there is a projected demand for 320 ha of developed land by 2037, falling to 283 ha by 2045. The demand for new residential and industrial lands each account for about one third of the land-based demand for the potential growth projection scenario.

The land-based projections present a range of potential outcomes, which reflect the projected change in population, households, and employment between 2025 and 2045. To reach the projected land-based demand by 2037—ranging from 27 ha (baseline) to 320 ha (potential growth)—the Municipality will need to see population, household, and employment growth beyond the baseline projection. Reaching these targets will require the development of serviced land parcels, along with new homes, commercial buildings, and community infrastructure and services to support a growing population.

2.4 VACANT LAND ANALYSIS

Understanding the availability, ownership, and development potential of vacant land is important for assessing the Municipality's capacity to accommodate future residential, commercial, recreational, institutional, and industrial growth. This section summarizes the inventory of vacant lands, findings from the vacant land analysis workshop, and a detailed vacant land analysis, including whether land is serviced, partially serviced, or unserviced. The section aims to identify lands that are development-ready and where investment may be needed to unlock future growth potential.

2.4.1 Vacant Land Analysis Workshop

In order to gain a greater understanding of the vacant lands in the Municipality, a vacant land analysis workshop was held on December 5, 2024 with Municipal Administration and stakeholders. At the time of the workshop, the vacant lands encompassed a total of 363 lots. Ownership of said vacant lots are broken down as follows:

- Municipal vacant lots: 86
- Private vacant lots: 196
- Crown vacant lots: 7
- Mining vacant lots: 73

The focus of the Workshop was narrowed specifically to Municipally owned properties and certain private parcels within the community boundaries, including:

- Municipal vacant parcels: 86
- Private vacant parcels: 72

It should be noted the Workshop predated the Municipality's acquisition of Harry's Corner from the Ministry of Natural Resources (Ontario), which encompasses approximately 190 acres of land at the northeast corner of Highways 105 and 125, shown on **Figure 2.4-1**. While these lands were not part of the vacant land analysis workshop, they were included in all vacant land and development analyses that followed. This dataset also excluded other Crown and mining lands as they are typically difficult to acquire with lengthy disposition processes and may require extensive land preparation or remediation efforts.

During the Workshop, each vacant Municipally-owned property was reviewed with the Municipality and stakeholders. Municipal leadership was asked whether they intended to retain it, sell it, or if they were unsure. In total, 126 lots were reviewed, including:

- Retain: 53
- Sell: 59
- Unsure: 14

The community maps (**Figure 2.4-1**, **Figure 2.4-2**, **Figure 2.4-3**, and **Figure 2.4-4**) for Red Lake, Balmertown, Cochenour and McKenzie Island, and Madsen demonstrate the reviewed lots and their identified status (retain, sell, or unsure). No map was included for Starratt Olsen since it does not have any vacant lands and is not expected to grow. The vacant lots were identified through the vacant land analysis workshop.

Appendix D contains a detailed inventory of the reviewed vacant lands by community, area, zoning, and identified status. Generally, the vacant land analysis workshop was completed to gain a greater understanding of existing vacant lands and the likelihood they could be developed to support identified residential, commercial, and community needs. Other topics of discussion that emerged during the vacant land analysis workshop include (Stakeholder Engagement 2025):

- Acknowledgement that there is substantial development interest. However, with the exception of a limited number of smaller vacant sites that could be developed quickly, most

vacant lands in the Municipality are part of larger parcels that would require services upgrades or extensions in order to be considered development-ready.

- The Municipality has policies relating to land sale, but a more detailed land disposition and development strategy is needed. **Section 3.2.4** describes the steps for facilitating more development in the short and medium-term.
- Mining companies own the majority of vacant privately owned land, originally to protect future mining operations. However, the mining companies recognize they own too much land and want to work with the Municipality and First Nations to help develop excess lands to support local planning and community goals.

Figure 2.4-1: Stakeholder Identified Vacant Lands in Red Lake

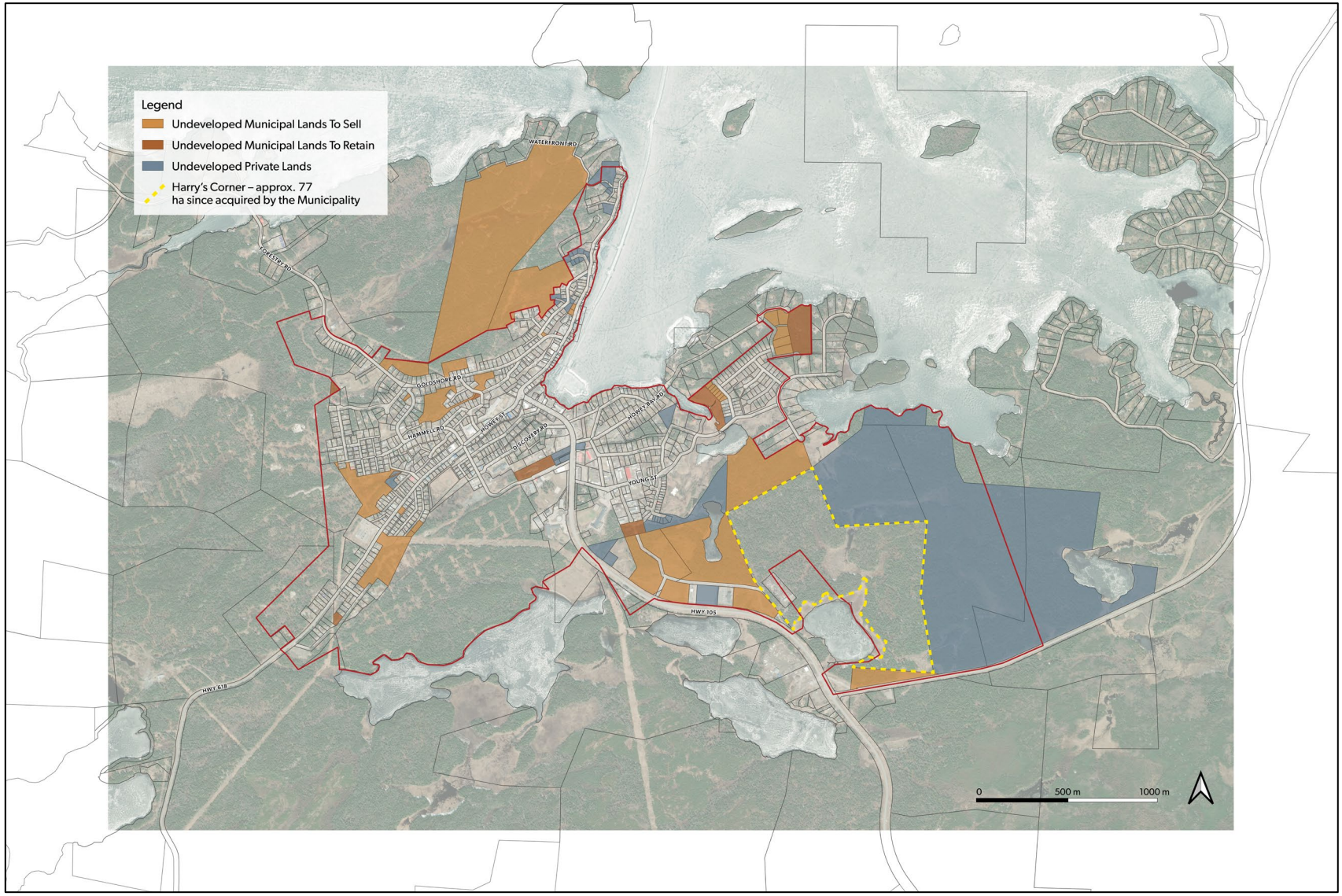


Figure 2.4-2: Stakeholder Identified Vacant Lands in Balmertown

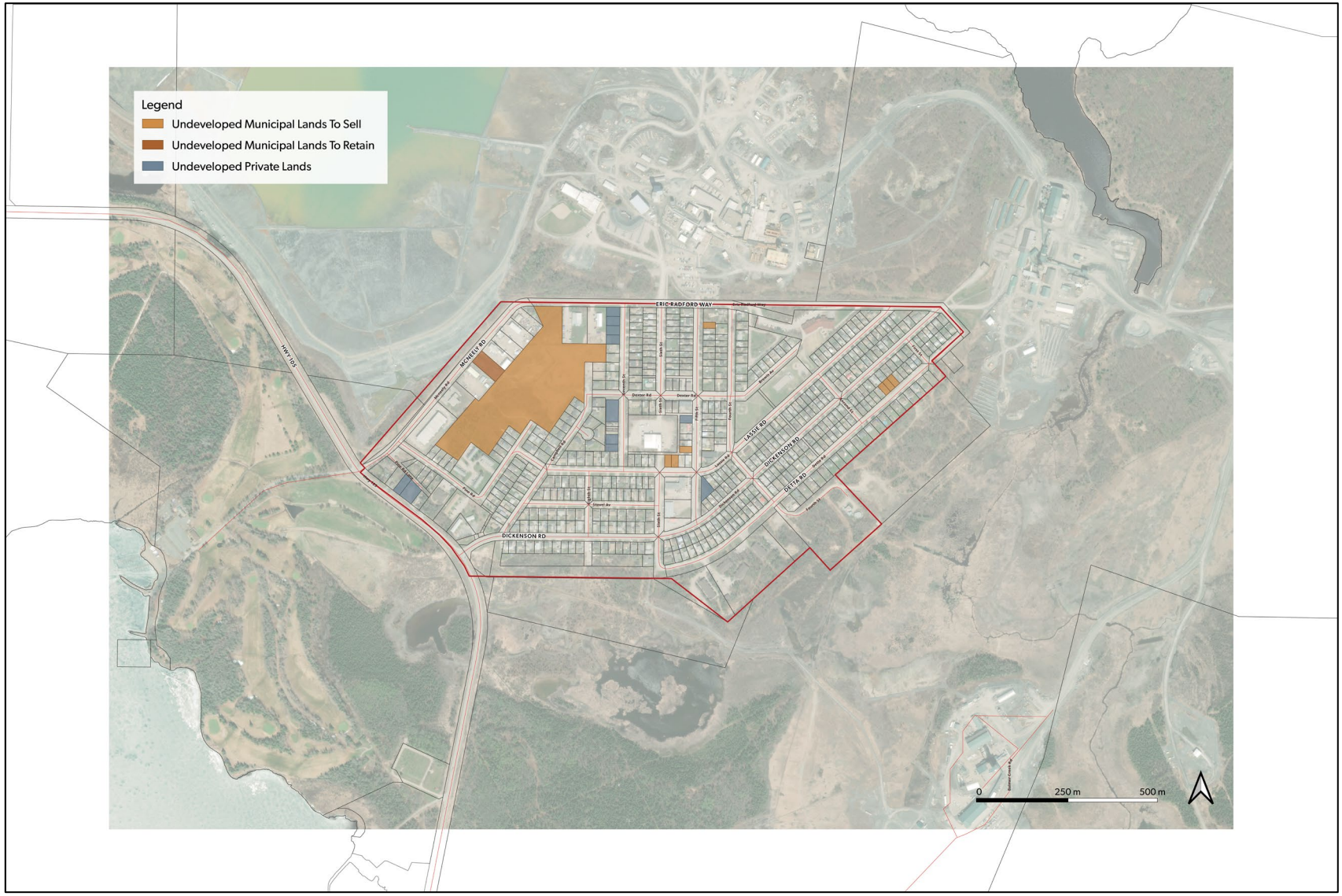


Figure 2.4-3: Stakeholder Identified Vacant Lands in Cochenour and McKenzie Island

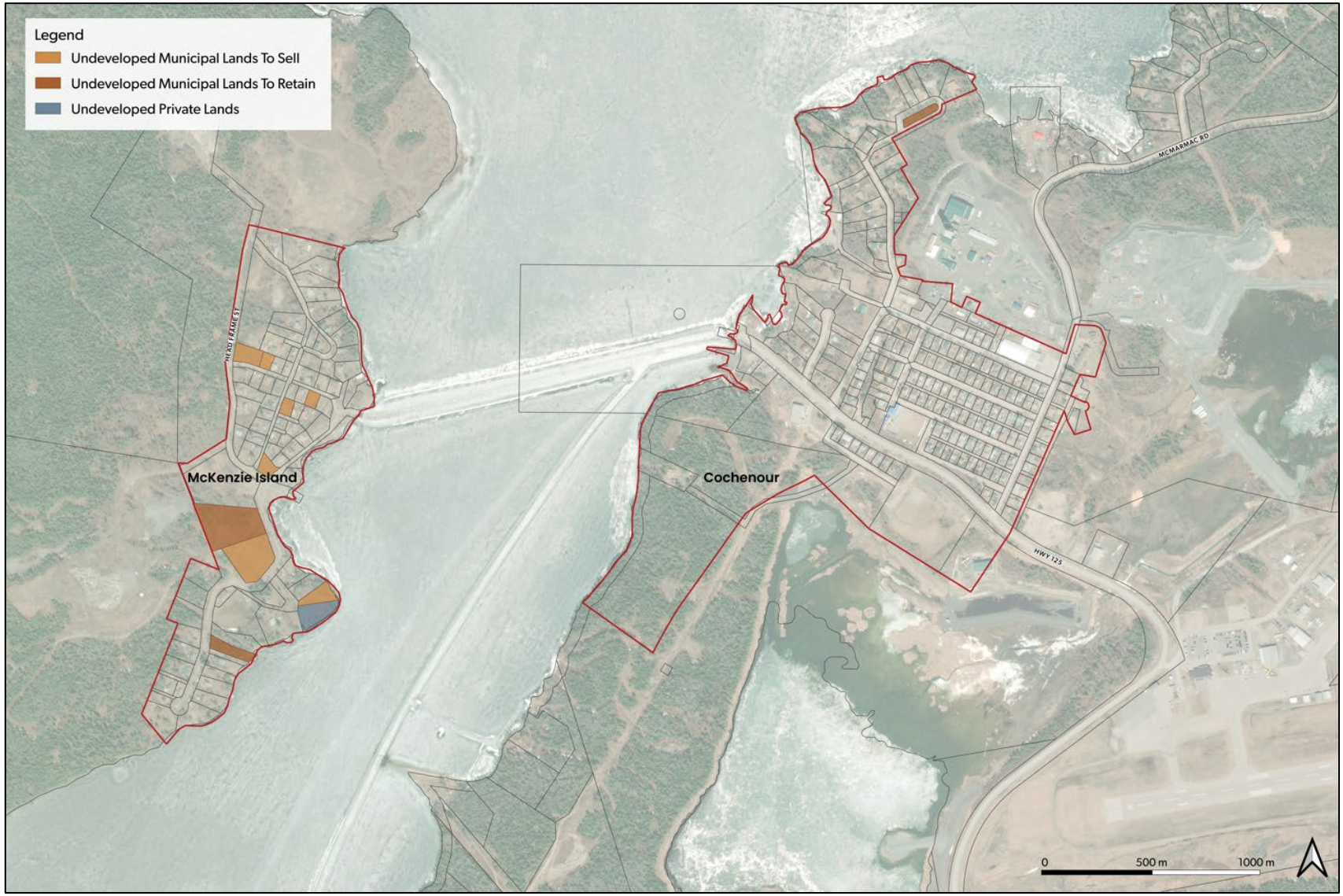
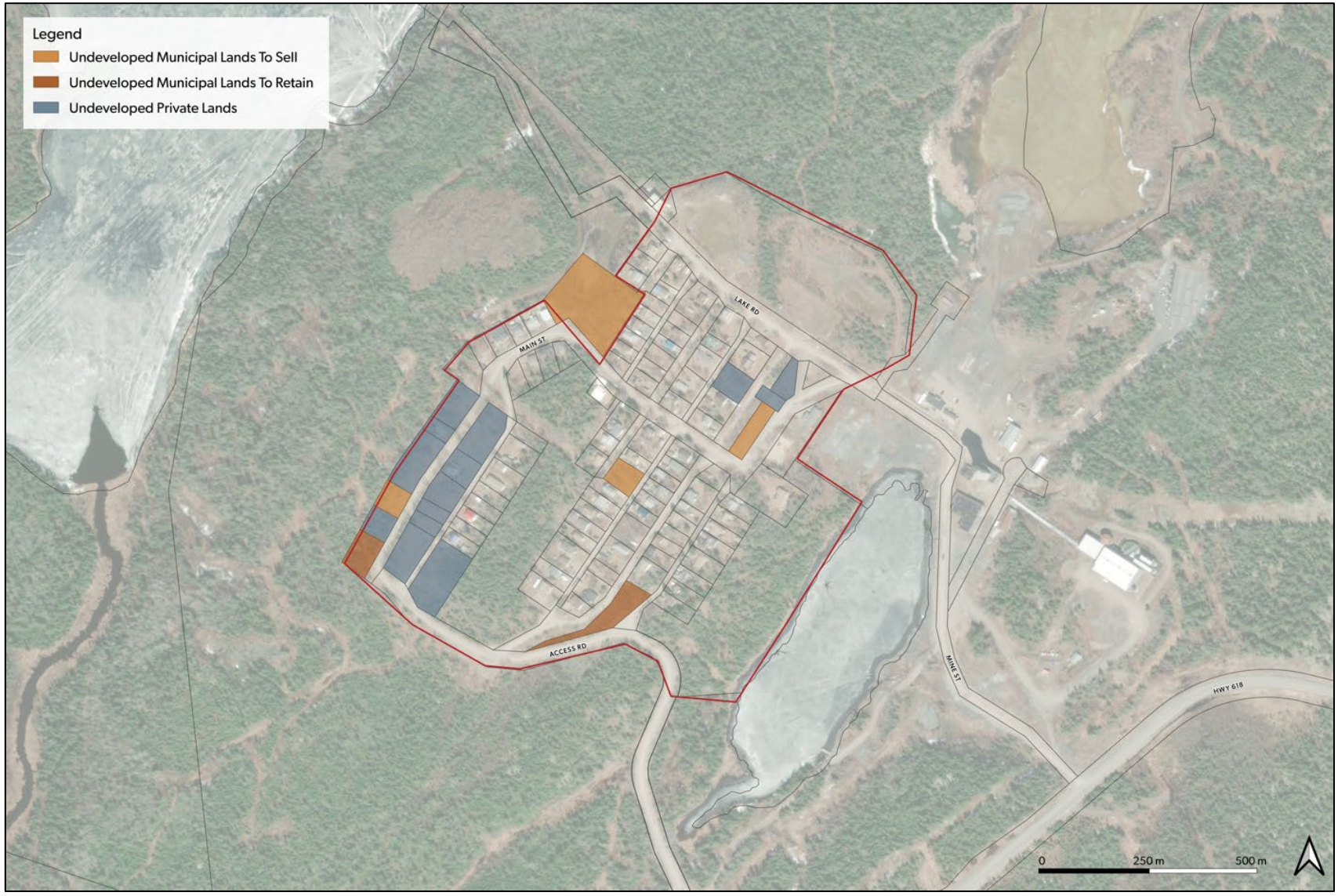


Figure 2.4-4: Stakeholder Identified Vacant Lands in Madsen



2.4.2 Vacant Land Analysis

Following the vacant land analysis workshop, further analysis of the vacant lands was completed to assess how much land is available to accommodate anticipated future population growth and development.

With the addition of Harry's Corner's approximately 66 hectares (163 acres), there are currently 297.7 hectares of vacant land within the community boundaries, which is 63% municipally and 37% privately owned. Over 95% of vacant land is located within Red Lake, while limited vacant lands exist in Balmertown (7.9 ha), McKenzie Island (3.1 ha), and Madsen (3.8 ha). There are no vacant lands in Cochenour or Starratt Olsen.

Excluding the vacant lands identified by the Municipality for retention, all vacant lands were categorized and analyzed in each community based on three variables:

- Whether they are privately owned or owned by the Municipality;
- The land use which is based on their current zoning district; and
- The presence or availability of services, including water, sewer, and road access.

In regard to the last variable, each vacant parcel was categorized based on the presence or availability of services. In particular, vacant parcels were determined to have either:

- **Full access**: if all of water, sewer, and road access is available.
- **Partial access**: if 1 or 2 of water, sewer, & road access is available.
- **No access**: if no services are available.

It is important to note that access to adjacent services or roads may be limited to a small portion of the parcel frontage. Furthermore, the level of access does not infer anything about the water, sewer, or road infrastructure's condition or capacity to service adjacent development. In general, greater access to services typically means the parcel will be easier and less costly to develop. However, there may be other site characteristics not considered in this analysis that can impact development viability and costs. In particular, topographic and geological conditions can add significant challenges.

Table 2.4-1 below demonstrates the combined amount of vacant land available in all communities in the Municipality, organized by the above variables. In general, the overall Municipal-level findings include:

- Most vacant land is zoned Residential (175.4 ha or 59%) and Commercial (52.4 ha or 18%).
- There is enough vacant land zoned Residential (175.4 ha available; and 101.1 ha required), Recreational, (67.4 ha; 5.1 ha); and Commercial (52.4 ha; 48.7 ha) for the lands needed under the 2037 Potential Growth Projection.
- Based on the Potential Growth Projection for 2045, there is a major shortage of land zoned Institutional (1.1 ha available; and 20.6 ha required) and Industrial (1.4 ha; 125 ha), even after the projected population declines slightly after the expected mine closures.

- All vacant land zoned for Industrial in the Municipality is located in McKenzie Island.
- Only 10% (30.5 ha) has full access to services and 35% (103.7 ha) has partial access, while the remaining 55% (163.6 ha) has no access to services. More fully serviced land is needed to facilitate development required for anticipated population growth.

Table 2.4-1: Vacant Lands in the Municipality of Red Lake

	Full Access (ha)			Partial Access (ha)			No Access (ha)			Total (ha)		
	Municipal	Private	Total	Municipal	Private	Total	Municipal	Private	Total	Municipal	Private	Total
Residential	18.9	2.1	**21.1**	17.3	8.4	**25.6**	56.2	72.4	**128.7**	**92.4**	**82.9**	**175.4**
Recreational	0.0	0.0	**0.0**	44.1	0.0	**44.1**	19.7	3.6	**23.3**	**63.8**	**3.6**	**67.4**
Institutional	0.0	0.1	**0.1**	0.0	0.4	**0.4**	0.6	0.0	**0.6**	**0.6**	**0.5**	**1.1**
Industrial	0.0	0.0	**0.0**	1.4	0.0	**1.4**	0.0	0.0	**0.0**	**1.4**	**0.0**	**1.4**
Commercial	7.6	1.7	**9.3**	22.0	10.2	**32.1**	0.0	11.0	**11.0**	**29.5**	**22.9**	**52.4**
TOTAL	**26.5**	**4.0**	**30.5**	**84.7**	**19.0**	**103.7**	**76.5**	**87.1**	**163.6**	**187.7**	**110.0**	**297.7**

The following community-level tables (**Table 2.4-2**, **Table 2.4-3**, **Table 2.4-4**, and **Table 2.4-5**) and maps (**Figure 2.4-5**, **Figure 2.4-6**, **Figure 2.4-7**, and **Figure 2.4-8**) for Red Lake, Balmertown, McKenzie Island, and Madsen demonstrate the location and areas of vacant lands in each community. In general, the overall community-level findings are as follows:

- Most vacant land (282.9 ha or 95%) is located in Red Lake.
- In Red Lake, 9% of vacant lands have full access to services (26.0 ha) and 35% have partial access (99.5 ha), while the remaining 56% have no access (157.4 ha). This means that approximately 91% of vacant lands in Red Lake need additional services in order to be considered development-ready.
- The next most available amount of vacant land is in Balmertown (7.9 ha). However, only 1.7 ha or 22% of which has full (12%) or partial (10%) access to services; and a large piece requires environmental remediation. More serviced land is needed in Balmertown to accommodate its expected share of population growth.
- There is only 3.1 ha of vacant land in McKenzie Island, 3.8 ha of vacant land in Madsen, and no vacant land in Cochenour or Starratt Olsen. More vacant land is needed in Cochenour to accommodate its expected share of population growth.

Table 2.4-2: Vacant Lands in Red Lake

	Full Access (ha)			Partial Access (ha)			No Access (ha)			Total (ha)		
	Municipal	Private	Total	Municipal	Private	Total	Municipal	Private	Total	Municipal	Private	Total
Residential	16.3	0.7	**17.0**	15.9	6.9	**22.8**	50.7	72.4	**123.1**	**82.8**	**80.0**	**162.8**
Recreational	0.0	0.0	**0.0**	44.1	0.0	**44.1**	19.7	3.6	**23.3**	**63.8**	**3.6**	**67.4**
Institutional	0.0	0.0	**0.0**	0.0	0.4	**0.4**	0.0	0.0	**0.0**	**0.0**	**0.4**	**0.4**
Industrial	0.0	0.0	**0.0**	0.0	0.0	**0.0**	0.0	0.0	**0.0**	**0.0**	**0.0**	**0.0**
Commercial	7.4	1.6	**9.0**	22.0	10.2	**32.1**	0.0	11.0	**11.0**	**29.4**	**22.9**	**52.2**
TOTAL	**23.7**	**2.4**	**26.0**	**82.0**	**17.5**	**99.5**	**70.4**	**87.1**	**157.4**	**176.0**	**106.9**	**282.9**

Table 2.4-3: Vacant Lands in Balmertown

	Full Access (ha)			Partial Access (ha)			No Access (ha)			Total (ha)		
	Municipal	Private	Total	Municipal	Private	Total	Municipal	Private	Total	Municipal	Private	Total
Residential	0.2	0.6	**0.8**	0.4	0.4	**0.7**	5.6	0.0	**5.6**	**6.1**	**1.0**	**7.1**
Recreational	0.0	0.0	**0.0**	0.0	0.0	**0.0**	0.0	0.0	**0.0**	**0.0**	**0.0**	**0.0**
Institutional	0.0	0.0	**0.0**	0.0	0.0	**0.0**	0.6	0.0	**0.6**	**0.6**	**0.0**	**0.6**
Industrial	0.0	0.0	**0.0**	0.0	0.0	**0.0**	0.0	0.0	**0.0**	**0.0**	**0.0**	**0.0**
Commercial	0.1	0.1	**0.2**	0.0	0.0	**0.0**	0.0	0.0	**0.0**	**0.1**	**0.1**	**0.2**
TOTAL	**0.3**	**0.6**	**1.0**	**0.4**	**0.4**	**0.7**	**6.1**	**0.0**	**6.1**	**6.8**	**1.0**	**7.9**

Table 2.4-4: Vacant Lands in McKenzie Island

	Full Access (ha)			Partial Access (ha)			No Access (ha)			Total (ha)		
	Municipal	Private	Total	Municipal	Private	Total	Municipal	Private	Total	Municipal	Private	Total
Residential	1.4	0.3	**1.7**	0.0	0.0	**0.0**	0.0	0.0	**0.0**	**1.4**	**0.3**	**1.7**
Recreational	0.0	0.0	**0.0**	0.0	0.0	**0.0**	0.0	0.0	**0.0**	**0.0**	**0.0**	**0.0**
Institutional	0.0	0.0	**0.0**	0.0	0.0	**0.0**	0.0	0.0	**0.0**	**0.0**	**0.0**	**0.0**
Industrial	0.0	0.0	**0.0**	1.4	0.0	**1.4**	0.0	0.0	**0.0**	**1.4**	**0.0**	**1.4**
Commercial	0.0	0.0	**0.0**	0.0	0.0	**0.0**	0.0	0.0	**0.0**	**0.0**	**0.0**	**0.0**
TOTAL	**1.4**	**0.3**	**1.7**	**1.4**	**0.0**	**1.4**	**0.0**	**0.0**	**0.0**	**2.8**	**0.3**	**3.1**

Note: No vacant land table is provided for Cochenour as it currently has no vacant lands.

Table 2.4-5: Vacant Lands in Madsen

	Full Access (ha)			Partial Access (ha)			No Access (ha)			Total (ha)		
	Municipal	Private	Total	Municipal	Private	Total	Municipal	Private	Total	Municipal	Private	Total
Residential	1.1	0.5	**1.6**	1.0	1.1	**2.1**	0.0	0.0	**0.0**	**2.1**	**1.6**	**3.7**
Recreational	0.0	0.0	**0.0**	0.0	0.0	**0.0**	0.0	0.0	**0.0**	**0.0**	**0.0**	**0.0**
Institutional	0.0	0.1	**0.1**	0.0	0.0	**0.0**	0.0	0.0	**0.0**	**0.0**	**0.1**	**0.1**
Industrial	0.0	0.0	**0.0**	0.0	0.0	**0.0**	0.0	0.0	**0.0**	**0.0**	**0.0**	**0.0**
Commercial	0.0	0.0	**0.0**	0.0	0.0	**0.0**	0.0	0.0	**0.0**	**0.0**	**0.0**	**0.0**
TOTAL	**1.1**	**0.6**	**1.7**	**1.0**	**1.1**	**2.1**	**0.0**	**0.0**	**0.0**	**2.1**	**1.8**	**3.8**

Figure 2.4-5: Vacant Lands in Red Lake

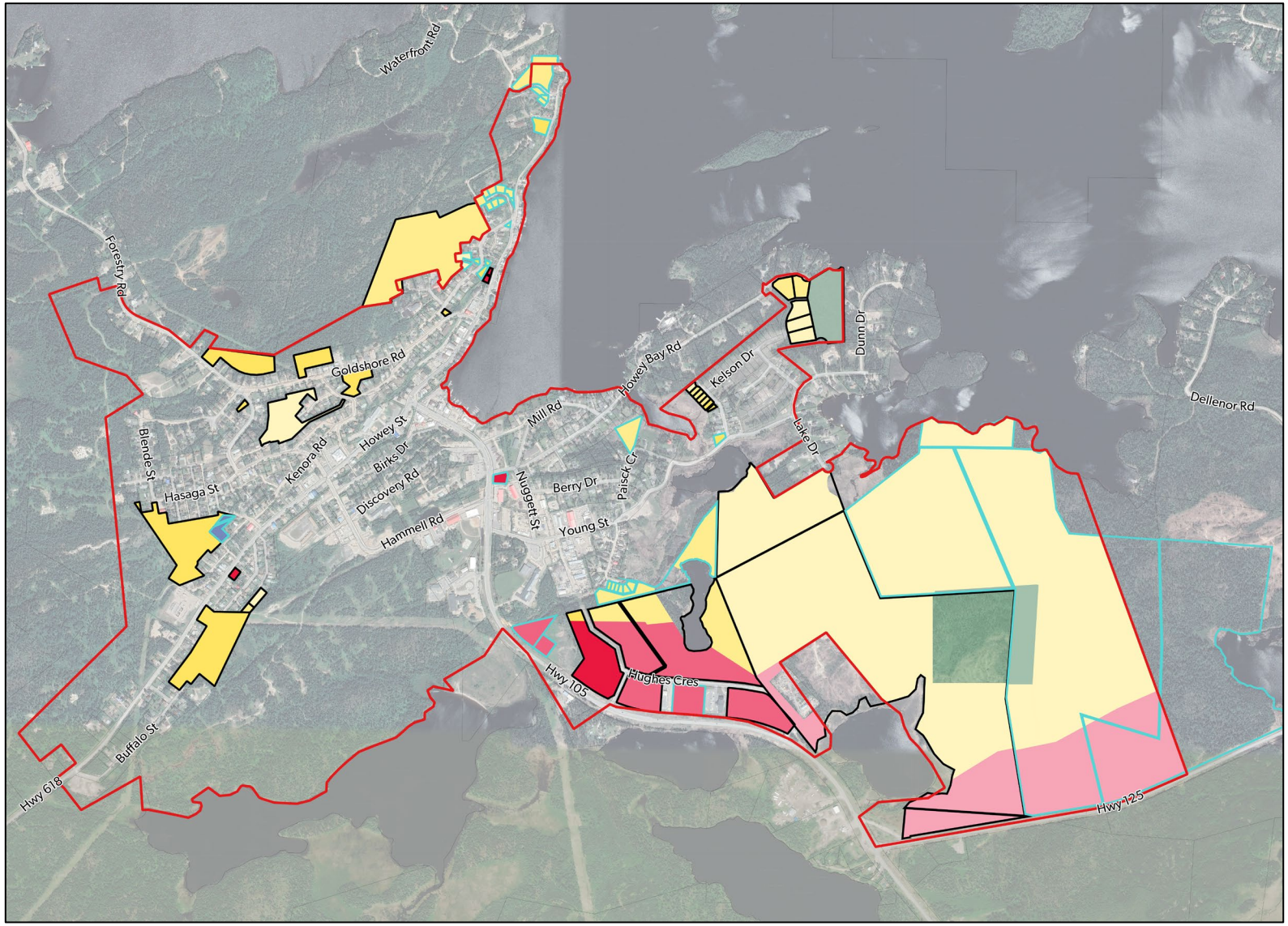


Figure 2.4-6: Vacant Lands in Balmertown

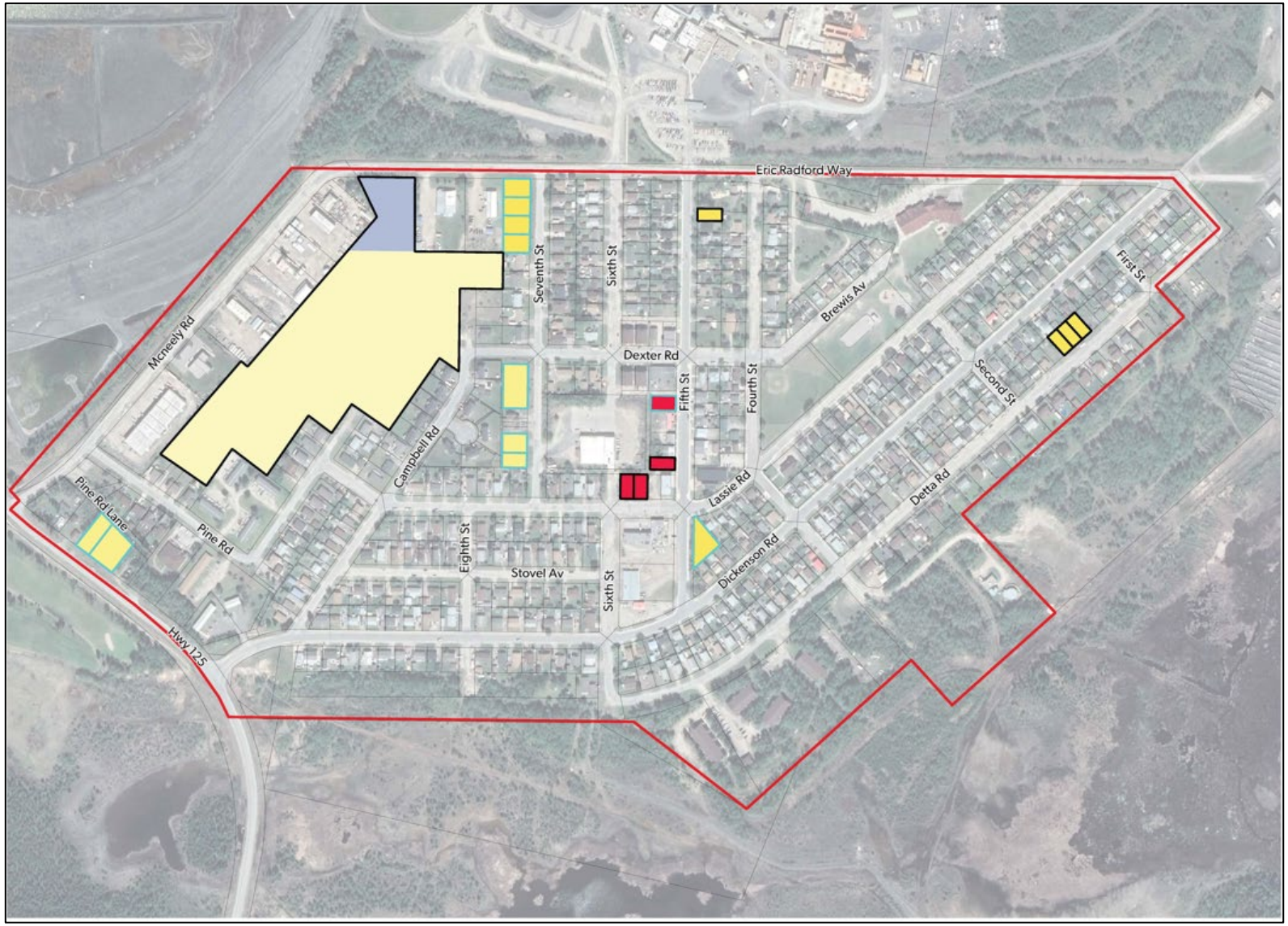


Figure 2.4-7: Vacant Lands in McKenzie Island and Cochenour

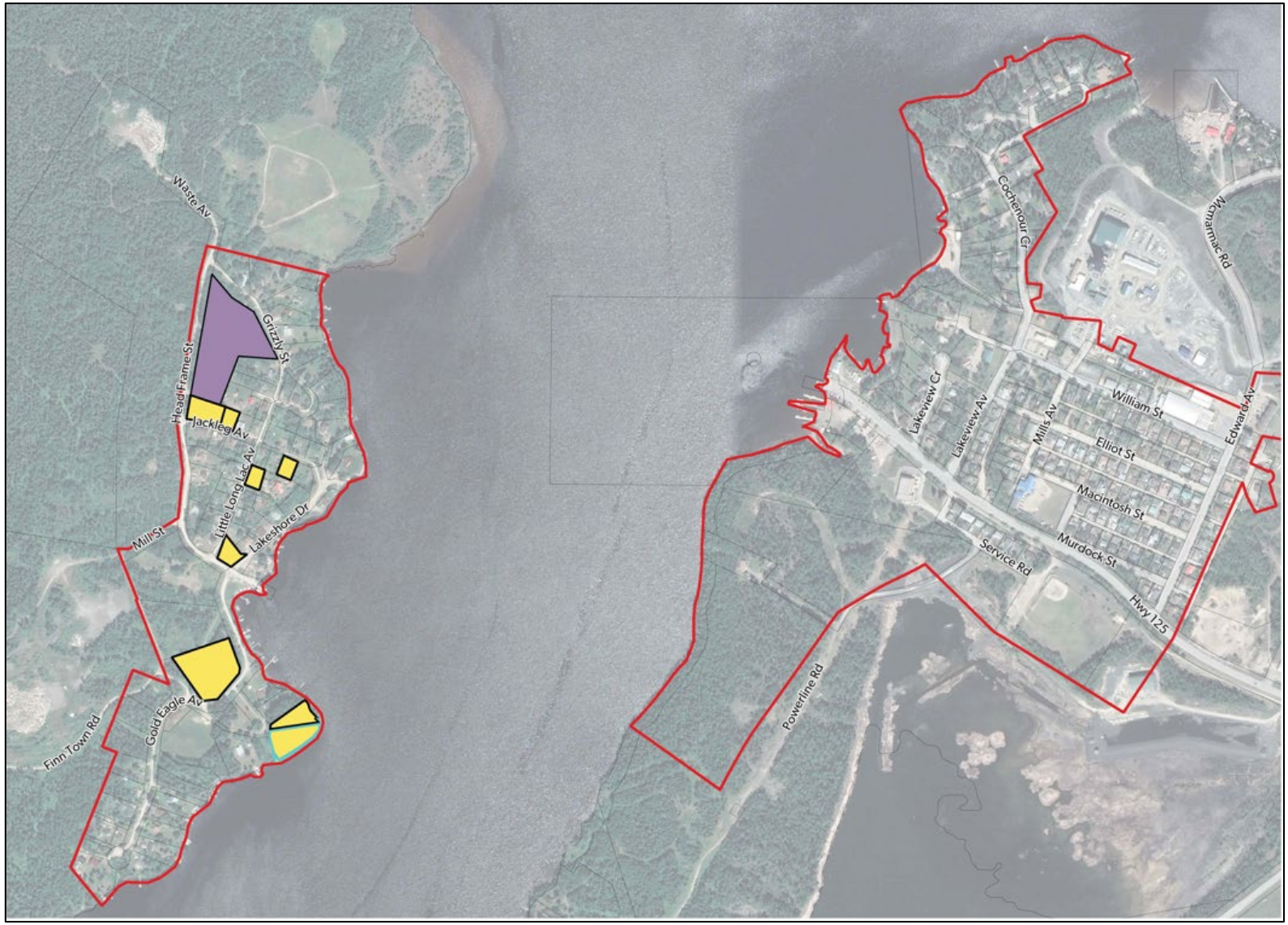


Figure 2.4-8: Vacant Lands in Madsen

2.5 MUNICIPAL INFRASTRUCTURE REVIEW

This section provides a review of the municipal infrastructure systems for the communities within the Municipality of Red Lake. It includes an assessment of water supply, treatment, and distribution; sewage collection, treatment, and disposal; and solid waste management. The purpose of the review is to identify existing capacity, condition, and service coverage to provide an understanding of the current infrastructure in the Municipality. **Section 3.3** provides an analysis of the existing infrastructure in the Municipality with a focus on understanding whether the current infrastructure is equipped to support the projected population growth and where upgrades or expansions may be required.

2.5.1 Water Supply, Treatment, and Distribution

The Municipality of Red Lake owns and operates several water supply, treatment and distribution facilities in the communities of Madsen, Red Lake, Balmertown, Cochenour and McKenzie Island. There are three water treatment plants (WTP) in: Madsen, Red Lake, and Cochenour. Additionally, Balmertown has a reservoir pumping station (RPS), which receives treated water from the Cochenour treatment plant. McKenzie Island is directly from the Cochenour WTP, which is named the “Duncan Wilson Water Treatment Plant”. All three WTPs and the Balmertown RPS are managed by Northern Waterworks Inc. (NWI), as the official operating authority.

Based on discussions with the Red Lake Fire Department, expected fire flows in all communities are based off of Section 18.4.4.1.1 of the National Fire Protection Association document NFPA 1- Fire Code and should be capable of 63.1L/s (1000 GPM) for a duration of one hour. Testing has not been conducted in the distribution system to determine if this flow is available at the hydrants, however this report will use this flow and duration when assessing pumping and storage capacities of each system.

2.5.1.1 Red Lake

The Red Lake Drinking Water System provides drinking water to the community of Red Lake. It is composed of a WTP, a water tower and a water distribution system. The Red Lake Drinking Water System is classified as a Large Municipal Residential system according to O. Reg 170/03 (Government of Ontario 2022).

2.5.1.1.1 Raw Water Supply

Skookum Bay of Red Lake serves as the surface raw water source for the Red Lake WTP. An intake structure is located approximately 10 to 14 m below the water level and a 400 mm cast iron intake pipe is used to convey water through two valve chambers to the raw water reservoirs located at the WTP. As per preliminary design drawings of WTP upgrades in 1995 and 1996, the raw water reservoir has four wet wells and three dry wells. One wet well receives raw water and passes through a screen to the remaining three wet wells, which are interconnected with intercell piping and valves located in dry wells.

There are three Goulds model VIT-CT vertical turbine pumps that transfer water to treatment units from the raw water chambers. The pumping system was originally designed for four raw water pumps; hence, there is room for a fourth pump. During the site visit, the operator noted that only one pump runs at a time on a normal day. The Skookum Bay Permit to Take Water allows a maximum intake of 6,480 m^3/day or 4,500 L/min (75 L/s) for 24 hours. **Table 2.5-1** summarizes the general characteristics of the raw water supply.

Table 2.5-1: Summary of Red Lake Raw Water Quality

Parameter	Unit[1]	Operational Plan[2] (2011-2022)	Annual Drinking Water Report 2023[3]	Annual Drinking Water Report 2024[3]
Turbidity[2]	NTU	0.33 – 1.68	0.31 – 1.60	0.29 – 1.70
UV Transmittance[2]	%	41.1 – 53.4	-	-
pH[2]		6.4 – 7.6	-	-
Alkalinity[2] (as $CaCO_3$)	mg/L	17 – 29	-	-
E. Coli[3]	MPN/100mL	<1 – 23	0 – 2	0 – 7
Total Coliforms[3]	MPN/100mL	<1 – 2420	0 – 488	0 – >2420

Notes:
1. NTU is Nephelometric Turbidity Unit and MPN is most probable number.
2. Turbidity, UV Transmittance, pH and alkalinity results from 2011 to 2022 are expressed as monthly averages.
3. The turbidity results for 2023 and 2024 are based on 81 and 82 samples, respectively. E. Coli and Total Coliform results for 2023 and 2024 are based on 52 samples (weekly).

2.5.1.1.2 Water Treatment Plant

According to the annual report written by NWI, the Red Lake WTP is a Class III chemically-assisted conventional filtration system using two treatment trains with a combined capacity of 6,048 m^3/day. It is located northwest of the main community area on Forestry Road, near Skookum Bay of Red Lake. The main treatment plant building was built adjacent to the raw water pump house under the Water Treatment Plant Expansion (Phase 2) project in 1996 and includes a pump room, a laboratory and a chemical storage room in a pre-engineered steel building with approximately 19.5 m x 16.0 m dimensions. The adjacent raw water pump house is approximately 12.1 m x 8.9 m in size.

Two conventional treatment skids operate in parallel and include a four-chambered flocculation basin, a sedimentation basin equipped with upflow tube settlers, and a dual-media filter. The incoming raw water stream is rapidly mixed with a coagulant (aluminum sulphate) and a pre-treatment alkalinity adjustment chemical (sodium carbonate) before entering the flocculation basins. A polymer is added directly to the flocculation basin to enhance the floc formation and is gently mixed. After the coagulation and flocculation process, process water enters the sedimentation basins, allowing the separation and settling of flocs. Settled flocs (sludge) are automatically removed from the bottom of the sedimentation basin. Flow velocity is reduced in the sedimentation basin to promote particle settling.

The sedimentation tank supernatant then enters the dual media filters composed of anthracite and silica sand. Filtered water passes through the filter under-drain system and enters the treated water reservoirs. The filters are periodically cleaned by using an air-scour system to agitate the media and reverse the flow through the filter. Primary disinfection is achieved by

chlorination using chlorine gas. Chlorine gas is mixed with water and injected into the incoming filter effluent stream before it enters the reservoirs. Sodium carbonate is again used for post-treatment pH adjustment, maintaining pH between 7.6 and 8.0 to adhere to a corrosion control plan to control lead release in residential and non-residential plumbing.

There are two interconnected underground treated water reservoirs, one backwash holding chamber and one sludge thickening chamber. Based on the Operational Plan (Revision 8) prepared by NWI and the Red Lake WTP Primary Disinfection Optimization Conceptual Design Plan prepared by Stantec, the total treated water storage volume is 563 m^3. Each treated water reservoir has a pump well with two vertical turbine high-lift pumps in it. There is a total of four Goulds model VIT-CT vertical turbine pumps equipped with 25 HP motors. Three pumps out of four are equipped with variable frequency drives, while one pump has a constant speed motor. The distribution pumping system transfers treated water to the Red Lake water tower and distribution system. The operation of the distribution pumps and transfer to the water tower are controlled by a water level indicator at the tower.

The Red Lake WTP is also equipped with programmable logic controllers, a Supervisory Control and Data Acquisition (SCADA) system for process control and monitoring and auto-dialers to notify operators about critical conditions and equipment malfunctions. Raw water flow, filter turbidity (both filters), treated water flow, treated water free chlorine residual and pH are continuously monitored with alarms to notify the operators. There is a 100 kW Kohler stand-by diesel generator to supply emergency power. Process wastewater generated from the treatment process and filter backwash are directed to the backwash holding chamber. A submersible pump in the backwash holding chamber transfers the collected process wastewater into the sludge thickening chamber. A polymer is added to condition the sludge for settling. After the sludge has settled in the thickening chamber, the supernatant is conveyed to Skookum Bay by gravity pipes. Settled sludge solids are pumped out periodically using a submersible sludge pump.

2.5.1.1.3 Water Distribution System

The Red Lake distribution system operates as a combination of a high-lift pumping system and a water tower to regulate the pressure in the system. High-lift pumps in the WTP transfer treated water to the tower, where water is recirculated continuously to prevent stagnation.

Red Lake Water Tower

Red Lake Water Tower is a concrete cylindrical elevated tank constructed with stressed concrete segments. There are eight equal-sized curved segments in one lift, forming a cylinder with an approximate inside diameter of 13.7 m. The tower consists of a total of 15 lifts, with water stored from the 9th lift up to the 15th lift. The water storage volume of the tower is 1,465 m^3 as per the Operational Plan (Revision 8) prepared by NWI. A duplex recirculation pump system operates to recirculate water. According to the operators, only one pump is set to operate while the other pump is set offline. The operators manually switch duties on the pumps every week. A gas-powered generator is utilized to provide emergency power during a power outage.

Piped Distribution System

The Red Lake piped water distribution system is composed of approximately 20,800 m of watermain piping and 122 hydrants, with associated hydrant isolation valves. Watermain piping is a combination of ductile iron, high density polyethylene (HDPE) and cast iron with diameter sizes varying from 150 mm to 250 mm.

2.5.1.2 Madsen

The Madsen Drinking Water System provides drinking water to the community of Madsen. It consists of a raw water pumping station, a WTP and a piped distribution system. The Madsen Drinking Water System is classified as a Small Municipal Residential System per O. Reg 170/03, and it adheres to the minimum treatment and disinfection requirements for a surface water raw water supply (Government of Ontario 2022).

2.5.1.2.1 Raw Water Supply

The raw water source of the Madsen WTP is Russet Lake, which is located northwest of the community. An intake structure is located approximately 30 m from the shoreline and eight metres below the mean lake water level which flows to the low lift pumping station where two pumps supply raw water via a 150 mm HDPE watermain pipe to a raw water reservoir in the Madsen WTP. The low lift station was not accessible via vehicle during the site visit; therefore, the current working condition is unknown, however the operators did not note any concerns with the system (Stakeholder Engagement 2025). Based on the information provided, the low lift pumping station is equipped with two constant-speed horizontal centrifugal pumps and a flow meter.

The Russett Lake Permit to Take Water limits the raw water intake to 564.48 m^3/day or 588 L/min (9.58 L/s) for 16 hrs/day; therefore, raw water flows exceeding this value are not authorized under the Permit. Per Schedule 11 (Microbiological Sampling and Testing) of O. Reg 170/03, weekly raw water samples were taken by an accredited laboratory and tested for E. Coli and Total Coliforms (Government of Ontario 2022). Raw water samples were taken at least every week and tested for turbidity as an operational requirement. The table below (**Table 2.5-2**) summarizes the general characteristics of the source water supply.

Table 2.5-2: Summary of Madsen Raw Water Quality

Parameter	Unit[1]	Operational Plan[2] (2011-2022)	Annual Drinking Water Report 2023[3]	Annual Drinking Water Report 2024[3]
Turbidity[2]	NTU	0.29 – 2.07	0.498 – 1.870	0.450 – 3.511
UV Transmittance[2]	%	50.3 – 65.1	-	-
pH[2]		6.4 – 7.6	-	-
Alkalinity[2] (as $CaCO_3$)	mg/L	27 – 38	-	-
Iron[1]	mg/L	0.01 – 0.16	-	-
Manganese[1]	mg/L	0.02 – 0.21	-	-
E. Coli[3]	MPN/100mL	<1 – 14	0 – 6	0 – 387
Total Coliforms[2]	MPN/100mL	<1 – >2420	0 – 4	0 – 172

Notes:
1. NTU is Nephelometric Turbidity Unit and MPN is most probable number.
2. Turbidity, UV Transmittance, pH, alkalinity, iron residual and manganese residual results from 2011 to 2022 are expressed as monthly averages.
3. The turbidity results for 2023 and 2024 are based on 52 and 72 samples, respectively. E. Coli and Total Coliform results for 2023 and 2024 are based on 52 samples.

2.5.1.2.2 Water Treatment Plant

The Madsen WTP is a Class III chemically-assisted conventional filtration WTP located on Lake Road on the north side of the community. Constructed in 2003 next to the old treatment plant, the main WTP building houses an office and laboratory, a chemical room with dry chemical storage, a main treatment area, and a washroom. The old treatment plant building was repurposed as a maintenance area and a new electrical room.

According to the annual report written by NWI the water treatment process includes pre-oxidation and a two-train conventional treatment system rated for 691 m^3/day capacity (with both trains running), each train contains a three-chambered flocculation tank, a sedimentation tank and a filter unit followed by chlorine disinfection. The incoming raw water stream is directed to a baffled raw water reservoir with a total capacity of 99 m^3. Potassium permanganate is added to the raw water as it enters the raw water reservoir for pre-oxidation of iron and manganese. Raw water pumping from the low lift station is interconnected with water levels in the raw water reservoir i.e. raw water pumping starts when the water level reaches a lower set point and stops when it reaches an upper set point.

Raw water is transferred the treatment skids using two 5 HP constant-speed centrifugal pumps powered by 575 V Baldor Electric motors. Coagulant (PAC) is added to the raw water and rapidly mixed during the coagulation process and then gently mixed as it passes through the flocculation tanks. A polymer is also added to the water at this stage to enhance the forming of larger and more stable flocs. Process water then enters the sedimentation tank equipped with upflow tube settlers where the velocity is reduced to allow for the settling of flocs. The sedimentation tank supernatant is then directed to a dual-media filter composed of anthracite and silica sand on a layer of support gravel.

Filter effluent is then fed with sodium carbonate (soda ash) for pH adjustment, and sodium hypochlorite to achieve primary disinfection prior to entering the treated water reservoirs. Based

on the tender drawings, the treated reservoirs were designed as two-cell baffled storage reservoirs with a storage volume of 190 m^3 to provide the required contact time for primary disinfection. Four 15 HP high-lift vertical turbine pumps equipped with variable frequency drive motor controllers are used to pump treated water to the Madsen distribution system. Each reservoir includes a pump well, and two distribution pumps are installed in each pump well. Additional sodium hypochlorite is added prior to distribution to achieve secondary disinfection by maintaining a free chlorine residual throughout the water distribution system. The distribution high-lift pumps are controlled by a pressure switch located on the distribution header inside the treatment plant.

The Madsen WTP is equipped with a PLC system complete with SCADA for process monitoring and control. Raw water flow, filter transfer flow, filtrate turbidity, treated water flow and treated water free-chlorine residual are continuously monitored. Emergency power is provided by a standby diesel generator. A dedicated duplex backwash pumping system consisting of two 7.5 HP vertical turbine pumps and an air-scour system are used to clean the filters periodically. Sedimentation sludge, backwash wastewater and rinse-to-waste wastewater are collected via a channel and directed to a backwash surge tank. A submersible pump is used to transfer wastewater to a backwash thickening tank from where the process wastewater is pumped to the Madsen wastewater collection system and accumulated sludge is disposed periodically by trucks.

2.5.1.2.3 Water Distribution System

The Madsen water distribution system is a Class I system consisting of approximately 2,600 m of watermain piping. Most of the watermains are 100 mm HDPE with 50 mm insulation and service lines are 25 mm and 60 mm pipes with 50 mm insulation. 300 mm and 375 mm corrugated steel pipe culvert sleeves were installed at road crossings where the cover is less than 1.2 m. The system is looped and includes four hydrants and fourteen isolation butterfly valve chambers. Two blow-off valves are installed at low points of the system to blow off sediment. There is an option for filling fire trucks directly from the raw water feed.

2.5.1.3 Balmertown, Cochenour, and McKenzie Island

Balmertown, Cochenour, and McKenzie Island communities are serviced by the Duncan Wilson WTP located in Cochenour (also identified as the BCMI WTP) and the Balmertown RPS. The BCMI WTP produces treated water for all three communities and transfers treated water to the Balmertown RPS for distribution in Balmertown. Cochenour and McKenzie Island are directly serviced by the BCMI WTP. Similar to the other drinking water systems in the Municipality of Red Lake, the BCMI drinking water system is operated and maintained by NWI. According to O. Reg. 170/03, the BCMI drinking water system is classified as a Large Municipal Residential System (Government of Ontario 2022).

2.5.1.3.1 Raw Water Supply

The BCMI WTP receives raw water from Bruce Channel in Red Lake which is classified as a surface water source. An intake structure is located west of the raw water pumping station,

approximately 115 m from the shoreline. Water flows by gravity through a 300 mm diameter, 135 m long intake pipe into the raw water wet wells at the pumping station. The raw water pumping station building is a 7.3 m x 13.4 m steel building with an underground reservoir foundation. There are five wet wells to store raw water with a total volume of 200 m^3 based on a 100-year water level in Bruce Channel. All wet wells are interconnected with 300 mm piping and valves and consist of 3.5 m high baffle walls. A 6 mm stainless steel mesh screen is installed in wet well #1 to retain larger particles.

Three 20 HP Peerless model 1OMA pumps equipped with 575 V US Electrical motors are used to transfer raw water to the BCMI WTP. The pumps are rated for 36.9 L/s flow at 27.7 m head. During the JRCC site visit, one of the three pumps was broken and out of service (Stakeholder Engagement 2025). Emergency power to the pump house is provided by a standby 125 kW diesel generator. A 300 mm diameter HDPE pipe conveys raw water to the treatment units in the BCMI WTP. The Bruce Channel Permit to Take Water has a maximum raw water intake limit of 6,065 m^3/day at 4,320 L/min (72 L/s) for 23.4 hours. The table below (**Table 2.5-3**) summarises the general characteristics of the raw water supply.

Table 2.5-3: Summary of Balmertown, Cochenour, and McKenzie Island Raw Water Quality

Parameter	Unit[1]	Operational Plan[2] (2011-2022)	Annual Drinking Water Report 2023[3]	Annual Drinking Water Report 2024[3]
Turbidity[2]	NTU	0.48 – 2.07	0.12 – 2.30	0.33 – 2.03
UV Transmittance[2]	%	29.3 – 48.7	-	-
pH[2]		6.8 – 7.5	-	-
Alkalinity[2] (as $CaCO_3$)	mg/L	18 – 29	-	-
E. Coli[3]	MPN/100mL	<1 – 36	0 – 2	0 – 2
Total Coliforms[3]	MPN/100mL	<1 – >2420	0 – 291	0 – 179

Notes:
1. NTU is Nephelometric Turbidity Unit and MPN is most probable number.
2. Turbidity, UV Transmittance, pH and alkalinity results from 2011 to 2022 are expressed as monthly averages.
3. The turbidity results for 2023 and 2024 are based on 98 and 79 samples, respectively. E. Coli and Total Coliform results for 2023 and 2024 are based on 52 samples (weekly).

2.5.1.3.2 Water Treatment Plant

The BCMI WTP is a Class III chemically-assisted conventional treatment facility with three parallel treatment units, each having a rated capacity of 2,021.7 m^3/day according to the annual report. It is located southwest of the main community area on Provincial Hwy #125 near the McKenzie Island ferry dock. The pre-engineered steel building with approximately 22.1 m x 36.6 m dimensions, includes a laboratory/control room, a treatment room, a diesel generator room, a storage/chemical room, an electrical control room, a workshop, a furnace room, a chlorine gas room, a washroom and an airlock in the upper level and a chemical feed area in the basement.

Each conventional treatment skid consists of a three-chambered flocculation basin, a sedimentation basin equipped with upflow tube settlers and a dual-media filter. Aluminum sulphate is used as a coagulant and sodium carbonate is used to adjust the alkalinity before the

raw water enters the flocculation basin. A polymer is mixed with process water during the flocculation stage to promote floc formation and enhance stability. In the sedimentation tank, flocs settle out as the flow velocity decreases, enabling flocs to separate and sink to the bottom. The supernatant of the sedimentation tanks overflows into effluent launders and is directed to the media filters.

Impurities that are not settled in the sedimentation basin are removed by passing the process water through a dual media filter composed of anthracite and silica sand, supported by a gravel layer. Filter effluent is collected through the under-drain system and directed to the treated water reservoirs. Primary disinfection is achieved by injecting a super-chlorinated solution made of chlorine gas into the filter effluent before it enters the treated water reservoir. Sodium carbonate is used for post-filtration pH adjustment as the coagulation process reduces the pH of the water.

After chlorination and pH adjustment, treated water is directed to a two-cell baffled treated water reservoir. JRCC reviewed the Issued for Tender drawings of the WTP construction project and calculated the useable reservoir volume to be 1,380 m^3 based on the dimensions noted on the plans. Four Peerless model 10LB variable-speed vertical turbine pumps, each having a rated capacity of 20.4 L/s at 59.7 m head, are used to transfer treated water to the Cochenour and McKenzie Island distribution systems. There is room for an additional pump as a future expansion. Four Cochenour/McKenzie Island distribution pumps draw water from two clear wells (two pumps in each clear well).

Two 25 HP Peerless model 12 MB constant-speed vertical turbine pumps, each capable of pumping 46.6 L/s at 28.7 m head, are used to transfer treated water to the Balmertown RPS. Balmertown transfer pumps draw water from the third clear well interconnected with the other two. Two 40 HP constant-speed backwash pumps, each rated for 139 L/s at 20 m head, are used to provide backwash flow to the treatment units. Filters are cleaned periodically by agitating the media using two 15 HP air blowers and backwashing. The process wastewater, consisting of sludge, filter backwash, and filter-to-waste, is directed to a 255 m^3 backwash surge tank. A submersible wastewater pump transfers the liquid into a 122 m^3 backwash thickening tank for settling of sludge. A polymer is injected into the wastewater stream before it enters the backwash thickening tank to condition the sludge. After sludge has settled in the thickening tank, the supernatant is returned to the Bruce Channel by gravity and thickened sludge is periodically removed by pumping into the sanitary sewer system or pumped to a truck for haulage and disposal at a designated disposal site. Submersible wastewater pumps, each having a rated capacity of 28 L/s at 5.7 m head are used to transfer wastewater to the thickening tank and remove thickened sludge.

The BCMI WTP is equipped with programmable logic controllers, completed with a SCADA system and an auto-dialer for process control, monitoring and alarm annunciation. Emergency power is provided by a 300-kW standby diesel generator. Incoming raw water flow, three filtrate turbidity, treated water flows to Balmertown RPS and Cochenour distribution system and free chlorine residual are continuously monitored as critical process parameters.

Balmertown Reservoir Pumping Station

The Balmertown reservoir pumping station provides treated water storage and pumping services to the community of Balmertown. The pre-engineered steel building with approximately 470 m^2 floor area includes an equipment room, a workshop, a generator room, a main SCADA control room with storage, a laboratory, a mechanical room, a main office, a meeting/training/lunch room and a washroom. Two underground water reservoirs and two clear wells have a total volume of 2,238 m^3 according to the NWI Operational Plan. The Tender drawings of the Balmertown RPS construction project were made available to JRCC to calculate the reservoir volumes. Based on the drawings, the two reservoir cells and two clear wells have a total usable volume of 2,201 m^3.

Four 40 HP variable-speed vertical turbine pumps, each having a rated capacity of 43.2 L/s at 55 m head, transfer treated water to the Balmertown distribution system. A chlorination system is available to boost the chlorine residual if needed, but is not used very often as there is adequate free chlorine residual in incoming treated water. The chlorination system uses chlorine gas as the chlorine source and there are two injection points; one upstream of the treated water reservoirs and one in the distribution header.

Turbidity, free chlorine residual and pH are continuously monitored in incoming treated water from the BCMI treatment system and outgoing treated water to the Balmertown distribution system. However, the incoming treated water monitoring instruments were not online during the JRCC site visit (Stakeholder Engagement 2025). A 300 mm diameter pipe conveys treated water to the reservoirs through a valve chamber, where a back-pressure valve is installed to regulate and maintain the upstream pressure and to prevent backflow and pressure surges, ensuring a smooth operation. A sump pump is installed with control and alarm floats inside the valve chamber to prevent flooding. The Balmertown RPS is equipped with programmable logic controllers and a SCADA for process control and monitoring. An auto-dialer is used to notify the operators about critical conditions and equipment malfunctions. A 230-kW standby diesel generator provides emergency power during a power outage.

2.5.1.3.3 Water Distribution System

There are two separate distribution systems in Cochenour/McKenzie Island and Balmertown. The BCMI WTP pumps water to the Cochenour/McKenzie Island distribution systems, while the Balmertown RPS pumps to the Balmertown distribution system.

Cochenour and McKenzie Island Water Distribution System

The Cochenour and McKenzie Island water distribution system consists of 9,200 m of 75 mm to 200 mm diameter watermain piping and contains 33 fire hydrants with associated water mains and isolation valves. Bleeders are installed in the system to maintain chlorine residual. A submerged 150 mm line extends between Cochenour and McKenzie Island through the McKenzie Channel. Fire flows are provided by the four distribution pumps in the BCMI WTP.

Balmertown Water Distribution System

The Balmertown distribution system is a stand-alone system that consists of approximately 8,800 m of watermains and 45 hydrants. The majority of the watermain pipes are 150 mm or 200 mm diameter pipes made of ductile iron, cast iron and asbestos-concrete materials. The Balmertown community fire protection is provided by the four distribution pumps in the Balmertown reservoir pumping station.

2.5.2 Sewage Collection, Treatment, and Disposal

2.5.2.1 Red Lake

2.5.2.1.1 Sewage Collection System

The Red Lake sewage collection system is a combination of gravity and pressure sewer piping. It features seven public lift stations and one private lift station (which services the housing on Opichee Cresent) to convey wastewater to the Red Lake Water Pollution Control Plan (WPCP). The private lift station services a housing complex in Red Lake on Opichee Cresent, and is referred to as the “Opichee” Lift Station by the operators. Lift stations (LS) 2, 4, 5, 6, and the Opichee station pump to LS1. LS7 pumps to LS3. LS1 and LS3 pump directly to the Red Lake WPCP. All lift stations are equipped with Wi-Fi connections to communicate with the SCADA system. The SCADA system monitors and records the lift station water levels, and dial-out alarms are set to notify operators. The lift station control panels include UPS for continuous operation during a power outage. Lift stations LS1, LS2, and LS6 are equipped with standby generators.

Based on the information provided by the municipality, there are 243 manholes in the gravity portion of the collection system.

There have been noted concerns at Lift Station 1 where capacity issues have led to the lift station overflowing (Stakeholder Engagement 2025). A project to upgrade the forcemain leaving LS1 and divert wastewater away from LS1 by rerouting LS4 and LS5 directly to the Red Lake WPCP has undergone engineering design and is awaiting a funding opportunity.

2.5.2.1.2 Sewage Treatment and Disposal

The Red Lake WPCP, which is also identified as the Howey Bay Pollution Control System, is an activated sludge system with two parallel clarifiers. It is located at Mill Road and Young Street in Red Lake. The sewage treatment plant was originally constructed with one aerated sludge unit in 1968 and expanded with a second pump activated sludge system in 1982. The Red Lake WPCP consists of preliminary treatment (screening and grit removal), extended aeration, clarification and chlorination before discharging. The Red Lake WPCP is operated by NWI.

The incoming wastewater from LS1 and LS3 enters a combined grit channel and then splits between the two systems (approximately 70% to the newer pump activated sludge unit, and 30% to the older unit). Three blowers and a silencer are located in the blower building to provide aeration to each activated sludge system. Both systems are combined into two joint chlorination tanks where the effluent is disinfected prior to discharge into Red Lake at Howey Bay via gravity

discharge piping. Chlorine gas is mixed with water to prepare a chlorine solution to disinfect the effluent. Solids are pumped out periodically and sent to a sludge drying bed before being disposed of at the solid waste disposal ground.

According to the Red Lake WPCP Chemical Metering and Storage Building Preliminary Design Report (2020) by R.V. Anderson Associates Ltd. and as-built drawings of Sewage Treatment Plant Expansion Project (1984) prepared by W.L. Wardrop & Associates Ltd., the rated capacity of the Red Lake WPCP is 2,460 m^3/day and the peak instantaneous flow is 7,728 m^3/day (5,648 m^3/day + 2,080 m^3/day by-pass).

2.5.2.2 Madsen

2.5.2.2.1 Sewage Collection System

The Madsen area is serviced by low-pressure sewer connections with a mainline gravity collection system, installed in 1982. There are approximately 1,500 m of 60 mm HDPE low-pressure pipes and 720 m of 200 mm HDPE gravity mainlines installed in the Madsen Collection System. Based on as-built drawings (1982) by Anderson Associates Ltd., Springbank Drive, Madsen Drive, Birch Lane, Beverage Street, Shephard Street, Park Lane, Poplar Road and the southwest portion of Main Street are serviced by 60 mm HDPE low-pressure pipes with 50 mm insulated encasement. Heat trace cables, equipped with a heat sensor and thermostat controls, were installed extending 600 mm from the house foundation to provide freeze protection.

The Main Street and Lake Road lots are serviced by a combination of 60 mm HDPE low-pressure connections and 100 mm HDPE gravity connections. A 200 mm HDPE gravity mainline runs along Main Street collecting wastewater from all low-pressure sewer and gravity connections. The 200 mm gravity mains from Main Street and Lake Road converge at the intersection, directing wastewater to a holding tank located near the Madsen Mine.

There are a total of 17 valve chambers and 7 clean-out chambers in the low-pressure collection system, and 11 manholes in the mainline gravity collection system. Similar to the water distribution system, 300 mm, 375 mm and 450 mm Corrugated Steel Pipe culvert sleeves were installed at road crossings where the cover is not sufficient.

2.5.2.2.2 Sewage Treatment and Disposal

The Madsen Sewage Collection System directs wastewater to a four-compartment holding tank located approximately 120 m north of the Madsen Mine on the east side of the community. The holding tank is made of concrete and covered with wood cladding and it has eight access hatches and eight 100 mm air vents. There are two primary settling chambers with separate 200 mm inlet pipes and has a total capacity of 98 m^3. Wastewater from the collection system flows into the primary settling chambers, where heavier solids settle at the bottom to form a sludge layer, while lighter materials rise to the surface, creating a scum layer. These chambers facilitate the initial separation and digestion of solids, significantly reducing the amount of solids passed into the secondary chamber.

There are two secondary chambers with separate 200 mm transfer pipes and a total capacity of 47 m^3. The partially filtered effluent between the sludge and scum layers in the primary settling chamber flows into the secondary chamber. The secondary settling chamber allows for further settling and digestion. Effluent is then transferred to a wastewater treatment plant in the Madsen Mine located adjacent to the holding tank, where it gets further treated before being discharged. The septic tank solids are pumped out a few times a year by NWI.

The operation of the wastewater treatment plant is the responsibility of the Madsen Mine. Information regarding the system was not provided, thus the capacity, condition, and treatment effectiveness is not known. As per discussions with the Municipality and NWI, there are no known concerns with the treatment system used by the mine.

2.5.2.3 Balmertown

2.5.2.3.1 Sewage Collection System

The Balmertown sewage collection system is primarily a gravity system with 108 manholes and two lift stations which convey wastewater to the Balmertown wastewater treatment system. One lift station is located on Pine Road and the other lift station is located at the wastewater treatment plant to feed the system. The Evolution Mine Site (Balmer Creek Complex) wastewater is directly pumped to a manhole near the plant. It was discussed with the operators that the waste from the mine is residential and not process wastewater.

The Pine Road lift station is equipped with a duplex pumping system, a 17-kW diesel generator and a control panel housed inside a 5.5 m x 3.3 m insulated wood frame building. The main lift station at the wastewater treatment plant has three pumps; two pumps are operating while one pump is left offline as backup.

2.5.2.3.2 Sewage Treatment and Disposal

The Balmertown sewage treatment system is identified as the Balmertown WPCP and was constructed in 1981. It consists of an activated sludge system and is located on the southeast side of Balmertown at the end of 4th Street. The wastewater treatment system includes preliminary treatment (grit removal and screening), extended aeration and clarification. The incoming wastewater is directed to the grit removal channel for preliminary treatment and screening. The process wastewater then flows through an influent distribution flume and enters an aeration tank, where return sludge is mixed with influent and aeration is provided by three 20 HP blowers.

Then, the wastewater is directed to the clarifier where the clear effluent is separated from the top scum layer and bottom settled sludge and transferred to a clear effluent chamber. The top scum layer is transferred to a scum tank and the bottom settled sludge is directed to a sludge holding tank. The WPCP contains a sludge dewatering and compaction system to process excess sludge. Compacted sludge is disposed of as solid waste. There are two pumps inside the clear effluent chamber which supply treated effluent to the outside of the building for watering the grounds. Treated effluent then enters a baffled chlorine contact chamber by gravity. During the JRCC site visit, the operators noted that the chlorine contact chamber is

bypassed currently and effluent flows to a manhole and then to an outfall in Balmer Creek via a 600 mm gravity pipe (Stakeholder Engagement 2025). The disinfection is bypassed because it is not required due to the effluent flow path.

A 30-kW diesel generator provides emergency power to the Balmertown WPCP. A 15.4 m x 10 m two-level control building includes a chlorine room, an office and laboratory, a washroom, a locker room, a blower room and an equipment room. According to the information provided by the operators, the Balmertown WPCP is designed for a rated capacity of 1,224 m^3/day and a peak instantaneous flow of 3,715 m^3/day.

2.5.2.4 Cochenour and McKenzie Island

2.5.2.4.1 Sewage Collection System

Cochenour and McKenzie Island are serviced by a combination of low-pressure and gravity sewer collection. McKenzie Island is completely serviced by a low-pressure collection system and wastewater is conveyed to a lift station near the McKenzie Island ferry dock in Cochenour. Cochenour is primarily serviced by gravity collection, except the north end of Cochenour Crescent is serviced by low-pressure sewer. Gravity collection system directs collected wastewater either to the lift station near the ferry dock or directly to the forcemain running from the lift station to the Cochenour lagoon. The Red Lake Airport is separately serviced by a gravity collection system.

A lift station located within the airport premises pumps the collected wastewater directly to the forcemain. Based on the information provided by the municipality, the forcemain is a 200 mm polyethylene (PE) pipe. There are a total of 62 manholes in Cochenour and 10 manholes within the Red Lake airport premises.

The main lift station near the Cochenour ferry dock is equipped with two pumps, two pump access hatches, a removable bar screen with an access hatch, a ladder access hatch, an emergency pump out connection and a 200 mm vent pipe. A 70-kW generator is housed inside a 4.7 m x 5.8 m building to provide emergency power during a power outage.

2.5.2.4.2 Sewage Treatment and Disposal

The Cochenour and McKenzie Island wastewater is treated by a facultative lagoon located approximately 800 m west of Cochenour directly north of the Red Lake Airport. The Cochenour lagoon is a two-cell lagoon built in 1985. The incoming wastewater enters a distribution chamber where the forcemain flow is split into three pipes: one goes to cell #1, one goes to cell #2 and the third pipe is capped for a future cell #3. Four gate valves were installed inside the chamber to control the total incoming flow, flow to cell #1, flow to cell #2 and future flow to future cell #3.

Based on the as-built drawings prepared by W.L. Wardrop & Associates Ltd. (1995), the two cells were constructed with two different floor elevations based on the sloped existing grade. Cell #2 perimeter dikes, intercell dike and cell #1 perimeter dikes, except the east dike, were constructed with a 4:1 inside slope using clay material. Both cells have approximately 1.8 m usable depth with 0.7 m freeboard. According to the Alternative Infrastructure Study conducted

by Engineering Northwest Ltd. In 2012, the Cochenour lagoon has a storage capacity of 92,333 m^3. The as-built drawings do not provide enough dimensions to verify the storage capacity. The storage capacity noted in the study was reviewed by measuring surface area of the liquid in both cells using areal imagery. The storage capacity of 92,333 m^3 is a realistic volume based on the liquid surface area and the dike slopes noted on the as-built plans.

The lagoon effluent is collected into an effluent chamber located on the intercell berm at the north end. Two 300 mm diameter pipes from each cell, one at a low level and one at a high level, transfer effluent to the effluent chamber. One 300 mm diameter overflow pipe from each cell is also directed to the effluent chamber. A 300 mm diameter discharge pipe directs the effluent to a gravity conveyance system with four manholes and discharges to a ditch near the Red Lake airport.

2.5.3 Solid Waste Management

The Municipality of Red Lake owns and operates a solid waste management facility, located on Hwy #125, between Red Lake and Balmertown, approximately 2 km south of Balmertown. The facility is approximately 9.2 hectares (ha) in size with a total property area of approximately 24.3 ha. It was originally used as a waste disposal site (the Balmertown Waste Disposal Site), under Environmental Compliance Approval No. A600903. The Balmertown Waste Disposal Site reached its capacity of 200,000 m^3 and was capped and closed in 2017. A waste disposal expansion area with 40,000 m^3 capacity and a waste transfer station were established to dispose of the low-leachate generating non-divertible waste and to temporarily store other accepted divertible waste streams.

The low-leachate generating waste material currently approved for disposal in the expansion area includes construction and demolition waste (including asbestos), wood ash from on-site burning, plastics (HDPE pipes, PVC, tarps), rubber and approved contaminated soil and construction material from within the boundaries of the municipality. The waste transfer station accepts a wide range of waste streams, including:

- Regular household and commercial waste;
- Co-mingled recyclable packaging (e.g., paper, cardboard, plastics and metal);
- Scrap metal;
- Used tires;
- Used batteries (household and commercial);
- Household hazardous waste (e.g. used oil, oil filters, CFL lightbulbs, paint, aerosol cans and propane tanks);
- Appliances;
- Electronic waste; and
- Clean wood and yard waste.

Non-divertible waste that does not meet the low-leachate requirements, is currently transferred to the Ear Falls Waste Disposal Site by the Municipality or a local contractor, Chukuni Sanitation. Co-mingled recyclables and scrap metal are transferred to respective facilities in Winnipeg by municipal staff. The Municipality is working with various Producer Responsible Organizations to transfer other accepted divertible material such as household hazardous waste, used tires, electronic waste and used batteries. The Municipality operates a curbside collection program for waste and recycling on a weekly and bi-weekly basis, respectively.

As a separate project, the Municipality of Red Lake has solicited proposals for the provision of a waste management solution in the form of a new landfill that would service both Red Lake and the Pikangikum First Nation. The goal of the project is to develop a regional landfill site capable of accepting an annual waste volume of 22,000 m^3/year, over a period of 25-30 years. This new site is expected to service the long-term needs of the Municipality and nearby communities.

3.0 PLANNING FOR GROWTH

This section builds on the situational analysis to identify how the Municipality can proactively plan for anticipated growth. It outlines current service levels, assesses capacity to accommodate population and employment increases, and highlights infrastructure and land development needs. The analysis is informed by jurisdictional scans, baseline service assessments, land-based needs projections, and input from stakeholders, including through engagement, workshops, interviews, and an in-community assessment. Together, these components provide a forward-looking framework to guide investment priorities and community development strategies.

3.1 MUNICIPAL SERVICE BASELINE AND GAP ANALYSIS

This section provides a comprehensive assessment of services within the Municipality by establishing a baseline and identifying service gaps. It begins with a jurisdictional scan (**Section 3.1.1**), comparing the Municipality with the chosen peer communities—Hearst, Sioux Lookout, and Dryden (**Figure 3.1-1**)—to highlight regional service models, infrastructure, and best practices. **Section 3.1.2** presents the Municipality's current service baseline, including available programs, facilities, and providers across a range of sectors. **Section 3.1.3** builds on this analysis by identifying service gaps and opportunities for enhancement, drawing on input from community engagement and benchmarking to inform strategic recommendations.

3.1.1 Service Baseline Jurisdictional Scan

To begin the service baseline assessment, a jurisdictional scan was conducted to compare the Municipality with three other Northern Ontario communities: Hearst, Sioux Lookout, and Dryden. These municipalities were chosen due to their similar geographical isolation, population sizes, resource-based economies, and their role as regional service hubs for surrounding areas.

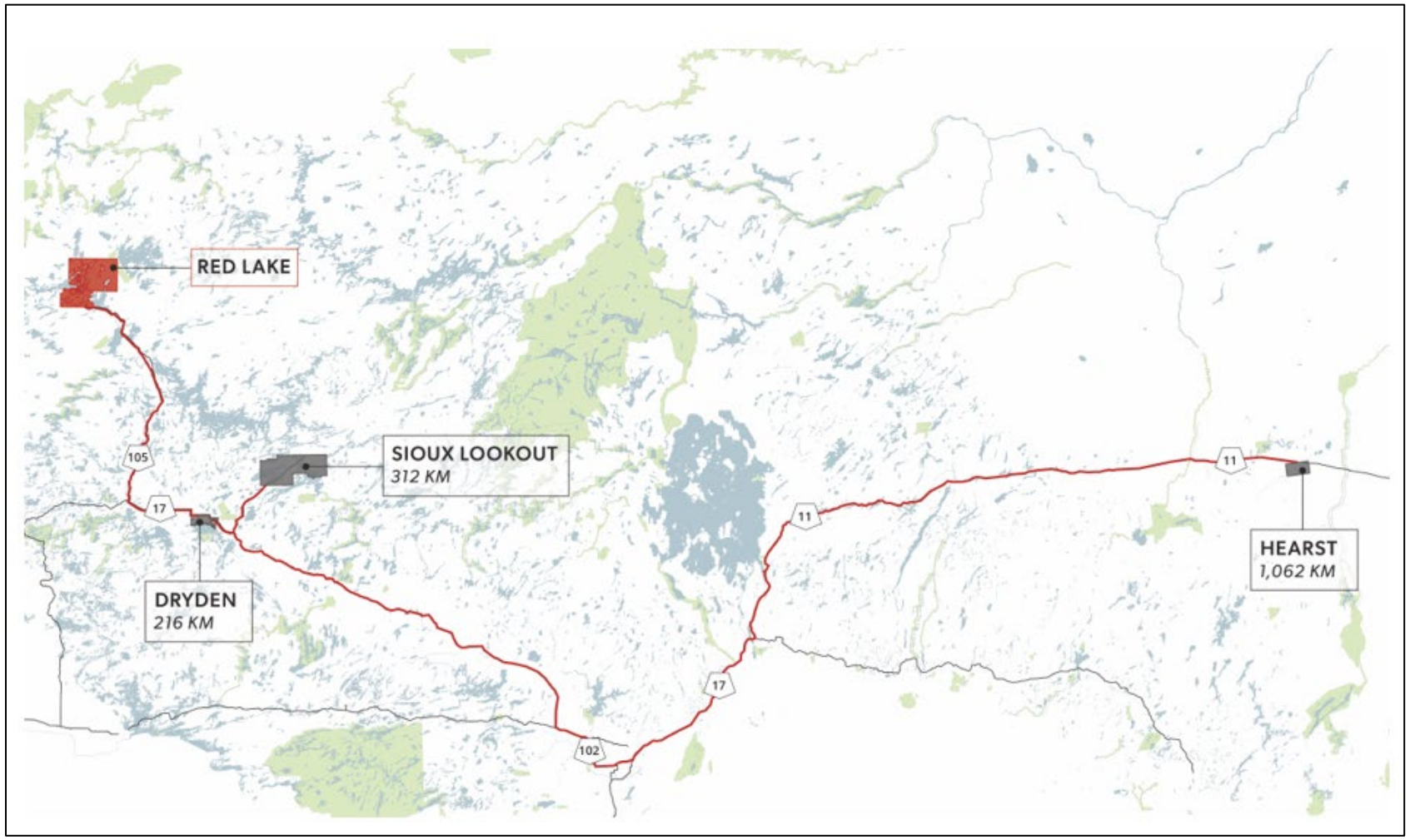
- **Hearst**: A population of 4,690 residents, located 1,062 km southeast of Red Lake. The economy is focused on forestry (logging, lumber, plywood manufacturing, biomass).
- **Sioux Lookout**: A population of 6,233 residents, located 312 km southeast of Red Lake. The economy is centred on forestry, air transportation, and tourism.
- **Dryden**: The largest of the comparable communities with a population of 7,224 residents and located 216 km southeast of Red Lake. The economy is centred on agriculture, mining, healthcare, and tourism.

The jurisdictional scan compared the following (see **Appendix F** for additional details):

- Demographic and population trends;
- Mining and road development projects;
- Municipal facilities and assets;
- Major employers;
- Commercial products and services that the Municipality provides to outlying areas;
- Transportation and regional accessibility; and
- Best practices in community and economic development.

The purpose of the comparison was to help better understand and evaluate where the Municipality stands today, and what opportunities exist to enhance it's future capacity and service delivery. In general, the Municipality compared well across all categories, providing similar offerings to the other jurisdictions despite having the smallest population of the four. In particular, the amount of recreational amenities and facilities in the Municipality stood out compared to its peers. It should be noted that this exercise did not include a deep examination into the size and capacity of existing assets or facilities. For example, while it is noted that all communities have a hospital and at least one medical clinic, the capacity of each hospital for its population was not analyzed. The capacity of the Municipality's services and facilities are examined further by the Municipal Services Assessment and Gap Analysis that follow.

Figure 3.1-1: Comparison Communities for the Service Baseline and Gap Analysis Jurisdictional Scan



3.1.2 Municipal Service Baseline

Following the jurisdictional scan and comparative analysis with Hearst, Sioux Lookout, and Dryden, a Municipal service baseline workshop was held on April 30, 2025, with Municipality of Red Lake administration and stakeholders. The purpose of the workshop was to share existing findings, gain insight from stakeholders on the availability and capacity of existing services, determine suitable levels of services and identify gaps, as well as discuss priorities for future investments.

The below table (**Table 3.1-1**) summarizes the key output of the workshop and the Municipal service assessment, which examined over 30 services that were previously identified as priorities by the CCDC and the Municipality. The assessment was designed to clarify Municipal responsibilities, review the level of service currently being provided, and identify any key issues with each service that was used to inform the gap analysis.

Table 3.1-1: Municipal Services Assessment

Service	Authority Having Jurisdiction	Explanation	Issues and Observations
Airport	Municipality of Red Lake	The Red Lake Airport is managed on behalf of the Municipality through a contract with Thunder Bay Airport Services. Oversight of the contract is the responsibility of the CAO of Red Lake.	**Issues:** • The airport is meeting current demands, however, it will need to plan strategically to meet future demands for expansion, as its current capacity limits its ability to accommodate aviation-related businesses that wish to operate in the Municipality. • Flight operations occasionally exceed capacity, leading to congestion and delays at times. Considerations for expansion is needed (and an Airside subdivision is under design) to limit loss of business to competitors with more advanced infrastructure and greater capacity (e.g., St. Andrews Airport in Manitoba and Pickle Lake Airport in Ontario). • Several pieces of equipment have surpassed their expected service life and need replacing. **Observations:** • While staffing is not an immediate concern, there are growing worries about future challenges, as the mining sector's higher wages may make it harder to attract skilled labour down the line (this is a concern throughout the Community and not just the Airport). • The Airport is currently undergoing the following projects: o Sewer and water extensions to service existing customers and businesses (funding from Northern Ontario Heritage Fund Corporation [NOHFC]). o Design and planning of a new industrial subdivision with airside access (funding from the Federal Economic Development Agency for Northern Ontario). o Runway lighting upgrades to LED (funding from Transport Canada Airports Capital Assistance Program). • All projects depend on the availability of external funding. The airport must compete nationally, provincially, and locally. Future funding will be hindered without an Airport Master Plan or Strategic Plan in place.
Ambulance	Kenora District Services Board (KDSB)	The KDSB has been made aware of the possible need for expanded services for the Municipality.	**Issues:** • The current facility in Red Lake has reached full capacity. There is a need to explore other options for a new base of operations. • The ambulance is facing staffing shortages due to the provincial and national healthcare worker shortages. Several positions in Red Lake remain unfilled. **Observations:** • Emergency Medical Services call volumes are increasing annually. They are anticipating a further rise in ambulance calls following the connection of Pikangikum First Nation to the all-season Berens River Bridge and Roads Project. • The KDSB is working to provide a diversity of housing options for paramedics using a mixed-rent model, including market and subsidized housing. • Provincial and service efforts have taken steps to increase staffing levels although some initiatives will not be fully realized until Spring 2026 or 2027.

Service	Authority Having Jurisdiction	Explanation	Issues and Observations
Animal control and by-law enforcement	Municipality of Red Lake	By-law services are provided across the Municipality. The By-law Enforcement Office is situated at the Municipal office in Balmertown, where the dog pound is also located.	**Issues or observations:** • A new by-law officer was hired in early 2025. The department is anticipated to be in good shape once they are fully settled however there is consideration of hiring a part time By-law enforcement officer to provide additional assistance. • There are currently no concerns regarding capacity.
Arts and culture	Municipality of Red Lake and various organizations	A collaborative effort by several organizations (e.g., Wilderness Entertainment Series, Patricia Players, and Red Lake Arts Council) to deliver arts and culture programming within the Municipality.	**Issues:** • Many arts and culture organizations rely heavily on volunteers or local industries for funding. Several initiatives, such as the local Arts Council and Family Entertainment Series, have disbanded due to lack of volunteer capacity. • The Municipality does not have a dedicated, purpose-built facility for arts and cultural programming. This limits opportunities for performance, exhibition, storage, and creation, and poses logistical challenges for local groups. • There is no dedicated arts and culture coordinator in the community. Many promising ideas remain unrealized. • The prevalence of fly-in fly-out work schedules in the mining sector has led to reduced community engagement in arts and cultural events, as residents working 12-hour shifts have limited time or energy to participate. • The Municipality has repeatedly applied for funding for a new Regional Events Arts and Cultural Hub, with a performance space and a replacement ice arena, but has been unsuccessful in securing support. • There is a need to update the 2011 Community Culture Plan. **Observations:** • There is strong local talent across multiple disciplines, including visual art, dance, music, and theatre. Artists such as Patrick Hunter, Cheryl Wilson-Smith, and Storm Angeconeb have brought national attention to the region. • Several organizations continue to offer valuable arts and culture programming, including the Patricia Players theatre group, the Red Lake Wilderness Entertainment Series, and the Red Lake Indian Friendship Centre. • Informal and collaborative events, such as community coffee houses and winter festivals, remain popular and benefit from cross-organizational cooperation and support from groups like the CCDC. • The Red Lake area is home to rich Indigenous and Métis cultural traditions, including being the birthplace of the Woodland Art style (first practiced by Norval Morisseau). The Friendship Centre offers cultural programming and workshops that are accessible to residents. • Recent immigration to the region has introduced new cultural perspectives, with growing interest in opportunities for newcomers to share their traditions. A coordinator could help bridge connections between longstanding and emerging cultural groups.

Service	Authority Having Jurisdiction	Explanation	Issues and Observations
Building permits and inspections	Municipality of Red Lake	The Municipality uses CloudPermit, an online platform that allows residents and contractors to apply for building permits, monitor application status, and request inspections remotely. Building inspections are delivered by RSM Building Consultants Inc.	**Issues or observations:** • The Municipality is able to manage service expansion to accommodate future growth with the systems that are currently in place. • In-person building permit applications may be submitted at the Municipal office. • RSM Building Consultants Inc. provides Chief Building Official services, plan reviews, inspections, and other functions related to the Building Code Act. Their services are highly regarded by numerous municipalities.
Childcare	Kenora District Services Board	In 2021, the KDSB assumed responsibility for the operations of the Red Lake Early Learning Centre, St. John's Early Learning Centre, Balmertown Early Learning Centre, and the EarlyON programs.	**Issues:** • The Municipality is experiencing a shortage of Early Childhood Educators, making it difficult for the KDSB to attract qualified staff. This shortage is impacting the broader workforce, as employers across various sectors face challenges in recruiting or retaining employees due to limited access to childcare. • A significant challenge relates to the hours during which childcare services are available. Many residents work rotational shifts, including evenings and weekends, but current childcare options do not accommodate these non-standard hours. • Due to the staff shortages, daycare services are often cancelled (at least once a week) or cut short, and parents are notified by email. **Observations:** • Daycare services, including before and after school programs, are available at three local schools. • One KDSB site offers extended hours, and KDSB are willing to extend other locations if the need is there. • While there is physical space and licensing approval to accommodate more children, staffing shortages prevent expanding capacity. • Some employers, such as the Municipality, offer flexible work hours to help employees manage childcare needs.
Cemetery services	Municipality of Red Lake	The Municipality of Red Lake operates two cemeteries: the Red Lake Cemetery in Red Lake and the Woodland Cemetery in Balmertown.	**Issues:** • Cemetery space is projected to run out within the next 15 years. **Observations:** • The Red Lake Cemetery recently underwent expansion. The columbarium option is highly popular, leading to the purchase of a second columbarium for Red Lake. There is potential for purchasing one for Balmertown.
First Nations cemetery services	First Nations	There are four burying grounds located within the Municipality of Red Lake.	No issues or observations identified.
Economic development	Municipality of Red Lake		**Issues:** • Until very recently, the Municipality had no Economic Development Officer.

Service	Authority Having Jurisdiction	Explanation	Issues and Observations
			• Growth is hindered by limited availability of serviceable land for new businesses, staff shortages, and insufficient housing and childcare for prospective employees. **Observations:** • The Municipality recently hired a new Economic Development Officer. • The CCDC plays a vital role in supporting Red Lake's economic development. • The NOHFC has committed funding to the Municipality, including: ○ $273,075 for updating existing exhibits and developing two new exhibits at the Red Lake Regional Heritage Centre. ○ $38,797 for constructing an off-leash dog park. ○ $7,875 to support the creation of an outdoor Fire Circle Gathering Area at the Red Lake Margaret Cochenour Memorial Hospital.
Educational Services	Keewatin Patricia District School Board	○ Red Lake High School ○ Red Lake Madsen Public School ○ Golden Learning Centre Public School	**Issues:** • Budget challenges resulting from a decrease in per-pupil funding. • The schools experience low enrollment, with approximately 50% of student spaces filled. • There are challenges with staff recruitment and retention. **Observations:** • New partnership with the Ontario Provincial Police. • Due to low enrollment, the school board has considering merging schools. However, plans may change after seeing the population projections provided in the CCS.
	Kenora Catholic District School Board	St. John School	**Issues or observations:** • Shares their space with Étoiles-du-Nord Catholic School.
	Conseil Scolaire De District Catholique des Aurores Boreales	Étoiles-du-Nord Catholic School	**Issues:** • Staff face high transportation costs when traveling to the Municipality from nearby communities, such as Kenora and Dryden. • There are ongoing challenges in recruiting and retaining education staff. **Observations:** • Shares their space with St. John School.
	Red Lake District Adult Learning Centre	Offers a wide variety of education; basic courses geared towards any adult wanting to upgrade their education, and courses geared toward adults with disabilities and anyone looking to get their high school diploma.	**Issues:** • The Red Lake Adult Learning Centre continues to face staffing challenges, particularly with recruiting and retaining education staff. **Observations:** • The Red Lake Adult Learning Centre recently underwent renovations and officially reopened on April 1st, 2025. • There is an increasing interest among students in upgrading their skills to pursue careers in the mining industry.
	Confederation College	Programs offered include full-time postsecondary diploma programs, full-time and part-time certificate programs,	**Issues or observations:** • In-person campus is located in Red Lake.

Service	Authority Having Jurisdiction	Explanation	Issues and Observations
		continuing education courses, general interest classes, and various other training opportunities.	
Electric utilities	Hydro One Networks Inc.		**Issues:** • Expanded services are needed to support community growth and accommodate the planned lithium mine north of Pikangikum. **Observations:** • Hydro One Networks and the Independent Electricity System Operator are planning to expand power services throughout Northern Ontario. • The Municipality and Evolution Mining have been contacted by a solar energy company about a potential 100-acre solar energy project in the Municipality.
Ferry services	Municipality of Red Lake	The ferry operates seasonally during the warmer months, providing service between Cochenour and McKenzie Island.	**Issues:** • Occasional mechanical failures cause temporary service interruptions. The ferry experiences delays because maintenance is challenging in the Municipality's remote location, and parts can take weeks to arrive. **Observations:** • During periods when the ferry is out of service due to the freezing of the Bruce Channel, the Municipality maintains an ice road to ensure continued access. • This is a well-received and appreciated service for the McKenzie Island community offered from mid-May to freeze up. • Preventative maintenance is in place, and the vessel is generally in good condition. Engine and transmission overhauls are required every few years.
Fire services	Municipality of Red Lake	There are four fire halls located in the communities of Red Lake, Balmertown, Cochenour, and McKenzie Island.	**Issues:** • The nearest training centre is in Thunder Bay, with course costs of approximately $2,800 per firefighter. • Many local workers, especially in the mining sector, are fly-in fly-out, impacting volunteer availability and consistency. The transient workforce makes it challenging to retain trained personnel long-term. • There is a need to plan and budget for a new vehicle to support ongoing operations. **Observations:** • Staffing includes one full-time Fire Chief and 36 volunteer firefighters; the ideal volunteer force size is 52 members. The department is actively recruiting volunteer firefighters and undertaking a review of training options to support the service. • Certification as a firefighter requires completing over 205 hours of training. • The Madsen Station was closed about five years ago. • A Red Lake Fire Rescue Services Report was completed in 2023.
Garbage and recycling collection	Municipality of Red Lake	Biweekly curbside pickup in residential areas is provided through a contracted service with Chukuni Sanitation and is available across all	**Issues or observations:** • The Red Lake Landfill has reached full capacity and now operates as a transfer station, with waste transported to Ear Falls. • The Municipality is currently collaborating with Pikangikum First Nation to identify a site for a new regional landfill. • Biohazard waste is collected by specialized vehicles upon request.

Service	Authority Having Jurisdiction	Explanation	Issues and Observations
		communities within the Municipality.	• Composting services are not offered due to strict provincial and federal regulations.
Heritage preservation	Municipality of Red Lake	The Red Lake Regional Heritage Centre serves as a community central hub and museum. Renovations began in 2019, and the facility reopened in 2023.	**Issues:** • The Ministry of Natural Resources fire base is situated on heritage-sensitive lands due to Indigenous findings. It will be relocated in the future, with Infrastructure Ontario currently exploring alternative properties around the Municipality. **Observations:** • The Municipality has developed a Community Improvement Plan that prioritizes heritage preservation for the museum. • The NOHFC awarded a $273,075 grant in 2022 to the Municipality for updating existing exhibits and developing two new exhibits at the Heritage Centre.
Library services	Municipality of Red Lake	There is one library in Red Lake, and one in Balmertown. They are both managed by a library board.	**Issues or observations:** • Discussions are ongoing regarding the potential merger of the two libraries. • The libraries offer a variety of programming and has an online catalogue for searching available books at both locations.
Long-term care and senior housing	Kenora District Services Board and District Kenora Home for the Aged	The KDSB oversees senior housing in the Municipality, while the District Kenora Home for the Aged manages Northwood Lodge, located within the community of Red Lake.	**Issues:** • Northwood Lodge is consistently full. There is an ongoing need for senior housing in the Municipality to support aging in place. **Observations:** • A 10-unit senior housing development is underway in the former Norseman Hotel, with completion expected by October 2025. • Efforts continue to develop alternative levels of care and rehabilitation pathways aimed at helping seniors return home rather than entering long-term care. • While the Municipality currently has a younger population, demand for senior housing is projected to increase, highlighting the need for proactive planning.
Local road maintenance	Municipality of Red Lake		**Issues:** • The cost of contracting road reconstruction continues to rise, driven by the increasing prices of materials like asphalt and concrete. **Observations:** • A winter ice road to McKenzie Island from Cochenour is maintained, subject to ice thickness protocols. • The Asset Management Plan, created in 2022, is currently being updated. Road rehabilitation and reconstruction remain a priority through asset management and an annual review of road infrastructure. • Significant infrastructure investments have been made by the Municipality in recent years, and the Municipality has the capacity to accommodate and adapt to future growth.
Natural gas	Enbridge Gas Inc.		**Issues or observations:** • Several neighborhoods in the Municipality lack access to natural gas, and there is a desire to extend it to other areas of Red Lake. Enbridge has requested financial support from the Municipality for this expansion, though the Municipality faces financial challenges in providing service to all communities. • The current Union Gas pipeline in Red Lake has a limited natural gas supply.

Service	Authority Having Jurisdiction	Explanation	Issues and Observations
			• Staff from the PAK Lithium Project noted that they are already facing power supply issues.
Parks and Recreation	Municipality of Red Lake		**Issues or observations** • Walkability and trail development are difficult due to high costs and fragmented land ownership across communities. • The arena is not centrally located and is approaching the end of its lifespan. Netting has been installed from the roof to prevent paint from falling onto the ice. Provincial and federal funding is necessary for the construction of a new arena and/or arena/event centre.
Police services (Ontario Provincial Police)	Ministry of Solicitor General	The Red Lake detachment is responsible for overseeing Pikangikum First Nation.	**Issues or observations:** • The planned relocation of the detachment will place it in a new building on Hughes Crescent. The land is in the process of being purchased from the Municipality.
Property assessment	Municipal Property Assessment Corporation	All Municipal communities are served; no physical presence in the Municipality	No issues or observations identified.
Provincial offences administration	Ministry of the Solicitor General	All Municipal communities are served; no physical presence in the Municipality	No issues or observations identified.
Public Health: Red Lake Hospital	Northwestern Health Unit and Ministry of Health		**Issues:** • The hospital discontinued surgical services approximately 30 years ago and currently does not offer services like childbirth, dialysis, psychiatric care, or CT imaging. • Recruiting new staff and filling part-time roles or maternity leaves has been a challenge. Staff returning from maternity leave struggle to find daycare, which hinders their ability to return to work. • The hospital has been operating under a financial deficit for the past few years. • There is no land currently available for expansion. • There is a lack of storage space if additional beds were to be purchased for the hospital. **Observations:** • Physician recruitment is ongoing, with the Clinic currently staffed by 3.5 doctors. NOHFC internships are being utilized by the hospital. • The Clinic operates at an average of 60% patient capacity, though demand for emergency services is rising. • Diagnostic and testing services are a primary focus, with frequent patient referrals to Thunder Bay, Dryden, Kenora, and Winnipeg for further care. • A new Facility Master Plan is being planned for the fall, guided by insights from the Community Capacity Study. • The hospital is launching a Safe Beds program, a 30-day transitional housing initiative, with staff being hired and the program expected to launch this year.

Service	Authority Having Jurisdiction	Explanation	Issues and Observations
Public Health: Red Lake Clinic	Municipality of Red Lake	The building is owned by the Municipality and operated by Red Lake Medical Associates.	**Issues or observations:** • The Clinic would benefit from an upgrade to its IT system.
Public transit	Not applicable.	As of June 2025, a Rural Transit Study is underway. Expected completion is December 2025	**Issues or observations:** • There is currently no public transit system in the Municipality. • Citizens have raised concerns that the absence of public transportation, especially for seniors and youth, greatly limits their ability to access services across the Municipality.
Sidewalks	Municipality of Red Lake	Sidewalks are available in three communities within the Municipality.	**Issues or observations:** • Sidewalk planning and improvements are part of the Asset Management Plan. • Upgrades and repairs are needed throughout the Community
Snow removal and plowing	Municipality of Red Lake		**Issues:** • Private snow removal companies are struggling due to high insurance costs, leading to a decline in service providers. • Equipment malfunctions are a challenge, with mechanics often having to travel from Winnipeg, leading to delays due to the availability of parts and labour. **Observations:** • The Municipality aims to clear all roadways of snow within the timeframes set by the Ontario Provincial Minimum Maintenance Standards. • Private snow removal services are also provided throughout the Municipality.
Red Lake Area Emergency and Homeless Shelter for Adults	Kenora District Services Board		**Issues:** • Transportation to the Red Lake Emergency Homeless Shelter for Adults is not accessible for individuals outside of the Municipality. • There is a shortage of mental health and addiction services, forcing some residents to leave the Municipality to access rehabilitation programs. **Observations:** • The Shelter for Adults has a partnership with the local high school for co-op students and operates a community-funded food security program, which served 7,053 meals in 2024.
Social housing	Kenora District Services Board		**Issues:** • There is a lack of transitional or addiction-related housing. **Observations:** • The KDSB manages the housing waitlist and offers affordable and supportive housing programs in the Municipality.
Storm sewers	Municipality of Red Lake		**Issues or observations:** • For sewer and storm sewer problems residents contact Public Works. • While the systems are generally functional, some of the systems (culverts) tend to freeze during the winter and require maintenance in the spring.
Tax collection	Municipality of Red Lake		**Issues or observations:** • Residents can pay their taxes either in person at the Municipal office or online.
Telecomm.	Rogers, Thunder Bay Telecomm., and Bell Canada		**Issues:** • Repeater towers have been known to fail during power outages.

Service	Authority Having Jurisdiction	Explanation	Issues and Observations
			• Some Municipal communities still lack full coverage, often relying on satellite services. There are several dead zones throughout the Municipality. **Observations:** • The Municipality is serviced by a telephone switch, with long-distance and network services provided via fiber optic cable by Bell Canada. • Expansion plans for these services are currently unknown.
Tourism	No specific authority	Various privately owned businesses promote and support tourism across the Municipality.	**Issues:** • There can be insufficient accommodations during peak tourism seasons. **Observations:** • Various privately owned businesses and the Municipality actively promote tourism in the region. • The CCDC is tasked with supporting tourism efforts. • The Highway 105 Tourism Marketing Board markets the Municipality, Ear Falls, and the surrounding areas.
Water and sewage	Municipality of Red Lake	Northern Waterworks Inc. is contracted to be the Operating Authority	**Issues:** • The Municipality is seeking over $4 million in funding to replace the force main (in concert with road and drainage upgrades) in Red Lake. This is a crucial upgrade needed to support community growth and housing development. **Observations:** • The existing water and sewer infrastructure is generally in fair to good condition.
Zoning and land use	Municipality of Red Lake	All Municipal communities receive land use planning services.	**Issues or observations:** • The Municipality employs an in-house junior planner/coordinator who is assisted by external planning consulting services. • The Municipality is in the process of commencing a year-long project of updating the Municipality of Red Lake Official Plan and Zoning By-law

Source: Stakeholder Engagement 2025; Stakeholder Interview Program 2025.

3.1.3 Municipal Services Gap Analysis

The following section, informed by the jurisdictional service baseline, municipal services baseline assessment, interviews and workshops, and professional judgement, describes the municipal service baseline gaps identified for residential development, economic and workforce development, the infrastructure and public realm, community and social services, health and wellness, and tourism and culture.

3.1.3.1 Residential Development Gaps

Residential Development Gap 1: Limited Supply of Housing

- There is a shortage of available housing (particularly attainable housing) across the Municipality. This makes it difficult to attract and retain workers, particularly immigrants and individuals relocating from outside the Municipality.
- Employers across various sectors report ongoing challenges with recruitment, noting that qualified candidates frequently decline job offers due to the limited housing options available locally (Stakeholder Engagement 2025).
- More housing is urgently needed to support the projected population growth.
- Current serviced vacant residential lands are not being developed. Partially serviced or unserviced vacant lands need investment to become development-ready.

Residential Development Gap 2: Housing Diversity

- Over 80% of total private dwellings occupied by usual residents (where a person or group permanently resides) are single-detached homes (1,385 dwellings or 81.5%). There are 160 dwelling units in apartments under five (5) storeys (9.4%). Another 115 dwelling units (8.3%) are in rowhouses (65), semi-detached dwellings (25), and duplexes (25). Finally, 40 units are considered movable dwellings (Statistics Canada 2023a).
- A greater diversity of housing supply is needed to support future growth, which may also help accelerate the delivery of new dwelling units.
- 75% of dwelling units are owner-occupied while 25% are rented (Statistics Canada 2023a). There is limited data on the rental vacancy rate in the Municipality, however it has been suggested that the rental market is tightening, leading to decreased vacancy and higher average rents (Stakeholder Engagement 2025).
- There is a limited supply of supportive or assisted living arrangements for seniors and individuals with disabilities. While the current average age in the Municipality is relatively low (39), as the population ages, demand for senior housing and long-term care facilities is expected to grow to allow seniors to remain in the Community.
- Temporary and seasonal accommodations are insufficient to meet the needs of contract or short-term workers (Stakeholder Engagement 2025).

3.1.3.2 Economic and Workforce Development Gaps

Economic and Workforce Development Gap 1: Commercial Development

- There is limited retail and food and beverage options across the Municipality.
- Commercial services in the Municipality are limited, and are particularly concentrated in the community of Red Lake, making access challenging for residents of the other communities.
- The downtown and waterfront requires revitalization.

Economic and Workforce Development Gap 2: Workforce Attraction and Retention

- Recent changes to the Temporary Foreign Worker Program, along with ongoing competition for employment from the mining sector, has strained the local workforce (Stakeholder Engagement 2025).
- The Municipality faces ongoing challenges attracting professionals in healthcare, education, trades, and technical sectors (Stakeholder Engagement 2025).
- Limited housing availability, childcare, and the area's general remoteness poses considerable barriers to recruiting and retaining workers (Stakeholder Engagement 2025).

Economic and Workforce Development Gap 3: Economic Diversification

- The local economy is heavily reliant on the mining sector, leaving residents outside of this industry with limited high-wage employment options (Stakeholder Engagement 2025).
- Economic instability in other sectors has resulted in local business losses and missed opportunities for growth (Stakeholder Engagement 2025).
- Greater diversification is needed to support a more resilient and inclusive local economy.

3.1.3.3 Infrastructure and Public Realm Gaps

Infrastructure and Public Realm Gap 1: Infrastructure Capacity and Expansion

- Municipal infrastructure, such as water and wastewater services, are available in some areas, but expansion is needed to support growth on developable lands in parts of the Municipality (specifically the newly acquired lands intended for housing development at 'Harry's Corners').
- The Municipality is continuing to explore policy tools and funding mechanisms (e.g., grants, partnerships) to support infrastructure expansion.

Infrastructure and Public Realm Gap 2: Funding Challenges

- Significant infrastructure development and upgrades rely on securing provincial and federal funding.

Infrastructure and Public Realm Gap 3: Construction Costs

- The Municipality's remote location and limited local skilled workforce increase construction costs due to transporting workers and equipment to the Municipality (Stakeholder Engagement 2025).
- The limited local availability of construction materials can lead to delivery delays and increased shipping costs from other regions. A focus on lead time is typical when planning for a construction project (Stakeholder Engagement 2025).
- The high cost of construction is not only unique to the Municipality, but is common across the entire Kenora district, which faces some of the highest constructions costs in Ontario.
- High construction costs likely lead to delays in the development of vacant serviceable lands.

Infrastructure and Public Realm Gap 4: Public Realm

- Although the Municipality has a strong provision of recreational and cultural facilities, including the centrally located Phillip Thomas Vinet Centennial Park, the connectivity to and between these spaces can be underdeveloped depending on the location.
- Connections to major attractions including Centennial Park and the waterfront are largely car-dependent and are accessible primarily via wide, fast-moving roads. These corridors lack the comfort, character, and safety cues needed to encourage walking/cycling and provide identity to the Municipality.
- Aside from the primary shopping areas on Howey Street, streetscapes are often unshaded, with minimal separation between pedestrians and traffic, and some of the aging sidewalk infrastructure is narrow with inconsistencies across the Municipality. These conditions diminish the community's ability to enjoy its own assets without a vehicle and weaken the relationship between recreation and everyday life.

3.1.3.4 Community and Social Services Gaps

Community and Social Services Gap 1: Operational Sustainability

- Staffing shortages across all sectors are limiting capacity to provide community and social services (Stakeholder Engagement 2025). Additional labour will be required to support expansion of services that comes with projected population growth.
- Many services, including fire protection and cultural programming, rely heavily on volunteers. This dependence presents a risk to service continuity if volunteers are unable to continue (Stakeholder Engagement 2025).

Community and Social Services Gap 2: Transportation Limitations

- Limited public transportation options within the Municipality and to nearby communities may restrict access to essential services. Communities facing systemic barriers, such as seniors, low-income families, Indigenous Peoples, and vulnerable community members are disproportionately affected, particularly those in outlying areas without access to private transportation.

- The Airport is challenged to meet demands for expansion due to current constraints on available land (Stakeholder Engagement 2025). An Airport Master Plan is needed to plan for growth and support funding applications.

Community and Social Services Gap 3: Childcare Availability

- Limited childcare availability is preventing some parents from re-entering the workforce (Stakeholder Engagement 2025).
- Existing childcare options do not accommodate non-traditional work hours such as evenings, weekends, or shift work, limiting access for many workers in the Municipality and further impacts recruitment and retention.

Community and Social Services Gap 4: Education

- There are ongoing challenges in recruiting and retaining education staff in the Municipality. Educators are often hired from outside the community and frequently relocate after short periods of time in the Municipality (Stakeholder Engagement 2025).

Community and Social Services Gap 5: Emergency Services

- The Municipality's growing population and future aging population is expected to increase demand for emergency medical services provided by the KDSB. The new all-season road connection to Pikangikum First Nation is also expected to increase ambulance call volumes.
- The Red Lake Ambulance Base is at capacity and the KDSB is looking for a new base that can accommodate expected increases in demand for emergency medical services (Stakeholder Engagement 2025).

3.1.3.5 Health and Wellness Gaps

Health and Wellness Gap 1: Transitional and Emergency Shelter Access

- Transitional and emergency shelter services are centralized in the Municipality, creating access challenges for individuals in surrounding areas without transportation.
- Transportation assistance (other than an expensive taxi service) is needed to support vulnerable individuals living in remote parts of the Municipality.

Health and Wellness Gap 2: Specialized Health Services

- Surgical services and maternity care are not available within the Municipality.
- Residents often need to travel to Thunder Bay, Kenora, or Dryden for specialized care, resulting in possible delays and added expenses (Stakeholder Engagement 2025).
- There is a rising demand for emergency services, placing additional strains on local resources (Stakeholder Engagement 2025).

Health and Wellness Gap 3: Healthcare Workforce

- There is a shortage of healthcare professionals in the region (Stakeholder Engagement 2025).

- The Municipality in concert with the Health Care Clinic in Red Lake actively recruit for Doctors and Health Care professionals (Stakeholder Engagement 2025).
- A lack of available childcare is preventing some staff from returning after parental leave, further exacerbating workforce shortages (Stakeholder Engagement 2025).

Health and Wellness Gap 4: Recreation Facilities

- Non-vehicular connectivity between recreational facilities, commercial areas, natural areas, and neighbourhoods is lacking.
- Cochenour Arena is approaching the end of its lifespan (Stakeholder Engagement 2025).

3.1.3.6 Tourism and Culture Gaps

Tourism and Culture Gap 1: Limited Lodging Options

- Local accommodations frequently reach full capacity during peak seasons, limiting tourism (Stakeholder Engagement 2025).
- Short-term rental and hotel options are insufficient to meet demand (Stakeholder Engagement 2025). This affects the attraction and retention of tourists.

Tourism and Culture Gap 2: Reliance on Volunteers for Arts and Culture Programming

- The tourism sector heavily depends on volunteers and small local businesses to run events and maintain services (Stakeholder Engagement 2025).
- This reliance creates vulnerability during periods of low volunteer availability.

3.2 MUNICIPAL LAND DEVELOPMENT ANALYSIS

This section provides an assessment of the Municipality's land development readiness in support of anticipated population and employment growth. It includes an analysis of residential, commercial, institutional, and industrial land needs based on population projections and vacant land availability. The section also examines the phasing of land development by community, identifying where and when servicing investments will be needed, and highlights priority development opportunities. The findings are intended to inform planning and policy decisions that ensure land supply and servicing capacity align with projected growth across the Municipality.

3.2.1 Residential Development

The vacant land analysis determined that there is a sufficient amount of vacant residential lands to accommodate anticipated population growth by the year 2037, when a peak population of 5,861 is reached under the potential growth projection. This represents an increase of 1,767 residents from the population of 4,094 in 2021 (Statistics Canada 2023a). More specifically, there is currently 162.8 ha of vacant residential land available in Red Lake alone and 101.1 ha is required according to the land-based needs projections.

Despite the perceived surplus of residential land, it is important to note that only 17 ha or 10% has full access to services, meaning water, sewer, and road access are present, while the

majority of land is either partial access (22.8 ha or 14%) or no access (123.1 ha or 76%). Furthermore, it should not be assumed that all vacant residential lands are serviceable, or at least not efficiently. At the same time, it should be acknowledged this analysis assumes that all new development will occur on vacant lands and does not account for the redevelopment and intensification of underutilized land. Therefore, it is understood that less vacant land will be needed to accommodate new population growth provided there is at least some redevelopment, and preferably intensification, of existing built-up and already serviced areas.

As indicated by **Table 3.2-1**, a total of 884 new households or dwelling units will be needed to be built by 2037 to house these new residents. Assuming the new units are split into a mix of 70% low density, 20% medium density, and 10% high density, that can be broken down to 618 low density, 177 medium density, and 89 high density units. While it is not expected for growth to occur at a linear rate, that requires an average total of approximately 74 new units per year for 12 years from 2025 to 2037. This includes approximately 52 low density, 15 medium density, and 7 high density units per year.

Table 3.2-1: Residential Units Required Under the Potential Growth Projections by Unit Type

		A	B	C	D	E	F[1]	G[2]
Unit Type	**Density (units/ha)**	**Existing Units**	**New Units by 2037**	**Avg Units per Year**	**New Units by 2045**	**Avg Unit per Year**	**2045 Pace by 2037**	**(B-F)/ 12**
Low Density	7.0	1,425	618	51.5	551	27.6	330.6	24.0
Medium Density	17.9	120	177	14.8	158	7.9	94.8	6.9
High Density	26.4	160	89	7.4	79	4.0	47.4	3.5
Total	**11.2**	**1705**	**884**	**73.7**	**788**	**39.4**	**472.8**	**34.3**

Notes:
1. Permanent units built by 2037 under the 2045 demand pace of 39.4 units per year.
2. Additional units required to be built per year to meet peak demand in 2037.

It will be very difficult to facilitate the development of 74 housing units per year. However, given the potential growth projection that the population will decline slightly between 2037 and 2045 due to expected mining closures, it may be beneficial to consider the number of units required by 2045 as the target number of “permanent units” needed by 2037. In that case, just under 40 “permanent units” will be needed to be built each year (the 2045 pace) until the year 2037. Since it is very likely that rapid housing technologies such as modular or mobile homes will need to be part of the solution anyway, they could be proposed to make up for the annual shortage of approximately 34 units per year until 2037. Regardless of the exact mix of housing unit densities and technologies, what is clear is that accelerating housing construction in the Municipality must be prioritized.

At the community level, **Table 3.2-2** confirms that the majority of new housing units will need to be built in Red Lake and Balmertown. Of the approximately 74 new housing units needed per year, 60 new units will be needed in Red Lake and 10 in Balmertown. A few new units per year may also be needed in Cochenour, however, the lack of vacant lands there may be barrier. Finally, less than one new housing unit per year is needed in each of Mackenzie Island and Madsen and no new housing units are required in Starratt Olsen.

Table 3.2-2: Residential Units Required Under the Potential Growth Projections by Community

Community	2021 Pop	2037 Pop	Add. Pop by 2037	A	Avg Units per Year	2045 Pop	Add. Pop by 2045	New Units by 2045	Avg Units per Year	B[1]	(A-B) /12[2]
				New Units by 2037						2045 Pace by 2037	
Red Lake	1,895	3,337	1,442	721	60	3,169	1,274	637	32	382	28
Balmertown	1,246	1,486	240	120	10	1,468	222	111	6	67	4
Cochenour	550	605	55	28	2	602	52	26	1	16	1
McKenzie Island	150	165	15	8	1	164	14	7	0	4	0
Madsen	153	168	15	8	1	167	14	7	0	4	0
Starratt Olsen	100	100	0	0	0	100	0	0	0	0	0
Total	**4,094**	**5,861**	**1,767**	**884**	**74**	**5,670**	**1,576**	**788**	**39**	**473**	**34**

Notes:
1. Permanent units built by 2037 under the 2045 demand pace of 39.4 units per year.
2. Additional units required to be built per year to meet peak demand in 2037.

3.2.2 Employment Lands Development

The vacant land analysis determined that there is a surplus of vacant commercial lands, which are located almost entirely in the community of Red Lake, to accommodate anticipated population growth and economic development by the year 2037. However, there is a substantial shortage of available vacant institutional and industrial lands, with only 0.6 ha and 1.4 ha available respectively. Vacant institutional lands are split between Red Lake (0.4 ha) and Madsen (0.2 ha) while all vacant industrial land is located in McKenzie Island.

The shortage of vacant institutional land is likely less concerning for two reasons. First, the gross amount of the shortage (22.8 ha in 2037) is much less than the industrial land shortage (140.7 ha in 2037). Second, it is likely possible for many institutional uses to be located on surplus vacant residential or commercial lands. While there may be some vacant industrial uses that would be suitable for some commercial lands, such as those along the Highway, they often have specific logistical needs (transportation, servicing, etc.) and may require minimum buffers from other uses.

As demonstrated by **Table 3.2-3** below, there is currently a total of 407.4 ha of employment lands in the Municipality, including 88.1 ha of commercial, 45.3 ha of institutional, and 274.0 ha

of industrial. Under the potential growth projection, an additional 214.2 ha of employment lands development will be required by the peak population year of 2037. This amounts to 17.8 ha of development each year, including 4.1 ha of commercial, 1.9 ha of institutional, and 11.8 ha of industrial. Given the slight population decline projected between 2037 and 2045, a slower development pace of 2.2 ha of commercial, 1.0 of ha of institutional ha, and 6.2 ha of industrial would ultimately result in the required employment lands development by the year 2045.

Table 3.2-3: Employment Lands Required Under the Potential Growth Projection by Land Use

Employment Land Use	Density (employment/ ha)	Current Ha	Gross 2037 Ha	Net 2037 Ha	Net Annual Ha[1]	Gross 2045 Ha	Net 2045 Ha	Net Annual Ha[2]
Commercial	6.2	88.1	136.8	48.7	4.1	131.3	43.2	2.2
Institutional	12.0	45.3	68.6	23.3	1.9	65.9	20.6	1.0
Industrial	0.6	274.0	416.1	142.1	11.8	399.0	125.0	6.2
Total		**407.4**	**621.5**	**214.2**	**17.8**	**596.2**	**188.8**	**9.4**

Notes:
1. 17.8 ha of employment lands need to be developed annually by 2037 under the potential growth projection.
2. 9.4 ha of employment lands need to be developed annually by 2045 under the potential growth projection.

3.2.3 Development Phasing by Community

The majority of population growth is expected to be centralized in the community of Red Lake, as demonstrated by the population projections (potential growth scenario). Further, this population growth is expected to occur in the very short-term (2025-2029) before plateauing and peaking by 2037 and declining slightly thereafter. As such, both residential and non-residential development will follow a similar pattern.

The following tables (**Table 3.2-4**, **Table 3.2-5**, **Table 3.2-6**, **Table 3.2-7**, and **Table 3.2-8**) show the land supply and demand by land use type (residential, commercial, industrial, and institutional) for each major community in the Municipality (Red Lake, Balmertown, Cochenour, McKenzie Island, and Madsen) for the short, medium, and long-terms. Land supply was calculated using the vacant land inventory, with short-term supply linked to fully serviced land, medium-term supply linked to partially serviced land, and long-term supply linked to unserviced land. This assumes that land with more municipal services is development ready, and therefore can be developed in the short-term, with partially serviced or unserviced lands entering the supply in the future, once they are fully serviced. Land demand was calculated as a function of population growth.

The majority of population growth and development is expected to occur in Red Lake (82%), while Balmertown will see a small increase (14%), and Cochenour, McKenzie Island, and Madsen are likely to see only very slight growth. No growth is expected in Starratt Olsen. As such, and as articulated in Section 3.1 of the Official Plan, the Municipality should direct most new development to Red Lake, Balmertown, and Cochenour, especially major commercial, industrial, and institutional uses. However, with no vacant lands in Cochenour, it is recommended to direct new commercial, industrial, and institutional development to Red Lake

and Balmertown. Where an under-supply is noted, it is recommended that additional lands be identified and designated for development through the upcoming Official Plan update.

Table 3.2-4: Red Lake Land Supply and Demand by Land Use

		Short (2025-2029)	Medium (2030-2033)	Long (2033-2037)	Total
Residential	Supply	17.0	22.8	123.1	162.8
	Demand	74.3	8.9	1.0	84.3
	Difference	(57.4)	13.9	122.1	78.6
Commercial	Supply	9.0	32.1	11.0	52.2
	Demand	36.3	4.7	0.9	41.9
	Difference	(27.3)	27.5	10.2	10.4
Industrial	Supply	0.0	0.0	0.0	0.0
	Demand	106.0	13.6	2.5	122.1
	Difference	(106.0)	(13.6)	(2.5)	(122.1)
Institutional	Supply	0.0	0.4	0.0	0.4
	Demand	0.4	2.2	0.4	3.1
	Difference	(0.4)	(1.8)	(0.4)	(2.7)

- **Residential:** While Red Lake has an over-supply of residentially zoned vacant land, only 17 ha or 10% is development ready. In the short-term, the Municipality should work to bring services to an additional 57.4 ha by 2029 to meet expected demand, with an additional 8.9 ha and 1.0 ha in the medium- and long-terms respectively.
- **Commercial:** While Red Lake has an over-supply of commercially zoned vacant land, only 9 ha or 17% is development ready. In the short-term, the Municipality should work to bring services to an additional 27.3 ha by 2029 to meet expected demand, with an additional 4.7 ha and 0.9 ha in the medium- and long-terms respectively.
- **Industrial:** Red Lake has no development ready industrial lands. As such, the Municipality should work to designate and service lands to keep up with demand. However, there are industrially zoned lands outside of the official Red Lake community boundary which were not considered in this study. Before designating new lands, the Municipality should also consider development and intensification of industrial lands in the surrounding area.
- **Institutional:** Red Lake has no development ready institutional lands. The Municipality should work to designate and service additional lands to keep up with demand.

Table 3.2-5: Balmertown Land Supply and Demand by Land Use

		Short (2025-2029)	Medium (2030-2033)	Long (2033-2037)	Total
Residential	Supply	0.8	0.7	5.6	7.1
	Demand	4.7	4.0	4.2	12.9
	Difference	**(3.9)**	**(3.3)**	**1.3**	**(5.8)**
Commercial	Supply	0.2	0.0	0.0	0.2
	Demand	2.5	2.1	2.2	6.8
	Difference	**(2.3)**	**(2.1)**	**(2.2)**	**(6.6)**
Industrial	Supply	0.0	0.0	0.0	0.0
	Demand	7.4	6.2	6.4	20.0
	Difference	**(7.4)**	**(6.2)**	**(6.4)**	**(20.0)**
Institutional	Supply	0.0	0.0	0.6	0.6
	Demand	1.2	1.0	1.1	3.3
	Difference	**(1.2)**	**(1.0)**	**(0.5)**	**(2.7)**

- **Residential:** Overall, Balmertown has 7.1 ha of residentially zoned vacant land - about 55% of the expected demand in 2037 - and only 0.8 ha of this is development ready. In the short-term, the Municipality should work to extend services to residentially zoned lands. In the medium and long-terms, the Municipality should designate additional areas for residential expansion.
- **Commercial:** With only 0.2 ha of commercially zoned vacant land, and a demand for 6.8 ha, the Municipality should designate and service additional lands for commercial land in Balmertown.
- **Industrial:** Balmertown has no development ready industrial vacant lands. As such, the Municipality should work to designate and service lands to keep up with demand.
- **Institutional:** Balmertown only has 0.6 ha of institutionally zoned vacant lands, but will need 3.3 ha by 2037. As such, the Municipality should work to designate and service lands to keep up with demand.

Table 3.2-6: Cochenour Land Supply and Demand by Land Use

		Short (2025-2029)	Medium (2030-2033)	Long (2033-2037)	Total
Residential	Supply	0.0	0.0	0.0	0.0
	Demand	1.0	0.8	0.8	2.6
	Difference	**(1.0)**	**(0.8)**	**(0.8)**	**(2.6)**
Commercial	Supply	0.0	0.0	0.0	0.0
	Demand	0.0	0.0	0.0	0.0
	Difference	**0.0**	**0.0**	**0.0**	**0.0**
Industrial	Supply	0.0	0.0	0.0	0.0
	Demand	0.0	0.0	0.0	0.0
	Difference	**0.0**	**0.0**	**0.0**	**0.0**
Institutional	Supply	0.0	0.0	0.0	0.0
	Demand	0.0	0.0	0.0	0.0
	Difference	**0.0**	**0.0**	**0.0**	**0.0**

Cochenour has no development ready vacant lands across all land uses. As such, the Municipality should work to designate and service lands to keep up with demand and potentially consider a boundary expansion.

Table 3.2-7: McKenzie Island Land Supply and Demand by Land Use

		Short (2025-2029)	Medium (2030-2033)	Long (2033-2037)	Total
Residential	Supply	1.7	0.0	0.0	1.7
	Demand	0.3	0.2	0.2	0.7
	Difference	**1.4**	**(0.2)**	**(0.2)**	**1.0**
Commercial	Supply	0.0	0.0	0.0	0.0
	Demand	0.0	0.0	0.0	0.0
	Difference	**0.0**	**0.0**	**0.0**	**0.0**
Industrial	Supply	0.0	1.4	0.0	1.4
	Demand	0.0	0.0	0.0	0.0
	Difference	**0.0**	**1.4**	**0.0**	**1.4**
Institutional	Supply	0.0	0.0	0.0	0.0
	Demand	0.0	0.0	0.0	0.0
	Difference	**0.0**	**0.0**	**0.0**	**0.0**

McKenzie Island has an adequate supply of residentially zoned serviced vacant land for expected demand. Commercial, industrial, and institutional development should generally be directed to Red Lake and Balmertown.

Table 3.2-8: Madsen Land Supply and Demand by Land Use

		Short (2025-2029)	Medium (2030-2033)	Long (2033-2037)	Total
Residential	Supply	1.6	2.1	0.0	3.7
	Demand	0.3	0.2	0.2	0.7
	Difference	**1.3**	**1.9**	**(0.2)**	**3.0**
Commercial	Supply	0.0	0.0	0.0	0.0
	Demand	0.0	0.0	0.0	0.0
	Difference	**0.0**	**0.0**	**0.0**	**0.0**
Industrial	Supply	0.0	0.0	0.0	0.0
	Demand	0.0	0.0	0.0	0.0
	Difference	**0.0**	**0.0**	**0.0**	**0.0**
Institutional	Supply	0.1	0.0	0.0	0.1
	Demand	0.0	0.0	0.0	0.0
	Difference	**0.1**	**0.0**	**0.0**	**0.1**

Madsen has an adequate supply of residentially zoned, serviced, vacant land for expected demand. Commercial, industrial, and institutional development should generally be directed to Red Lake and Balmertown.

3.2.4 Development Opportunities

Appendix D catalogues all vacant land development opportunities in the Municipality by their ownership (municipal or private), Official Plan designation, zoning category, area, and access to services. It also proposes a development timeline for when the development is completed of short- (2025-2029), medium- (2030-2033), or long-term (2033-2037).

Based on the vacant land and municipal land development analyses, the Municipality's efforts to accommodate growth should generally focus on the community of Red Lake given it is where the majority of developable land is concentrated, and therefore where the greatest development yields can be achieved. As identified in the Municipal Service Gap Analysis (**Section 3.1.3**), it is also where the majority of commercial and community services are.

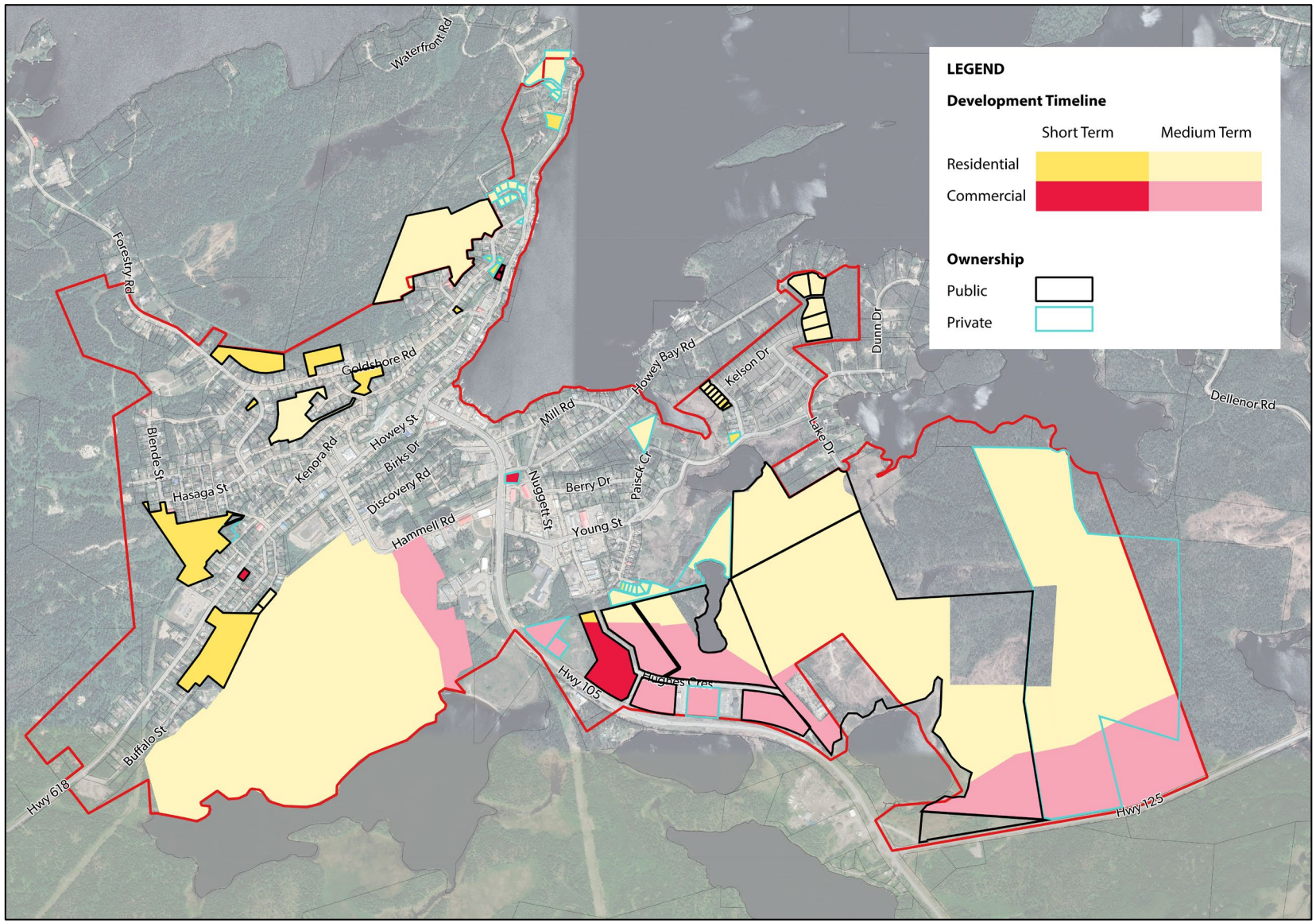
An exception to the focus on developing large vacant land parcels in Red Lake should be any single or group of vacant sites that are adjacent to existing services (water, sewer, and road). For example, there are many vacant infill sites in Balmertown that could accommodate new development immediately, seven of which are owned by the Municipality. Below is an action plan to develop these and other short-term development opportunities that are already development-ready.

Short-Term Development Opportunities Action Plan.

1. Market development-ready lots owned by the Municipality both online (passive promotion) and directly to the development community and service providers in need of housing (e.g. KDSB).
2. Consider development incentives (grants, tax exemptions, etc.) to entice land buyers, as well as conditions to ensure development is expedited.
3. Promote relaxed land use permissions from residential recommendations (**Table 4.1-2**) as implemented.
4. Expedite construction through rapid housing technologies and/or work with CMHC on their Housing Design Catalogue as per the residential recommendations (**Table 4.1-2**).
5. Provide notice of potential incentives and permissions to private landowners of development-ready vacant lots.

Figure 3.2-1 shows the development opportunities in Red Lake. As explained above, development can begin on vacant sites with a full suite of municipal services in the very short-term. However, this will not provide enough supply for the projected demand and therefore land with partial or no access to services will also be required to keep up with projected population growth. These areas require more infrastructure investment and planning, which means development is more likely to occur in the medium-term.

Figure 3.2-1: Red Lake Development Opportunities



As further outlined in **Section 3.2.5**, the recently acquired Harry's Corner is a priority development opportunity with substantial potential. However, it will involve numerous steps, substantial capital investment, and a longer timeline to bring to fruition. Therefore, despite being identified as medium-term, this work should begin immediately to get the lands development-ready as soon as possible. An action plan is outlined below for developing Harry's Corner and other larger sites without full access to services that require more work to become development-ready.

Medium-Term Development Opportunities Action Plan

1. Pursue funding and partnership opportunities to conduct required pre-development analysis.
2. Prepare preliminary development concept to understand potential opportunities and challenges, provided there is sufficient understanding of site's servicing potential and any complexities such as hazardous conditions.
3. Conduct pre-development analysis / technical studies, including but not limited to:
    - Preliminary geotechnical analysis;
    - Drainage study; and
    - Serviceability study.
4. Prepare or refine the preliminary development concept with the additional knowledge from the pre-development analysis.
5. Use the preliminary development concept to begin business planning by analyzing development feasibility. This generally begins with a development pro-forma. The business plan should also examine: the market for the development; estimated costs (construction, consultants, application fees, levies, taxes, operations); expected timelines; potential revenues; and how to secure funding to finance the project. Real estate development, market experts, and financial professionals can be retained to assist in completing a business plan.
6. Retain a team of qualified and experienced development professionals (planning, engineering, etc.) to prepare the preliminary development and infrastructure/servicing concepts. The concept will evolve and eventually drawings will be prepared to meet the requirements of the upcoming approvals or permitting process. For larger areas encompassing multiple lots, the plan of subdivision approvals process and the associated subdivision agreement is typically what drives land development. In addition to creating land parcels that can be sold or purchased, it defines responsibilities for the provision of infrastructure and services. Corresponding approvals such as Official Plan or Zoning Bylaw amendments (rezoning) may be required to establish the required land use permissions.
7. Once the necessary approvals are obtained, detailed construction documents will need to be prepared for the infrastructure construction tendering process. The successful proponent (lead contractor) will obtain all permits for construction and will organize the trades to complete construction in accordance with the detailed documents.

Under a typical process involving privately owned land, the above actions are carried out by a private developer, who decide when to initiate the development when they have raised the required capital and determine the market conditions are right. However, there is a clear and urgent need in the Municipality of Red Lake to develop land quickly to prepare for, and benefit from projected population growth. Furthermore, much of the developable vacant land is owned by the Municipality. This provides the Municipality with greater autonomy over the process, including when to initiate development and when to include private development partners. By undertaking more of, or sharing in the costs of the pre-development work, the Municipality can decrease the risk for private partners and increase the likelihood of their participation.

3.2.5 Conceptual Plan for Harry's Corner

The Municipality's recent acquisition of approximately 66 hectares (163 acres) of Crown land near the intersection of Highways 125 and 105 in Red Lake represents a unique opportunity for the Municipality to define its own future. **Figure 3.2-2** shows a conceptual plan for this area and surrounding properties, totalling approximately 250 hectares (618 acres) of public and private lands in the southeast corner of Red Lake. This plan shows a conceptual option to develop the area's urban structure, including the location of collector streets and the distribution of land uses. Major considerations in the structure include Official Plan land use designations, identified wetland areas, topography, hydrology, development status, and community boundaries.

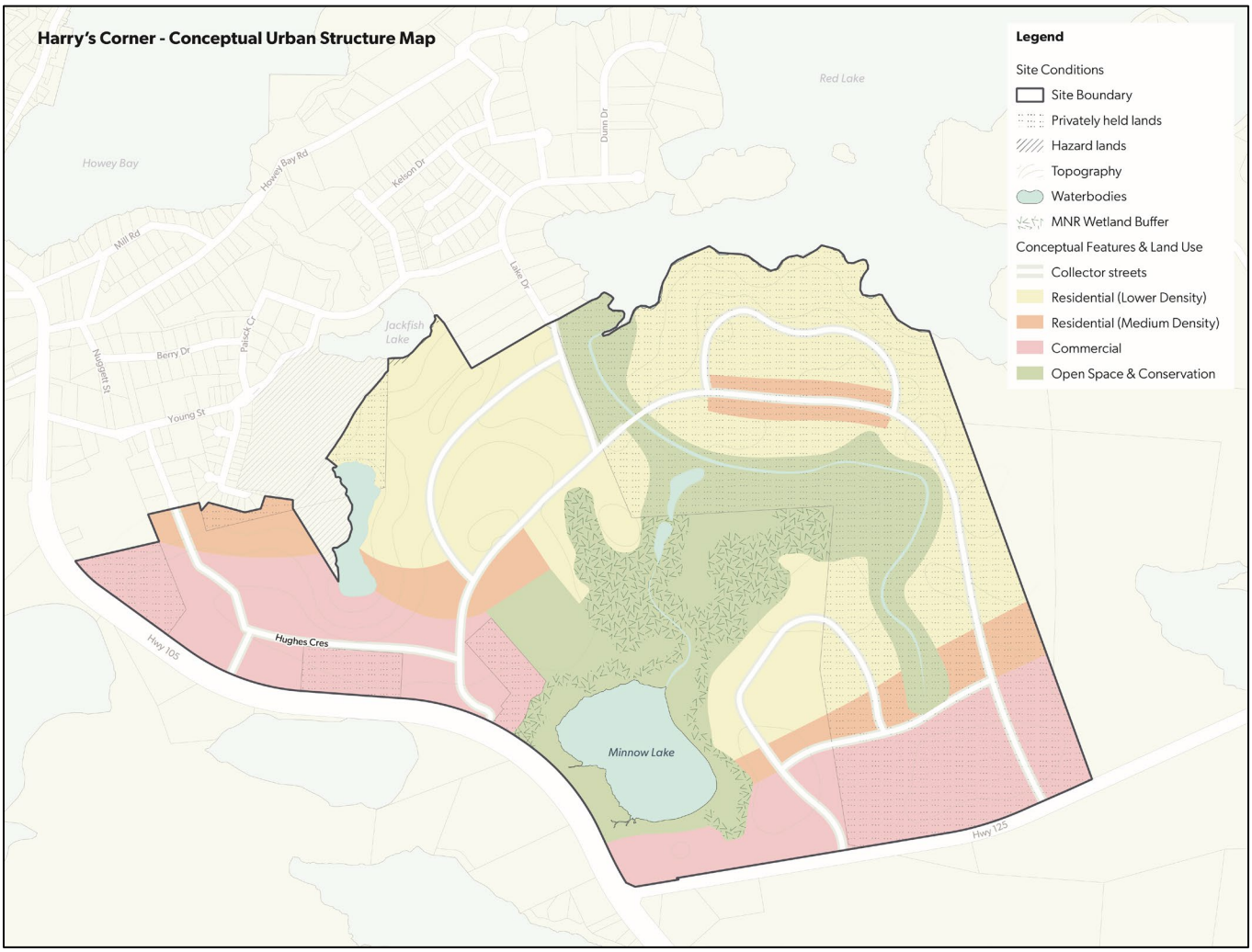
The conceptual street network shows Hughes Crescent connecting to Industrial Park Street to the northwest, an extension of Lake Drive connecting south to Highway 125, as well as a series of internal collector streets. Where practical, collector streets were placed to delineate commercial and residential land uses and/or along property lines to ensure access to multiple properties during build out.

The conceptual land uses generally follow the Official Plan's designations, and include:

- **Residential Lower Density (7.0 households/ha) - 100 hectares (247 acres):** Predominantly to accommodate development of single and semi-detached dwellings.
- **Residential Medium Density (17.9 households/ha) - 25 hectares (62 acres):** Predominantly to accommodate development of semi-detached dwellings, townhouses, and apartment buildings.
- **Commercial - 60 hectares (148 acres):** Would accommodate development of employment, services, retail, and hospitality uses, as well as mixed-use buildings.
- **Open Space & Conservation - 50 hectares (123 acres):** Would include parks, open spaces, recreation facilities, and natural areas. The location, configuration, and size of the area on the conceptual plan differs from what is shown in the Official Plan, in order to capture the identified wetland area as well as additional areas where this wetland may extend.
- **Waterbodies - 15 hectares (37 acres):** Existing waterbodies and including Minnow Lake.

Further study will be required to understand the full extent of wetland (beyond the areas already identified by the Ministry of Natural Resources), geotechnical considerations, and serviceability.

Figure 3.2-2: Conceptual Plan for Harry's Corner and Adjacent Lands



Notably, the conceptual plan introduces four Residential Medium Density areas. While these are not shown on the Official Plan maps, they align with the intent of the Official Plan and add specificity. Three of the areas act as transitions between commercial and lower density residential areas and the fourth is a pocket within a lower density residential area.

Using the residential densities outlined in **Section 1.2.4** that are used throughout this study, the Residential Lower Density lands could accommodate approximately 700 new homes (7.0 households per hectare) and the Residential Medium Density lands could accommodate approximately 448 new homes (17.9 households per hectare), for a total of 1,148 homes total.

This exceeds the projected number of 884 residential units required by 2037, the peak population year under the potential growth projection. However, it is unlikely to be able to satisfy the Municipality's short-term housing needs due to the required planning and construction time needed to initiate development and deliver homes that people can move into. As a result, Harry's Corner is considered as a medium-term opportunity in **Section 3.2**. In reality, later

phases of Harry's Corner will most likely be required in the long-term, or even beyond 2045, the last year of this study's projected timeline.

As mentioned in **Section 3.2.4**, preliminary planning work should begin as soon as possible so that parts of Harry's Corner can be developed and absorbed in time to meet the Municipality's medium-term development needs. In particular, the commercial lands along Highway #105 and #125 may be able to be expedited to satisfy more imminent demand for employment lands, including light industrial development. However, the later phases of Harry's Corner are likely better suited to serve the Municipality's long-term housing needs, including those beyond the year 2045 or the end of this study's projection timeline.

In addition to development timing and phasing, the Municipality must also consider the capital costs. The installation of new water supply, sewage collection, and road infrastructure is estimated to cost $740,000 to $810,000 per hectare, the former reflecting a development with ditches and the latter reflecting a development with curbs and gutters. Adverse soil conditions (e.g., presence of groundwater or bedrock), challenging topography, and technical studies would result in more costly development. Conversely, sites with access to some existing services would cost less to develop. Thus, the Municipality should generally advance the development lands with full or partial access to services, as they will be less expensive in the short run, and generate new property tax revenue which, in turn, can be reinvested into future infrastructure projects.

3.3 ANALYSIS OF EXISTING MUNICIPAL INFRASTRUCTURE

This section provides an assessment of the ability of municipal infrastructure systems for the communities within the Municipality of Red Lake to meet future demands, focusing on water supply, treatment, and distribution and sewage collection, treatment, and disposal. A review of current conditions is provided in **Section 2.5**, which describes how the infrastructure systems are generally well-functioning and meet current needs, while the following review identifies specific capacity limitations and service gaps that may require attention to support anticipated growth. The assessment helps to inform future infrastructure planning and identify priority areas for investment, in support of recommendations. Solid waste management is described in **Section 2.5.3**.

3.3.1 Water Supply, Treatment, and Distribution

3.3.1.1 Red Lake

3.3.1.1.1 Raw Water Supply

Skookum Bay of Red Lake is the surface water source of the Red Lake drinking water system. Raw water flows by gravity to wet wells in the Red Lake WTP, hence the wet-well water level cannot be regulated and varies with the lake water level. The operators noted that during a flooding event in past, the water level was above the chamber hatches.

The raw water flow is monitored and reported daily to verify compliance with the daily water intake limit of 6,480 m^3/day. Based upon the 2024 flow data, the average daily raw water intake

volume was 880 m^3/day with a maximum day flow of 1,485 m^3/day which is approximately 23% of the daily intake limit. Three constant-speed vertical turbine raw water pumps are rated for 25 L/s at 14.3 m head each, providing a rated capacity of 75 L/s and a firm capacity of 50 L/s (with one unit is out of service). Hence, the pumping system is capable of handling the current raw water demand with one pump out of service.

Based on the 2024 flow data, the dual-train conventional treatment system demonstrated 88% efficiency. Based on the system efficiency, 6,480 m^3 of raw water could produce 5,508 m^3 of treated water which is lower than the treatment system capacity (with both units running), thus could be a limiting factor if water demand increases.

3.3.1.1.2 Water Treatment Plant

The Red Lake WTP has two parallel treatment skids and each has a rated capacity of 3,024 m^3/day (and 6,048 m^3/day with both units in service), therefore, the firm capacity of the treatment system is 3,024 m^3/day to provide system redundancy. According to historic water use in the 2024 annual report, the average daily water usage between 2014 and 2024 was 982.8 m^3 and the maximum daily water usage was 2,290 m^3 (which occurred in 2018), resulting in a maximum day peaking factor of 2.33. The maximum daily demand is approximately 38% of the rated capacity and 76% of the firm capacity of the treatment system. The treatment system has sufficient capacity to meet the current maximum day demand with one treatment unit in service.

Treatment units are back-washed and cleaned daily or as required. Based on the on-site review, a pressure-reducing valve regulates the backwash pressure provided by the water tower (Stakeholder Engagement 2025). The average water consumption for filter backwash is 60 m^3/day.

Recommended water storage volumes is outlined in the Ministry of the Environment Conservation and Parks (MECP) *Design Guidelines for Drinking Water Systems* (2016) for systems providing fire protection (Section 8.4.2) and systems not providing fire protection (Section 8.4.3). The recommended sizing is calculated based on the water use in the system, as well as the design fire flow. The recommended storage for a system with an average daily flow of 982.8 m^3/day, a maximum daily flow of 2,290 m^3/day and a fire flow of 63 L/s (1,000 gallons per minute [GPM]) for a duration of one hour is 999.1 m^3 if fire protection is provided, and 965.6 m^3 is no fire protection is provided. The existing treated water storage volume is 2,208 m^3 (563 m^3 at the Red Lake WTP and 1,465 m^3 from the water tower), thus the existing water storage volume is sufficient to provide the recommended fire flow and accommodate the current water use.

Treated Water Quality and Monitoring

Treated water quality is continuously monitored and reported, adhering to O. Reg 170/03. Samples are collected every week for microbiological analysis by an accredited laboratory. The analysis includes tests for E. coli, total coliforms, and heterotrophic plate count. As per Schedule 7 of O. Reg 170/03, the regulated operational parameters that must be monitored include filtrate turbidity and free chlorine residuals (Government of Ontario 2022). However, per the Municipal

Drinking Water License, treated water pH and alkalinity must be monitored. The tables below (**Table 3.3-1** and **Table 3.3-2**) summarise the water quality analysis results taken from the 2023 and 2024 annual reports.

Table 3.3-1: Summary of Red Lake Treated Water Quality (Operational Parameters)

Parameter	Unit[1]	2023			2024		
		Min.	Max.	Avg.	Min.	Max.	Avg.
Turbidity (Filter 1)	NTU	0.031	>2.0[2]	0.159	0.049	0.567	0.139
Turbidity (Filter 2)	NTU	0.049	>2.0[2]	0.142	0.047	0.372	0.140
Turbidity (Treated)	NTU	0.024	0.343	0.084	0.028	0.393	0.083
pH		6.66	8.36	7.80	7.40	8.37	7.75
Alkalinity (as $CaCO_3$)	mg/L	20.0	78.0	52.4	32.7	63.0	52.4
Aluminum Residual	mg/L	0.022	0.980	0.050	0.012	0.085	0.039
Free Chlorine (Treated)	mg/L	1.41	2.55	1.92	1.17	2.76	1.91
Free Chlorine (Distribution)	mg/L	0.07	2.16	1.28	0.55	1.84	1.18

Notes:
1. NTU is nephelometric turbidity unit.
2. Maximum filtrate turbidity was due to an adverse water quality incident reported in the annual report as prescribed in O. Reg 170/03. Corrective actions were taken to test treated water samples and four distribution samples. All sample results were acceptable and no further corrective actions were required.

Table 3.3-2: Summary of Red Lake Treated Water Quality (Microbiological Parameters)

Parameter	Unit[2]	2023		2024	
		Treated	Distribution	Treated	Distribution
E. Coli[1]	MPN/100mL	absent	absent	absent	absent
Total Coliforms[1]	MPN/100mL	absent	absent	absent	absent
Heterotrophic Plate Counts[1]	CFU/mL	0 - 3	0 - 39	0 - 3	0 - >300

Notes:
1. E. Coli, Total Coliforms and Heterotrophic Plate Count results for 2023 and 2024 are based on weekly sampling and testing (52 samples per year) as a minimum.
2. MPN is most probable number and CFU is colony forming units.

Schedule 13 (Chemical Sampling and Testing) of O. Reg 170/03 applies to Large Municipal Residential systems for monitoring inorganics, organics, disinfection by-products such as trihalomethanes and haloacetic acids, nitrate and nitrite, sodium and fluoride (Government of Ontario 2022).

Schedule 15.1 (Lead) of O. Reg 170/03 outlines the sampling and testing requirements for lead in the Red Lake drinking water system (Government of Ontario 2022). In 2011, due to the excessive number of standard exceedances, a corrosion control plan was required to be implemented in the Red Lake drinking water system. Measures were taken to maintain treated water pH at a range of 7.6 – 8.0 using a sodium carbonate chemical feed system. This corrosion control plan resulted in a 90% reduction in average lead levels and an 82% reduction in the 90th

percentile lead concentration as per the 2024 Annual Report. Currently, the system follows a lead monitoring program outlined in its Municipal Drinking Water License. A total of two samples from the distribution system and 24 samples from 12 different locations in plumbing systems were collected annually for testing.

Treated water results from the 2023 and 2024 annual reports were reviewed for the Red Lake WTP. All operational, microbiological and chemical parameters were compared with Ontario Drinking Water Quality Standards (DWQS) and Health Canada Guidelines for Drinking Water Quality (GCDWQ). The results are based on the following sampling procedures:

- Inorganic parameters are sampled once per year.
- Organic parameters are sampled once per year.
- Lead is on an annual basis (as required by the Red Lake WTP drinking water license).
- Disinfection by products are sampled quarterly and averaged. The regulatory limit is based on the running annual average of the most recent four quarters.
- Nitrate and nitrite are sampled quarterly.

All parameters except sodium meet the provincial and federal water quality regulations. A sodium advisory is already in place for the Red Lake drinking water system. One lead sample from a non-residential plumbing system exceeded the Ontario DWQS and Health Canada Guidelines in 2024 and no corrective action is required according to the O. Reg 170/03 (Government of Ontario 2022). **Table E1** in **Appendix E** outlines all water quality test results.

Conventional Filtration Performance

The minimum treatment required for the Red Lake drinking water system is chemically assisted conventional filtration, primary disinfection and secondary disinfection. As per the *Filtration Process Technical Bulletin* by the Province of Ontario, in order to claim 2-log *Cryptosporidium* removal, 2.5-log *Giardia* removal and 2-log virus removal, the conventional filtration process must meet the performance criterion for filtered water turbidity of less than or equal to 0.3 Nephelometric Turbidity Unit in 95% of the measurements each month.

The Red Lake conventional filtration system has shown satisfactory performance to meet the pathogen removal criterion. The table below (**Table 3.3-3**) summarises the maximum and minimum monthly performance percentages recorded in 2023 and 2024 based on the turbidity compliance throughout the month. One adverse water quality incident was reported due to the loss of continuous monitoring of filter #1 effluent for more than 15 minutes during a backwash cycle, with the effluent valve slightly open, sending water to the next stage of treatment.

Table 3.3-3: Summary of Red Lake Monthly Performance Based on Turbidity Compliance

Location	2023		2024	
	Maximum	Minimum	Maximum	Minimum
Filter 1	100%	99.2%	100%	99.9%
Filter 2	100%	99.6%	100%	99.9%

Disinfection

Primary disinfection is achieved by post-filter chlorination using chlorine gas. The effectiveness of primary disinfection is assessed according to a supporting document issued by the Province of Ontario; *Procedure for Disinfection of Drinking Water in Ontario.* Assuming a normal low operating volume of 188 m^3 (approximately one-third of the total volume), a conservative poor baffling factor of 0.3, and using a peak hour factor of 3.38 as per the Ontario Design Guidelines, the effective contact time is calculated as 31 minutes. The lowest observed treated water free chlorine residual concentration was recorded as 1.17 mg/L in 2024. Using the above calculated contact time and 1.17 mg/L free chlorine residual concentration, the calculated CT value is 36.4 mg/L·min.

Table 6 of the Province of Ontario disinfection supporting document provides the required minimum CT values to achieve a certain level of log inactivation for *Giardia*. Based on the highest recorded pH value of 8.37 and a conservative water temperature of 0.5°C or lower, 0-log inactivation for *Giardia* cysts can be achieved by post-filter chlorination. This violates the regulatory requirement of achieving at least 0.5-log inactivation for *Giardia* cysts through the disinfection portion of the overall treatment process. Therefore, the lowest operating volume to achieve 0.5-log inactivation of *Giardia* is reverse-calculated based on the same assumptions and using the same parameters. The Red Lake WTP has to be operated at a low operating treated water reservoir volume of 370 m^3 (approximately 65% of the total volume) to achieve 0.5-log inactivation for *Giardia* cysts.

Additional disinfection is provided by the contact time in the Red Lake water tower, however, there are some connections to the supply line between the WTP and the water tower, so all disinfection requirements must be met prior to water leaving the Red Lake WTP reservoir.

Table 7 of the same document outlines the inactivation of viruses by free chlorine. Based on a pH value of 6 to 9 and a water temperature of 0.5 °C, the calculated CT value of 63 mg/L·min (when operating at 370 m^3 volume) would achieve 4-log reduction for viruses. The following table (**Table 3.3-4**) provides a summary of the overall log reduction.

Table 3.3-4: Summary of Red Lake Log Removal Credits

Unit Process	Log Removal Credits		
	Cryptosporidium	***Giardia Cysts***	**Viruses**
Conventional Filtration	2	2.5	2
Post-Filter Chlorination	-	0.5	4
Total Log Reduction	**2**	**3.0**	**6**

According to O. Reg 170/03, the Red Lake drinking water system should achieve a minimum of 2-log (99%) inactivation of *Cryptosporidium* oocyst, 3-log (99.9%) inactivation of *Giardia* cyst and 4-log inactivation of viruses through the overall treatment process. Based on the above calculated overall log reduction credits, the Red Lake drinking water system meets the provincial disinfection requirements.

The maintenance of disinfectant residual in the distribution system is required to protect the water from microbiological re-contamination and bacterial re-growth and control biofilm formation. The secondary disinfection serves as an indicator of distribution system integrity. The regulatory requirement for secondary disinfection is to maintain a minimum free chlorine residual of 0.05 mg/L throughout the distribution system. Based on 2023 and 2024 year-round sampling and testing for free chlorine residual in the distribution system, the lowest recorded value was 0.07 mg/L in 2023.

Distribution Pumping System

The Red Lake distribution pumping system consists of four 25 HP vertical turbine pumps with a rated capacity of 20.19 L/s at 70.1 m head. The firm capacity of the distribution pumping system is 60.57 L/s. The current peak hour demand is calculated to be 30.2 L/s based on a 3.38 peak hour factor as per the Ontario Design Guidelines. The Red Lake water tower provides the fire flow to the community. Hence, the pumping system is capable of handling the current peak hour flow even with the largest unit out of service.

Condition Assessment

JRCC was on-site to review the existing conditions in December 2024. The Red Lake WTP appears to be in good working condition (Stakeholder Engagement 2025). Some pipes, floor coatings, furnishings, and equipment show signs of age and wear with defects in the coatings, but the issues appear to be purely aesthetic with no concerns of any process impacts. In general, the equipment appears to be in adequate condition given the age. The building itself is in good shape and is well maintained.

3.3.1.2 Madsen

3.3.1.2.1 Raw Water Supply

The Madsen raw water flow is monitored daily and verified for compliance with the Permit to Take Water. Based on 2024 flow data, the average raw water flow was 167 m^3/day which is approximately 30% of the Permit to Take Water daily limit of 564.48 m^3/day and the maximum daily raw water intake was 383 m^3/day which is approximately 68% of the Permit to Take Water daily limit. Under normal conditions, only one of two pumps is operated to ensure the raw water flow remains below the maximum flow rate of 9.8 L/s, as outlined in the Permit to Take Water, thus the system can operate with one pump out of service providing system redundancy.

Based on the average raw water, and treated water flows in 2024, the treatment units demonstrate an efficiency level of approximately 85%, aligning closely with the standard efficiency of conventional filtration systems. Based on the system efficiency, 564.48 m^3 of raw water could produce 479.8 m^3 of treated water in a day which is lower than the treatment system capacity (with both units running), thus could be a limiting factor if water demand increases.

3.3.1.2.2 Water Treatment Plant

The Madsen WTP is a well-maintained conventional treatment system with a firm capacity of 345.5 m^3/day (one of two treatment trains has a capacity of 345.5 m^3/day) and an overall capacity of 691 m^3/day with both filters running. There are currently no reported issues or concerns regarding the system capacity and none are anticipated in the immediate future.

According to historic water use in the 2024 annual report, the average daily water usage between 2010 and 2024 was 111.4 m^3 and the maximum daily water usage was 436.0 m^3 (which occurred in 2016) and represents a 3.91 max day peaking factor. The treatment system is not cable of meeting the historic max day demands with one unit out of service, however, this demand can be met with both units running.

Recommended water storage volumes is outlined in the MECP *Design Guidelines for Drinking Water Systems* (2016) for systems providing fire protection (Section 8.4.2) and systems not providing fire protection (Section 8.4.3). The recommended sizing is calculated based on the water use in the system, as well as the design fire flow. The recommended storage for a system with an average daily flow of 111.4 m^3/day, a maximum daily flow of 436.0 m^3/day and a fire flow of 63 L/s (1,000 GPM) for a duration of one hour is 419.8 m^3 if fire protection is provided, and 153.6 m^3 if no fire protection is provided. The existing treated water storage volume is 190 m^3, thus the existing water storage volume is not adequate to provide the recommended fire flow, but is sufficient for the current water demands in Madsen.

Treated Water Quality and Monitoring

According to Schedule 11 (Microbiological Sampling and Testing), Schedule 7 (Operational Checks), and Schedule 6 (Operational Checks, Sampling, and Testing - General) of O. Reg. 170/03, samples are taken and tested for regulated and selected operational parameters (Government of Ontario 2022). The tables below (**Table 3.3-5** and **Table 3.3-6**) summarize the treated water quality results of the Madsen treatment system and were taken from the 2023 and 2024 annual reports.

Table 3.3-5: Summary of Madsen Treated Water Quality (Operational Parameters)

Parameter	Unit[1]	2023			2024		
		Min.	Max.	Avg.	Min.	Max.	Avg.
Turbidity (Filter 1)	NTU	0.019	0.420	0.062	0.026	0.418	0.108
Turbidity (Filter 2)	NTU	0.020	0.382	0.057	0.023	0.32	0.03
Turbidity (Treated)	NTU	0.023	2.719	0.198	0.070	0.5	0.166
pH		7.0	8.7	7.8	7.1	8.3	7.7
Alkalinity (as $CaCO_3$)	mg/L	32.0	102.3	54.0	44.3	65.7	53.0
Aluminum Residual	mg/L	0.012	0.21	0.024	0.009	0.036	0.016
Free Chlorine (Treated)	mg/L	0.56	1.521	1.085	1.06	3.40	1.94
Free Chlorine (Distribution)	mg/L	0.73	3.06	-	0.69	2.52	-

Notes:
1. NTU stands for Nephelometric Turbidity Unit

Table 3.3-6: Summary of Madsen Treated Water Quality (Microbiological Parameters)

Parameter	Unit[2]	2023		2024	
		Treated	Distribution	Treated	Distribution
E. Coli[1]	MPN/100mL	absent	absent	absent	absent
Total Coliforms[1]	MPN/100mL	absent	absent	absent	absent
Heterotrophic Plate Counts[1]	CFU/mL	0 - 1	0 - 3	0 - 6	0 - 15

Notes:
1. E. Coli, Total Coliforms and Heterotrophic Plate Count results for 2023 and 2024 are based on weekly sampling and testing (52 samples per year).
2. MPN is most probable number and CFU is colony forming units.

Schedule 13 (Chemical Sampling and Testing) of O. Reg 170/03 outlines the testing requirement for inorganics, organics, trihalomethanes, haloacetic acids and nitrate and nitrite and Section 15.1 (Lead) sets the requirements for sampling and testing for lead (Government of Ontario 2022).

Treated water results from the 2023 and 2024 annual reports were reviewed. All operational, microbiological and chemical parameters were compared with Ontario Drinking Water Quality Standards (DWQS) and Health Canada Guidelines for Drinking Water Quality (GCDWQ). The results are based on the following sampling procedures:

- Inorganic parameters are sampled once per year.
- Organic parameters are sampled once per year.
- Lead is sampled every third year (reduced lead sampling in Madsen is permitted due to past test results).
- Disinfection by products are sampled quarterly and averaged. The regulatory limit is based on the running annual average of the most recent four quarters
- Nitrate and nitrite are sampled quarterly.

All the parameters except sodium are within acceptable limits. Health Canada only recommends an aesthetic objective of 200 mg/L for sodium and Ontario Standards does not identify sodium as a toxic element although an exceedance of 20 mg/L requires reporting and corrective actions as per O. Reg 170/03 (Government of Ontario 2022). A sodium advisory is already in place in the Madsen drinking water system. **Table E2** in **Appendix E** outlines all water quality test results.

Conventional Filtration Performance

Schedule 1 (Treatment Equipment) of O. Reg 170/03 outlines the minimum treatment requirement for surface water raw water supply as chemically assisted filtration, primary disinfection and secondary disinfection. The *Filtration Processes Technical Bulletin* by the Province of Ontario provides clarification on assessing filter performance to claim pathogen removal credits as outlined in *Procedure for Disinfection of Drinking Water in Ontario.*

Conventional filtration can provide up to 2.5 log removal credits for *Giardia Cyst*, 2 log removal credits for Viruses and 2 log removal credits for *Cryptosporidium Oocyst,* only if the system meets the performance criterion for filtered water turbidity of less than or equal to 0.3 Nephelometric Turbidity Unit in 95% of the measurements each month. According to the annual reports, both filters met the performance criteria in 2023 and 2024. The table below (**Table 3.3-7**) summarises the maximum and minimum monthly performance percentages recorded in 2023 and 2024 based on the turbidity compliance throughout the month. One adverse water quality incident was reported in 2023 due to the loss of continuous monitoring of filter effluent for more than 15 minutes (approximately 40 minutes) and no adverse water quality incidents were reported in 2024.

Table 3.3-7: Summary of Madsen Monthly Filter Performance Based on Turbidity Compliance

Location	2023		2024	
	Maximum	Minimum	Maximum	Minimum
Filter 1	100%	100%	100%	99.98%
Filter 2	100%	100%	100%	100%

Disinfection

Primary disinfection is achieved by chlorination prior to the filter effluent entering the treated water reservoir. Using a normal low operating volume of 64 m^3 (approximately one-third of the total volume), a peak hour factor of 4.13 as per the MECP *Design Guidelines for Drinking Water Systems* (2016) and an average baffling factor of 0.5, the effective contact time (T_{10}) can be calculated as 100 minutes. According to annual reports, the lowest recorded free chlorine residual concentration is 0.56 mg/L. The chlorination CT value is calculated as 57 mg/L·min. Assuming a worst-case scenario of 0.5 °C water temperature and 8.5 pH. (Average of maximum pH in 2023 and 2024), post-filter chlorination provides 0.5 log inactivation credits for *Giardia Cysts* and 4 log inactivation credits for viruses. The table below (**Table 3.3-8**) summarizes the total log reduction at the Madsen Water Treatment.

Table 3.3-8: Summary of Madsen Log Removal Credits

Unit Process	Log Removal Credits		
	Cryptosporidium	*Giardia Cysts*	Viruses
Conventional Filtration	2	2.5	2
Post-Filter Chlorination	-	0.5	4
Total Log Reduction	**2**	**3.0**	**6**

According to the minimum treatment requirements outlined in O. Reg 170/03, a drinking water system that obtains raw water from a surface water source must have a treatment process that is capable of achieving an overall performance that provides a minimum of 2-log (99%) inactivation for *Cryptosporidium,* 3-log (99.9%) inactivation for *Giardia Cysts*, and 4-log (99.99%) inactivation for viruses (Government of Ontario 2022). Hence, the Madsen treatment

system meets the provincial regulations for minimum pathogen inactivation log credit requirements.

The minimum observed free chlorine residual in the distribution system is 0.69 mg/L, which surpasses the regulatory recommendation of 0.2 mg/L free chlorine residual to achieve secondary disinfection in compliance with O. Reg 170/03 (Government of Ontario 2022).

Distribution Pumping System

Four variable frequency drive-controlled vertical turbine pumps are used to pump treated water to the distribution system and to provide the required fire flow. All four pumps are 15 HP Emerson pumps equipped with US Electric motors. The model numbers were missing from the pump nameplates therefore the pumping capacity of the system was not able to be reviewed.

Condition Assessment

JRCC was on-site to review the existing conditions in December 2024. The Madsen WTP appears to be in good working condition (Stakeholder Engagement 2025). Some pipes and equipment show signs of age and wear with defects in the coatings, but the issues appear to be purely aesthetic with no concerns of any process impacts. The building itself is in good shape and is well maintained.

3.3.1.2.3 Water Distribution System

The Madsen water distribution system is a looped system mainly consisting of 100 mm HDPE pipes. Looped systems create multiple paths for water to reach consumers, providing more redundancy and reliability. There is only one dead-end with a blow-off chamber for cleaning sediment. Water leaves the Madsen WTP at approximately 390 kPa. Based on discussions during the site visit, the operators have no major concerns regarding the Madsen water distribution system (Stakeholder Engagement 2025).

3.3.1.3 Balmertown, Cochenour, and McKenzie Island

3.3.1.3.1 Raw Water Supply

Raw water flows by gravity to the wet wells in the Cochenour raw water pump house. Based on the 1987 Cochenour water pumping station tender drawings, the 100-year maximum lake water level is 356.7 m, and the minimum water level is 355.0 m. The pipe invert elevation of the raw water conveying pipe is approximately 353.6 m, 1.4 m below the minimum lake water level. The pump house finished floor elevation is 359.4 m, 2.7 m above the 100-year maximum lake water level.

Based on 2024 water usage records, the average daily raw water flow is 925 m^3/day with a maximum of 1,846 m^3/day, which is approximately 30% of the Bruce Channel Permit to Take Water daily raw water intake limit of 6,065 m^3/day. The raw water pumping system has a rated capacity of 151.5 L/s with a firm capacity of 101 L/s when the largest unit is out of service which exceeds the current treatment capacity, thus the pumping system has sufficient capacity.

The BCMI WTP has shown 83% efficiency, which is on the low side of the efficiency range for a standard conventional filtration system. Based on the system efficiency, 6,065 m^3 of raw water could produce 5,034 m^3 of treated water in a day which is lower than the treatment system capacity (with all three units running), thus could be a limiting factor if water demand increases.

3.3.1.3.2 Water Treatment Plant

The BCMI WTP has three parallel conventional treatment trains each rated for a capacity of 2,021.7 m^3/day, providing a firm capacity of 4,043.3 m^3/day to the system (or 6,065 m^3/day if all three units are in service). According to historic water use in the 2024 annual report, the combined average daily water usage between 2010 and 2024 in Balmertown, Cochenour and McKenzie Island was 1,026.8 m^3/day, while the maximum daily usage was 2,773 m^3/day (which occurred in 2023), resulting in a maximum day peaking factor of 2.7. The maximum daily demand is approximately 46% of the rated capacity and 69% of the firm capacity of the treatment system. The treatment system has sufficient capacity to meet the current maximum day demand with one treatment unit in service.

Recommended water storage volumes is outlined in the MECP *Design Guidelines for Drinking Water Systems* (2016) for systems providing fire protection (Section 8.4.2) and systems not providing fire protection (Section 8.4.3). The recommended sizing is calculated based on the water use in the system, as well as the design fire flow. The BCMI WTP provides storage for Cochenour and McKenzie Island, but not Balmertown, thus sizing requirements are based on the water demand in only those two communities. Historic water use prior to 2024 was not provided with a breakdown between communities so the 2024 water use will be used to determine the sizing requirements. In 2024, Cochenour and McKenzie Island had an average day water demand of 196 m^3/day and a maximum day water demand of 651 m^3/day.

The recommended storage for a system with a fire flow of 63 L/s (1,000 GPM) for a duration of one hour is 486.9 m^3 if fire protection is provided, and 241.2 m^3 is no fire protection is provided. The existing treated water storage volume is 1,380 m^3 thus the existing water storage volume is sufficient to provide the recommended fire flow and accommodate the current water use.

Balmertown Reservoir Pumping Station

The Balmertown RPS stores treated water from the BCMI WTP. It features a chlorination system that enhances the free chlorine residual before the water is pumped to the Balmertown water distribution system. Based on 2024 water usage records, the average daily water usage in Balmertown is 584 m^3/day and the maximum daily water usage is 855 m^3/day, resulting in a maximum day peaking factor of 1.5. To provide 63 L/s fire flow for a one duration and a maximum daily flow of 855 m^3/day with equalization and emergency storage, the required storage volume in the Balmertown RPS is 550.7 m^3 if fire protection is provided and 447.4 m^3 if no fire protection is provided. The available storage volume of 2,201 m^3 is sufficient to provide fire protection for Balmertown.

Treated Water Quality and Monitoring

NWI monitors and reports the treated water quality to meet the O. Reg 170/03 monitoring and reporting requirements. Samples are collected on a weekly basis for microbiological analysis by

an accredited laboratory. The analysis includes tests for E. coli, total coliforms and heterotrophic plate count. As per Schedules 6 and 7 of O. Reg 170/03, filtrate turbidity and free chlorine residuals associated with primary disinfection are continuously monitored. In addition to that, pH, alkalinity and aluminum residual are tested as unregulated operation parameters. Distribution free-chlorine is tested in both distribution systems to ensure that secondary chlorination is achieved. The tables below (**Table 3.3-9** and **Table 3.3-10**) summarise the water quality analysis results taken from the 2023 and 2024 annual reports.

Table 3.3-9: Summary of Balmertown, Cochenour, and McKenzie Island Treated Water Quality (Operational Performance)

Parameter	Unit	2023			2024		
		Min.	Max.	Avg.	Min.	Max.	Avg.
Turbidity (Filter 1)	NTU	0.024	0.952	0.057	0.018	0.158	0.052
Turbidity (Filter 2)	NTU	0.011	0.788	0.048	0.031	0.200	0.051
Turbidity (Filter 3)	NTU	0.039	0.204	0.062	0.023	0.123	0.062
Turbidity (Treated)	NTU	0.08	0.71	0.16	0.06	0.81	0.15
pH		6.4	8.4	7.3	7.0	7.83	7.37
Alkalinity (as $CaCO_3$)	mg/L	20	74	47.1	41	63.3	49.4
Aluminum Residual	mg/L	0.020	0.440	0.042	0.015	0.051	0.029
Free Chlorine (BCMI WTP)	mg/L	0.51	2.19	1.09	1.17	2.20	1.66
Free Chlorine[2] (Balmertown RPS)	mg/L	0.39	1.90	1.03	0.91	1.98	1.43
Free Chlorine[3] (Distribution – Cochenour and MI)	mg/L	0.51	2.19	-	0.55	1.92	-
Free Chlorine[3] (Distribution – Balmertown)	mg/L	0.39	1.90	-	0.91	1.98	-

Notes:
1. NTU is Nephelometric Turbidity Unit.
2. RPS is Reservoir Pumping Station
3. Free chlorine residuals are tested at various locations in the Cochenour / McKenzie Island and Balmertown distribution systems. The values in the table pertain to the minimum and maximum results of collected samples across all locations in the calendar year. 350+ samples were taken from Cochenour/McKenzie Island distribution system and 400+ samples were taken from Balmertown distribution system.

Table 3.3-10: Summary of Balmertown, Cochenour, and McKenzie Island Treated Water Quality (Microbiological Performance)

Parameter	Unit[1]	2023		2024	
		Treated[3]	Distribution[4]	Treated[3]	Distribution[4]
E. Coli[2]	MPN/100mL	absent	absent	absent	absent
Total Coliforms[2]	MPN/100mL	absent	absent	absent	absent
Heterotrophic Plate Counts[1] in BCMI WTP	CFU/mL	0 - 1	0 - 1	0 - 1	0 - 8
Heterotrophic Plate Counts[1] in Balmertown RPS	CFU/mL	0 - 2		0 - 1	

Notes:
1. MPN is most probable number and CFU is colony forming units.
2. E. Coli, Total Coliforms, and Heterotrophic Plate Count results for 2023 and 2024 are based on weekly sampling and testing (52 samples per year) as a minimum.
3. Treated samples include weekly sampling in both the BCMI WTP and the Balmertown RPS.
4. Distribution samples were taken in both the Cochenour / McKenzie Island and Balmertown distribution systems. A total of 142 and 147 distribution samples were taken in 2023 and 2024, respectively.

Schedule 13 of Ontario Regulation 170/03 outlines chemical sampling and testing requirements for Large Municipal Residential systems. It mandates regular monitoring of inorganics, organics, and disinfection by-products such as trihalomethanes and haloacetic acids, as well as nitrate, nitrite, sodium, and fluoride. Per the regulation, if a system sources water from a surface water supply, at least one sample must be collected annually for inorganics and organics testing (Government of Ontario 2022). Trihalomethanes and haloacetic acids should be monitored by taking samples in each calendar quarter, from a point in the distribution system or plumbing system connected to the drinking water system, that is anticipated to have an elevated potential for the formation of disinfection by-products. Samples should be taken every three months and tested for nitrate and nitrite, while sodium and fluoride are tested every 60 months.

Schedule 15.1 (Lead) of O. Reg 170/03 applies to the sampling and testing for lead in the Red Lake drinking water system. Based on meeting the reduced sampling requirements, the BCMI drinking water system previously qualified for reduced lead sampling and was ultimately exempted from sampling at plumbing locations (Government of Ontario 2022).

Treated water results from the 2023 and 2024 annual reports were reviewed for the BCMI WTP. All operational, microbiological and chemical parameters were compared with Ontario Drinking Water Quality Standards (DWQS) and Health Canada Guidelines for Drinking Water Quality (GCDWQ). The results are based on the following sampling procedures:

- Inorganic parameters are sampled once per year.
- Organic parameters are sampled once per year.
- Lead is sampled every third year (reduced lead sampling in BCMI is permitted due to past test results).

- Disinfection by products are sampled quarterly and averaged. The regulatory limit is based on the running annual average of the most recent four quarters.
- Nitrate and nitrite are sampled quarterly.

Based on the comparison with Ontario DWQS and Health Canada GCDWQ, all parameters except sodium and haloacetic acids meet the provincial and federal water quality regulations. A sodium advisory is already in place for the BCMI drinking water system. Multiple haloacetic acids exceedance incidents occurred in 2023. Samples were taken monthly instead of quarterly throughout 2023 to monitor the levels more frequently. The 4th quarter running annual average was 78.8 µg/L, meeting the provincial and federal limit of 80 µg/L. According to the 2024 annual report, zero haloacetic acids exceedance was reported in 2024, showing a satisfactory recovery. Monthly sampling will be continued in 2025, and quarterly sampling may be continued in 2026 if there are no further exceedances. **Table E3** in **Appendix E** outlines all water quality test results.

Conventional Filtration Performance

As per the O. Reg 170/03, the minimum treatment required for the surface water raw water source in the BCMI WTP is chemically assisted conventional filtration, primary disinfection and secondary disinfection (Government of Ontario 2022). As per the Filtration Process Technical Bulletin by the Province of Ontario, the conventional filtration process must meet the performance criterion for filtered water turbidity of less than or equal to 0.3 Nephelometric Turbidity Unit in 95% of the measurements each month in order to claim 2-log Cryptosporidium inactivation, 2.5-log Giardia inactivation, and 2-log virus inactivation.

The BCMI conventional filtration system has demonstrated satisfactory performance to meet the pathogen removal criterion in the last two years. The table below (**Table 3.3-11**) summarises the maximum and minimum monthly performance percentages recorded in 2023 and 2024 based on the turbidity compliance throughout the month.

Table 3.3-11: Summary of Balmertown, Cochenour, and McKenzie Island Monthly Filter Performance Based on Turbidity Compliance

Location	2023		2024	
	Maximum	Minimum	Maximum	Minimum
Filter 1	100%	99.9%	100%	99.9%
Filter 2	100%	99.9%	100%	99.9%
Filter 3	100%	99.8%	100%	99.9%

Disinfection (BCMI WTP)

Primary disinfection is achieved by post-filter chlorination using chlorine gas. The effectiveness of primary disinfection is assessed according to a supporting document issued by the Province of Ontario; Procedure for Disinfection of Drinking Water in Ontario. Assuming a normal low operating volume of 460 m^3 (one-third of the total volume), a conservative average baffling factor of 0.5, and using a peak hour factor of 3.38 as per the Ontario Design Guidelines, the effective contact time is calculated to be 95 minutes for the treated water leaving the BCMI

WTP. Based on 2023 and 2024 operational water quality data, the lowest recorded free chlorine residual concentration in treated water is 0.51 mg/L. Using the above calculated contact time and 0.51 mg/L free chlorine residual concentration, the calculated CT value is 48.4 mg/L·min.

Table 6 of the Province of Ontario disinfection supporting document provides the required minimum CT values to achieve 0.5 to 4 log inactivation for Giardia. Based on the highest recorded pH value of 8.4 and a water temperature of 0.5 °C or lower (which is the worst case scenario), 0-log inactivation for Giardia cysts can be achieved by post-filter chlorination. This does not comply with the regulatory requirement of achieving at least 0.5-log inactivation for Giardia cysts through the disinfection portion of the overall treatment process. The BCMI WTP has to be operated at a low operating treated water reservoir volume of 542 m^3 (approximately 40% of the total volume) to achieve 0.5-log inactivation for Giardia cysts.

Table 7 of the same document outlines the inactivation of viruses by free chlorine. Based on a pH value of 6 to 9 and a water temperature of 0.5 °C, the calculated CT value of 57.1 mg/L·min (when operating at 542 m^3 volume) would achieve 4-log reduction for viruses. The following table (**Table 3.3-12**) provides a summary of the overall log removal credits.

Table 3.3-12: Summary of Balmertown, Cochenour, and McKenzie Island Log Removal Credits

Unit Process	Log Removal Credits		
	Cryptosporidium	***Giardia Cysts***	**Viruses**
Conventional Filtration	2	2.5	2
Post-Filter Chlorination	-	0.5	4
Total Log Reduction	**2**	**3.0**	**6**

Per O. Reg 170/03, the BCMI water treatment system is capable of achieving a minimum of 2-log (99%) inactivation of Cryptosporidium oocyst, 3-log (99.9%) inactivation of Giardia cyst, and 4-log inactivation of viruses through the overall treatment process. Based on the above-calculated overall log reduction credits, the BCMI water treatment system meets provincial disinfection requirements.

The maintenance of disinfectant residual in the distribution system is required to achieve the intended secondary disinfection. The regulatory requirement for secondary disinfection is to maintain a minimum free chlorine residual of 0.05 mg/L throughout the distribution system and O. Reg 170/03 recommends a free chlorine residual of 0.2 mg/L. Based on 2023 and 2024 year-round sampling and testing for free chlorine residual in the distribution system, the lowest recorded value was 0.51 mg/L in 2023, thus the secondary disinfection requirements are being met.

Disinfection (Balmertown Reservoir Pumping Station)

The Balmertown RPS is equipped with a chlorination system that can be dosed on the incoming water, or the outgoing water. The lowest recorded free chlorine residual during 2023 and 2024, was 0.39 mg/L, which is above the regulation recommendations. Hence, there is no need to

boost the free chlorine residual entering the Balmertown RPS. The treated water received from the BCMI WTP is stored in Balmertown reservoirs and pumped to the distribution system.

As noted, the BCMI WTP provides adequate primary disinfection, however, the additional contact time in the Balmertown reservoir will provide additional disinfection. Assuming a normal low operating volume (one-third of the total usable volume) of 733.6 m^3, average baffling conditions and using 3.75 as the peak hour factor according to the Ontario design guidelines, the Balmertown RPS provides an additional 241 minutes of effective contact time for primary disinfection. Using the lowest recorded free chlorine residual concentration of 0.39 mg/L, the CT value can be calculated as 94 mg/L·min, achieving 0.5-log inactivation of Giardia and 4-log inactivation of viruses when the water temperature is 0.5 °C or lower and pH value is 8.5. The following table (**Table 3.3-13**) provides a summary of the total log removal credits for Balmertown treated water.

Table 3.3-13: Summary of Balmertown Log Removal Credits

Unit Process	Log Removal Credits		
	Cryptosporidium	***Giardia Cysts***	**Viruses**
Conventional Filtration	2	2.5	2
Post-Filter Chlorination (Contact time in BCMI WTP)	-	0.5	4
Post-Filter Chlorination (Contact time in Balmertown RPS)	-	0.5	4
Total Log Reduction	**2**	**3.5**	**10**

It exceeds the minimum pathogen removal log credits required for a surface water raw water source, as per O. Reg 170/03 (Government of Ontario 2022). The free chlorine residual concentration in the Balmertown distribution system has been maintained at a minimum of 0.39 mg/L, exceeding the regulatory minimum and recommended concentration to achieve secondary disinfection.

Distribution Pumping System (Cochenour and McKenzie Island)

The Cochenour and McKenzie Island distribution pumping system consists of four vertical turbine pumps with a rated capacity of 20.4 L/s at 59.7 m head and there is room for a fifth pump for a future expansion. The current peak hour demand is calculated to be 9.4 L/s based on a 4.13 peak hour factor as per the Ontario Design Guidelines. The 2024 maximum day demand was 7.5 L/s and the recommended fire flow is 63 L/s. The firm capacity of the pumping system is 61.2 L/s if one pump is out of service, thus the pumping system is undersized to handle the current maximum day demand plus fire flow when the largest unit is out of service, as recommended in Ontario Design Guidelines. If the pumping system is upgraded with a similar-sized fifth pump, the firm capacity exceeds the required design capacity.

Transfer Pumping System

Two vertical turbine pumps, each having a rated capacity of 46.6 L/s at 28.7 m head are used to transfer treated water from the BCMI WTP reservoir to the Balmertown RPS. The firm capacity of the duplex transfer pumping system is 46.6 L/s with one pump out of service. According to the water usage records in Balmertown, the current maximum day demand is 9.9 L/s (855 m^3/day) while the estimated current peak hour demand is 25.35 L/s based on a 3.75 peak hour factor. Considering the Balmertown reservoirs have sufficient storage for fire protection, the Balmertown transfer pumping system in the BCMI WTP has a sufficient capacity to handle the current maximum day demand and peak hour demand with one pump out of service.

Distribution Pumping System (Balmertown)

The Balmertown distribution pumping system, located in the Balmertown RPS, has a rated capacity of 172.8 L/s and a firm capacity of 129.6 L/s when the largest unit is out of service. There are four vertical turbine pumps with room for a fifth pump. The Balmertown water usage reports indicate a maximum day demand of 9.9 L/s and the recommended fire flow is 63 L/s. Hence, the Balmertown distribution pumping system has adequate capacity to handle the current maximum day demand plus the fire flow with one pump out of service.

Condition Assessment

JRCC was on-site to review the existing conditions in December 2024. The BCMI WTP and Balmertown RPS appear to be in good working condition and are well maintained (Stakeholder Engagement 2025). Besides a few spots of minor corrosion and chemical residue, the buildings and equipment are in excellent condition.

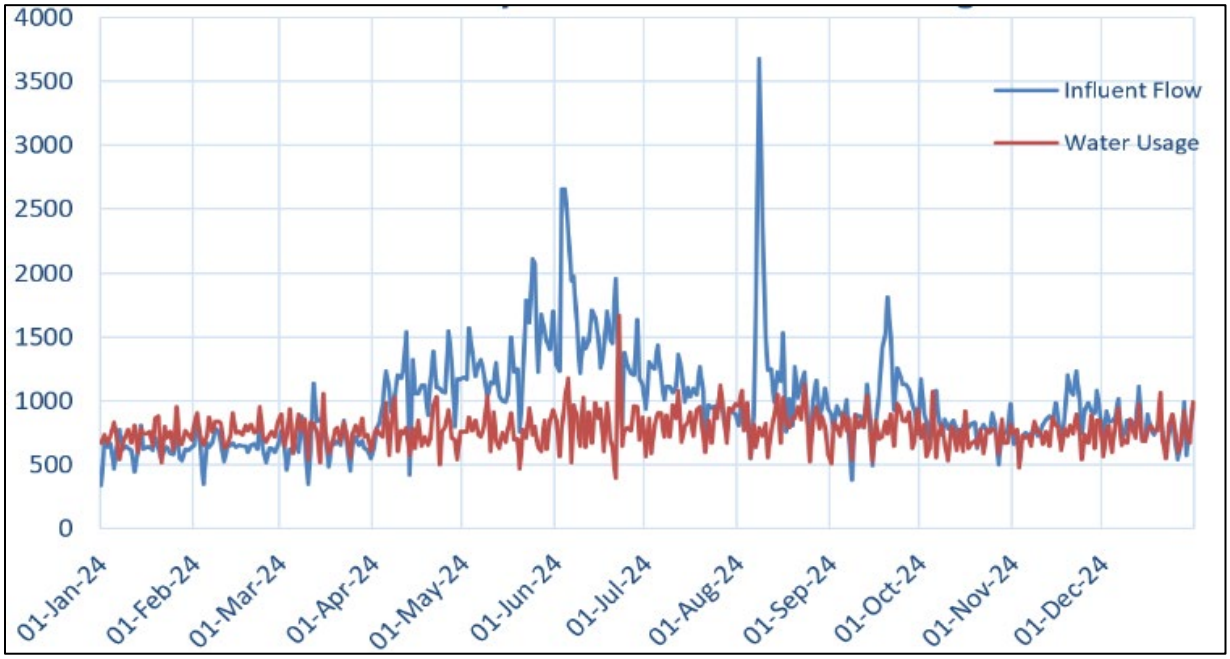
3.3.2 Sewage Collection, Treatment, and Disposal

3.3.2.1 Red Lake

3.3.2.1.1 Sewage Collection System

The Red Lake sewage collection system is the largest in Red Lake. It is well operated and maintained by the municipality and the authorized operator, NWI. During the winter period, the infiltration is reduced as the surface of the ground is frozen, resulting in nearly zero surface runoff into the sewer system. Infiltration from groundwater is still possible at the depth of the gravity sewer pipes and manholes. Based on 2024 wastewater flow and water usage data, the average daily wastewater flow and average daily water consumption during the winter period (November 1 to March 31) are 720 m^3/day and 750 m^3/day, respectively. During the wet weather period (April 1 to October 31), the average wastewater flow is 1,145 m^3/day and the average water consumption is 783 m^3/day. It indicates that the infiltration and inflow is approximately 46% of the average water consumption. **Figure 3.3-1** below illustrates the comparison between water usage and wastewater influent flow in Red Lake.

Figure 3.3-1: Red Lake Daily Influent Flow Versus Water Usage



3.3.2.1.2 Sewage Treatment and Disposal

JRCC was on-site to review the existing conditions in December 2024. The Red Lake WPCP appears to be in adequate condition given the age of the equipment (Stakeholder Engagement 2025). Pipes and equipment show signs of wear, but there are no major concerns that would impact the functionality of the treatment system. The treatment systems and lift stations are well maintained and operated.

Based on 2024 data, the average influent flow was 968 m^3/day and the peak instantaneous flow was 3,680 m^3/day. The Red Lake WPCP has a rated capacity of 2,460 m^3/day and a rated peak instantaneous flow of 7,728 m^3/day, including the bypass capacity. The current average wastewater generation and peak instantaneous influent flow are well below the rated capacity. The average demand represents 39% of the system capacity and the peak flow represents 48% of the system capacity. No major concerns were discovered during the JRCC site visit (Stakeholder Engagement 2025). The operators and the Municipality conduct regular maintenance routines to maintain the integrity of the Red Lake WPCP.

3.3.2.2 Madsen

3.3.2.2.1 Sewage Collection System

The Madsen sewage collection system is a more than 40-year-old low-pressure and gravity combined collection system. Based on the discussions with municipal officials, they do not anticipate large-scale expansions in Madsen. Considering the age of sewer pipes, infiltration and inflow could be high in the system. Due to the unavailability of wastewater generation and

collection flow data, the infiltration and inflow cannot be estimated. However, there were no reported concerns in the Madsen wastewater collection system.

3.3.2.2.2 Sewage Treatment and Disposal

JRCC was on-site to review the existing conditions in December 2024. The wood cladding on the exterior of the Madsen holding tank is in poor condition, however, the tank itself appears to be in adequate condition (Stakeholder Engagement 2025).

The Madsen wastewater holding tank provides minimal treatment to the incoming raw wastewater. The effluent is directed to the Madsen Mine wastewater treatment system for further treatment before being discharged. Similar to the collection system, no major concerns were reported in the Madsen wastewater holding tank. The Municipality does not expect any large-scale expansions except the regular maintenance works. If the treatment system from the mine were to be decommissioned, the holding tank would not be able to adequately treat wastewater in Madsen. If there is a possibility that the treatment system cannot be used in the future, an independent treatment solution should be considered in Madsen.

3.3.2.3 Balmertown

3.3.2.3.1 Sewage Collection System

Balmertown operates a gravity collection system with two lift stations. The Evolution Mine (Balmer Creek Complex) pumps its wastewater directly to the gravity collection system. Daily flow records of the total wastewater effluent at the Balmertown WPCP are logged by NWI, but information of the lift station flows were not available. The operators did not note any capacity issues with the sewage collection system.

3.3.2.3.2 Sewage Treatment and Disposal

JRCC was on-site to review the existing conditions in December 2024. The Balmertown WPCP appears to be in good condition (Stakeholder Engagement 2025). There are minor signs of wear on equipment and floor coatings, but there are no concerns regarding the condition of the equipment impacting the system functionality.

The Balmertown WPCP is rated for 1,224 m^3/day influent flow and a rated peak instantaneous flow of 3,715 m^3/day. Based on 2024 flow records, the average wastewater flow is 549 m^3/day and the peak instantaneous flow is 1,207 m^3/day according to the recorded effluent data. The 2024 average daily flow is approximately 45% of the rated capacity of the Balmertown WPCP. The recorded peak instantaneous flow is approximately 97% of the rated capacity and 32% of the rated peak instantaneous capacity of the WPCP. Therefore, the Balmertown WPCP is capable of handling the current average and peak flows. However, the treatment system operation does not provide any redundancy. Thorough maintenance routines and timely upgrades are recommended to provide uninterrupted service to Balmertown.

3.3.2.4 Cochenour and McKenzie Island

3.3.2.4.1 Sewage Collection System

The Cochenour and McKenzie Island sewage collection system directs the wastewater to the Cochenour lagoon. Two lift stations, the Cochenour lift station and the airport lift station, pump wastewater to the lagoon. Based on 2024 data provide by NWI, the Cochenour lift station pumped 44,641 m^3 of wastewater to the lagoon and the airport lift station pumped a total of 7,215 m^3 for a combined hydraulic loading of 51,856 m^3 in 2024. The volume of treated water pumped from the BCMI WTP to Cochenour and McKenzie Island in 2024 was 71,632 m^3, which is greater than the volume of wastewater sent to the lagoon which indicates that not all treated water leaving the WTP enters the sewer system. The cause of this discrepancy could be due to a number of factors:

- Leaks in the water distribution system
- Buildings that are serviced by independent wastewater treatment systems (such as septic tanks or fields)
- It appears that the mine in Cochenour is connected to the water network. If there are waste processes that are sent elsewhere this would also impact the results
- Bleeders on the water distribution system (as per discussion with the operators, these are in use, and the water is not sent to the sewer system
- Measurement error (flow meters not providing accurate data).

3.3.2.4.2 Sewage Treatment and Disposal

JRCC was on-site to review the existing conditions in December 2024. The Cochenour Lagoon appears to be in good condition. There is moderate vegetation growth on the inner berms of the lagoon, but this does not impact the functionality of the capacity of the system. Roots have potential to compromise the liner integrity, so it is recommended that vegetation growth is monitored and maintained.

Based on 2024 data, the average daily wastewater flow to the lagoon is 142 m^3/day. The total usable storage capacity of the lagoon is 92,333 m^3, resulting in approximately 650 days of storage based on the current wastewater generation. Based on the Cochenour Lagoon 2024 Assessment Report prepared by NWI, lagoon cell #2 was discharged from May 13 to June 9 (for 28 days) and cell #1 was discharged from October 21 to November 9 (for 20 days). According to the Ontario MECP Design Guidelines for Sewage Works, the hydraulic detention time should not be less than the number of days the lagoon is under ice cover, which is approximately 180 days in Red Lake based on the frost day projections for Red Lake between 2021-2050 on climateatlas.com. The Cochenour lagoon has sufficient capacity to meet the current wastewater generation in Cochenour and Mckenzie Island.

4.0 RECOMMENDATIONS

The recommendations presented in this section are intended to guide the Municipality of Red Lake as it prepares for projected growth and responds to identified service and infrastructure gaps. Drawing from the situational analysis and land-based needs assessment in **Section 2.0**, and the planning for growth framework in **Section 3.0**, these recommendations are designed to support long-term community development, enhance quality of life, and ensure the Municipality is positioned to accommodate increasing population and employment demands. Each recommendation aligns with key themes raised through stakeholder engagement and provides actionable steps to help prioritize investment, inform policy, and respond to opportunities for funding and partnership.

The recommendations are organized by timeframe, financial consideration, and level of effort.

The timeframes include:

- Short-term: 1 to 4 year timeframe;
- Medium-term: 5 to 8 year timeframe; and
- Long-term: 8+ years and could be pursued in conjunction with the other recommendations.

The financial categories for the service baseline and land analysis recommendations are provided by low, medium, and high cost ranges, whereas actual budgetary costs in dollars are provided for the water and wastewater infrastructure recommendations. Additional details on costing for the conceptual land development plan for Harry's Corner, including estimated costs per hectare, are provided in **Section 3.2.5**. The definitions for low, medium and high cost include:

- Low cost: actions that can be implemented using existing staff time, minimal funding, or in-kind contributions. The low cost category is approximately $25,000 and under.
- Medium cost: actions that require moderate investment—such as studies and program development. The medium cost category is approximately $25,000 to $250,000.
- High cost: actions that involve major capital expenditures, new infrastructure, or long-term financial commitments. The high cost category is approximately $250,000 and over.

The level of effort reflects the complexity, coordination, and time required to implement each recommendation.

- Low-effort: actions are generally simple to execute, require limited coordination, and can often be undertaken by existing Municipal staff or partners using current resources, tools and processes.
- Medium-effort: actions may involve multiple stakeholders, additional planning, or temporary increases in staff time or external support.
- High-effort: actions typically require extensive collaboration, long-term commitment, or new staffing.

Section 4.1 provides the service baseline and land analysis recommendations and **Section 4.2** provides the municipal infrastructure recommendations.

4.1 SERVICE BASELINE AND LAND ANALYSIS RECOMMENDATIONS

The following section provides a summary of the proposed recommendations for the service baseline and land analysis. Each recommendation includes a proposed timeframe, the potential partners or general organizations to partner with, as well as the anticipated financial consideration and operational effort required. It should be acknowledged that these timeframes are a point-in-time recommendation, and it is expected that they will be revisited and revised as budgetary realities and priorities evolve over time. There were no long-term recommendations identified for the service baseline and land analysis, all recommendations are identified as short-term and medium-term recommendations.

The potential partnerships include a variety of local and regional organizations that may or may not be involved in providing these services. The organizations are listed by sector below in **Table 4.1-1**. Many, but not all the organizations listed were involved in the preparation of this Community Capacity Study. The intent is not to obligate any organization to participate, but rather to stimulate continued dialogue and collaboration between organizations to facilitate progress on implementation. It is also important to note that the list of organizations is not exhaustive, and additional partners may be involved in implementing each recommendation.

The recommendations for the service baseline and land analysis include the following tables:

- **Table 4.1-2**: summary of recommendations for residential development;
- **Table 4.1-3:** summary of recommendations for economic and workforce development;
- **Table 4.1-4:** summary of recommendations for infrastructure and public realm;
- **Table 4.1-5:** summary of recommendations for community and social services;
- **Table 4.1-6:** summary of recommendations for health and wellness; and
- **Table 4.1-7:** summary of recommendations for tourism and recreation.

Table 4.1-1: Potential Partnership Organizations by Sector

Housing Services	Economic and Commercial Services
• CMHC • District of Kenora Homes • KDSB • Ontario Aboriginal Housing Services • Local and regional homebuilders	• CCDC • Red Lake District Chamber of Commerce • Mining Companies • Local businesses • Local and regional developers • Commercial building owners • Thunder Bay Airport Services • Utility providers (natural gas and electricity)
Community and Social Services	**Tourism and Cultural Services**
• Balmertown and Margaret McDougall Memorial Public Libraries • KDSB: Emergency Homeless Shelter; Childcare; Social Housing. • Association francophone de Red Lake • Harmony Centre for Community Living • Red Lake Career and Employment Services	• Red Lake Regional Heritage Centre • West Red Lake Mining Museum • Red Lake Indian Friendship Centre • The Patricia Players theater group • Red Lake Family Entertainment Services • Red Lake Wilderness Entertainment Series • Norseman Festival
Education Services	**Health Services**
• Confederation College • Early Learning and Child Care (KDSB) • Red Lake District Adult Learning Centre • Keewatin-Patricia District School Board • Kenora Catholic District School Board • Conseil Scolarie de District des Aurores Boreales • Apatisiwin Alternative Secondary School	• Red Lake Margaret Cochenour Memorial Hospital • Northwestern Health Unit • Red Lake Pharmacy • Social work; Counselling; Crisis Response; Psychotherapy
Emergency Services	**Indigenous Services**
• Ambulance Services (KDSB) • Ontario Provincial Police • Treaty Three Police Service	• First Nations: Keewaytinook Okimakanak; Sandy Lake; Poplar Hill; North Spirit Lake; McDowell Lake; Deer Lake; Keewaywin; Pikangikum • Shared Spirits Economic Development Corporation • Red Lake Indian Friendship Centre
General Public	
• Residents • Landowners	

Table 4.1-2: Summary of Residential Development Recommendations

Recommendation	Action	Potential Partners	Financial Cost and Effort
Short-term recommendations (over the next 1 to 4 years)			
1. Develop vacant lands	Prioritize vacant lands that are most development-ready, such as those with either full or partial access to services.		Low cost; Low-effort
	Pursue funding opportunities to extend services to partially or unserviced lands (see **Section 4.1.1**).	• Federal and Provincial Governments	Low cost; Low-effort
	Initiate development of Municipally owned vacant lands. • Strategically disposing of lands to motivated development-ready partners as determined through a request for proposals process; and/or, • Taking a leading role in their development, potentially by establishing a Municipal Development Corporation.	• Local and regional developers • Housing services orgs.	Medium cost; Medium-effort
	Work with private landowners and developers to develop privately owned lands; or consider acquiring development-ready sites from willing landowners not interested in development.	• Local and regional • Housing services orgs. • Residents and landowners • Indigenous services orgs.	Medium cost; Medium-effort
2. Increase residential density and diversify housing stock	Encourage development and intensification of vacant or underutilized lands that are already serviced.	• Local and regional developers • Housing services orgs. • Residents and landowners	Low cost; Low-effort
	Ensure Official Plan and Zoning Bylaw supports development and intensification by permitting multi-unit residential buildings in more areas. • Most residential land in Red Lake and Balmertown is zoned R1, which only allows 2 units per site. At minimum, 4 units should be permitted per site as-of-right in all residential areas. • In the R2 zone, multi-unit and row/townhouse dwellings are only allowed a maximum of 4 units. At minimum, this should be increased to 6 units.		Low cost; Low-effort
	Amend Zoning Bylaw development standards that restrict development such as maximum units per lot, lot coverage, height, and minimum setbacks.		Low cost; Low-effort
	Reduce or eliminate minimum on-site parking requirements for residential development.		Low cost; Low-effort
	Incentivize multi-unit, mixed-use, and affordable housing development.	• Local and regional developers • Housing services orgs.	Medium cost; Medium-effort
	Pursue funding opportunities for affordable and housing development (see **Section 4.1.1**).	• Federal and Provincial Governments • Housing services orgs. • Indigenous services orgs.	Low cost; Low-effort

Recommendation	Action	Potential Partners	Financial Cost and Effort
Short-term recommendations (over the next 1 to 4 years)			
3. Produce more housing quickly	Collaborate with industry groups on solutions to reduce costs of construction.	• Local and regional developers • Housing services orgs.	Medium cost; Medium-effort
	Explore potential for expediting residential and accommodations development with rapid housing technologies such as modular, mobile, and modified shipping-container homes. A 60-room hotel was built in Sioux Lookout in 2015 using 120 surplus shipping containers.	• Federal and Provincial Governments • Local and regional developers • Housing services	Low cost; Medium-effort
	Work with CMHC on implementing their Housing Design Catalogue, which includes Ontario-specific regional designs for everything from Accessory Dwelling Units to a Sixplexes.	• Federal and Provincial Governments • Local and regional developers • Housing services orgs.	Low cost; Low-effort
	Expedite approvals process for housing development projects.		Low cost; Low-effort
	Rezone lands that are suitable for residential development, such as those already identified in the Official Plan.		Low cost; Low-effort
	Identify an additional 5 to 10 ha of residential land in Balmertown and rezone appropriately.		Low cost; Low-effort
4. Understand community needs	Engage sector organizations to better understand industry's demand for, and potentially collaborate on, delivery of temporary housing.	• Economic services orgs. • Local and regional developers • Housing services • Indigenous services	Low cost; Medium-effort
	Work with sector organizations on demand and supply of affordable and supportive housing options.	• Community and social services • Indigenous services	Low cost; Medium-effort
Medium-term recommendations (over the next 5 to 8 years)			
5. Understand community needs	Monitor demand and supply of seniors housing to support aging in place.	• Community and social services • Indigenous services	Low cost; Low-effort

Table 4.1-3: Summary of Economic and Workforce Development Recommendations

Recommendation	Action	Potential Partners	Financial Cost and Effort
Short-term recommendations (over the next 1 to 4 years)			
1. Create a supportive environment for economic development	Permit mixed-use development in appropriate areas such as the downtown and waterfront.		Low cost; Low-effort
	Increase commercial density by reducing minimum standards such as lot sizes and setbacks.		Low cost; Low-effort
	Reduce or eliminate minimum on-site parking requirements for commercial development, especially in the downtown waterfront area.		Low cost; Low-effort
	Identify an additional 5 to 10 ha of commercial lands in the Official Plan in the Balmertown area.		Medium cost; Low-effort
	Identify suitable areas for industrial development in the Official Plan, with consideration for industry-specific servicing needs and other logistical requirements.	• Economic services orgs.	Medium cost; Low-effort
2. Attract workers and businesses to Red Lake	Collaborate on development of a talent attraction strategy that focuses on industries facing worker and talent shortages such as healthcare, education, construction, arts and culture, etc.	• Economic services orgs.	Medium cost; Medium-effort
	Pursue economic diversification initiatives and attract more commercial businesses.	• Economic services orgs. • Tourism and cultural services orgs. • Indigenous services orgs.	Medium cost; High-effort
	Consider incentivizing commercial development.	• Economic services orgs. • Tourism and cultural services orgs.	Medium cost; Medium-effort
	Promote employment opportunities by leveraging the Municipality's natural and physical assets.	• Economic services orgs. • Tourism and cultural services orgs. • Indigenous services orgs.	Low cost; Medium-effort
Medium-term recommendations (over the next 5 to 8 years)			
3. Create a supportive environment for economic development	Create a Downtown and Waterfront Master Plan for Red Lake's waterfront and core commercial areas.	• Economic services orgs. • Community and social services orgs. • Tourism and cultural services orgs. • Indigenous services orgs.	Medium cost; Medium-effort
	Activate high-profile vacant commercial sites with temporary uses such as pop-up markets or recreational uses.	• Economic services orgs. • Community and social services orgs. • Tourism and cultural services orgs.	Medium cost; Medium-effort
	Create an Airport Master Plan and continue efforts to develop industrial lands adjacent to the airport.	• Economic services orgs.	Low cost; Low-effort

Table 4.1-4: Summary of Infrastructure and Public Realm Recommendations

Recommendation	Action	Potential Partners	Financial Cost and Effort
Short-term recommendations (over the next 1 to 4 years)			
1. Extend Municipal infrastructure to facilitate growth	Invest and partner in extending services to desirable and under-serviced sites or areas.	• Federal and Provincial Governments • Local and regional developers	High cost; High-effort
	Coordinate infrastructure projects with land development projects to ensure contiguous growth and efficient service delivery.	• Economic services orgs. • Housing services orgs.	Medium cost; Medium-effort
	Pursue all available and relevant infrastructure funding (see **Section 4.1.1**).	• Federal and Provincial Governments	Low cost; Low-effort
2. Improve connectivity	Explore feasibility of introducing public transportation within the Municipality including services to remote parts of the Municipality.	• Economic services orgs. • Tourism and cultural services orgs.	Medium cost; Medium-effort
Medium-term recommendations (over the next 5 to 8 years)			
3. Extend Municipal infrastructure to facilitate growth	Extend natural gas to all parts of the Municipality.	• Economic services orgs.	High cost; High-effort
4. Improve connectivity	Invest in sidewalks and pedestrian spaces with more shading and lighting, and greater separation from vehicles to promote safety, walkability, public-realm enhancement, economic productivity, and non-vehicular connectivity.	• Economic services orgs. • Tourism and cultural services orgs.	High cost; Medium-effort
	Promote active transportation by creating a formalized multi-use trail network that is integrated with natural amenities, recreational areas, and major linkages within the Municipality such as the waterfront, beaches, parks, schools, commercial areas, and the hospital.	• Economic services orgs. • Tourism and cultural services orgs.	High cost; Medium-effort
5. Beautify and enhance the public realm	Integrate local public art into the design of streetscape improvements and public spaces including sculptures, murals, and other functional elements (i.e., street furnishings, banners, landscape features, planters, waste receptacles)	• Economic services orgs. • Tourism and cultural services orgs. • Community and social services orgs. • Indigenous services orgs.	Medium cost; Medium-effort
	Incorporate winter-friendly elements such as decorative lighting, bright colours to offset darkness, and materials that absorb heat for comfortable winter seating.	• Economic services orgs. • Tourism and cultural services orgs.	Medium cost; Low-effort

Table 4.1-5: Summary of Community and Social Services Recommendations

Recommendation	Action	Potential Partners	Financial Cost and Effort
Short-term recommendations (over the next 1 to 4 years)			
1. Deliver high-quality community services to support population growth	Pursue all available and relevant funding for community and social services (see **Section 4.1.1**).	• Community and social services orgs. • Indigenous services orgs.	Low cost; Low-effort
	Support community and social service organizations in education, health care, emergency services, and other sectors in their employee attraction efforts.	• Community and social services orgs.	Low cost; Medium-effort
2. Deliver high-quality recreation services and amenities	Invest in improvements to public realm that support walkability in key areas such as the downtown and waterfront.		High cost; High-effort
	Improve community wide connectivity for non-vehicular modes of travel (walking, cycling, etc.).		
	Advance plans for a new arena or multi-purpose sports and recreation venue. Consider opportunities to integrate arts and cultural facilities within the venue.	• Economic services orgs. • Tourism and cultural services orgs. • Community and social services orgs.	High cost; High-effort
3. Collaborate with partners to improve community services	Consult with the KDSB and Province to advocate for increasing the number of daycare spaces as the demand increases with population growth, including those with flexible hours that accommodate shift-work.	• Community and social services orgs.	Medium cost; Medium-effort
	Collaborate with First Nations and Indigenous organizations on the delivery of community and social services.	• Indigenous services orgs.	Medium cost; Medium-effort
Medium-term recommendations (over the next 5 to 8 years)			
4. Deliver high-quality community services to support population growth	Consult with School Boards to ensure there are adequate educational facilities to support increased enrollment.	• Community and social services orgs.	Low cost; Medium-effort
5. Deliver high-quality recreation services and amenities	Update the 2010 Recreation Plan. The Municipality has a strong provision of recreational facilities for a community of its size and benefits from its abundant access to nature. Furthermore, community expectations for recreational facilities are very similar between communities with populations between 5,000 to10,000 people. Aside from the new arena and existing facility maintenance, investment in the public realm and connectivity should be prioritized.	• Economic services orgs. • Tourism and cultural services orgs. • Community and social services orgs.	Medium cost; Medium-effort
6. Collaborate with partners to improve community services	Share data with community, social, education, and emergency service providers to ensure a coordinated approach as the population grows and needs evolve.	• Tourism and cultural services orgs. • Community and social services orgs. • Indigenous services orgs.	Medium cost; Medium-effort

Table 4.1-6: Summary of Health and Wellness Recommendations

Recommendation	Action	Potential Partners	Financial Cost and Effort
Short-term recommendations (over the next 1 to 4 years)			
1. Support the Hospital's efforts to deliver health services	Support the Hospital and Province on a healthcare worker attraction strategy.	• Community and social services orgs.	Medium cost; Medium-effort
2. Improve community well-being	Continue implementation of the Community Safety and Well-Being Plan (2020).	• Community and social services orgs. • Indigenous services orgs.	Medium cost; Medium-effort
	Collaborate with sector organizations on community wellness initiatives.	• Community and social services orgs. • Economic services orgs. • Indigenous services orgs.	Medium cost; Medium-effort
3. Expand capacity of emergency services	Support KDSB to expand or replace their Red Lake Ambulance Base, which is currently at capacity, and in their efforts to attract additional staff (including paramedics). For example, KDSB is seeking to expand housing options for staff, which aligns with the residential development recommendations in **Table 4.1-2**.	• Community and social services orgs.	Low cost; Medium-effort
Medium-term recommendations (over the next 5 to 8 years)			
4. Support the Hospital's efforts to deliver health services	Work with the Hospital and Province on expanding health services that can be provided in the Municipality.	• Community and social services orgs.	Medium cost; Low-effort
	Work with the Hospital on facility expansion plans, if any, following the completion of their new Facility Master Plan.	• Community and social services orgs.	Medium cost; Low-effort

Table 4.1-7: Summary of Tourism and Culture Recommendations

Recommendation	Action	Potential Partners	Financial Cost and Effort
Short-term recommendations (over the next 1 to 4 years)			
No short-term recommendations were identified for tourism and culture.			
Medium-term recommendations (over the next 5 to 8 years)			
1. Support the local tourism industry	Increase quantity and variety of lodging accommodations.	• Economic services orgs. • Tourism and cultural services orgs.	Medium cost; Medium-effort
	Review allocation of Municipal Accommodation Tax.	• Economic services orgs. • Tourism and cultural services orgs.	Low cost; Low-effort
2. Bolster local cultural offerings	Update the 2011 Cultural Plan.	• Economic services orgs. • Tourism and cultural services orgs. • Community and social services orgs. • Indigenous services orgs.	Medium cost; Medium-effort
	Advance plans for a purpose-built arts and culture hub such as an event or performance venue.	• Economic services orgs. • Tourism and cultural services orgs. • Community and social services orgs. • Indigenous services orgs.	High cost; High-effort
	Reestablish the Red Lake Arts Council (disbanded since 2016).	• Tourism and cultural services orgs. • Community and social services orgs. • Indigenous services orgs.	Low cost; Low-effort
	Consider creating an Arts and Culture Coordinator position.	• Tourism and cultural services orgs. • Community and social services orgs. • Indigenous services orgs.	High cost; Medium-effort

4.1.1 Service Baseline and Land Analysis Implementation

Coming Together for Red Lake

The realization of the service baseline and land analysis recommendations will require swift action, collective commitment, and enduring effort on the part of the Municipality of Red Lake, CCDC, key stakeholders, and the public. Everyone will have an important role to play in advancing the vision and supporting the evolution of the community while ensuring that growth and development occurs in a sustainable and equitable manner. This includes those who live, work, and visit attractions in the Municipality, as they are the ones who will continue to bring life, culture, and vitality to the area, helping to create a vibrant, safe, and attractive community and destination.

Endorsement and Accountability

Successful implementation of this study's recommendations will require endorsement and integration across Municipal leadership, administration, and council. This multidisciplinary approach must also be duplicated outside the Municipality by other levels of government and the various sectors operating in Red Lake from private businesses to social service providers. Red Lake has always relied on the investment of both the public and private sector and the realization of this study's recommendations will be no different. While not intended to be prescriptive, the recommendations identify potential partners for each action. Embracing collaboration and pursuing mutually beneficial partnerships between organizations will be critical to achieving positive outcomes.

Respond Efficiently and Effectively to Funding Opportunities

The implementation of this study's recommendations will require substantial investment in community infrastructure and services. Priorities should be established quickly, but the Municipality should continually monitor and always be prepared to pursue external funding opportunities. Relevant sources to monitor include:

- Housing, Infrastructure and Communities Canada;
- Federal Economic Development Agency for Northern Ontario;
- Federation of Canadian Municipalities, such as the Green Municipal Fund and Community Economic Development Initiative;
- Canada Mortgage and Housing Corporation, such as the Affordable Housing Fund;
- Government of Ontario, such as the Ontario Municipal Partnership Fund and Infrastructure Ontario's Loan Program;
- Ontario Trillium Foundation grants for many types of organizations and communities to deliver social programs and services.
- Ontario's municipal governments co-fund through Consolidated Municipal Services Managers and District Social Service Administration Boards; and
- Other funding programs available to the private sector and First Nations.

Recommendations, Monitoring, Review, and Adaptation

Urgent action is required on this study's recommendations in order for the Municipality to capitalize on the identified potential for growth. However, recognizing that this study sets a long-term vision for the evolution of Red Lake over the next decade and beyond, the recommendations should be considered as a flexible framework that must adapt to remain relevant in the face of changing conditions. Accordingly, the CCDC, Municipality, and their partners should frequently review this study to ensure it remains relevant to the community and to adapt where needed. The recommendations summary intends to help the CCDC and Municipality balance the priorities and timelines of the recommendations while tracking their progress.

4.2 INFRASTRUCTURE RECOMMENDATIONS

The following section outlines recommendations to support the development, expansion, and maintenance of municipal infrastructure necessary to accommodate projected population and employment growth. These recommendations are informed by the infrastructure baseline review presented in **Section 2.5** and the infrastructure needs assessment in **Section 3.3**. They are intended to help the Municipality strategically plan for future upgrades and investments. Recommendations focus on core systems including water supply, treatment, and distribution; and sewage collection, treatment, and disposal.

Recommendations are presented in summary tables that identify the type of infrastructure system, recommended action, associated timeframe, and estimated financial cost and level of effort. Unlike the preceding section, this infrastructure-focused section does not assess required partnerships. Instead, emphasis is placed on cost and sequencing to guide long-term capital planning and ensure service delivery can meet future demand.

The cost estimates provided are an opinion of probable construction costs. This opinion is based on assumptions as to the actual conditions that will be encountered on-site, as actual site conditions may be at variance with the information obtained from on-site review and available documents. The specific decision and design of other design professionals engaged (i.e. geotechnical soils analysis); the means and methods of construction the Contractor will employ; the costs and extent of labour, equipment and materials the Contractor will employ; contractor's techniques in determining prices and market conditions at the time; may be based upon other factors over which JRCC has no control. The cost estimates herein represent the best estimates of JR Cousin Consultants Ltd. Cost estimates are considered a budgetary estimate and include a contingency and allowance for non-construction costs (engineering, project management, project team coordination). Unless otherwise noted, the cost estimate represents the capital cost for construction and does not include any ongoing operation and maintenance costs.

4.2.1 Water Infrastructure Recommendations

Table 4.2-1 summarizes the water infrastructure recommendations for the communities within the Municipality, including the timeline and estimated financial consideration. In summary the Red Lake WTP, Madsen WTP, Balmertown WTP, and Balmertown RPS appear in good condition, with systems well maintained and performing within regulatory requirements.

However, upgrades are recommended to address aging equipment, improve fire protection storage, and ensure long-term redundancy and reliability.

Table 4.2-1: Summary of Water Infrastructure Recommendations

Community	Recommendation	Budgetary Cost	Effort
Short-term recommendations (over the next 1 to 4 years)			
Red Lake	1. Implement control measures to prevent flooding of raw water chambers during high lake levels.	$20,000 to $50,000[1]	Medium-effort
Balmertown, Cochenour, and McKenzie Island	2. Install an additional pump at the BCMI WTP to ensure redundancy for fire and maximum day flows.	$150,000 to $175,000	Medium-effort
Long-term recommendations (8+ years)			
Madsen	3. Assess feasibility of increasing treated water storage to meet fire protection standards.	$900,000 to $1,100,000[2]	High-effort
Madsen	4. Evaluate and plan for system redundancy by upgrading or adding an additional treatment unit.	$5,500,000 to $6,500,000[2]	High-effort

Notes:
1. Depending on the level of automation and design complexity.
2. Potential cost savings if a reservoir expansion and treatment unit upgrade are combined.

Red Lake

The Red Lake WTP appears to be in good condition. The equipment and interior finished are showing their age, but there are no major concerns related to the process functionality as the system is well maintained and operated (Stakeholder Engagement 2025). The lower area of the building contains raw water chambers and a generator. The raw water chambers are connected to Red Lake via a gravity intake line, so the water level in the chamber is equal to the lake elevation. The operators noted that there have been issues in the past where the lake level exceeds the height of the chamber which causes flooding in the lower level of the WTP. Control measures are recommended to prevent the raw water chambers from overflowing.

The historic average water demand between 2014 and 2024 in Red Lake was 982.8 m^3/day and the maximum day demand was 2,290 m^3/day. The treatment system consists of two treatment units each rated for 3,024 m^3/day, thus the treatment system is adequately sized to meet the current maximum day demands with one unit out of service. The maximum day water use represents 38% of the total system capacity of 6,048 m^3/day if both filters are in use and 76% of the capacity of a single unit. The treatment system has sufficient capacity to meet the current maximum day demands with one unit out of service.

The maximum raw water flow in 2024 was 1,485 m^3/day which is below the regulatory limit of 6,480 m^3/day.

The Red Lake WTP and water tower have a combined 2,208 m^3 of available treated water storage. The recommended treated water storage is 999.1 m^3 if fire protection is provided and 965.6 m^3 if no fire protection is provided, thus there is adequate treated water storage capacity in Red Lake. Distribution flows are provided by the water tower, thus there are no concerns about the system providing adequate flows for domestic water use and fire protection.

The treatment system is currently doing a good job of treating the raw water. Based on the sampling provided, there are no parameters in the treated water which exceed any provincial or federal guidelines. One elevated sample of lead was noted in the annual report which was taken from a non-residential plumbing system. No samples taken from the distribution system exceeded the guidelines for lead.

Madsen

The Madsen WTP appears to be in good condition. There are moderate aesthetic defects throughout the building, but the system is well maintained and operated (Stakeholder Engagement 2025).

The historic average water demand between 2010 and 2024 in Madsen was 111.4 m^3/day and the maximum day demand was 436 m^3/day. The treatment system consists of two treatment units each rated for 345.5 m^3/day, thus the treatment system cannot meet historic maximum day demands with a treatment unit out of service but can meet this demand with both units. The maximum day water use represents 63% of the total system capacity of 691 m^3/day if both filters are in use and 126% of the capacity of a single unit.

The maximum raw water flow in 2024 was 383 m^3/day which is below the regulatory limit of 564 m^3/day.

The Madsen WTP has 190 m^3 of available treated water storage. The recommended treated water storage is 419.8 m^3 if fire protection is provided and 153.6 m^3 if no fire protection is provided, thus the reservoir is undersized to provide fire protection.

The treatment system is currently doing a good job of treating the raw water. Based on the sampling provided, there are no parameters in the treated water which exceed any provincial or federal guidelines.

The fire flow requirements, storage capacity and overall treatment capacity should be reviewed as the system is not capable of providing fire flow storage. The treatment system is capable of meeting the current demands, but does not have a redundant unit.

Balmertown, Cochenour, and McKenzie Island

The BCMI WTP and Balmertown RPS are both in excellent condition. The systems are well maintained and operated and there are no concerns regarding the condition of the buildings or equipment (Stakeholder Engagement 2025).

The average combined water demand between 2010 and 2024 in Balmertown, Cochenour and McKenzie Island was 1026.8 m^3/day and the maximum day demand was 2,773 m^3/day. The treatment system consists of three treatment units each rated for 2,021.7 m^3/day with a firm system capacity of 4,043.4 m^3/day, thus the treatment system is adequately sized to meet the

current maximum day demands with two out of the three units running. The maximum day water use represents 46% of the total system capacity of 6,065 m^3/day if all three filters are in use and 69% of the capacity if two units are in use leaving one for redundancy. The treatment system has sufficient capacity to meet the current maximum day demands with one unit out of service.

The maximum raw water flow in 2024 was 1,846 m^3/day which is below the regulatory limit of 6,065 m^3/day.

The BCMI WTP has 1,380 m^3 of available treated water storage. The recommended treated water storage is 486.9 m^3 if fire protection is provided and 241.2 m^3 if no fire protection is provided based on 2024 water use, thus there is adequate treated water storage capacity provide fire protection to Cochenour and McKenzie Island. The distribution pumping system is not capable of providing the maximum day flows in addition to fire flows with one pump out of service. If all pumps are in use, this flow can be met. There is a spare pump port in the BCMI WTP. It is recommended that an additional pump is purchased and installed to provide system redundancy.

The Balmertown RPS has 2,201 m^3 of available treated water storage. The recommended treated water storage is 550.7 m^3 if fire protection is provided and 447.4 m^3 if no fire protection is provided based on 2024 water use, thus there is adequate treated water storage capacity to provide fire protection in Balmertown. The distribution pumping system is capable of providing maximum day flows in addition to fire flows with one pump out of service.

The treatment system is currently doing a good job of treating the raw water. There were exceedances of haloacetic acids in 2023 which the operators are aware of and closely monitor. No exceedances were seen in 2024. Based on the sampling provided, no other parameters in the treated water exceeded any provincial or federal guidelines.

It is recommended that an additional pumping capacity is provided in the BCMI WTP to provide sufficient fire flow and maximum day flows with one pump out of service.

4.2.2 Wastewater Infrastructure Recommendations

Table 4.2-2 summarizes the wastewater infrastructure recommendations across the communities within the Municipality, including the timeline and estimated financial consideration for each. In general, the Red Lake and Balmertown wastewater treatment systems and associated lift stations are well maintained and adequately sized to meet current demands. The Cochenour lagoon system is also in good condition, with sufficient storage capacity.

Table 4.2-2: Summary of Wastewater Infrastructure Recommendations

Community	Recommendation	Budgetary Cost	Effort
Short-term recommendations (over the next 1 to 4 years)			
Cochenour and McKenzie Island	1. Implement regular vegetation removal on lagoon berms to preserve liner integrity.	$10,000 per year	Low-effort

Red Lake

The Red Lake WPCP and lift station network is well maintained and operated. The WPCP appears to be in adequate condition given the age of the infrastructure and is meeting the current wastewater demands in Red Lake. There are no concerns about the system functionality based on the on-site condition review (Stakeholder Engagement 2025).

The 2024 average wastewater demand in Red Lake was 969 m^3/day with a peak instantaneous flow of 3,680 m^3/day. The treatment system has a rated capacity of 2,460 m^3/day and a rated peak instantaneous flow of 7,728 m^3/day, thus the system is adequately sized to meet the current demands. The average demand represents 39% of the system capacity and the peak flow represents 48% of the system capacity.

Madsen

Wastewater in Madsen is directed to a holding tank which then flows to a treatment system owned and operated by the mine. The wood siding on the exterior of the holding tank is in poor condition, however the tank itself which is constructed of concrete appears to be in adequate condition. Since the treatment system is not owned or operated by Red Lake, no information was available regarding the capacity or treatment effectiveness. Wastewater can continue to be treated by the existing system.

Cochenour and McKenzie Island

The Couchenour Lagoon and lift stations are well maintained and operated and appear to be in good condition. The lagoon has moderate vegetation growth on the inner berms which have potential to compromise the liner integrity, but does not impact the functionality or capacity of the system. The 2024 wastewater production in Cochenour and McKenzie Island was 51,856 m^3 based on the meter readings from the lift stations with an average day flow of 142 m^3/day. The Cochenour lagoon has a storage capacity of 92,333 m^3 which equates to 650 days of storage based on the current demands, thus is adequately sized for the current wastewater demands from Cochenour and McKenzie Island.

It is recommended that vegetation removal is added to the operation tasks of the lagoon.

Balmertown

The Balmertown WPCP and lift station network is well maintained and operated. The WPCP appears to be in adequate condition given the age of the infrastructure and is meeting the current wastewater demands in Balmertown. There are no concerns about the system functionality based on the on-site condition review (Stakeholder Engagement 2025).

The 2024 average wastewater effluent leaving the WPCP in Balmertown was 549 m^3/day with a peak instantaneous flow of 1,207 m^3/day. Lift station flows were not provided, so the influent volumes were not reviewed. The treatment system has a rated capacity of 1,224 m^3/day and a rated peak instantaneous flow of 3,715 m^3/day, thus the system is adequately sized to meet the current demands. The current effluent flows represent 32% of the system capacity and the peak flow represents 45% of the system capacity.

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APPENDIX A:
Municipality of Red Lake Population Projections

Appendix A: Municipality of Red Lake Population Projections

The following summarizes population projections prepared by InterGroup Consultants (InterGroup) for the Chukuni Communities Development Corporation (CCDC) and the Municipality of Red Lake. It consolidates information from publicly available sources on regional mining and road development projects as well as comparable population trends in other Ontario municipalities and regions. These population projections will support the Community Capacity Study, which will assess the Municipality of Red Lake's potential to accommodate population growth, considering current and anticipated constraints in infrastructure, facilities, and services. The following focuses exclusively on population projections and does not address the broader implications for community capacity.

A1 Introduction

Population projections were completed for the Municipality of Red Lake (Red Lake, Balmertown, Cochenour, McKenzie Island, Madsen, and Starratt Olsen) for a 20-year period from 2025-2045. InterGroup reviewed existing population projections for the Province of Ontario, northwest Ontario, and other communities within northern Ontario to understand comparable assumptions. Details on these other population projections and their underlying assumptions are provided in **Attachment A1.**

The baseline population projection model used an age cohort survival method with Statistics Canada 2021 Census as the baseline. The age cohort survival method is used by the Ontario Ministry of Finance and Statistics Canada for developing population projections. This approach forecasts year-over-year population change from the base year, projecting births, deaths, and migration by age and gender. These forecasts rely on past trends adjusted for potential future changes. The population projections document potential population changes without and with the referenced mining and road development projects, which include existing operations (Evolution Mine) and planned operations (West Red Lake Gold,[6] Great Bear Project – Kinross Gold, PAK Lithium Project - Frontier Lithium, and the Berens River Bridge and Roads Project). The baseline population projection scenario includes existing mining and road development projects (i.e., Evolution Mine), and the potential growth population projection scenario includes the referenced existing and planned mining and road development projects. Additional information on the approach used and assumptions for the referenced mining and road development projects are provided in **Attachment A2**. For illustrative purposes, the projections for the Municipality of Red Lake were further disaggregated by community (i.e., Red Lake, Balmertown, Cochenour, McKenzie Island, Madsen, and Starratt Olsen) to support the municipal infrastructure and services assessment and are provided in **Attachment A3**.

A2 Population Projections for the Municipality of Red Lake

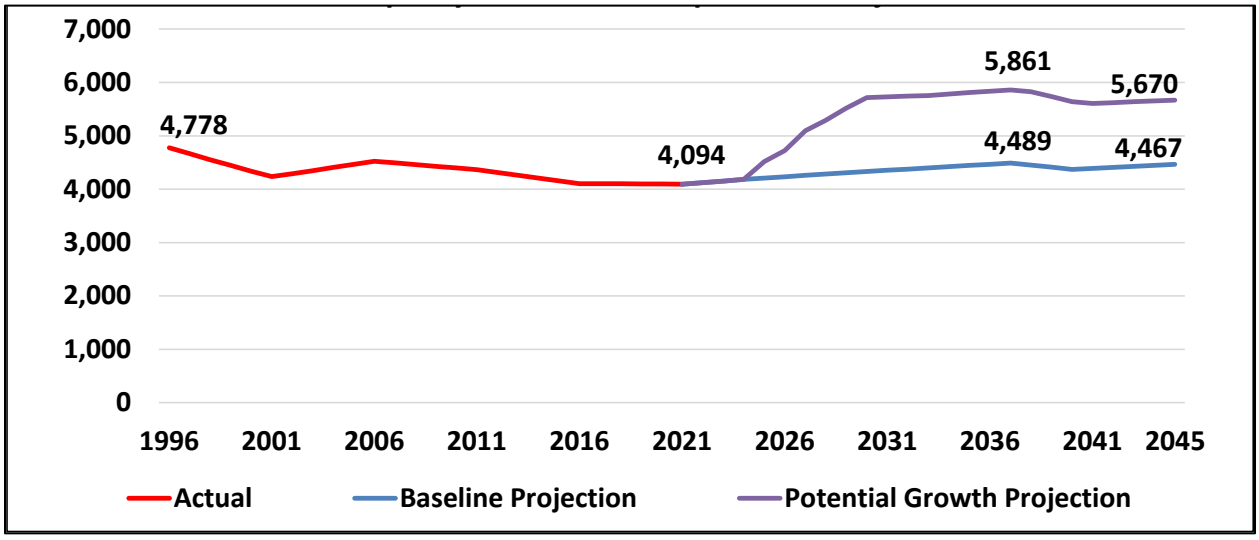
- Two scenarios were developed to project the potential range of population change as a factor of changes in overall economic conditions. The two scenarios include:

[6] As of June 2025, the West Red Lake Gold mine has restarted operations.

- The **baseline projection** used an age cohort survival method that projects an increase in population for the Municipality of Red Lake. The projection includes the change in population from existing operations (Evolution Mine) and documents the potential population change without the planned referenced mining and road development projects. The model utilized the fertility rates, net migration rates, and death rates assumptions used by the Ontario Ministry of Finance for their population projections for the Kenora District Census Division.
- The **potential growth projection** used the age cohort survival method from the baseline projection and included the incremental additions of in-migration from the planned mining and road development projects. This projection reflects a maximum upper bound of population growth associated with known resource development and infrastructure projects.

Figure A1 shows the results for the baseline and potential growth projection from 2022 to 2045 and the historical population for the Municipality of Red Lake from 1996 to 2021.

Figure A1: Red Lake Actual Population from 1996-2021 and Baseline and Potential Growth Projections from 2022-2045



Sources: Ontario Ministry of Finance 2024; Statistics Canada 2002, 2007, 2012, 2017, 2022, 2024.
Notes: Projections for the Municipality of Red Lake were prepared by InterGroup Consultants Ltd.

The population in the Municipality of Red Lake was 4,094 people in 2021 (Statistics Canada 2022). The population decreased from 4,778 in 1996 to 4,094 in 2021 (or by 684 people at an average annual rate of change of -0.62%) (Statistics Canada 2002, 2022). Since 2001, the median age has remained relatively constant, increasing from 37.0 years in 2001 to 38.4 years in 2021.

In summary, the results of **Figure A1** show:

- **Baseline projection** scenario: the population is projected to increase from 4,094 in 2021 to 4,467 by 2045 (or average annual growth rate of 0.35%); and

- **Potential growth projection**: the population is projected to increase from 4,094 in 2021 to 5,670 by 2045 (or average annual growth rate of 1.37%). Given the closure of some of the referenced mining projects between 2036-2041, the population of the Municipality of Red Lake is projected to peak at 5,861 in 2037 for the potential growth projection.

The population projections reflect a range of potential outcomes accounting for numerous factors affecting population change. To reach a 2045 population between the baseline projection of 4,467 people and the potential growth projection of 5,670 people, in-migration to the Municipality of Red Lake will need to exceed the baseline rates. For this to happen, the referenced mining and road development projects need to be realized with employment opportunities that attract new residents to the Municipality. These projections are within the projected rates for other Ontario municipalities and regions (**Attachment A1**).

Over the projection period a total of 974 people (269 from direct employment, 269 from families, and 436 due to economic job creation) are projected to migrate to the Municipality of Red Lake as a result of the referenced mining and road development projects. Additional details regarding assumptions on employment for the referenced mining and road development projects and the family and economic multipliers are summarized in **Attachment A2**.

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Appendix A Attachment A1: Review of Existing Population Projections in Ontario

Existing population projections were reviewed for the Province of Ontario, northwest Ontario, and communities in northern Ontario. Population projections are a useful tool for municipal and regional planning to understand future capacity and needs of municipal services and infrastructure. Assumptions used for other population projections and the range of average annual growth rates were applied to support the development of the Municipality of Red Lake population projections. **Table A1-1** compares the population projections and the average annual growth rates for the Municipality of Red Lake compared to projections reviewed for Ontario, Northwest Ontario, Dryden, Thunder Bay, Sioux Lookout, and Greater Sudbury.

Table A1-1: Population Projections in Ontario

Community	Population Projection	Average Annual Growth Rate
Municipality of Red Lake	2021 - 4,094 2045 - 4,467 to 5,670	0.35% to 1.37%
Ontario	2023 - 15.6 million 2045 - 17.8 to 23.0 million	0.60% to 1.79%
Northwest Ontario	2023 - 248,800 2045 - 275,200	0.46%
Dryden	2021 - 7,388 2041 - 6,658 to 8,536	-0.52% to 1.12%
Thunder Bay	2021 - 108,843 2045 - 108,637 to 124,959	-0.04% to 2.8%
Sioux Lookout	2016 - 5,272 2031 - 6,378	1.3%
City of Greater Sudbury	2021 - 170,210 2051 - 188,510 to 200,000	1.11% to 1.18%

Sources: City of Greater Sudbury 2023; Explorer Solutions 2022; Ontario Ministry of Finance 2024; Sioux Lookout 2021; Statistics Canada 2017, 2022, 2024; Thunder Bay 2022.
Notes: Projections for the Municipality of Red Lake were prepared by InterGroup Consultants Ltd.

Ontario Population Projections

Statistics Canada publishes population projections for Canada and all provinces and territories over the next 25 years; with projections for Canada available for the next 50 years. Similarly, the Ontario Ministry of Finance produces population projections for all 49 Ontario census divisions to 2051. Both projections use 2023 population estimates for Ontario from Statistics Canada released in May 2024 and based on the 2021 Census of Population. The 2023 population

estimates include changes in the population to reflect recent trends in fertility, mortality, and migration.

With an estimated population of 15.6 million for Ontario in 2023, the Statistics Canada and Ontario Ministry of Finance population projections range from 17.8 million (or an average annual growth rate of 0.60%) to 23.0 million (or an average annual growth rate of 1.79%) by 2045 (Ontario Ministry of Finance 2024; Statistics Canada 2024).

Northwest Ontario Population Projections

The Ontario Ministry of Finance projects the population for northwest Ontario (i.e., Kenora District, Rainy River District, and Thunder Bay District Census Divisions) to grow from 248,800 in 2023 to 275,200 (or an average annual growth rate of 0.46%) by 2045 (Ontario Ministry of Finance 2024). The Kenora District population is projected to increase from 73,177 in 2023 to 83,345 by 2045 (or an average annual growth rate of 0.59%). Population growth in the Kenora District is expected to occur at a higher rate than the Thunder Bay District and the Rainy River District over the projection period.

The Kenora District Services Board (KDSB) provides essential services for municipalities and the people living in the unincorporated territories within the Kenora District including social services, employment and financial support services, community housing services, childcare, and emergency medical services. Population growth and associated housing demand growth are projected to understand the demand for residential housing in the Kenora District for a twenty-year period (KDSB 2023). The KDSB anticipates economic growth to be driven by mining, forestry, transportation, and manufacturing sectors. Projected population growth due to increased economic activity may range from 12% (or an average annual growth rate of 0.45%) to as high as 40% (or an average annual growth rate of 1.35%) in high economic scenarios by 2045 (KDSB 2022).

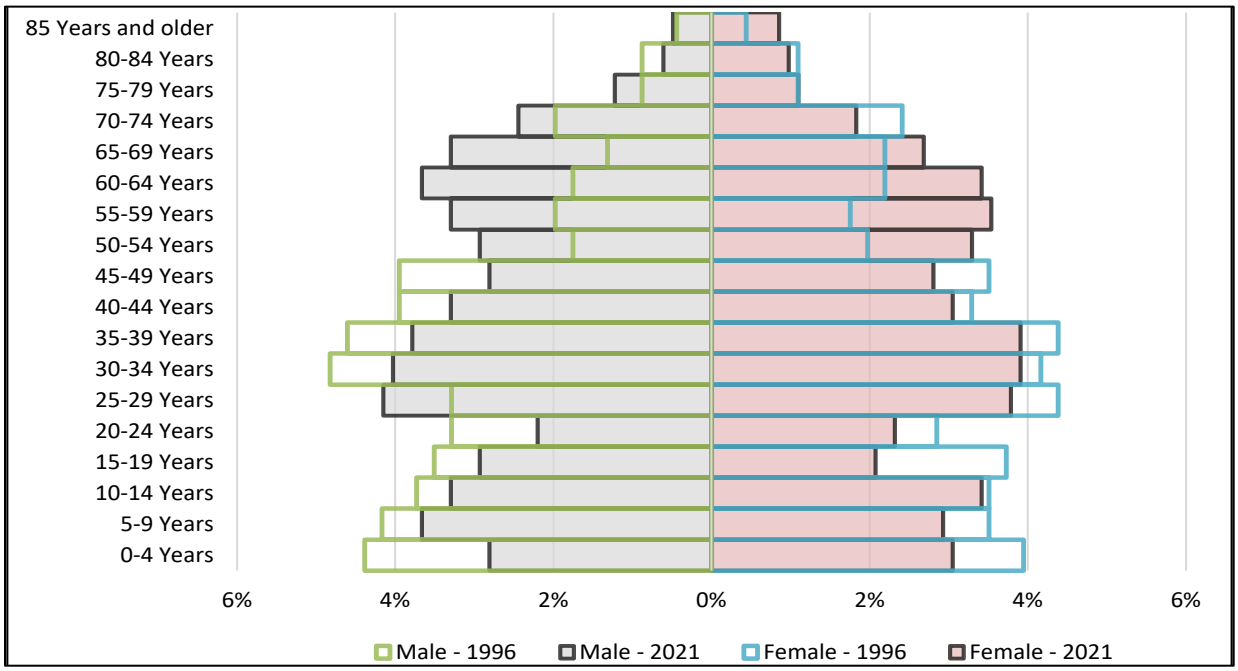
Population Projections for Municipalities in Northern Ontario

Municipality of Red Lake

The population in the Municipality of Red Lake was 4,094 people in 2021 (Statistics Canada 2022). The population decreased from 4,778 in 1996 to 4,094 (or by 684 people at an average annual rate of change of -0.62%) in 2021 (Statistics Canada 2002, 2022). Since 2001, the median age has remained relatively constant, increasing from 37.0 years in 2001 to 38.4 years in 2021.

Figure A1-1 shows the population distribution by age and sex for 1996 and 2021 for the Municipality of Red Lake. The age cohorts are presented along the vertical axis with each block representing the proportion of males or females for the corresponding year. The horizontal axis presents the proportion of the total population with the female population presented on the right side and the male population on the left side. The figure shows a maturing population, with a larger proportion of people 50 years and older and smaller proportion of the population aged 0 to 24 years old in 2021 compared to 1996.

Figure A1-1: Population Age and Sex Distribution for the Municipality of Red Lake, 1996 and 2021



Sources: Statistics Canada 1998, 2022.

In 2011, the Municipality of Red Lake developed population projections which projected between 2,226 (or an average annual growth rate of 2.02%) to 4,553 (or an average annual growth rate of 3.54%) additional residents by 2031 (FoTenn Planning and Urban Design 2011). The projections assumed the population in the Municipality of Red Lake would increase from 4,526 in 2011 to between 6,752 and 9,079 by 2031. The high and low growth scenario assumptions include:

- The high growth scenario projected a population of 6,970 by 2021 compared to the actual population of 4,094 in 2021 (Statistics Canada 2022). The high growth projection assumed five new mines would open by 2031 and higher growth in the highway commercial and proposed industrial park areas (FoTenn Planning and Urban Design 2011).
- The low growth projection assumed existing mines would operate and grow, at least two mines would open by 2031, and lower growth in the highway commercial and proposed industrial park area. The low growth projection assumed the population would increase to about 5,528 by 2031 (based on average annual growth rate of 2.02%) (FoTenn Planning and Urban Design 2011).

The 2011 projections were completed to understand if there was a need to expand the municipal boundaries and were based on mining assumptions that included a range of two to five projected mining operations. The approach and assumptions behind the 2011 projections differ from the 2022-2045 population projections produced by InterGroup.

City of Dryden

In 2022, population projections for Dryden were developed for different growth scenarios for the 2021 to 2041 forecast period. The population projections, the underlying assumptions, and average annual growth rates are summarized in **Table A1-2**. Some of the assumptions used for the projections were utilized in developing the Municipality of Red Lake population projections.

Table A1-2: City of Dryden Population Projections for Various Scenarios

Projection	Assumptions	Average Annual Growth Rate
Historical Dryden Growth Trend	Growth rate is reflective of Dryden's change in population over the previous 20 years.	-0.52%
Regional Growth Trend	Growth rate is based on projections for urban centres in Northern Ontario, including Thunder Bay, City of Kenora, City of Dryden, Municipality of Red Lake, and Sioux Lookout.	0.43%
High Growth (Goliath Gold Complex)	Uses the regional growth trend projection and additional assumptions for the expected gold mine. The mine was estimated to create 450 new jobs, with an expected mine life of 13.5 years. 33% of the jobs would be allocated to newcomers who would move to Dryden; of which 50% would be single persons, 25% would be a family of two, and 25% would be a family of four. This implies a family multiplier of 2.0. A multiplier of 1.32 for indirect jobs and 1.20 for induced jobs were created for each job. This implies an economic multiplier of 1.52. 25% of newcomers who moved to Dryden would move out of the city after the mine closes.	1.12%

Sources: Explorer Solutions 2022.

Thunder Bay, Sioux Lookout, and City of Greater Sudbury

Table A1-3 shows information on population projections that were prepared for Thunder Bay, Sioux Lookout, and Greater Sudbury. The projections for other communities within Ontario are informative for understanding the range of growth rates assumed in population projections.

Table A1-3: Thunder Bay, Sioux Lookout, and the City of Greater Sudbury Population Projections

Community	Population Projection	Average Annual Growth Rate
Thunder Bay	2021 – 108,843 2045 - 108,637 to 124,959	-0.04% to 2.8%
Sioux Lookout	2016 - 5,272 2031 - 6,378	1.3%
City of Greater Sudbury	2021 - 170,210 2051 - 188,510 to 200,000	1.11% to 1.18%

Sources: City of Greater Sudbury 2023; Sioux Lookout 2021; Thunder Bay 2022.

Appendix A Attachment A2: Projections Approach

Typical drivers of population change are fertility rates, mortality rates, and net migration. These drivers are affected by multiple factors including the age structure of the current population, government initiatives (e.g., programs to promote migration such as the Rural and Northern Immigration Pilot), and economic opportunities. Economic opportunities require consideration of multipliers as the creation of new jobs may generate additional growth. As such, the growth of two sets of multipliers is considered driven by economic opportunities:

- **Family multiplier:** The family multiplier accounts for family members who migrate to the area with their spouses/partners/parents/children. Assumed 50% of migrants will be single persons, 25% will be accompanied by one person (two-person household), and 25% will be accompanied by three people (four-person household) for a total multiplier of 2.0.
- **Economic multiplier**: Private (e.g., retail, accommodation) and public (e.g., healthcare, educational services) sector jobs are created in response to economic development and the associated increase in population. The economic multipliers were used to estimate the number of additional indirect and induced jobs that are created due to growth in jobs. Assumed an economic multiplier (i.e., indirect and induced job creation) of 1.87 for families migrating with employed persons for the mining and road development projects; 1.73 for gold mining projects; 2.49 for road development projects; and 1.59 for lithium mining projects.

Age Cohort Survival Method

The age cohort survival method projections for the Kenora District Census Division were the starting point for the Municipality of Red Lake population projections. This model was derived from the Ontario Ministry of Finance population projections (Ministry of Finance Ontario 2024). The growth rate was determined by using the fertility rate of females ages 15-49 years old, the observed death rates by age and gender, and net migration rate by Census Divisions. Net migration was disaggregated by immigration, emigration, non-permanent residents, interprovincial migration, and intraprovincial (i.e., movement from one census subdivision to another within a province) migration. Data provided by the Ministry of Finance included:

- Deaths by age and gender;
- Projected number of births by gender; and
- Projected net migration.

Approximations of the fertility rate, death rates, and migration rates by age and gender were obtained for the Kenora District Census Division. Using these calculated values yielded the same results for the projected population by year as the projections published by the Ontario Ministry of Finance for the Kenora District Census Division.

The first step for using the age cohort survival method for the Municipality of Red Lake was to obtain a single age breakdown by gender for municipal residents. This was done by using the population breakdown by single-age in the 2021 Census of Population. The death rate by age and gender, constant fertility rate for women aged 15 to 49, and net migration rate by age and

gender derived from the Kenora District projections were used to create the projection for the Municipality of Red Lake. It was assumed that the fertility rate, death rate, and migration rate for the Kenora District would be similar to the Municipality of Red Lake over the projection period.

Economic Assumptions

Population projections for the Municipality of Red Lake require additional economic growth to achieve a population between the baseline projection and the potential growth projection by 2045. For the potential growth projection, InterGroup assumed the West Red Lake Gold,[7] Great Bear Project – Kinross Gold, PAK Lithium Project - Frontier Lithium, Berens River Bridge and Roads Project would become active during the projection period and would generate jobs for people in the Municipality of Red Lake, leading newcomers to migrate into the Municipality to fulfill a portion of the jobs. Information on the Evolution Mine, which is currently operating, is also included as this mine is expected to close during the projection period and is included in both the baseline and potential growth population projection scenarios. The Berens River Bridge and Roads Project is a key infrastructure component that will support the PAK Frontier Lithium Project by providing essential all-season access to transport mined materials. **Table A2-1** summarizes available information for the mining and road development projects including the expected mine life or construction period and labour force inputs.

Table A2-1: Mining and Road Development Projects Expected Life and Labour Force Inputs

Project	Expected Mine Life (Project Timeline)	Labour Force Inputs
Evolution Mine (Currently Operating)	18 years (or until 2040)	• Currently about 610 employees and 340 contractors. Camp size of 280 people. • 70% of employees are local, 10% are Indigenous individuals, and 21% are women.
West Red Lake Gold – Madsen Mine	7 years (2025-2032)	• Recently hired 140 people, and about 60% are local. Will continue to prioritize local hires. Camp size of 115 people. • Average workforce of around 245 people from 2026-2028.
Great Bear Project	12 years (2029-2041) Construction 2027-2029	• Average workforce of about 900 people, with a peak workforce of 1,100 people. • Camp size of 300 people during operations and 600 during construction.
PAK Frontier Lithium	24 years (2027-2051) Construction 2025-2030	• Construction will require a workforce of up to 300 on-site and operations up to 285 on-site. • Assumed a workforce of 400 people during construction and 600 during operations to accommodate shift schedules. Have a camp for construction and camp during operations will accommodate up to 400 people.
Berens River Bridge and Roads Project	2025-2027	• Assumed a construction workforce of 300 people and a camp size of 150 people.

[7] As of June 2025, the West Red Lake Gold mine has restarted operations.

Sources: Berens River Bridge and Roads Project n.d.; BBA and WSP 2023; Evolution Mining 2022, 2023; Pfeiffer et al. 2024; SRK Consulting 2025; West Red Lake Gold 2024a, 2024b.
Notes: Assumptions were prepared by InterGroup Consultants Ltd.

The mining and road development projects will employ people locally and outside of the northwest Ontario region. It was assumed that camps will be fully utilized. For local projects (i.e., Evolution Mine, West Red Lake Gold, and Great Bear Project) camps will accommodate people from outside of the Municipality of Red Lake or northwest Ontario. The following assumptions were made for the workforce age and gender distributions for the referenced mining and road development projects:

- **Workforce** – Assumed all new migrants are people between the ages of 25 to 64 years old.
- **Gender Distribution** – Assumed 70% of new migrants are men and 30% are women. Currently about 20% of employees at Evolution Mine are women. Assumed the referenced mining and road projects will employ a higher proportion of women to meet efforts with increasing representation of women in mining and construction industries.

Table A2-2 summarizes information on the employment and migration assumptions used in the potential growth projection. Assumptions for the currently operating Evolution Mine were also used in the baseline projection scenario.

Table A2-2: Mining and Road Development Projects Employment and Migration Assumptions

Project	Employment and Migration Assumptions
Evolution Mine	• 30% of the people not staying at the camp recently moved to the Municipality of Red Lake (200 people). • 25% of migrants will leave the Municipality of Red Lake when the mine closes (50 people) over the final three years of the project (2038-2040).
West Red Lake Gold – Madsen Mine	• 75% of people not staying at the camp will live in the Municipality of Red Lake (100 people), of which 63% will migrate to Red Lake (85 people) from 2025-2027. • 15% of migrants will leave the Municipality of Red Lake when the mine closes (13 people) around the final years of the project (2031-2033).
Great Bear Project	• 35% of people not staying at the camp will live in the Municipality of Red Lake (105-210 people), of which 30% will migrate to the Municipality during the construction phase (90 people) from 2027-2028 and the operating phase (90 additional people) from 2029-2030. • 25% of migrants will leave the Municipality of Red Lake when the mine closes (45 people) over the final three years of the project (2039-2041).
PAK Frontier Lithium	• Given the remote location all workers will stay at the camp. 20% of people will live in the Municipality of Red Lake, of which 15% will migrate to the Municipality during the construction phase (67 people) from 2025-2027 and operations (23 additional people) phase from 2028-2029. • No migration of people leaving the Municipality of Red Lake were forecasted given the mine is expected to close in 2051, which is after the projection period.
Berens River Bridge and Roads Project	• Given the remote location, 20% of people will live in the Municipality of Red Lake (60 people), of which 10% will migrate to the Municipality in 2025 (30 people). • 25% of migrants will leave the Municipality of Red Lake when the project finishes in 2027 (8 people).

Notes: Assumptions were prepared by InterGroup Consultants Ltd.

Multipliers

The use of multipliers was used to account for the family members who migrate to the area with their spouses/partners/parents/children for the referenced mining and road development projects (i.e., family multiplier) and from more jobs being created due to the increase in economic activity from the creation of new jobs (i.e., economic multiplier).

The assumption for the family multiplier aligns with the assumptions made for the City of Dryden population projections related to the Goliath Gold Project (Explorer Solutions 2022). It was assumed that 50% of migrants will be single persons, 25% will be accompanied by one person (two-person household), and 25% will be accompanied by three people (four-person household); for a total family multiplier of 2.0. The age distribution for migrants from the family multiplier were assumed to range from 0 to 90 years old and would be 50% men and 50% women.

The use of the economic multiplier captures the effect that when there are more available jobs in a region, it will increase the overall purchasing power of the community. Additionally, these jobs may be filled by residents who migrate into the region, which will result in an increased demand for all the services and amenities an individual accesses in their everyday life. This increase in demand and purchasing power incentivises other businesses to expand services to meet the increased demand.

The economic multiplier is derived from the 2019 Statistics Canada Input/Output employment multipliers for Ontario (Statistics Canada 2023b). Economic multipliers are typically smaller for smaller geographical areas, and it was assumed that 50% of the indirect and induced employment multipliers for within Ontario would be occur in the Municipality of Red Lake. The following economic multipliers were used in the projections:

- 1.87 for families migrating with employed persons for the referenced mining and road development projects. Uses the total industries multiplier;
- 1.73 for gold mining projects. Used the average of multipliers associated with occupations in support activities for mining; gold and silver ore mining; non-ferrous metal (except aluminum) production and processing; and architecture, engineering, and related services;
- 2.49 for road development projects. Used the average of multipliers associated with occupations in of support activities for transportation; transportation engineering construction; and architecture, engineering, and related services; and
- 1.59 for lithium mining projects. Used the average of multipliers associated with occupations in support activities for mining; other metal ore mining; alumina and aluminum production and processing; and architecture, engineering, and related services.

The economic and family multipliers are assumed to have an interaction where the creation of a job and ensuing migration of the employee with their family to the Municipality of Red Lake (i.e., family multiplier) will generate an increase in demand for private and public services (i.e., economic multiplier). In other words, both the new worker and the additional family members are subject to the economic multiplier. One limitation to the assumption that the family and

economic multipliers interact is that it assumes that the new jobs created from the economic multiplier will be resourced exclusively by residents living outside of the Municipality of Red Lake. This creates an upward bias for the number of residents migrating to the Municipality by assuming all new jobs will be filled by residents not currently residing in the Municipality. A more precautionary approach is taken when projecting for growth relative to things like infrastructure, by overestimating demand to ensure that the basic needs of the community can be met.

Table A2-3 shows the assumed direct employment for the referenced mining and road development projects that will be fulfilled by migrants to the Municipality of Red Lake and the associated number of family members and creation of new jobs (and migrants) as a result of the assumed family and economic multipliers. Over the projection period a total of 974 people (269 from direct employment, 269 from families, and 436 due to economic job creation) are projected to migrate to the Municipality as a result of the referenced existing and planned mining and road development projects.

Table A2-3: Mining and Road Development Projects Projected Population Increase

Project	Direct Employment	Family Multiplier	Economic Multiplier
Evolution Mine	0 new migrants 50 people leave Red Lake when the project finishes	50 people leave Red Lake when the project finishes	80 people leave Red Lake when the project finishes
West Red Lake Gold – Madsen Mine	85 new migrants 13 people leave Red Lake when the project finishes	85 new migrants 13 people leave Red Lake when the project finishes	136 new migrants 20 people leave Red Lake when the project finishes
Great Bear Project	180 new migrants 45 people leave Red Lake when the project finishes	180 new migrants 45 people leave Red Lake when the project finishes	287 new migrants 72 people leave Red Lake when the project finishes
PAK Frontier Lithium	90 new migrants	90 new migrants	131 new migrants
Berens River Bridge and Roads Project	30 new migrants 8 people leave Red Lake when the project finishes	30 new migrants 8 people leave Red Lake when the project finishes	71 new migrants 17 people leave Red Lake when the project finishes
Total	385 new migrants 116 leave Red Lake = **269 new residents**	385 new migrants 116 leave Red Lake = **269 new residents**	625 new migrants 189 leave Red Lake = **436 new residents**

Source: Statistics Canada 2023.
Notes: Assumptions were prepared by InterGroup Consultants Ltd.

Appendix A Attachment A3: Community-Level Population Projections

The population projections for the Municipality of Red Lake were further disaggregated by community (i.e., Red Lake, Balmertown, Cochenour, McKenzie Island, Madsen, and Starratt Olsen) to support the community capacity study. These projections are intended to help identify potential capacity constraints at the community-level. However, population data is not publicly available to complete age cohort survival-based projections for individual communities within the Municipality. Statistics Canada only reports population counts for the Municipality as a whole and does not provide data for all communities, including Balmertown, Cochenour, McKenzie Island, and Starratt Olsen. As a result, community-level projections are provided for illustrative purposes only and rely on multiple data sources, including Statistics Canada and the Chukuni Communities Development Corporation. Given the variability of projections for smaller communities and the assumptions used to estimate the current population for each community, the results should be interpreted with caution.

Table A3-1 provides the population counts assumed for each of the communities based on available information.

Table A3-1: The Municipality of Red Lake Population by Community, 2021[1]

Community	Population	Proportion of Population
Red Lake[2]	1,895	46%
Balmertown[4]	1,246	30%
Cochenour[3]	550	13%
McKenzie Island[3]	150	4%
Madsen[2]	153	4%
Starratt Olsen[4]	100	3%
Total - Municipality of Red Lake	**4,094**	**100%**

Source: Chukuni Communities Development Corporation (CCDC) n.d. Statistics Canada 2023.
Notes:

1. Assumptions were prepared by InterGroup Consultants Ltd.
2. Statistics Canada reported a population of 1,263 for the Red Lake population centre in 2021. This does not include the entire Red Lake community or the surrounding dwellings outside of municipal boundaries which are included in the Municipality of Red Lake population total. To account for this discrepancy, it was assumed that the actual population is 50% higher than reported. The population of Madsen was reported to have 153 people in 2021.
3. The population counts for McKenzie Island and Cochenour were sourced from the CCDC website.
4. Population counts were derived for Balmertown and Starratt Olsen through the review of municipal zoning maps.

Community-level projections were developed by reviewing vacant land parcels allocated for residential development or multi-use development[8]. No data on vacant land was available for Starratt Olsen and due to the size of the community, was not assumed to have any population growth over the projection period.

[8] Multi-use development land included parcels for some combination of residential and/or residential high-density development and commercial, institutional, industrial, hazard lands, or open space development.

Table A3-2 shows the proportion of vacant lands available by community and development type.

Table A3-2: The Municipality of Red Lake Proportion of Vacant Lands by Community and Development Type

Community	Residential	Residential High-Density	Multi-use	Total
Red Lake	55%	7%	19%	81%
Balmertown	5%	0%	10%	15%
Cochenour	0%	0%	1%	1%
McKenzie Island	2%	0%	0%	2%
Madsen	1%	0%	0%	1%
Starratt Olsen	0%	0%	0%	0%
Total	**63%**	**7%**	**30%**	**100%**

Source: Municipality of Red Lake 2025.

Red Lake and Balmertown account for over 95% of vacant land for residential development purposes. Most of the population growth over the projection period is expected to occur in these two communities. Due to the lack of available lands in Cochenour, McKenzie Island, Madsen, only minor amount of growth is expected to occur in these communities.

The community-level projections focus on the needs for 2037 and 2045.[9] In 2037, population and employment are expected to peak as a result of the forecast mining and road development projects. In 2045, projections reflect the end of the projection period.

The following assumptions were used to produce the community-level population projection, aligning with the assumptions used for the vacant land analysis:

1. The baseline growth projection assumes an average annual growth rate of 0.6% from 2021 to 2037 and an average annual growth rate of -0.1% from 2037 to 2045 for Red Lake, Balmertown, Cochenour, McKenzie Island, and Madsen. No data on vacant land was available for Starratt Olsen and due to the size of the community, was not assumed to have any population growth over the projection period.
2. The potential growth scenario assumed any additional growth beyond the baseline growth scenario will primarily occur in Red Lake or Balmertown, due to the lack of vacant lands in other communities.
    i. Residential high-density lands are concentrated in Red Lake and account for less than 100 dwellings over the projections period.

[9] Population projections for the Municipality of Red Lake were developed using the age cohort survival methodology, which relies on population data by age, fertility rates, mortality rates, and net migration. In absence of complete data, InterGroup developed assumptions to disaggregate the Municipality's projected population for 2037 and 2045. These community-level projections are intended for illustrative purposes only. Given the variability of projections for smaller communities and the assumptions used to estimate the current population for each community, the results should be interpreted with caution. Smaller communities are particularly sensitive to minor population changes and projections for these communities should be interpreted accordingly.

ii. Multi-use development was assumed to accommodate 11.1 households per hectare, where residential uses are permitted.
iii. The number of persons per household is assumed to be 2.0 for new development.
iv. Some development was assumed to occur on multi-use development lands, with 3% of available vacant multi-use development lands in Red Lake (22 dwellings or 44 people) and 2% in Balmertown (14 dwellings or 28 people) assumed to accommodate residential development.

Table A3-3 shows the existing population in 2021 and community-level projections for 2037 and 2045, which are provided for illustrative purposes given data limitations (lack of publicly available population counts for individual communities) and development assumptions.

Table A3-3: Illustrative Community-Level Population Projections for the Municipality of Red Lake, 2021, 2037, and 2045[1,2]

	Actual	Baseline Projection		Potential Growth Projection	
	2021	**2037**	**2045**	**2037**	**2045**
Red Lake	1,895	2,082	2,072	3,337	3,169
Balmertown	1,246	1,369	1,362	1,486	1,468
Cochenour	550	605	602	605	602
McKenzie Island	150	165	164	165	164
Madsen	153	168	167	168	167
Starratt Olsen	100	100	100	100	100
Total	**4,094**	**4,489**	**4,467**	**5,861**	**5,670**

Notes:
1. Population projections were prepared by InterGroup Consultants Ltd.
2. Results should be interpreted with caution due the variability of projections for smaller communities and the assumptions used to estimate the current population for each community in the absence of available data. Smaller communities are particularly sensitive to minor population changes and projections for these communities should be interpreted accordingly.

The community-level projections indicate that most of the growth is expected to occur in Red Lake over the projection period. Balmertown and Cochenour are projected to experience growth, while Madsen, McKenzie Island, and Starratt Olsen are projected to experience slight increases or no change in population.

APPENDIX B:
Municipality of Red Lake Land-Based Needs Projections

Appendix B: Municipality of Red Lake Land-Based Needs Projections

B1 Introduction

This memo summarizes land-based projections prepared by InterGroup Consultants (InterGroup) for the Chukuni Communities Development Corporation (CCDC) and the Municipality of Red Lake. It consolidates information from publicly available sources on land-based projections as well as comparable trends in other Ontario municipalities and regions. These land-based projections will support the Community Capacity Study, which will assess the Municipality of Red Lake's potential to accommodate population growth and resulting land-based needs, including residential, commercial, industrial, institutional, and recreational land-based needs. This memo focuses exclusively on land-based projections and does not address the broader implications for community capacity, including vacant and non-vacant lands.

B2 Land-Based Projections Approach

Land-based projections were completed for the Municipality of Red Lake (Red Lake, Balmertown, Cochenour, McKenzie Island, Madsen, and Starratt Olsen) for a 20-year period from 2025-2045. InterGroup reviewed existing land-based and household projections for the Province of Ontario, Kenora District Census Division (Kenora CD), and other communities within northern Ontario (e.g., Red Lake, and Ignace) to understand comparable assumptions. The land-based projections for 2025-2045 completed for the Municipality of Red Lake were developed based on the methodologies used in the Ignace (2019) and Red Lake (2011) studies. Details on these other land-based projections and their underlying assumptions are provided in **Attachment B1.**

The steps used to complete the residential, commercial, industrial, institutional, and recreational land-based projections are as follows:

Residential

1. Completed population and household projections to understand residential land-based demand.
2. Calculated the existing number of residential households per hectare for various densities and the projected split of low-, medium-, and high-density residential households over the projection period. This was completed by examining the number of households per hectare for land parcels with various densities in the Municipality of Red Lake.
3. Calculated the land-based projections for residential lands using the household projections, existing number of households per hectare for low-, medium-, and high-density residential land parcels, and the projected split of low-, medium- and high-density residential households.

Commercial, Industrial, and Institutional

1. Completed employment projections to determine the demand for institutional, commercial, and industrial lands.

2. Determined the existing number of employed people by employment lands[10] (i.e., institutional, commercial, industrial) using information on employment by industry from the 2021 Census of Population and occupied land parcels for institutional, commercial, and industrial lands in the Municipality of Red Lake.
3. Calculated the land-based projections for employment lands using the average employment per hectare for institutional, commercial, and industrial lands and the employment projections by industry.

Recreational

1. Determined the land-based projections for recreational lands as a proportion of the residential land-based projections based on the Municipality of Red Lake Official Plan requirement for dedicating 5% of lands for park or public recreation purposes as required under the Planning Act (Government of Ontario 2024a; Municipality of Red Lake 2015).

Information on the approach used and assumptions for the household, employment, and land-based projections are provided in **Attachment B2**.

B3 Land-Based Projections for the Municipality of Red Lake

Two scenarios were developed to project the potential range of land-based projections. The land-based projections utilized the results from the population projections to determine the household and employment projections. The two scenarios include:

- The **baseline projection** includes population changes resulting from existing operations (Evolution Mine) and projects potential changes to population, households, and employment in the absence of the forecast mining and road development projects.
- The **potential growth projection** applied the results from the baseline projection and included additional in-migration and resulting household and employment increases from the forecast mining and road development projects (West Red Lake Gold's Madsen Mine, Kinross Gold’s Great Bear Project, the Frontier Lithium PAK Project, and the Berens River Bridge and Roads Project). This potential growth projection reflects a maximum upper bound of land-based demand associated with these projects.

InterGroup examined various land parcels to determine the average number of households for low-, medium-, and high-density parcels to calculate the residential land-based demand. The 2021 average employment level for institutional, industrial, and commercial industries and the corresponding occupied land parcels were examined to calculate employment land-based demands.

The Municipality of Red Lake Official Plan states subdivisions for residential purposes may be required to provide 5% of land dedicated for park or public recreation purposes (Municipality of Red Lake 2015). Land-based projections for recreational lands were calculated by multiplying the demand for new residential land by 5% for 2037 and 2045.

[10] Employment lands are lands zoned for the purpose of accommodating commercial, industrial, and institutional business employment needs.

Table B1 shows the projected net demand for residential, institutional, industrial, commercial, and recreational lands for the baseline and potential growth scenarios for 2037 and 2045.

Table B1: Projected Net Residential, Institutional, Industrial, Commercial, and Recreational Land-based Demand for 2037 and 2045

Lands	Baseline[1,2]		Potential Growth[1,2]	
	2037	2045	2037	2045
Residential	22.6 ha	21.3 ha	101.1 ha	90.1 ha
Recreational	1.1 ha	1.1 ha	5.1 ha	4.5 ha
Institutional	0.4 ha	0.5 ha	23.4 ha	20.6 ha
Industrial	1.7 ha	1.7 ha	142.1 ha	125.0 ha
Commercial	0.8 ha	1.0 ha	48.7 ha	43.2 ha
Total	**26.7 ha**	**25.6 ha**	**320.3 ha**	**283.4 ha**

Notes:
1. Projections for the Municipality of Red Lake were prepared by InterGroup Consultants Ltd.
2. Totals may not add due to rounding.

In summary, the results of **Table B1** show:

- **Baseline projection**: there is a projected demand for 27 hectares of developed land by 2037 and 26 hectares by 2045. The demand for new residential land accounts for the majority of land-based demand for the baseline projection scenario.
- **Potential growth projection**: there is a projected demand for 320 hectares of developed land by 2037 and 283 hectares by 2045. The demand for new residential and industrial lands each account for about one third of the land-based demand for the potential growth projection scenario.

The land-based projections reflect a range of potential outcomes, which reflect the projected change in population, households, and employment between 2025 and 2045. To reach the land-based demand by 2045 between the baseline projection of 26 ha and the 2037 potential growth projection[11] of 320 ha, population, household, and employment growth will need to exceed the baseline projection in **Table B1**. For this to happen, the referenced mining and road development projects need to be realized with employment opportunities that attract new residents to the Municipality. The household projections are within the projected rates for other Ontario municipalities and regions (**Attachment B1**).

[11] Employment for the planned mining and road development projects is expected to peak in 2037.

B4 References

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Appendix B Attachment B1: Review of Existing Land-Based and Household Projections in Ontario

Land-based projections are a useful tool for municipal and regional planning to understand future capacity and needs for residential, commercial, industrial, and recreational lands. Household projections are required for understanding land-based projections for residential land parcels. Assumptions used for household projections from other jurisdictions and the range of average annual growth rates were applied to support the development of the Municipality of Red Lake household projections for 2025 to 2045. **Table B1-1** compares the household projections and the average annual household growth rates for the Municipality of Red Lake compared to projections reviewed for Ontario, Kenora District Census Division, Ignace, Thunder Bay, and Greater Sudbury.

Table B1-1: Household Projections in Ontario

Community	Household Projection	Average Annual Household Growth Rate
Municipality of Red Lake	2021 – 1,703 2045 – 1,892 to 2,493	0.44% to 1.60%
Ontario	2021 – 5.49 million 2031 – 6.99 million	2.44%
Kenora District	2021 – 24,818 2041 - 27,483 to 32,956	0.51% to 1.43%
Ignace	2016 - 590 2038 - 832 to 1,996	1.57% to 5.70%
Thunder Bay	2021 – 48,405 2045 – 49,785 to 57,230	0.12% to 0.70%
City of Greater Sudbury	2021 – 71,476 2051 – 81,860	0.45%

Sources: City of Greater Sudbury 2023; Government of Ontario 2024b; KDSB 2023; Statistics Canada 2017, 2022, 2024; Thunder Bay 2022; WSP 2019.
Notes: Projections for the Municipality of Red Lake were prepared by InterGroup Consultants Ltd.

Ontario Household Projections

There were 5.49 million residential dwellings and 14.22 million people in Ontario in 2021 (Statistics Canada 2022). In November 2022, the Government of Ontario set a goal of building at least 1.5 million homes by 2031 (Government of Ontario 2024b). If this goal were to be achieved, there would be at least 6.99 million residential dwellings by 2031 (or an average annual growth rate of 2.44%). Larger urban centres in Ontario (e.g., Toronto, Ottawa) are driving the higher household growth rate. Using the Ontario Ministry of Finance reference population projection for Ontario of 17.35 million by 2031, would imply approximately 2.1 persons per household for new residential household development (Ontario Ministry of Finance 2024; Statistics Canada 2022).

Kenora District Household Projections

There were 24,818 residential dwellings in the Kenora District Census Division in 2021 (Statistics Canada 2022). The KDSB Housing Strategy (2023) projected a demand for between 2,635 and 8,108 additional housing units for the Kenora District by 2041. The projections

assumed the number of dwellings in the Kenora District Census Division would increase from 24,848 in 2021 to between 27,483 and 32,956 by 2041. This projection reflects the high demand for housing in northwest Ontario and the uncertainty in the projected population as a result of anticipated increases to economic activity and the ability for communities to provide housing to new residents.

Household and Land-Based Projections for Municipalities in Northern Ontario

Municipality of Red Lake

There were 1,703 residential dwellings in the Municipality of Red Lake in 2021. The population in the Municipality of Red Lake was 4,094 people in 2021 and there were 2.4 persons per household (Statistics Canada 2022). The number of residential dwellings decreased from 1,750 in 2006 to 1,705 in 2021 (Statistics Canada 2007, 2022). **Table B1-2** shows the number and proportion of private dwelling types by structural types in 2021.

Table B1-2: Private Dwellings[1] in the Municipality of Red Lake in 2021

Dwelling Types	Dwellings	Proportion
Single-detached house	1,385	81.5%
Semi-detached house	25	1.5%
Row house	65	3.8%
Apartment or flat in a duplex	25	1.5%
Apartment with fewer than 5 storeys	160	9.4%
Apartment with 5+ storeys	0	0%
Other single-attached house	5	0.3%
Movable dwelling	40	2.4%

Sources: Statistics Canada 2022

Notes:

1. Private dwellings only include dwellings which are occupied by usual residents. This does not include private dwellings occupied by seasonal residents or dwellings not suitable for year-round occupancy.

In 2011, the Municipality of Red Lake developed land-based projections which projected an additional demand for residential dwellings between 856 (or an average annual growth rate of 2.02%) to 1,751 (or an average annual growth rate of 3.54%) by 2031 (FoTenn Planning and Urban Design 2011). The projections assumed the number of dwellings in the Municipality of Red Lake would increase from 1,740 in 2011 to between 2,596 and 3,491 by 2031. The high and low growth scenario assumptions include (FoTenn Planning and Urban Design 2011; Statistics Canada 2022):

- The high growth scenario projected there would be 2,679 households by 2021 compared to the actual number of households of 1,703 in 2021. The high growth projection assumed five new mines would open by 2031 and there would be higher growth in the highway commercial and proposed industrial park areas.
- The low growth projection assumed existing mines would operate and grow, at least two mines would open by 2031, and there would be lower growth in the highway commercial and proposed industrial park areas. The low growth projection assumed there would be 2,199 households by 2021 compared to the actual number of households of 1,703 in 2021.

- The projections assumed the demand for residential land would be based on existing densities observed in the Municipality of Red Lake. They determined residential land development for low-density housing would have 15 units/ha, medium-density would have 25 units/ha, and high-density would have 43 units/ha. It was assumed that new residential land-development would be 60% low-density, 30% medium-density, and 10% high-density.
- Land-based projections were completed for the aggregate of all employment lands. They determined there would be 15.5 jobs per gross hectare and 2.1 jobs per gross hectare for development in the Nungesser Road Industrial Park.
- The employment land-based projections assumed 85% of jobs would be located within the Municipality of Red Lake.

The 2011 projections were completed to understand if there was a need to expand the municipal boundaries and were based on mining assumptions that included a range of two to five projected mining operations. The approach and assumptions behind the 2011 projections differ from the 2025-2045 household and land-based projections produced by InterGroup. Some of the differences in the approach and assumptions include:

- **Household densities**—The 2011 study assumed new residential development would be 60% low-density, 30% medium-density, and 10% high-density, compared to 70% low-density, 20% medium-density, and 10% high-density in the current study.
- **Aggregate density**—The 2011 study assumed an aggregate density of 18.41 units per net hectare compared to 11.1 units per net hectare in the current study. The 2011 study used samples of existing parcels for each density classification, whereas the current study examined all occupied medium- and high-density dwellings and a sample of a new development of occupied and unoccupied dwellings for low-density dwellings.
- **Employment Projections**—The 2011 study assumed 85% of jobs would be located within the Municipality of Red Lake. The current study excluded mining related employment from the demand for industrial lands. Mining was excluded given there are no plans for planned mine development within the Municipality that would require an increase in demand of mineral mining lands. Planned mines are expected to occur outside of the Municipality and would not necessitate an increase in employment lands.
- **Employment lands**—The 2011 study examined the aggregate of all employment lands while the current study examined the demand for commercial, institutional, and industrial lands separately. The 2011 study assumed 50% of employment lands were occupied compared to 70% in the current study.

Additional information on the approach used and assumptions for the household, employment, and land-based projections are provided in **Attachment B2**.

The KDSB Regional Housing Strategy (2023) projected housing needs for communities in the Kenora District. For Red Lake, there were 1,703 occupied private dwellings in 2021 (Statistics Canada 2022). The KDSB projected the need for between 107 to 1,277 additional housing units for Red Lake by 2041 (or between 1,810 and 2,980 households). The projections completed by InterGroup fall within the projected range of households completed by the KDSB.

Township of Ignace

Ignace completed land-based projections in 2019 as part of their Zoning By-law Review which projected an increase in households from 590 in 2016 to between 832 and 1,996 by 2038. The large projected increase was due to assumptions of residents migrating to Ignace for the Ring of Fire mining opportunities and the Nuclear Waste Management Organization's Adaptive Phased Management Deep Geological Repository for used nuclear fuel. The additional demand for residential households assumed an average persons per household of between 1.6 to 2.2 (WSP 2019). Employment projections were completed for industrial and commercial industries to determine the land-based demand for employment lands. The study determined the demand for between 13.41 ha and 77.94 ha of residential lands, between 1.8 ha and 19.1 ha of industrial lands, and between 8.4 ha and 48.3 ha of commercial lands. The following assumptions were used to complete the land-based projections:

- Employment for agriculture and forestry; mining, oil, and gas; utilities; and construction would occur in rural areas outside of the Township and would not result in an increase in demand of employment lands within the municipal boundary.
- Institutional lands and employment were included in the commercial land-based analysis and projections.
- Assumed 22% of employment would be home-based or have no fixed place of work and would not require development of employment lands in the Township.
- Assumed 85% of residential demand would be low-density (16 households per hectare) and 15% would be high-density (55 households per hectare).
- Assumed 11 jobs per hectare for industrial employment and 12 jobs per hectare for commercial employment. It was estimated that there were 1.35 jobs per hectare for industrial employment due to the existing number of large industrial land parcels. This is much lower than typically used for vacant land analysis so the average of the observed rate and the typical assumption of 15 to 25 jobs per hectare was used.

Thunder Bay and City of Greater Sudbury

Table B1-3 shows information on household projections that were prepared for Thunder Bay and Greater Sudbury.

- Thunder Bay used the Organization for Economic Co-operation and Development target of 462 housing units per 1,000 residents (over average persons per household of 2.2) for new residential housing demand based on their population projections (Thunder Bay 2022).
- Greater Sudbury assumed an average persons per household of 1.77 over the projection period.

The household projections for other communities within Ontario are informative for understanding the range of growth rates assumed in household projections.

Table B1-3: Thunder Bay and the City of Greater Sudbury Household Projections

Community	Household Projection	Average Annual Growth Rate
Thunder Bay	2021 – 48,405 2045 – 49,785 to 57,230	0.12% to 0.70%
City of Greater Sudbury	2021 – 71,476 2051 – 81,860	0.45%

Sources: City of Greater Sudbury 2023; Statistics Canada 2022; Thunder Bay 2022.

Attachment B2: Detailed Land-Based Projections Approach

Household and Employment Projections Approach

Two population projection scenarios were developed for the Municipality of Red Lake for 2025-2045:

- **Baseline projection** scenario: the population is projected to increase from 4,094 in 2021 to 4,467 by 2045 (or average annual growth rate of 0.35%); and
- **Potential growth projection**: the population is projected to increase from 4,094 in 2021 to 5,670 by 2045 (or average annual growth rate of 1.37%). Given the closure of some of the referenced mining projects between 2036-2041, the population of the Municipality of Red Lake is projected to peak at 5,861 in 2037 for the potential growth projection.

Population projections informed household projections which are needed to develop the residential land projections. The employment projections were used to develop the commercial, industrial, and institutional land projections. The projections focus on the needs for 2037 and 2045. In 2037, population and employment are expected to peak as a result of forecast mining and road development. In 2045, projections reflect the end of projection period.

The projected number of households as a result of the increase in population was assumed to be 2.0 persons per household. This aligns with the population projections assumption that 50% of migrants will be single persons, 25% will be accompanied by one person (two-person household), and 25% will be accompanied by three people (four-person household); for a total family multiplier of 2.0. The projected number of households were calculated by dividing the projected increase in the population by the number of persons per household (2.0).

Employment projections were calculated by taking the existing number of employed people in the Municipality of Red Lake in 2021 (2,060 people) and adding the change in the number of people between the ages of 25-64 years old for the baseline population projection scenario. The projection includes the reduction in employees from the expected Evolution Mine closure in 2040. The potential growth scenario used the projected number of employed people from the baseline scenario and added the number of employed people assumed to migrate to and from the Municipality of Red Lake for the West Red Lake Gold's Madsen Mine, Kinross Gold’s Great Bear Project, the Frontier Lithium PAK Project, and the Berens River Bridge and Roads projects. Projections were completed for 2037 as this is when population and employment are expected to peak and for 2045; the end of the projection period.

Table B2-1 shows the actual population, number of households and employment in 2021 and the projected population, number of households and employment for 2037 and 2045 in the Municipality of Red Lake.

Table B2-1: Municipality of Red Lake Population, Households and Employment Baseline and Projected Growth Projections, 2037 and 2045

	Actual	Baseline Projection[1]		Potential Growth Projection[1]	
	2021	2037	2045[2]	2037[3,4]	2045[4]
Population	4,094	4,489	4,467	5,861	5,670
Households[5]	1,705	1,903	1,892	2,589	2,493
Employment	2,060	2,076	2,078	3,194	3,059

Sources: Statistics Canada 2022.
Notes:
1. Projections for the Municipality of Red Lake were prepared by InterGroup Consultants Ltd.
2. Assumed 130 people would leave Red Lake when Evolution Mine is anticipated to close (between 2038 and 2040) and 22 family members between the ages of 25-64 years old would also leave.
3. Assumed the West Red Lake Gold's Madsen Mine, Kinross Gold's Great Bear Project, the Frontier Lithium PAK Project, and the Berens River Bridge and Roads projects will result in an increase to employment of 984 from direct, indirect, and induced jobs and an increase of 173 from family members between the ages of 25-64 years old that would migrate with employees of direct jobs. See the **Population Projections memo** for more information on employment assumptions.
4. Assumed 280 people would leave Red Lake when West Red Lake Gold, Great Bear Project – Kinross Gold, and Evolution Mine are anticipated to close (between 2030 and 2041) and 48 family members between the ages of 25-64 years old would also leave. See the **Population Projections memo** for more information on employment assumptions.
5. Households are private dwellings which are occupied by permanent residents. Households include single- and semi-detached houses, row houses, apartments or flats in a duplex, and moveable dwellings (Statistics Canada 2022).

Employment projections were further disaggregated by institutional, industrial, and commercial industries using data on employment by industry sectors from the 2021 Census. Additional information on the approach used and assumptions for the household, employment, and land-based projections are provided below.

Residential Land-Based Projections Approach

In 2021, the Municipality of Red Lake had 1,703 residential dwellings. The majority of residential dwellings are low-density (83% or 1,425 dwellings) land parcels and the remainder are medium- or high-density (17% or 280 dwellings) (Statistics Canada 2022) land parcels.

InterGroup examined the current number of households per hectare for low-, medium-, and high-density residential land parcels[12]. The occupied developed lands for residential dwellings were determined by multiplying the total developed area for each residential zone by 90% (i.e., the proportion of dwellings that are occupied by usual residents in 2021) (Statistics Canada 2022). The following parcels were examined to determine the average number of households per hectare:

- Low-density—Kelson Drive, Greenstone Crescent, Dupont Drive, and two unlabelled roads for a total of 79 parcels were examined which determined the average number of households per hectare for low-density land parcels is about 7.000. When examining all low-density residential occupied developed areas within the Municipality of Red Lake, the density was 2.792 households per hectare. By examining all low-density dwellings, parcels with large lot sizes will skew the results downwards. For this reason, a sample of five streets

[12] InterGroup assumed 50% of occupied lands in the high-density zone (12.123 ha) are high-density dwellings and the remaining occupied lands are medium-density dwellings. Medium-density zoning is assumed to also include the remaining residential zone not being used for single-detached houses or moveable dwellings.

with unoccupied and occupied parcels were chosen to reflect the expected density for future developments.

- Medium-density—Parcels with semi-detached houses, row houses, duplexes, and other single attached houses were examined which determined the average number of households per hectare for medium-density land parcels is 17.888.
- High-density—Apartments were examined which determined the average number of households per hectare for high-density land parcels is 26.397.

The residential land-based projections assumed that 70% of households would be low-density, 20% medium-density, and 10% high-density. **Table B2-2** shows the number households, number of hectares by density, and net density[13] households per hectare for residential lands.

Table B2-2: Average Residential Density

Density	Households	Hectares	Households/Hectare
Low Density	1,425	510.468 ha	7.000[1]
Medium Density	120	6.709 ha	17.888
High Density	160	6.061 ha	26.397
Weighted Average	**-**	**-**	**11.147**

Notes:
1. The existing low-density households per hectare is 2.792. Land-based projections for new low-density household developments used the assumption of 7.000 households per hectare which is based on a sample of 79 parcels.

Table B2-3 shows the projected demand for households and the residential land-based projections by density for the baseline and potential growth scenarios for 2037 and 2045.

[13] Net density is the number of dwelling units per hectare and does not include lands for roads, sidewalks, etc.

Table B2-3: Projected Total Residential Land-Based Demand by Density for 2037 and 2045

Density[3]	Steps	Units	Baseline[1,2]		Potential Growth[1,2]	
			2037	2045	2037	2045
Residential Low Density	A	Projected Households	1,563	1,556	2,043	1,976
	B	Existing Households	1,425	1,425	1,425	1,425
	C	Households/ha.[4]	7.000	7.000	7.000	7.000
	D = E + (A-B)/ C	Gross ha.[5]	530.099 ha	529.006 ha	598.288 ha	588.767 ha
	E	Current ha.	510.468 ha	510.468 ha	510.468 ha	510.468 ha
	D - E	**Net ha.**	**19.632 ha**	**18.538 ha**	**87.820 ha**	**78.299 ha**
Residential Medium Density	F	Projected Households	160	157	297	278
	G	Existing Households	120	120	120	120
	H = G/J	Households/ha.	17.888	17.888	17.888	17.888
	I = F/H	Gross ha.	8.917 ha	8.794 ha	16.587 ha	15.519 ha
	J	Current ha.	6.709 ha	6.709 ha	6.709 ha	6.709 ha
	I – J	**Net ha.**	**2.208 ha**	**2.085 ha**	**9.878 ha**	**8.810 ha**
Residential High Density	K	Projected Households	180	179	249	239
	L	Existing Households	160	160	160	160
	M = L/O	Households/ha.	26.397	26.397	26.397	26.397
	N = K/M	Gross ha.	6.809 ha	6.768 ha	9.416 ha	9.046 ha
	O	Current ha.	6.061 ha	6.061 ha	6.061 ha	6.061 ha
	N - O	**Net ha.**	**0.748 ha**	**0.707 ha**	**3.335 ha**	**2.985 ha**
Total Residential	P = A + F + K	Projected Households	1,903	1,892	2,589	2,493
	Q = B + G + L	Existing Households	1,705	1,705	1,705	1,705
	R[4] = 0.7*C + 0.2*H + 0.1*M	Households/ha.[4]	11.147	11.147	11.147	11.147
	S = D + I + N	Gross ha.[5]	545.825 ha	544.568 ha	624.291 ha	613.332 ha
	T = E + J + O	Current ha.	523.238 ha	523.238 ha	523.238 ha	523.238 ha
	S - T	**Net ha.**	**22.587 ha**	**21.330 ha**	**101.053 ha**	**90.094 ha**

Notes:

1. Projections for the Municipality of Red Lake were prepared by InterGroup Consultants Ltd.
2. Totals may not add up due to rounding.
3. Residential density assumptions include 70% low density, 30% medium density, and 10% high density.
4. The existing low-density households per hectare is 2.79. Land-based projections for new household developments used the assumption of 7.00 households per hectare which is based on a sample of 79 parcels.
5. Gross hectares for low-density residential was calculated by adding the existing land area (510.47 ha) with the difference in household growth divided by the assumption of 7.00 households/ha for new household developments.

Institutional, Commercial, and Industrial Land-Based Projections Approach

Employment projections from **Table B2-1** were disaggregated by institutional, industrial, and commercial industries using data on employment by industry sectors from the 2021 Census. The projections assumed that some of the projected employment growth will be for home-based businesses and will not require additional commercial, industrial, or institutional lands. In 2021, 16% of employed people in the Municipality of Red Lake worked from home or had no fixed place of work (Statistics Canada 2022). This proportion was discounted for each employment classification, excluding mining, over the projection period. **Table B2-4** shows the actual number of employment by NAICS (North American Industry Classification System) industry sectors in 2021 and the projected employment by NAICS industry sectors for 2037 and 2045. The employment classifications were assumed to include the following industry sectors:

- Institutional – public administration; educational services; healthcare and social assistance; and waste management and remediation.
- Industrial – agriculture, forestry, fishing and hunting; utilities; mining; manufacturing; wholesale trade; and transportation and warehousing.
- Commercial – construction; retail trade; finance and insurance; real estate; professional services; accommodation and food services; information and cultural industries; arts, entertainment, and recreation; and other services.

Mining related employment was excluded from the analysis given some of the anticipated mining projects would occur outside of the Municipality and would not necessitate an increase in demand for industrial lands within the Municipality. Evolution Mine is located within municipal boundaries; however, there are no plans for planned mine development within the Municipality that would require an increase in demand of mineral mining lands.

Table B2-4: Actual Employment by Industry in 2021 and the Projected Employment by Industry for 2037 and 2045

	Actual	Baseline Projection[1]		Potential Growth Projection[1]	
	2021	2037[2]	2045[2]	2037[3,4]	2045[3,4]
Institutional - Total	647	652	653	980	941
Institutional - Home-based[6]	104	104	104	157	151
Net Institutional	**543**	**548**	**549**	**823**	**790**
Industrial - Total	766	772	773	1,211	1,155
Industrial - Mining	576	580	581	922	878
Industrial - Home-based[6]	30	31	31	46	44
Net Industrial[5]	**160**	**161**	**161**	**243**	**233**
Commercial - Total	647	652	653	1,003	963
Commercial - Home-based[6]	104	104	104	160	154
Net Commercial	**543**	**548**	**549**	**843**	**809**
Total Employment[5]	**1,246**	**1,257**	**1,259**	**1,909**	**1,832**

Sources: Statistics Canada 2022.
Notes:
1. Projections for the Municipality of Red Lake were prepared by InterGroup Consultants Ltd.
2. Assumed the proportion of employment by industry would remain constant for the baseline projection period.
3. Assumed the proportion of employment by industry would remain constant for induced and indirect employment and employment of family members moving with direct employees for the referenced mining projects.
4. Assumed there would be no additional indirect and induced employment or family members migrating with direct employees for the mining industry.
5. Employment in the mining industry is excluded from industrial and total employment.
6. Home-based employment was calculated by taking 16% of the total employment after any other additional discounts (e.g., mining). This proportion is based on the proportion of employed people in the Municipality of Red Lake that worked from home or had no fixed place of work (Statistics Canada 2022).

InterGroup examined the developed institutional, commercial, and industrial land parcels to determine the actual hectares of land for each classification in the Municipality of Red Lake. InterGroup assumed 70% of the developed institutional, commercial, and industrial land parcels were occupied by operating businesses, to determine the number of employments per hectare of occupied employment lands. **Table B2-5** shows the number of hectares for occupied institutional, commercial, and industrial land parcels, the net employment for each employment classification and the average employment per hectare.

Table B2-5: Current Employment per Hectare for Institutional, Industrial, and Commercial Lands

Classification	Employment	Hectares	Employment/Hectare
Institutional	543	45.273 ha	11.994
Industrial[1]	160	273.959 ha	0.584
Commercial	543	88.138 ha	6.161

Notes: 1. Employment in the mining industry is excluded from industrial employment.

Table B2-6 shows the projected employment and total institutional, industrial, and commercial land-based projections for the baseline and potential growth scenarios for 2037 and 2045.

Table B2-6: Projected Total Employment Land-Based Demand for 2037 and 2045

Employment Lands[3]	Steps	Units	Baseline[1,2]		Potential Growth[1,2]	
			2037[4]	2045	2037	2045
Institutional	A	Employment	548	549	823	790
	B = A/D	Employment/ha.	11.994	11.994	11.994	11.994
	C = A/B	Gross ha.	45.690 ha	45.774 ha	68.619 ha	65.867 ha
	D	Current ha.	45.273 ha	45.273 ha	45.273 ha	45.273 ha
	C - D	**Net ha.**	**0.417 ha**	**0.501 ha**	**23.346 ha**	**20.594 ha**
Industrial	E	Employment[3]	161	161	243	233
	F = E/H	Employment/ha.	0.584	0.584	0.584	0.584
	G = E/F	Gross ha.	275.671 ha	275.671 ha	416.074 ha	398.952 ha
	H	Current ha.	273.959 ha	273.959 ha	273.959 ha	273.959 ha
	G – H	**Net ha.**	**1.712 ha**	**1.712 ha**	**142.115 ha**	**124.993 ha**
Commercial	I	Employment	548	549	843	809
	J = I/L	Employment/ha.	6.161	6.161	6.161	6.161
	K = I/J	Gross ha.	88.949 ha	89.112 ha	136.833 ha	131.314 ha
	L	Current ha.	88.138 ha	88.138 ha	88.138 ha	88.138 ha
	K - L	**Net ha.**	**0.811 ha**	**0.974 ha**	**48.695 ha**	**43.176 ha**
Total Employment	M = A + E + I	Employment[3]	1,257	1,259	1,891	1,832
	N = C + G + K	Gross ha.	404.920 ha	410.557 ha	621.526 ha	596.133 ha
	O = D + H + L	Current ha.	407.370 ha	407.370 ha	407.370 ha	407.370 ha
	N - O	**Net ha.**	**2.940 ha**	**3.187 ha**	**214.156 ha**	**188.763 ha**

Notes:
1. Projections for the Municipality of Red Lake were prepared by InterGroup Consultants Ltd.
2. Totals may not add due to rounding.
3. Employment in the mining industry is excluded from industrial and total employment.

Recreational Land-Based Projections Approach

The Municipality of Red Lake Official Plan states subdivisions for residential purposes may be required to provide 5% of land dedicated for park or public recreation purposes as required under the Planning Act (Government of Ontario 2024a; Municipality of Red Lake 2015). Land-based projections for recreational lands were calculated by multiplying the demand for new residential land by 5% for 2037 and 2045. **Table B2-7** shows the projected total recreational land for 2037 and 2045 for the baseline and potential growth scenario.

Table B2-7: Projected Total Residential and Recreational Land-Based Demand for 2037 and 2045

Lands	Steps	Baseline[1]		Potential Growth[1]	
		2037	2045	2037	2045
Residential – Gross ha	A	545.825 ha	544.568 ha	624.291 ha	613.332 ha
Recreational – Gross ha.	B = 0.05*A	27.291 ha	27.228 ha	31.215 ha	30.667 ha
Recreational – Existing ha.	C	26.162 ha	26.162 ha	26.162 ha	26.162 ha
Recreational – Net ha.	**B - C**	**1.129 ha**	**1.066 ha**	**5.053 ha**	**4.505 ha**

Notes:

1. Projections for the Municipality of Red Lake were prepared by InterGroup Consultants Ltd.
2. Totals may not add due to rounding.

Net Land-Based Projected Demand

Table B2-8 shows the summary of the projected net recreational, residential, and employment land area required for new development in the Municipality of Red Lake for the baseline and potential growth scenarios for 2037 and 2045.

Table B2-8: Projected Net Residential, Institutional, Industrial, Commercial, and Recreational Land-Based Demand for 2037 and 2045

Lands	Baseline[1,2]		Potential Growth[1,2]	
	2037	2045	2037	2045
Residential	22.587 ha	21.330 ha	101.053 ha	90.094 ha
Recreational	1.129 ha	1.066 ha	5.053 ha	4.505 ha
Institutional	0.417 ha	0.501 ha	23.346 ha	20.594 ha
Industrial	1.712 ha	1.712 ha	142.115 ha	124.993 ha
Commercial	0.811 ha	0.974 ha	48.695 ha	43.176 ha
Total	**26.656 ha**	**25.583 ha**	**320.262 ha**	**283.362 ha**

Notes:

1. Projections for the Municipality of Red Lake were prepared by InterGroup Consultants Ltd.
2. Totals may not add due to rounding.

APPENDIX C:
Municipality of Red Lake Facilities Inventory

Appendix C: Municipality of Red Lake Facilities Inventory

The following tables provide a list of facility inventories, including for Red Lake (**Table C1**), Balmertown (**Table C2**), Cochenour (**Table C3**), Madsen (**Table C4**), McKenzie Island (**Table C5**), and rural facilities inventory list (**Table C6**). The tables describe the facility category (recreation, culture, economy, services, well-being, and health), the facility name, address, services provided, and any accompanying notes.

Table C1: Red Lake Facilities Inventory

Facility Category	Facility Name	Facility Address	Services Provided
Culture	Red Lake Regional Heritage Centre	51A ON-105	Museum
Culture	Anglican/United Church	7 Discovery Road	Church
Culture	Christ Lutheran Church	231 Hammell Road	Church
Culture	Forestry Fellowship	100D Forestry Road	Church
Culture	Glad Tidings Church	262 Howey Street	Church
Culture	Grace Community Church	100 Hammell Road	Church
Culture	St. John's Catholic Church	21 Discovery Road	Church
Culture	Red Lake United Church	7 Discover Road	Church
Culture	The Whitefeather Forest Initiative	138 Howey St	Arms-length corporation in Pikangikum First Nation
Economy	Draco (1985) Ltd.	7 Industrial Park Street	General contractor
Economy	CIBC	155 Howey Street	Bank
Economy	Scotiabank	#21 Highway 105	Bank
Economy	Apatisiwin	1 Legion Road	Employment and training program
Economy	Red Lake Career and Employment Services	146 Howey Street	Free access to employment supports
Economy	Goldseekers Canoe Outfitting	75 Forestry Road	Canoe and kayak tour agency
Economy	Westland Insurance	141 Howey Street	
Economy	The Standard Insurance Brokers	179 Howey Street	Insurance broker
Economy	SGS Canada	16A Young Street	Mining consultant
Economy	Northern Waterworks Inc.	104 Howey Street & 14 Young Street	Water treatment facility
Economy	Red Lake Accommodations	95 Hammell Road	Hotel
Economy	Red Lake District Chamber of Commerce	137 Howey Street	Chamber of commerce
Economy	Chukuni Communities Development Corporation	137 Howey Street	Employment and business development support.
Economy	Ministry of Northern Development and Mines	227 Howey Street	Business support services, grants, and loans.
Economy	Ministry of Natural Resources	227 Howey Street	Promotes economic opportunities in the resource sector and

Facility Category	Facility Name	Facility Address	Services Provided
			supports outdoor recreation opportunities.
Economy	Ministry of Mines	227 Howey Street	Geological consultation and advisory services.
Economy	Super 8	11 Hughes Crescent	Hotel
Economy	Birch Lake Lodge	14 Mill Road	Hotel and tourist outfitter
Economy	The Howey	26 ON-105	Hotel
Economy	Geary Sportsman's Lodge	5 Pugsley Street	Hotel and tourist outfitter
Economy	Norseman Inn	28A Highway 105	Hotel
Health	Northwestern Health Unit	234 Howey Street	Medical clinic
Health	Community Counselling and Addiction Services	146 Howey St	Mental health clinic
Health	Red Lake Margaret Cochenour Memorial Hospital	51 ON-105	Hospital
Health	Guardian - Red Lake Pharmacy	51 ON-105	Pharmacy
Health	Goldcorp Red Lake Regional Medical Centre	51 ON-105	Health clinic
Health	Red Lake District Diabetes Program	51 ON-105	Diabetes centre
Health	Knudsen Colin Dr	2 Howey Bay Road	Optometrist
Health	Canadian Mental Health Association	201 Hammell Road	Mental health supports
Health	Sunset Country Psychotherapy Survivors	9 Goldshore Road	Mental health clinic
Health	Sunrise Chiropractic	140 Howey Street	Chiropractor
Health	Firefly	201 Howey Street	Support services for children, youth and families.
Recreation	Phillip Thomas Centennial Park	10 Hammell Road	Skatepark, splash pad, pavilion, outdoor rink, basketball nets, playground equipment, exercise equipment, multi-use paths.
Recreation	Dan Kucheran Baseball Field	10 Hammell Road	Baseball field
Recreation	The Pavillion	10 Hammell Road	Outdoor rink in winter; basketball and weekly framers market in summer basketball.
Recreation	Evolution Mining RLO Recreation Centre	1 Eric Radford Way	Bowling, pool, weightroom, and daycamp.
Recreation	Balmertown Outdoor Rink	Red Lake, Ontario	Outdoor rink.
Recreation	Cochenour Beach	Cochenour Crescent	Covered picnic area and beach.
Recreation	Keesic Beach	Red Lake, Ontario	Beach; pow wow arbour
Recreation	Kinsmen Beach	St Pauls Bay	Beach, playground, picnic areas.

Facility Category	Facility Name	Facility Address	Services Provided
Recreation	Rahill Beach	6 West Rahill Drive	Tennis courts, beach volleyball, playground, fire pits, covered picnic areas.
Recreation	Sandy Point Beach	Red Lake, Ontario	Beach
Recreation	Norseman Park	150-174 Howey Street	Norseman Float Plane, picnic area.
Recreation	Kelson's Farm Playground	Red Lake, Ontario	Play structures and seating areas.
Recreation	McKenzie Island Playground	Red Lake, Ontario	Play structures and a large field.
Recreation	Howey Bay Camps	64 Howey Bay Road	Children's camp and tourist outfitter.
Recreation	Laverty Park	Red Lake, Ontario	Play structures, a community garden, seating areas, large field
Recreation	Government Dock	Red Lake, Ontario	Municipal boat launch.
Recreation	St. Paul's Bay Boat Launch	Red Lake, Ontario	Municipal boat launch.
Recreation	Wright's Wilderness Camp	200 Weavers Road	Outpost and tourist outfitter
Recreation	Black Moose Outposts	50 Howey Street	Outpost
Recreation	Chimo Lodge	68 Howey Street	Outpost
Recreation	Loon Haunt Outposts	102 Dellenor Road	Outpost
Recreation	Big Hook Wilderness Camp	1 Opasquia Provincial Park	Outpost
Recreation	Chukuni River RV Tent & Trailer Park	20 Pickerel Drove	Trailer park
Recreation	Canadian Fly-In Fishing	8 Pickerel Drove	Outpost
Recreation	Red Lake Community Gardens	2 Berry Drove	Community gardens
Recreation	Community Garden	near 2 Fifth Street	Community gardens
Recreation	Red Lake Cross Country Ski Club	Red Lake, Ontario	Ski club.
Recreation	Red Lake Community Centre	10 Hammell Road	Recreation centre
Services	Margaret McDougall Memorial Public Library	117 Howey Street	Library
Services	Ontario Provincial Police	115 Howey Street	Police
Services	Red Lake Fire Station	Red Lake, Ontario	Fire
Services	Red Lake District Office	227 Howey Street	District government office
Services	Canada Post	141 A Howey Street	Post office
Services	Royal Canadian Legion Branch 102	31 ON-105	Legion
Services	Miss McKenzie II Ferry	Red Lake, Ontario	Ferry Service
Services	Red Lake Taxi Cabs	4 Pine Crescent	Taxi
Services	Gardewine	23 Young Street	Trucking transportation company
Services	U-Haul	80 ON-105	Truck rental
Services	Chukuni Sanitation Inc.	14 Discovery Road	Waste disposal service
Services	Aiken Red Lake Storage	213 Howey Street	Storage facility
Services	Red Lake Distance Adult Learning	232 Howey Street	Adult learning
Services	Drive Test	31 ON-105	Driver examination centre
Services	Woodland Cemetery	Red Lake, Ontario	Cemetery

Facility Category	Facility Name	Facility Address	Services Provided
Services	Red Lake District Cemetery	Forestry Road	Cemetery
Services	Public Works Garage	3 Nugget Street	Public works
Well-being	Moozoons Child Care Centre	1 Legion Road	Daycare
Well-being	Red Lake Early Learning	201 Howey Street	Daycare
Well-being	EarlyON Child and Family Centre	201 Howey Street	Day care
Well-being	St. Johns Early Learning Centre	54 Discovery Road	Day care
Well-being	Harmony Centre For Community Living	26 Young Street	Provides community orientated programs for persons with a developmental disability
Well-being	Northwood Lodge	51 Hwy 105	Long-Term Care Home
Well-being	New Starts for Women Inc.	Red Lake, Ontario	Emergency women's shelter
Well-being	Red Lake Area Emergency Shelter	220 Howey Street	Homeless shelter
Well-being	Red Lake Indian Friendship Centre	1 Legion Road and 114 Forstry Road	Services and support for babies, youth, adults and seniors
Well-being	Tikinagan Child & Family Services	117 Howey Street	Family support
Well-being	ParaMed Home Health Care	53 Highway 105	Seniors supports

Table C2: Balmertown Facilities Inventory

Facility Category	Facility Name	Facility Address	Services Provided
Culture	St Francis Xavier Church	200 Dexter Street	Church
Culture	Calvary Baptist Church	2 Fourth Street	Church
Culture	Ukranian Catholic Church	5 Church Street	Church
Economy	Red Lake Accommodations	5-10 Dexter Road	Apartment buildings
Economy	Evolution - Red Lake Mines	Balmertown, Ontario	Mine
Economy	Natures Inn Red Lake	50 Detta Road	Hotel
Economy	Balmertown Motel	147 5th Street	Hotel
Economy	Paddle Inn Bed and Breakfast	75 Forestry Rd	Bed & Breakfast
Recreation	Red Lake Golf and Country Club	1541 ON-125	Golf and country club
Recreation	Sportsman's Lodge and Trophy Outposts	1 Pickerel Drive	Outpost
Recreation	Amik Outposts	6 Pickerel Drive	Outpost
Services	Balmertown Public Library	12 5th Street	Library
Services	Dennis Malloy Memorial Fire Station	Balmertown, Ontario	Fire Station
Services	Municipal Office	2 Fifth Street	Municipal office
Services	Canada Post	6 5th Street	Post office
Services	Public Works Department	2 Fifth Street	Public works
Services	Lac Seul Airways Ltd	6 Pickeral Drive	Chartered air and transport
Services	Red Lake Mine Rescue Station	20 Dickenson Road	Mine rescue
Well-being	Balmertown Early Learning Centre	16 Radford Way	Early learning centre

Table C3: Cochenour Facilities Inventory

Facility Category	Facility Name	Facility Address	Services Provided
Recreation	Cochenour Boat Launch	Red Lake, Ontario	Municipal boat launch
Recreation	Couchenour Playground	18 Cochenour Crescent	Playground
Recreation	Cochenour Basketball Court	27 William Street	Basketball court
Recreation	Cochenour Arena	1 William Street	Arena
Recreation	Cochenour Community Hall	1 William Street	Community hall
Recreation	Excellent Adventures and Cat Island Lodge	61 McMarmac Road	Outpost
Recreation	Cochenour Baseball Diamond and Soccer Field	136-138 Service Rd	Baseball diamond and soccer field
Services	NorthStar Air	Red Lake, Ontario	Air charter service
Services	Excellent Air Service	Red Lake, Ontario	Air charter service
Services	Superior Airways	2508 ON-125	Air charter service
Services	Wasaya Airways	2509 ON-125	Air charter service
Services	Bearskin Airlines	2509 ON-125	Air charter service
Services	Red Lake Airport	2508 ON-125	Airport

Table C4: Madsen Facilities Inventory

Facility Category	Facility Name	Facility Address	Services Provided
Economy	Madsen Mine	2 Mine Street	Mine
Recreation	Red Lake Archery	12 Springbank Drive	Archery
Recreation	Madsen Playground	Red Lake, Ontario	Playground

Table C5: McKenzie Island Facilities Inventory

Facility Category	Facility Name	Facility Address	Services Provided
Economy	Rod And Holly's McKenzie Island Cabins	52 Finn Town Road	Hotel and tourist outfitter
Economy	The Kenzie House	34 Gold Eagle Avenue	Hotel and tourist outfitter

Table C6: Rural Facilities Inventory

Facility Category	Facility Name	Facility Address	Services Provided
Economy	Five Lakes Lodge	Red Lake, Ontario	Hotel
Services	Red Lake Seaplane Service	2 Wendell Road	Seaplane base

APPENDIX D:
Municipality of Red Lake Development Opportunities

Appendix D: Municipality of Red Lake Development Opportunities

The following tables provide the development opportunities within the Municipality of Red Lake. The development opportunities include:

- The community, including for Red Lake (**Table D1**), Balmertown (**Table D2**), McKenzie Island (**Table D3**), Madsen (**Table D4**);
- Disposition of municipal or private lands;
- Official plan (OP) categorization, including:
    - TR: townsite residential;
    - HC: highway commercial;
    - TE: townsite employment;
    - OS: open space;
    - HL: hazard lands;
    - RR; rural residential; and
    - IND: industrial.
- Zone category such as residential, commercial, institutional, recreational, or industrial;
- Area in hectares;
- Servicing including whether the development has a water line, storm water, sewer access, or road access;
- Development term by short (0 to 4 years), medium (5 to 8 years), and long-term (9 to 12 years);
- Municipal Property Assessment Corporation (MPAC) code and roll number;
- Potential density in units per hectare (residential properties only); and
- Potential unit yield (residential properties only).

The potential development yields consider historic development patterns and densities, zoning, and site potential. They are meant to provide a conceptual scenario only. Actual yield may vary depending on infrastructure, market factors, construction costs, and developer motivations.

Table D1: Red Lake Development Opportunities

Disposition	Civic Address	OP	Zone Category	Area (ha)	Water Line	Storm Water	Sewer Access	Road Access	Development Timeline	MPAC Code	MPAC Roll Number	Density (Units/ha)	Yield	Status
Municipal	Forestry Road	TR	Residential	1.78	Yes	Yes	Yes	Yes	Short-Term	100	604141000406000.00	7	13	Sell
Municipal	Highway 105	TR; HC	Residential; High Density Commercial	3.857	Yes	No	Yes	Yes	Medium-Term	100	604141000602900.00	26.4	6	Sell
Municipal	91 Howey Street	TE	Commercial	0.087	Yes	Yes	Yes	Yes	Short-Term	100	604141000400700.00	-	-	Sell
Municipal	278 Howey Street	TE	Commercial	0.113	Yes	No	Yes	Yes	Medium-Term	105	604141000101800.00	-	-	Sell
Municipal	Kostynuk Drive	TR	Residential	0.494	No	No	No	No	Long-Term	100	604141000529000.00	7	4	Sell
Municipal	101 Howey Bay Rd	TR	Residential	0.52	No	No	No	Yes	Medium-Term	100	604141000528900.00	7	4	Sell
Municipal	Kostynuk Drive	TR	Residential	0.499	No	No	No	No	Long-Term	100	604141000529200.00	7	4	Sell
Municipal	McKee Street	TR	Residential	0.226	No	Yes	No	No	Medium-Term	100	604141000109000.00	7	2	Sell
Municipal	Highway 105	HC	Commercial	1.806	Yes	Yes	Yes	Yes	Short-Term	100	604141000602900.00	-	-	Sell
Municipal	Kanawenim Drive	HC; TR	Commercial; Residential High Density	3.737	Yes	No	Yes	Yes	Medium-Term	100	604141000602900.00	26.4	19	Sell
Municipal	Highway 105	HC	Commercial	3.249	No	Yes	No	Yes	Medium-Term	105	604141000604700.00			Sell
Municipal	103 Howey Bay Rd	TR	Residential	0.45	No	Yes	No	Yes	Medium-Term	100	604141000528800.00	7	4	Sell
Municipal	71 Goldshore Road	TR	Residential	0.977	Yes	No	Yes	Yes	Medium-Term	106	604141000405900.00	7	7	Sell
Municipal	Kostynuk Drive	TR	Residential	0.475	No	No	No	No	Long-Term	100	604141000529100.00	7	4	Sell
Municipal	Granite Road	OS	Open Space	9.523	No	No	No	No	Long-Term	100	604141000410500.00			Sell
Municipal	Howey Street	TR	Residential	4.599	Yes	Yes	Yes	Yes	Short-Term	100	604141000101000.00	7	33	Sell
Municipal	Highway 105	HC	Commercial	2.682	Yes	No	Yes	Yes	Medium-Term	100	604141000602900.00			Sell
Municipal	246 Hammell Road	TR	Residential	0.084	Yes	Yes	Yes	Yes	Short-Term	100	604141000205901.00	7	1	Sell
Municipal	34 McDougall Street	TR	Residential	0.051	Yes	Yes	Yes	Yes	Short-Term	100	604141000407300.00	7	1	Sell
Municipal	89 Howey Street	TE	Commercial	0.075	Yes	Yes	Yes	Yes	Short-Term	105	604141000400800.00			Sell
Municipal	49 McKee Street	TR	Residential	0.106	No	Yes	No	Yes	Medium-Term	100	604141000106600.00	7	1	Sell
Municipal	Dynes Street	TR	Residential	4.639	Yes	Yes	Yes	Yes	Short-Term	100	604141000206900.00	7	33	Sell
Municipal	Lake Drive	TR	Residential	11.578	No	Yes	No	No	Medium-Term	110	604141000536200.00	7	82	Sell
Municipal	Null	OS; HL	Open Space; Hazard Lands	50.646	No	Yes	No	Yes	Medium-Term	110	604141000413500.00	-	-	Sell
Municipal	24 Dupont Drive	TR	Residential	0.081	No	Yes	No	Yes	Medium-Term	100	604141000526200.00	7	1	Sell
Municipal	14 Dupont Drive	TR	Residential	0.089	Yes	Yes	Yes	Yes	Short-Term	100	604141000525700.00	7	1	Sell
Municipal	26 Dupont Drive	TR	Residential	0.088	No	No	No	No	Long-Term	100	604141000526300.00	7	1	Sell
Municipal	16 Dupont Drive	TR	Residential	0.082	Yes	Yes	Yes	Yes	Short-Term	100	604141000525800.00	7	1	Sell
Municipal	22 Dupont Drive	TR	Residential	0.083	Yes	Yes	No	Yes	Medium-Term	100	604141000526100.00	7	1	Sell
Municipal	Hammell Road	TR	Residential	2.585	No	No	No	No	Long-Term	100	604141000304700.00	7	19	Sell
Municipal	20 Dupont Drive	TR	Residential	0.083	Yes	Yes	No	Yes	Medium-Term	100	604141000526000.00	7	1	Sell
Municipal	Goldshore Road	TR	Residential	0.738	Yes	No	Yes	Yes	Medium-Term	100	604141000311100.00	7	6	Sell
Municipal	Highway 105	TE; HC; TR; HL	Commercial; Residential High Density; Residential; Hazard Lands	12.087	Yes	Yes	Yes	Yes	Short-Term	105	604141000605100.00	7	35	Sell
Municipal	Highway 105	HL; OS; TR	Commercial; Residential; Open Space	66.02	No	No	No	Yes	Medium-Term	105	604141000605300.00	7	324	Purchased by Municipality
Municipal	18 Dupont Drive	TR	Residential	0.084	Yes	Yes	No	Yes	Medium-Term	100	604141000525900.00	7	1	Sell
Private	59 Howey Street	TR	Residential	0.025	No	Yes	No	Yes	Medium-Term	100	604141000402090.00	7	1	
Private	41 Chelsea Street	TR	Mobile Residential	0.062	Yes	No	Yes	No	Medium-Term	100	604141000521700.00	7	1	
Private	Highway 105	TR	Residential	25.163	No	No	No	No	Medium-Term	150	604141000604600.00	7	177	
Private	61 Howey Street	TR	Residential	0.025	No	Yes	No	Yes	Medium-Term	301	604141000402000.00	7	1	
Private	1 Granite Road	TR	Residential	0.113	No	Yes	No	Yes	Medium-Term	100	604141000410100.00	7	1	

Disposition	Civic Address	OP	Zone Category	Area (ha)	Water Line	Storm Water	Sewer Access	Road Access	Development Timeline	MPAC Code	MPAC Roll Number	Density (Units/ha)	Yield	Status
Private	Null	HC	Commercial; Natural Resources	41.891	No	No	No	Yes	Medium-Term	150	604141000606400.00	-	-	
Private	4 Granite Road	TR	Residential	0.064	No	Yes	No	Yes	Medium-Term	100	604141000410800.00	7	1	
Private	43 Chelsea Street	TR	Mobile Residential	0.08	Yes	No	Yes	No	Medium-Term	100	604141000521600.00	7	1	
Private	20 Paisck Crescent	TR	Residential	0.724	No	Yes	No	Yes	Medium-Term	100	604141000515500.00	7	6	
Private	29 Highway 105	HL	Hazard Lands	0.183	Yes	Yes	Yes	Yes	Short-Term	105	604141000119600.00	-	-	
Private	28 Highway 105	HC	Commercial	0.213	Yes	Yes	Yes	Yes	Short-Term	105	604141000507510.00	-	-	
Private	9 Granite Road	TR	Residential	0.069	No	Yes	No	Yes	Medium-Term	100	604141000410300.00	7	1	
Private	6 Granite Road	TR	Residential	0.078	No	Yes	No	Yes	Medium-Term	100	604141000410700.00	7	1	
Private	10 Granite Road	TR	Residential	0.07	No	Yes	No	Yes	Medium-Term	100	604141000410600.00	7	1	
Private	39 Chelsea Street	TR	Mobile Residential	0.051	Yes	No	Yes	No	Medium-Term	100	604141000521800.00	7	1	
Private	1 Waterfront Road	RR; TR	Rural Residential; Residential	1.374	No	Yes	No	Yes	Medium-Term	110	604141000411300.00	7	10	
Private	Granite Road	TR	Residential	0.146	No	Yes	No	Yes	Medium-Term	100	604141000410401.00	7	2	
Private	55 Howey Street	TR	Residential	0.093	No	Yes	Yes	Yes	Medium-Term	100	604141000402100.00	7	1	
Private	12 McDougall Street	TR	Residential	0.063	Yes	Yes	Yes	Yes	Short-Term	100	604141000408100.00	7	1	
Private	3 Gallagher Street	TR	Residential	0.051	No	Yes	No	Yes	Medium-Term	100	604141000411200.00	7	1	
Private	2 Feldspar Street	TR	Residential	0.07	No	No	No	No	Long-Term	100	604141000409800.00	7	1	
Private	5 Gallagher Street	TR	Residential	0.068	No	Yes	No	Yes	Medium-Term	100	604141000411100.00	7	1	
Private	5 Church Street	TR	Institutional	0.317	Yes	Yes	No	Yes	Medium-Term	105	604141000207600.00	-	-	
Private	96 Dellenor Road	TR	Seasonal Residential	3.343	No	No	No	No	Medium-Term	313	604141000605000.00	7	24	
Private	45 Chelsea Street	TR	Mobile Residential	0.103	Yes	No	Yes	No	Medium-Term	100	604141000521500.00	7	1	
Private	37 Chelsea Street	TR	Mobile Residential	0.051	Yes	No	Yes	No	Medium-Term	100	604141000521900.00	7	1	
Private	2 Waterfront Road	TR	Residential	0.103	No	Yes	No	Yes	Medium-Term	100	604141000411201.00	7	1	
Private	7 Granite Road	TR	Residential	0.099	No	Yes	No	Yes	Medium-Term	100	604141000410200.00	7	1	
Private	35 Chelsea Street	TR	Mobile Residential	0.051	Yes	No	Yes	Yes	Medium-Term	100	604141000522000.00	7	1	
Private	1 Feldspar Street	TR	Residential	0.171	No	No	No	No	Long-Term	100	604141000409900.00	7	2	
Private	Highway 105	HC	Commercial	1.422	Yes	Yes	Yes	Yes	Short-Term	100	604141000602900.00	-	-	
Private	66 Highway 105	HC	Commercial	0.405	No	No	No	Yes	Medium-Term	105	604141000602800.00	-	-	
Private	Null	TR; OS; HC	Commercial; Residential; Open Space; Natural Resources	65.533	No	No	No	Yes	Medium-Term	150	604141000605900.00	7	304	
Private	Highway 105	HC	Commercial	0.944	No	No	No	Yes	Medium-Term	100	604141000602900.00	-	-	
Private	Null	TR; HL	Mobile Residential; Residential; Hazard Lands	4.16	Yes	No	Yes	No	Medium-Term	100	604141000520000.00	7	17	
Private	25 Highway 105	HC	Commercial	0.367	No	Yes	No	Yes	Medium-Term	105	604141000119500.00	-	-	
Private	29 Highway 105	HL	Hazard Lands	0.023	No	Yes	No	Yes	Medium-Term	105	604141000119600.00	-	-	
Private	25 Highway 105	HL	Hazard Lands	0.067	No	Yes	No	Yes	Medium-Term	105	604141000119500.00	-	-	
Private	25 Highway 105	HL	Hazard Lands	0.087	Yes	Yes	Yes	Yes	Short-Term	105	604141000119500.00	-	-	
Private	Null	TR	Residential	0.039	Yes	Yes	Yes	Yes	Short-Term	0	604141000406900.00	7	1	
Private	27 Howey Street	TR	Residential High Density	0.336	Yes	Yes	Yes	Yes	Short-Term	100	604141000402400.00	26.4	9	
Private	2 Dupont Drive	TR	Residential	0.135	Yes	Yes	Yes	Yes	Short-Term	100	604141000525100.00	7	1	
Private	1 Goldshore Road	TR	Residential	0.142	Yes	Yes	Yes	Yes	Short-Term	100	604141000403400.00	7	1	
Private	5 Church Street	TR	Institutional	0.093	No	Yes	No	Yes	Medium-Term	105	604141000207600.00	-	-	

Table D2: Balmertown Development Opportunities

Disposition	Civic Address	OP	Zone Category	Area (ha)	Water Line	Storm Water	Sewer Access	Road Access	Development Timeline	MPAC Code	MPAC Roll Number	Density (Units/ha)	Yield	Status
Municipal	115 Detta Road	TR	Residential	0.047	Yes	Yes	Yes	Yes	Short-Term	100	604144000102307.00	7	1	Sell
Municipal	31 Lassie Road	TE	Commercial	0.05	Yes	Yes	Yes	Yes	Short-Term	105	604144000115908.00	-	-	Sell
Municipal	113 Detta Road	TR	Residential	0.047	Yes	Yes	Yes	Yes	Short-Term	100	604144000102306.00	7	1	Sell
Municipal	33 Lassie Road	TE	Commercial	0.052	Yes	Yes	Yes	Yes	Short-Term	105	604144000115910.00	-	-	Sell
Municipal	111 Detta Road	TR	Residential	0.046	Yes	Yes	Yes	Yes	Short-Term	100	604144000102305.00	7	1	Sell
Municipal	Campbell Road	TR	Residential	0.355	No	Yes	No	Yes	Medium-Term	100	604144000102396.00	7	3	Sell
Municipal	30 Fifth Street	TR	Residential	0.047	Yes	Yes	Yes	Yes	Short-Term	100	604144000123100.00	7	1	Sell
Municipal	Mine Road	TR; TE	Residential; Institutional	6.134	No	No	No	No	Long-Term	100	604144000128610.00	7	43	Sell
Municipal	3 Fifth Street	TE	Commercial	0.047	Yes	Yes	Yes	Yes	Short-Term	105	604144000123700.00	-	-	Sell
Private	Seventh Street	TR	Residential High Density	0.072	No	Yes	No	Yes	Medium-Term	100	604144000128664.00	26.4	2	
Private	Seventh Street	TR	Residential High Density	0.168	Yes	Yes	Yes	Yes	Short-Term	100	604144000128611.00	26.4	5	
Private	Seventh Street	TR	Residential High Density	0.056	No	Yes	No	Yes	Medium-Term	100	604144000128664.00	26.4	2	
Private	26 Lassie Road	TR	Residential	0.11	Yes	Yes	Yes	Yes	Short-Term	100	604144000112350.00	7	1	
Private	1510 Highway 125	TR	Residential	0.165	No	Yes	Yes	Yes	Medium-Term	100	604144000100400.00	7	2	
Private	1512 Highway 125	TR	Residential	0.099	No	Yes	Yes	Yes	Medium-Term	100	604144000100300.00	7	1	
Private	11 Fifth Street	TE	Commercial	0.059	Yes	Yes	Yes	Yes	Short-Term	105	604144000124100.00	-	-	
Private	Null	TR	Residential	0.075	Yes	Yes	Yes	Yes	Short-Term	0	60435000.00	7	1	
Private	Null	TR	Residential	0.075	Yes	Yes	Yes	Yes	Short-Term	0	60434000.00	7	1	
Private	Null	TR	Residential	0.076	Yes	Yes	Yes	Yes	Short-Term	0	60437000.00	7	1	
Private	Null	TR	Residential	0.076	Yes	Yes	Yes	Yes	Short-Term	0	60436000.00	7	1	

Table D3: McKenzie Island Development Opportunities

Disposition	Civic Address	OP	Zone Category	Area (ha)	Water Line	Storm Water	Sewer Access	Road Access	Development Timeline	MPAC Code	MPAC Roll Number	Density (Units/ha)	Yield	Status
Municipal	13 Gold Eagle Ave	TR	Residential	0.665	Yes	Yes	Yes	Yes	Short-Term	100	604144000306800.00	7	5	Sell
Municipal	8 Little Long Lac	TR	Residential	0.082	Yes	Yes	Yes	Yes	Short-Term	301	604144000313300.00	7	1	Sell
Municipal	5 Jackleg Avenue	TR	Residential	0.078	Yes	Yes	Yes	Yes	Short-Term	100	604144000314300.00	7	1	Sell
Municipal	4 Ore Zone Avenue	TR	Residential	0.081	Yes	Yes	Yes	Yes	Short-Term	100	604144000313600.00	7	1	Sell
Municipal	7 Jackleg Avenue	TR	Residential	0.199	Yes	Yes	Yes	Yes	Short-Term	100	604144000314400.00	7	2	Sell
Municipal	6 Bruce Channel	TR	Residential	0.204	Yes	Yes	Yes	Yes	Short-Term	110	604144000304600.00	7	2	Sell
Municipal	Grizzly Street	IND	Industrial	1.381	No	Yes	No	Yes	Medium-Term	100	604144000316900.00	-	-	Sell
Municipal	Head Frame Street	TR	Residential	0.113	Yes	Yes	Yes	Yes	Short-Term	100	604144000307100.00	7	1	Sell
Private	6 Bruce Channel	TR	Residential	0.29	Yes	Yes	Yes	Yes	Short-Term	110	604144000304600.00	7	3	
Private	6 Bruce Channel	TR	Residential	0.027	Yes	Yes	Yes	Yes	Short-Term	110	604144000304600.00	7	1	
Private	6 Bruce Channel	TR	Residential	0.007	Yes	Yes	Yes	Yes	Short-Term	110	604144000304600.00	7	1	

Table D4: Madsen Development Opportunities

Disposition	Civic Address	OP	Zone Category	Area (ha)	Water Line	Storm Water	Sewer Access	Road Access	Development Timeline	MPAC Code	MPAC Roll Number	Density (Units/ha)	Yield	Status
Municipal	35 Main Street	TR	Residential	0.91	No	Yes	No	Yes	Medium-Term	100	604195001006200.00	7	7	Sell
Municipal	Plan M667 Blk J Pt Pcl 5282	HL	Hazard Lands	0.612	Yes	Yes	Yes	Yes	Short-Term	100	604195001007100.00	-	-	Sell
Municipal	23 Birch Lane	TR	Residential	0.94	Yes	Yes	Yes	Yes	Short-Term	301	604195001004000.00	7	7	Sell
Municipal	2 Beveridge Street	TR	Residential	0.063	Yes	Yes	No	Yes	Medium-Term	100	604195001004800.00	7	1	Sell
Municipal	7 Main Street	TR	Residential	0.143	Yes	Yes	Yes	Yes	Short-Term	410	604195001010500.00	7	2	Sell
Private	1 Main Street	TR	Institutional	0.078	Yes	Yes	Yes	Yes	Short-Term	105	604195001010700.00	-	-	
Private	3 Main Street	TR	Institutional	0.046	Yes	Yes	Yes	Yes	Short-Term	105	604195001010600.00	-	-	
Private	19 Main Street	TR	Residential	0.144	Yes	Yes	Yes	Yes	Short-Term	100	604195001006500.00	7	2	
Private	19 Beveridge Street	TR	Residential	0.054	No	Yes	No	Yes	Medium-Term	100	604195001005750.00	7	1	
Private	39 Main Street	TR	Residential	0.093	No	Yes	No	Yes	Medium-Term	100	604195001006100.00	7	1	
Private	13 Beveridge Street	TR	Residential	0.119	Yes	Yes	No	Yes	Medium-Term	100	604195001005770.00	7	1	
Private	17 Beveridge Street	TR	Residential	0.053	No	Yes	No	Yes	Medium-Term	100	604195001005760.00	7	1	
Private	22 Beveridge Street	TR	Residential	0.304	No	Yes	No	Yes	Medium-Term	100	604195001005600.00	7	3	
Private	25 Main Street	TR	Residential	0.054	Yes	Yes	Yes	Yes	Short-Term	100	604195001006400.00	7	1	
Private	27 Main Street	TR	Residential	0.207	Yes	Yes	Yes	Yes	Short-Term	100	604195001006300.00	7	2	
Private	8 Birch Lane	TR	Residential	0.112	No	Yes	No	Yes	Medium-Term	100	604195001010200.00	7	1	
Private	21 Beveridge Street	TR	Residential	0.185	No	Yes	No	Yes	Medium-Term	100	604195001005700.00	7	2	
Private	1 Beveridge Street	TR	Residential	0.194	No	Yes	No	Yes	Medium-Term	100	604195001005900.00	7	2	
Private	9 Beveridge Street	TR	Residential	0.109	Yes	Yes	Yes	Yes	Short-Term	301	604195001005800.00	7	1	

APPENDIX E:
Municipality of Red Lake Treated Water Quality

Appendix E: Municipality of Red Lake Treated Water Quality

The following tables outline the treated water quality chemistry results from the 2023 and 2024 annual reports at the Red Lake WTP (**Table E1**), Madsen WTP (**Table E2**), and BCMI WTP (**Table E3**). Provincial (DWQS) and federal (GCDWQ) guidelines are presented in the table. Any parameters that exceed one or both of the guidelines are in bold.

Table E1: Summary of Red Lake Treated Water Quality (Chemical Parameters)

Parameters	Units	Health Canada GCDWQ	Ontario DWQS	Treated Water	
				Red Lake WTP	
				2023	2024
Inorganic Parameters					
Antimony	µg/L	6	6	<0.60	<0.60
Arsenic	µg/L	10	10	<1.0	<1.0
Barium	µg/L	2000	1,000	<10	<10
Boron	µg/L	5000	5000	<50	<50
Cadmium	µg/L	7	5	<0.10	<0.10
Chromium	µg/L	50	50	<1.0	<1.0
Fluoride[1]	mg/L	1.5	1.5	<0.020[1]	
Mercury	µg/L	1	1	<0.10	<0.10
Selenium	µg/L	50	50	<1.0	<1.0
Sodium[1]	mg/L	200	-	26.2[1]	
Uranium	µg/L	20	20	<2.0	<2.0
Organic Parameters					
Alachlor	µg/L		5	<0.10	<0.050
Atrazine and metabolites	µg/L		5	<0.20	<0.14
Azinphos-methyl	µg/L		20	<0.10	<0.100
Benzene	µg/L	5	1	<0.50	<0.50
Benzo(a)pyrene	µg/L		0.01	<0.005	<0.005
Bromoxynil	µg/L	30	5	<0.200	<0.250
Carbaryl	µg/L		90	<0.20	<0.050
Carbofuran	µg/L		90	<0.20	<0.0250
Carbon Tetrachloride	µg/L	2	2	<0.20	<0.20
Chlorpyrifos	µg/L	90	90	<0.10	<0.10
Diazinon	µg/L		20	<0.10	<0.0250
Dicamba	µg/L	110	120	<0.20	<0.10
1,2-Dichlorobenzene	µg/L		200	<0.50	<0.50
1,4-Dichlorobenzene	µg/L	5	5	<0.50	<0.50
1,2-Dichloroethane	µg/L	5	5	<0.50	<0.50
1,1-Dichloroethylene	µg/L		14	<0.50	<0.50
Dichloromethane	µg/L	50	50	<1.0	<1.0
2,4-Dichlorophenol	µg/L		900	<0.30	<0.20
2,4-D	µg/L	100	100	<0.050	<0.050
Diclofop-methyl	µg/L		9	<0.20	<0.100
Dimethoate	µg/L	20	20	<0.10	<0.050
Diquat	µg/L	50	70	<1.0	<1.0
Diuron	µg/L		150	<1.0	<0.050

Parameters	Units	Health Canada GCDWQ	Ontario DWQS	Treated Water	
				Red Lake WTP	
				2023	2024
Glyphosate	µg/L	280	280	<0.2	<0.20
Malathion	µg/L	290	190	<0.10	<0.0250
MCPA	µg/L	350	100	<0.002	<0.00005
Metolachlor	µg/L		50	<0.10	<0.0250
Metribuzin	µg/L	80	80	<0.10	<0.100
Monochlorobenzene	µg/L		80	<0.50	<0.50
Paraquat	µg/L		10	<1.0	<1.0
Pentachlorophenol	µg/L	60	60	<0.50	<0.50
Phorate	µg/L		2	<0.10	<0.250
Picloram	µg/L		190	<0.20	<0.50
Total PCBs	µg/L		3	<0.030	<0.030
Prometryne	µg/L		1	<0.10	<0.0250
Simazine	µg/L		10	<0.10	<0.100
Terbufos	µg/L		1	<0.10	<0.50
Tetrachloroethylene	µg/L	10	10	<0.50	<0.50
2,3,4,6-Tetrachlorophenol	µg/L		100	<0.50	<0.50
Triallate	µg/L		230	<0.10	<0.100
Trichloroethylene	µg/L	5	5	<0.50	<0.50
2,4,6-Trichlorophenol	µg/L	5	5	<0.50	<0.20
Trifluralin	µg/L		45	<0.10	<0.10
Vinyl Chloride	µg/L	2	1	<0.50	<0.50
Lead					
Lead (Distribution)[2]	µg/L	5	10	<1.0	<1.0
Lead (Plumbing)[3]	µg/L	5	10	1.9	**58.8**
Disinfection Byproducts					
Trihalomethanes	µg/L	100	100	82.4	79.4
Haloacetic acids	µg/L	80	80	67.6	63.3
Nitrate and Nitrite					
Nitrate (as nitrogen)	mg/L	10	10	0.021 - 0.1	<0.020 - 0.096
Nitrite (as nitrogen)	mg/L	1	1	<0.010	<0.010

Notes:

1. Sodium and fluoride are sampled every five (5) years. The parameter sodium is not considered toxic and is not associated with Ontario DWQS (O. Reg 169/03), however, an exceedance of 20 mg/L requires reporting and corrective actions as per O. Reg 170/03. Health Canada has an aesthetic objective of 200 mg/L.
2. Maximum result of two samples taken in the distribution system.
3. Maximum result of 24 samples taken in 12 different locations in residential and non-residential plumbing systems all other results were below the detection limit.

Table E2: Summary of Madsen Treated Water Quality (Chemical Parameters)

Parameters	Units	Health Canada GCDWQ	Ontario DWQS	Treated Water Madsen WTP	
				2023	2024
Inorganic Parameters					
Antimony	µg/L	6	6	<0.60	<0.60
Arsenic	µg/L	10	10	<1.0	<1.0
Barium	µg/L	2000	1,000	<10	<10
Boron	µg/L	5000	5000	<50	<50
Cadmium	µg/L	7	5	<0.10	<0.10
Chromium	µg/L	50	50	2.3	<1.0
Fluoride[1]	mg/L	1.5	1.5	<0.020[1]	
Mercury	µg/L	1	1	<0.1	<0.1
Selenium	µg/L	50	50	<1.0	<1.0
Sodium[1]	mg/L	200	-	24.6[1]	
Uranium	µg/L	20	20	<2.0	<2.0
Organic Parameters					
Alachlor	µg/L		5	<0.10	<0.050
Atrazine and metabolites	µg/L		5	<0.20	<0.14
Azinphos-methyl	µg/L		20	<0.10	<0.100
Benzene	µg/L	5	1	<0.50	<0.50
Benzo(a)pyrene	µg/L		0.01	<0.005	<0.005
Bromoxynil	µg/L	30	5	<0.20	<0.250
Carbaryl	µg/L		90	<0.20	<0.050
Carbofuran	µg/L		90	<0.20	<0.0250
Carbon Tetrachloride	µg/L	2	2	<0.20	<0.20
Chlorpyrifos	µg/L	90	90	<0.10	<0.10
Diazinon	µg/L		20	<0.10	<0.0250
Dicamba	µg/L	110	120	<0.20	<0.10
1,2-Dichlorobenzene	µg/L		200	<0.50	<0.50
1,4-Dichlorobenzene	µg/L	5	5	<0.50	<0.50
1,2-Dichloroethane	µg/L	5	5	<0.50	<0.50
1,1-Dichloroethylene	µg/L		14	<0.50	<0.50
Dichloromethane	µg/L	50	50	<1.0	<1.0
2,4-Dichlorophenol	µg/L		900	<0.30	<0.20
2,4-D	µg/L	100	100	<0.050	<0.050
Diclofop-methyl	µg/L		9	<0.10	<0.10
Dimethoate	µg/L	20	20	<0.10	<0.050
Diquat	µg/L	50	70	<1.0	<1.0
Diuron	µg/L		150	<1.0	<0.050
Glyphosate	µg/L	280	280	<0.2	<0.20
Malathion	µg/L	290	190	<0.10	<0.0250
MCPA	µg/L	350	100	<0.002	<0.00005
Metolachlor	µg/L		50	<0.10	<0.0250
Metribuzin	µg/L	80	80	<0.10	<0.100
Monochlorobenzene	µg/L		80	<0.50	<0.50
Paraquat	µg/L		10	<0.10	<1.0

Pentachlorophenol	µg/L	60	60	<0.50	<0.50
Phorate	µg/L		2	<0.10	<0.250
Picloram	µg/L		190	<0.20	<0.50
Total PCBs	µg/L		3	<0.030	<0.030
Prometryne	µg/L		1	<0.10	<0.0250
Simazine	µg/L		10	<0.10	<0.100
Terbufos	µg/L		1	<0.10	<0.50
Tetrachloroethylene	µg/L	10	10	<0.50	<0.50
2,3,4,6-Tetrachlorophenol	µg/L		100	<0.50	<0.50
Triallate	µg/L		230	<0.10	<0.100
Trichloroethylene	µg/L	5	5	<0.50	<0.50
2,4,6-Trichlorophenol	µg/L	5	5	<0.50	<0.20
Trifluralin	µg/L		45	<0.10	<0.100
Vinyl Chloride	µg/L	2	1	<0.50	<0.50
Lead					
Lead[2]	µg/L	5	10	<1.0[2]	-
Disinfection Byproducts					
Trihalomethanes	µg/L	100	100	53.9	67.9
Haloacetic acids	µg/L	80	80	42.4	45.2
Nitrate and Nitrite					
Nitrate (as nitrogen)	mg/L	10	10	0.026 – 0.122	<0.020 – 0.089
Nitrite (as nitrogen)	mg/L	1	1	<0.010	<0.010

Notes:

1. Sodium and fluoride are sampled every five years. The parameter sodium is not considered toxic and is not associated with Ontario DWQS (O. Reg 169/03), however, an exceedance of 20 mg/L requires reporting and corrective actions as per O. Reg 170/03. Health Canada has an aesthetic objective of 200 mg/L.
2. Based on previous favourable results, only two distribution samples are collected every year and analyzed for lead in every third 12-month period.

Table E3: Summary of Balmertown, Cochenour, and McKenzie Island Treated Water Quality (Chemical Performance)

Parameters	Units	Health Canada GCDWQ	Ontario DWQS	Treated Water Madsen WTP	
				2023	2024
Inorganic Parameters					
Antimony	µg/L	6	6	<0.60	<0.60
Arsenic	µg/L	10	10	<1.0	<1.0
Barium	µg/L	2000	1,000	<10	<10
Boron	µg/L	5000	5000	<50	<50
Cadmium	µg/L	7	5	<0.10	<0.10
Chromium	µg/L	50	50	<1.0	<1.0
Fluoride[1]	mg/L	1.5	1.5	<0.020[1]	
Mercury	µg/L	1	1	<0.10	<0.10
Selenium	µg/L	50	50	<1.0	<1.0
Sodium[1]	mg/L	200	-	24.3[1]	
Uranium	µg/L	20	20	<2.0	<2.0
Organic Parameters					
Alachlor	µg/L		5	<0.10	<0.050
Atrazine and metabolites	µg/L		5	<0.20	<0.14
Azinphos-methyl	µg/L		20	<0.10	<0.100
Benzene	µg/L	5	1	<0.50	<0.50
Benzo(a)pyrene	µg/L		0.01	<0.005	<0.005
Bromoxynil	µg/L	30	5	<0.20	<0.250
Carbaryl	µg/L		90	<0.20	<0.050
Carbofuran	µg/L		90	<0.20	<0.0250
Carbon Tetrachloride	µg/L	2	2	<0.20	<0.20
Chlorpyrifos	µg/L	90	90	<0.10	<0.10
Diazinon	µg/L		20	<0.10	<0.0250
Dicamba	µg/L	110	120	<0.20	<0.10
1,2-Dichlorobenzene	µg/L		200	<0.50	<0.50
1,4-Dichlorobenzene	µg/L	5	5	<0.50	<0.50
1,2-Dichloroethane	µg/L	5	5	<0.50	<0.50
1,1-Dichloroethylene	µg/L		14	<0.50	<0.50
Dichloromethane	µg/L	50	50	<1.0	<1.0
2,4-Dichlorophenol	µg/L		900	<0.30	<0.20
2,4-D	µg/L	100	100	<0.050	<0.050
Diclofop-methyl	µg/L		9	<0.10	<0.100
Dimethoate	µg/L	20	20	<0.10	<0.050
Diquat	µg/L	50	70	<1.0	<1.0
Diuron	µg/L		150	<1.0	<0.050
Glyphosate	µg/L	280	280	<0.2	<0.20
Malathion	µg/L	290	190	<0.10	<0.0250
MCPA	µg/L	350	100	<0.0002	<0.00005
Metolachlor	µg/L		50	<0.10	<0.0250
Metribuzin	µg/L	80	80	<0.10	<0.100
Monochlorobenzene	µg/L		80	<0.50	<0.50

Paraquat	µg/L		10	<1.0	<1.0
Pentachlorophenol	µg/L	60	60	<0.50	<0.50
Phorate	µg/L		2	<0.10	<0.250
Picloram	µg/L		190	<0.20	<0.50
Total PCBs	µg/L		3	<0.030	<0.030
Prometryne	µg/L		1	<0.10	<0.0250
Simazine	µg/L		10	<0.10	<0.100
Terbufos	µg/L		1	<0.10	<0.100
Tetrachloroethylene	µg/L	10	10	<0.50	<0.50
2,3,4,6-Tetrachlorophenol	µg/L		100	<0.50	<0.50
Triallate	µg/L		230	<0.10	<0.100
Trichloroethylene	µg/L	5	5	<0.50	<0.50
2,4,6-Trichlorophenol	µg/L	5	5	<0.50	<0.20
Trifluralin	µg/L		45	<0.10	<0.10
Vinyl Chloride	µg/L	2	1	<0.50	<0.50
Lead					
Lead (Distribution) [2]	µg/L	5	10	-	<1.0 – 2.3
Lead (Plumbing)[3]	µg/L	5	10	-	-
Disinfection Byproducts					
Trihalomethanes	µg/L	100	100	67.3	80.2
Haloacetic acids	µg/L	80	80	78.8 - **82.9**	67.8 - 74.8
Nitrate and Nitrite					
Nitrate (as nitrogen)	mg/L	10	10	<0.020 - 0.09	0.035 - 0.097
Nitrite (as nitrogen)	mg/L	1	1	<0.010	<0.010

Notes:

1. Sodium and fluoride are sampled every five years. The parameter sodium is not considered toxic and is not associated with Ontario DWQS (O. Reg 169/03), however, an exceedance of 20 mg/L requires reporting and corrective actions as per O. Reg 170/03. Health Canada has an aesthetic objective of 200 mg/L.
2. Four samples were taken in the distribution system and tested for lead in every third 12-month period.
3. Due to previous favourable results, lead sampling and testing in plumbing systems were exempted.

APPENDIX F:
Service Baseline Jurisdictional Scan

Appendix F: Service Baseline Jurisdictional Scan

The following appendix provides a jurisdictional scan to compare the Municipality with three other Northern Ontario communities: Hearst, Sioux Lookout, and Dryden. These municipalities were chosen due to their similar geographical isolation, population sizes, resource-based economies, and their role as regional service hubs for surrounding areas.

The jurisdictional scan compared the following:

- Demographic and population trends;
- Mining and road development projects ;
- Municipal facilities and assets;
- Major employers;
- Commercial products and services that the Municipality provides to outlying areas;
- Transportation and regional accessibility; and
- Best practices in community and economic development.

F1 Demographic and Population Trends

In contrast to the Municipality of Red Lake, Hearst, and Dryden, which have all experienced a decline in population since 2011 of about 5% to 6%, Sioux Lookout has seen a steady increase in population over the same period, from 5,037 to 6,233 (Environics 2024; Statistics Canada 2013). This growth may reflect Sioux Lookout's role as the “Hub of the North” (Municipality of Sioux Lookout n.d.a) as well as its larger Indigenous population, with 27.4% of Sioux Lookout’s residents identifying as Indigenous, compared to 19.3% in Red Lake and 17.0% in Dryden. Indigenous populations represent a notable proportion in all four communities, especially in Sioux Lookout and the Municipality of Red Lake (Environics; 2024; Statistics Canada 2013).

The average age across these municipalities is similar, ranging from 39 to 45 years, indicating that the populations are relatively young to middle-aged. However, Hearst has a slightly older demographic with an average age of 45.1 years, compared to 39.6 years in Red Lake and 39.2 years in Sioux Lookout. This could influence the types of community services required, such as more senior care and healthcare infrastructure in Hearst (Environics 2024).

The Municipality of Red Lake had a similar immigrant population at 6.0% to Sioux Lookout (7.5%) and Dryden (7.1%), which may drive the demand for services and cultural integration efforts in each community.

Table F1 provides the demographic and population trends identified for the jurisdictional scan.

Table F1: Demographic and Population Trends Identified for the Jurisdictional Scan

Municipality of Red Lake	Hearst	Sioux Lookout	Dryden
• Reached 4,670 residents in 2011, as of 2024 is 4,104. • Average age: 39.6 years. • 19.3% Indigenous population. • 6.0% immigrant population. • Total median household income: $122,500.	• Reached 5,090 population in 2011, as of 2024 is 4,690. • Average age: 45.1 years. • 8.7% Indigenous population. • 3.3% immigrant population. • Total median household income: $90,000.	• Population was 5,037 population in 2011, as of 2024 is 6,233. • Average age: 39.2 years. • 27.4% Indigenous population. • 7.5% immigrant population. • Total median household income: $115,500.	• Reached 7,617 in 2011, as of 2024 is 7,224. • Average age: 45.1 years. • 17.0% Indigenous population. • 7.1% immigrant population. • Total median household income: $88,000.

Source: Environics 2024; Statistics Canada 2013.

F2 Mining and Road Development Projects

The communities of the Municipality of Red Lake, Hearst, Sioux Lookout, and Dryden are all undergoing notable changes due to major mining and infrastructure projects. Many of these projects, particularly those in the mining sector and infrastructure development, have a lasting economic impact that extends beyond immediate job creation. The following summary outlines key development initiatives underway across the Municipality, Hearst, Sioux Lookout, and Dryden.

Approximately 25 km south of the community of Red Lake is the site of the Kinross Great Bear Project, a large-scale mining operation slated to begin full production by 2029. The project is expected to employ over 1,000 local and non-local workers, generating jobs across sectors such as construction, transportation, and services (Kinross Gold 2025). In addition, the Berens River Bridge and Roads Project will improve the connection to seven First Nations communities to the provincial highway network, improving access for over 8,000 residents. This infrastructure will enhance regional connectivity and promote broader economic development (Berens River Bridge and Roads Project n.d).

The Town of Hearst is currently investing in the $2.4 million West Street Road Reconstruction project (Villeneuve Construction 2025). This initiative includes upgrades to storm sewers, water valves, hydrants, and roadways, and is expected to improve public services and support future business investment. Simultaneously, Noble Mineral Exploration's Boulder Project, though still in the early exploration phase, has shown promising mineral findings that could lead to job creation and increased economic activity in the region (Noble Mineral Exploration 2025).

In the Municipality Sioux Lookout, the Drayton Black Lake Project by Heritage Mining Ltd. has attracted attention following gold discoveries in one of Northwestern Ontario's last unexplored greenstone belts (Heritage Mining 2025). Although still in exploration, the project has the potential to contribute substantially to local employment and economic growth. Meanwhile, the Green Technology Metals - Root Lithium Mine Project is scheduled to open in 2028. Given the increasing demand for electric vehicle battery materials, this lithium project is expected to support long-term economic stability and job creation (Green Technology Metals 2025).

The City of Dryden is home to the Goliath Gold Project, a combined open-pit and underground mining operation currently in development (NexGold 2025a). Once operational, it will create numerous local jobs and stimulate related sectors such as construction, transportation, and services. Additionally, the Nuclear Waste Management Organization's Deep Geological Repository, planned for operation in the early 2040s, will position Dryden and the surrounding area as a central site for Canada's first deep nuclear waste storage facility. This project is expected to create sustained employment in engineering, skilled trades, and environmental services for up to 175 years (NWMO n.d.).

Table F2 provides the mining and road development projects identified for the jurisdictional scan.

Table F2: Mining and Road Development Projects Identified for the Jurisdictional Scan

Municipality of Red Lake	Hearst	Sioux Lookout	Dryden
• Evolution Mine • West Red Lake Gold – Madsen Mine • Kinross Gold – Great Bear Project • PAK Frontier Lithium • Berens River Bridge and Road Project	• West Street Road Reconstruction • Noble Mineral Exploration – Boulder Project	• Drayton Black Lake Project – Heritage Mining Ltd. • Green Technology Metals: Root Lithium Mine Project • The Goldlund Gold Project	• Drayton Black Lake Project – Heritage Mining Ltd. • The Goliath Gold Project • Mavis Lake Lithium Project • Nuclear Waste Management Organizations Deep Geological Repository

Source: Berens River Bridge and Roads Project n.d.; Critical Resources 2025; Evolution Mining 2025; Frontier Lithium 2025; Green Technology Metals 2025; Heritage Mining 2025; Kinross Gold 2025; NexGold 2025a, 2025b; Noble Mineral Exploration 2025; NWMO n.d.; Villeneuve Construction 2025; West Red Lake Gold 2025.

F3 Municipal Facilities and Assets

This section outlines the range of municipal facilities and community assets that support health services, wellness initiatives, and recreational activities for residents in the municipalities of Red Lake, Hearst, Sioux Lookout, and Dryden. These community assets are grouped under the following categories:

- Hospital and medical clinics;
- Library;
- Pool;
- Arenas;
- Sport pitch and play fields;
- Beach;
- Boat launch;
- Community halls;
- Curling;
- Golf courses;
- Museum;
- Trails;
- Recreation centre; and
- Other sports, recreational, and leisure facilities.

Despite having the smallest population among the four, the Municipality maintains a comparable range of municipal facilities.

From a health and wellness standpoint, each of the four municipalities maintains a hospital and at least one medical clinic. Public health services are provided by the Northwestern Health Unit in Sioux Lookout, Dryden, and the Municipality while Hearst is served by the Porcupine Health Unit. Hearst benefits from a broader range of support networks including the Nord-Aski Family Health Team and community-specific health and aging programs. Similarly, Sioux Lookout is home to the Sioux Lookout Meno Ya Win Health Centre, which serves a population of about 30,000, including 28 First Nations communities.

The Municipality offers the greatest access to waterfront amenities, with five public beaches (more than any of the other communities). Municipal boat launches are available in Red Lake, Sioux Lookout, and Dryden, while Hearst currently does not operate a municipal boat launch.

Each community maintains at least one public library, with the Municipality operating two separate branches. All four municipalities also have at least one recreation centre. Dryden and Hearst feature full-service facilities that include swimming pools, arenas, and fitness equipment. Sioux Lookout's Cedar Bay Complex and Fitness Centre, along with Red Lake's Evolution Mining Recreation Centre and the Red Lake Community Fitness Centre, provide similarly well-equipped recreational spaces.

Additional leisure and sport infrastructure across the communities includes soccer fields, baseball diamonds, playgrounds, skateparks, splash pads, curling rinks, squash courts, and winter sports amenities. Notably, the Municipality and Dryden offer particularly well-developed outdoor recreation networks, supporting a wide variety of year-round activities.

Table F3 provides the municipal facilities and assets identified for the jurisdictional scan.

Table F3: Municipal Facilities and Assets Identified for the Jurisdictional Scan

Municipal Facility	Municipality of Red Lake	Hearst	Sioux Lookout	Dryden
Hospitals, medical clinics, and pharmacies	• Red Lake Margaret Cochenour Memorial Hospital • Goldcorp Red Lake Regional Medical Centre • Red Lake Pharmacy	• Notre-Dame Hospital • Hearst Community Locum Clinic • Nord-Aski Family Health Team • Hearst Community Living • North Eastern Ontario Family and Children's Services • Aging at Home	• Sioux Lookout Meno Ya Win Health Centre • Hugh Allen Clinic	• Dryden Regional Health Centre • Dingwall Medical Clinic
Libraries	• Balmertown Public Library • Margaret McDougall Memorial Public Library	• Hearst Public Library	• Sioux Lookout Public Library	• Dryden Public Library
Arenas and recreation centres	• Cochenour Arena • Cochenour Community Hall • The Red Lake Pavillion • Evolution Mining Recreation Centre and diamond (Balmertown) • Red Lake Community Fitness Centre	• Claude Larose Arena • Claude Larose Recreation Centre • Hearst Community Curling Club	• Sioux Lookout Memorial Arena • Cedar Bay Recreation Complex • Sioux Lookout Fitness Centre • Sioux Lookout Outdoors Sport Complex	• Dryden Memorial Arena • Dryden Recreation Centre • Ball Diamond Event Centre
Beaches	• Cochenour Beach • Keesic Beach • Kinsmen Beach • Rahill Beach	• Johnson's Lake	• Farlinger Town Beach • Second Sandy Beach	• Sandy Beach • Aaron Park

Municipal Facility	Municipality of Red Lake	Hearst	Sioux Lookout	Dryden
	• Sandy Point Beach		• Ojibway Provincial Park	
Museums	• Red Lake Regional Heritage Centre • West Red Lake Mining Museum	• Hearst Eco Museum	• Sioux Lookout Museum	• Dryden and District Museum
Trails	• Pakwash Provincial Park Trail (5km) • Multipurpose Trail at High School to Hughes Crescent (600m)	• Mattawishkwia River Trail (3km) • Highway 11 Trial (7.5km) • Johnson's Lake Trail (2km)	• Ojibway Provincial Park Trails • Umfreville Trail (4km) • Cedar Bay (10km)	• Dryden Urban Trail (12km) • Aaron Park Trail System • Nature in the City Trail • Dryden Signature Trail
Golf courses	• Red Lake Golf and Country Club	• Hearst Golf Club	• Sioux Lookout Golf and Country Club	• Anderson's Homestead Golf Course
Other sports and leisure facilities	• Cochenour Basketball Court • Cochenour Baseball Diamond and Soccer Field • Dan Kucheran Baseball Field • Outposts (11) • Playgrounds (8 including others identified (i.o.i)) • Outdoor Rinks (3 i.o.i) • Tennis/Pickle Ball Courts (2 i.o.i) • Red Lake Cross	• Softball Fields (3) • JD Levesque Park Baseball Field • Tennis Courts (4) • Skateboard Park • Cross Country Ski and Snowshoeing • Stephane Lecours Swimming Pool • Water Park • Outdoor Rink • Winter Slide	• Skateboard Park • Baseball Diamonds (2) • Bocce and Tennis Courts • Indoor Squash Court • Outdoor Skating Rink •	• Dryden Skatepark • Soccer fields (7) • Baseball diamonds (4) with Event Centre • Milestone Outdoor Rink • Tennis and Pickleball (2022) • Squash Courts • Fall Fair Grounds • Beach Volleyball Courts • Splashpads (2)

Municipal Facility	Municipality of Red Lake	Hearst	Sioux Lookout	Dryden
	Country Ski Club • Phillip Thomas Vinet Centennial Skatepark • Splash Pad • Beach Volleyball Courts • Snowmobile Trail Network • Cross-Country Ski Trails • Curling rink • Squash courts (2 i.o.i) • Baseball Diamonds (4 i.o.i) • Soccer fields (2 i.o.i)			• Rotary Park Community Splash Park • Dryden Ski and Snowboard Complex • Cross-country ski and snowshoe

Sources: CCDC 2025; Municipality of Hearst 2025; Municipality of Sioux Lookout 2021; Townfolio 2025a, 2025b.

F4 Major Employers

Major employers play an important role in shaping the size, demographics, and needs of a community. By identifying the primary industries and major employers in each municipality, we can better understand the types of services required to support the workforce and the broader population. The economic composition of each community also provides insight into potential vulnerabilities and opportunities for growth or diversification.

The Municipality's economy is heavily influenced by the mining sector, with several major exploration and production companies operating in the area. These employers not only drive local job creation but also contribute to the demand for housing, transportation, and services. As mining projects expand, the community will see increased pressure on housing, infrastructure, and skilled trades training.

The Town of Hearst's economy is primarily driven by the forestry and wood manufacturing industries, supported by a smaller public service and healthcare sector (Municipality of Hearst 2025). The community's economic foundation is closely tied to its natural resources, particularly timber. Given Hearst's dependence on forestry, shifts in global lumber demand or changes in environmental policy could significantly impact the local economy. The presence of strong public health and education networks helps provide balance and resilience.

The Municipality of Sioux Lookout benefits from a diverse mix of employers, including regional healthcare services, transportation, and communication sectors. Its role as a service hub for surrounding First Nations communities notably expands its economic footprint. The Meno Ya Win Health Centre is one of the region's largest employers, supporting approximately 500 staff and serving over 30,000 people—including residents of 28 remote First Nations communities. This makes Sioux Lookout a regional hub for healthcare and employment (Municipality of Sioux Lookout 2021).

The City of Dryden has a relatively balanced economy, with key employers across forestry, healthcare, public administration, and education (Townfolio 2025b). The City benefits from both traditional industries and a growing service sector. Dryden's economy is supported by a mix of long-standing employers and emerging investments. The ongoing development of nearby mining and energy projects (e.g., the Goliath Gold Project and the Nuclear Waste Management Organizations Deep Geological Repository) may generate additional employment and infrastructure needs soon.

Table F4 provides the major employers identified for the jurisdictional scan.

Table F4: Major Employees Identified for the Jurisdictional Scan

Municipality of Red Lake	Hearst	Sioux Lookout	Dryden
• Evolution Mining Ltd. • West Red Lake Gold Mines Ltd. • Red Lake Margaret Cochenour Memorial Hospital • Ministry of Natural Resources • The Province of Ontario • Municipality of Red Lake • Keewatin Patricia District School Board • Great Bear Resources (Kinross) Ltd. • Keewaytinook Okimakanak-Northern Chiefs	• Columbia Forest Products-Levesque Plywood Ltd. • Lecours Lumber • Notre-Dame Hospital • Conseil Scolaire Catholique de District des Grandes Rivieres • Villeneuve Construction • Tembec	• Meno Ya Win Health Centre • Municipality of Sioux Lookout • Heritage Mining • Dun and Bradstreet • Canadian National Railway • Madsen Motors Ltd. • Wawatay Communications Society • Bearskin Airlines • Province of Ontario	• Dryden Fibre Canada • Keewatin Patricia District School Board • Dryden Regional Health Centre • Municipality of Dryden • The Province of Ontario • Ricci's Group of Companies

Source: CCDC 2025; Municipality of Hearst 2025; Municipality of Sioux Lookout 2021; Townfolio 2025a, 2025b.

F5 Outlying Areas that Depend on the Centralized Municipality for Commercial Products and Services

The municipalities of Red Lake, Hearst, Sioux Lookout, and Dryden each function as key service hubs for surrounding rural, remote, and Indigenous communities. These centralized municipalities provide access to essential goods, professional services, and recreational or cultural amenities that are often limited or unavailable in more isolated areas.

All four municipalities offer a range of health and wellness services, including dentists, optometrists, pharmacies, and mental health professionals, serving not only the local population but also individuals from neighboring communities who travel in for care.

From a commercial perspective, each municipality hosts a core selection of retail outlets, such as home hardware stores, independent grocers, and general merchandise vendors. Dryden and Sioux Lookout, being somewhat larger regional hubs, offer the broadest selection of goods and services. Both communities feature big-box retailers such as Canadian Tire, Walmart, and other national chains, drawing consumers from surrounding areas who rely on these centralized shopping destinations for bulk purchases, appliances, electronics, and other goods not available locally (City of Dryden n.d.a; Sioux Lookout Chamber of Commerce n.d.).

In addition to retail and healthcare, these municipalities provide educational services, recreational programming, and cultural events, contributing to regional cohesion and quality of life.

In particular, the Municipality supports a high number of remote outposts and seasonal camps. Its local economy includes grocery stores, bait and tackle shops, fuel stations, and building supply outlets that cater to both residents and seasonal visitors (CCDC n.d.b, n.d.c).

Table F5 provides the commercial products and services that the Municipality of Red Lake provides to outlying areas as identified for the jurisdictional scan.

Table F5: Commercial Products and Services the Municipality of Red Lake Provides to Outlying Areas Identified for the Jurisdictional Scan

Municipality of Red Lake	Hearst	Sioux Lookout	Dryden
• Grocery Stores • Lumber and Building Supplies (Home Hardware) • Northwest Timber Mart • Bait and Tackle Shops • Outposts • Fuel • Professional services (dentist, optometrist, chiropractic, mental health etc.) • Restaurants • Hotels and Accommodations • Festivals and Events	• Canadian Tire • Grocery stores • Fuel • Restaurants • Skilled trades • Hotels and accommodations	• Fuel • Grocery stores • Big box stores (Giant Tiger, Home Hardware) • Restaurants • Health and wellness service providers • Hotels and accommodations • Sioux Lookout Blueberry Festival	• Big box stores (Walmart, Canadian Tire, Mark's, Rona, Home Hardware) • Grocery stores • Fuel • Car dealerships • Arenas • Festivals and Events • Health and wellness service providers • Professional services (dentist, optometrist, chiropractic, etc.) • Hotels and accommodations • Restaurants • Building materials • Skilled trades

Source: CCDC n.d.b, n.d.c; City of Dryden n.d.a; Municipality of Heart n.d.a; Sioux Lookout Chamber of Commerce n.d.

F6 Transportation and Regional Accessibility

Each of the four municipalities: Red Lake, Hearst, Sioux Lookout, and Dryden, offer varying degrees of regional connectivity through road, air, rail, and local transportation services. Their transportation infrastructure plays a key role in facilitating access to services, goods, and employment, both for residents and surrounding communities.

The Municipality is accessible via Highways 105 and 125, providing a direct road link to the provincial highway network. The Red Lake Airport offers scheduled passenger flights and charter services, supported by carriers such as Bearskin Airlines, Fast Air, Lac Seul Airways Ltd., North Star Air, Superior Airways, Wasaya Airways Hangar, and Wilderness North Air (Municipality of Red Lake 2025). Seasonal access to remote communities is further supported by the Miss McKenzie II Ferry and a network of winter ice roads. While the Municipality benefits from strong road and air infrastructure, the absence of shuttle bus services, public transit options and rail connectivity may limit its regional accessibility relative to other municipalities.

The Town of Hearst is located along Highway 11 and is served by Ontario Northland's intercity bus service. Although it lacks a local airport, residents can access air travel through the Timmins Airport, located approximately three hours away by road (Municipality of Hearst n.d.b, n.d.c). As a result, Hearst primarily depends on highway and bus networks for regional

transportation. Local mobility options are limited, but the town remains accessible to surrounding communities through its central location along a major highway corridor.

The Municipality of Sioux Lookout stands out for its multimodal transportation network. The municipality is connected by Highway 72 and is home to the Sioux Lookout Airport, which offers regular commercial flights and floatplane access to remote northern communities. Rail service is also available through VIA Rail's transcontinental route (Municipality of Sioux Lookout 2021; Sioux Lookout First Nations Health Authority n.d.). This diverse infrastructure strengthens Sioux Lookout's role as a key regional hub and gateway to the North.

The City of Dryden is well-connected through Highway 17 (Trans-Canada Highway), the Dryden Regional Airport, and both intercity bus and freight rail services. The community offers a range of transportation options, including car rentals, accessible van services, and service by multiple bus operators (City of Dryden n.d.b). This multimodal access ensures strong regional mobility and positions Dryden as a well-connected service centre for both travelers and outlying populations.

Table F6 provides the transportation and regional connectivity as identified for the jurisdictional scan.

Table F6: Transportation and Regional Connectivity Identified for the Jurisdictional Scan

Municipality of Red Lake	Hearst	Sioux Lookout	Dryden
• Highway 105 and 125 • Red Lake Airport • Miss McKenzie II Ferry • Lac Seul Airways • Wasaya Airways Hangar • Bearskin Airlines • Superior Airways • Fast Air Jet Centre • Wilderness North Air • North Star Air • Gardewine North and Purolator Courier (Truck Transportation) • Red Lake Taxi	• Highway 11 • Mattawishkwia River • Ontario Northland Bus • Timmins Victor M. Power Airport (3hr drive from Hearst)	• Highway 72 • Sioux Lookout Municipal Airport • Sioux Lookout Railway Station • Pelican Lake Bay Water Base • G and R Taxi Ltd. • Sandy's Taxi • A and A Taxi • Sioux Taxi • NDS Taxi • Avis Rent a Car	• Highway 17 • Dryden Regional Airport • Enterprise Rent-a-Car • National Car and Truck Rental • MyLift Van Service • George's Taxi • Cabbie's Taxi • Canadian National Railway • Hutchinson Bus Lines • Iron Range Bus Lines • Kasper Transportation Service • Ontario Northland

Source: City of Dryden n.d.b; CCDC n.d.d; Municipality of Hearst n.d.b, n.d.c; Municipality of Red Lake 2025; Sioux Lookout First Nations Health Authority n.d.

F7 Best Practices in Community and Economic Development

Each of the four municipalities has adopted innovative approaches to community and economic development. These strategies reflect best practices in local governance, investment readiness, cultural inclusion, and long-term sustainability.

The Municipality of Red Lake has taken proactive steps to enhance livability and attract investment through the implementation of its Community Improvement Plan and the recently adopted Strategic Plan (2024–2027). These guiding documents provide a clear framework for prioritizing infrastructure upgrades, business development, and community initiatives. Red Lake has also demonstrated a strong commitment to preserving its cultural heritage, including commitment to the Red Lake Regional Heritage Centre, upgrades to public spaces such as the Centennial Park Pavilion and the Norseman Park (with phase two and phase three planned for construction in the next 2 to 4 years, provided funds are available). The Municipality's support for local businesses through targeted grants and incentives is a reflection of their commitment to encouraging growth that values tourism and economic development, quality of life for residents, and historical preservation.

The Town of Hearst continues to advance community development through strategic investments in downtown revitalization, driven by the momentum of its Strategic Plan. Ongoing beautification projects and infrastructure improvements have helped maintain the appeal of the

town centre, while financial incentives for commercial and residential property improvements have encouraged reinvestment and business retention (Municipality of Hearst n.d.d). Hearst's focus on revitalizing core areas supports small business vitality and enhances the overall quality of life for residents.

The Municipality of Sioux Lookout stands out for its collaborative and inclusive approach to development, strengthened through intergovernmental partnerships. This approach has enabled the community to secure multi-level funding for major infrastructure projects. A key best practice is Sioux Lookout's emphasis on Indigenous partnerships in planning and development, demonstrated through joint initiatives that incorporate Indigenous values and priorities (Municipality of Sioux Lookout n.d.). Notably, the municipality has also introduced innovative building solutions, such as a hotel constructed from shipping containers, addressing both affordability and sustainability, while providing short-term, temporary housing (CBC News 2015).

The City of Dryden has supported regional development through the combined use of its Community Improvement Plan and findings from its Community Capacity Study (2022). One notable best practice is its collaboration with Wabigoon Lake Ojibway Nation on a proposed hotel and commercial complex, which exemplifies meaningful Indigenous partnership and co-development. This project is designed to generate long-term employment opportunities, expand local services, and promote Indigenous economic inclusion. Dryden's commitment to regional cooperation and shared economic outcomes highlights the value of equitable partnerships in sustainable community growth.

Table F7 provides the best practices in community and economic development as identified for the jurisdictional scan.

Table F7: Best Practices in Community and Economic Development Identified for the Jurisdictional Scan

Municipality of Red Lake	Hearst	Sioux Lookout	Dryden
• Cultural and heritage preservation • Centennial Park Pavilion upgrades • Local business supports • Community Improvement Plan • Strategic Plan 2024-2027 • Community Safety and Well Being Plan • Conservation and Demand Management Plan • Cultural Plan • Emergency Plan • Recreation Master Plan • Sustainability Plan • Tourism Marketing Strategic Plan • Review of Waste and Recycling Management Report • Review of Ice Arena Modernization and Efficiency Report • Trails Engineering Study • Events Centre Feasibility Study • Alternate Infrastructure Study • Vacant Land Growth Study	• Strategic Plan • Ongoing downtown revitalization projects: including street beautification and infrastructure upgrades, financial incentives for property renovations and upgrades	• Community Improvement Plan • Multi-level Government Financing • Loan repayment/operating budget • Emphasis on Indigenous partnerships in local development projects • Infrastructure upgrades and community service expansions • Hotel built out of 120 shipping containers	• Community Improvement Plan • Community Capacity Study 2022 • Wabigoon Lake Ojibway Nation hotel and commercial complex

Source: CBC News 2015; City of Dryden n.d.c; Ingenious 2016; Municipality of Hearst n.d.d; Municipality of Sioux Lookout n.d.b.


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