WATER & WASTEWATER SERVICING MASTER PLAN

(MARKDALE-FLESHERTON-KIMBERLEY-AMIK-EUGENIA-BEAVER VALLEY

Municipality of Grey Highlands

Project No: 111-13229-00
Date: December 2017

WSP Canada Inc.
1450 – 1st Ave. W.
Suite 101
Owen Sound, ON N4K 6W2

Phone: 519-376-7612
Fax: 519-376-8008
www.wspgroup.com

EXECUTIVE SUMMARY

The Municipality of Grey Highlands is situated in Grey County and is made up of the former Townships of Artemesia, Euphrasia, Osprey and the Villages of Markdale and Flesherton. The Municipality of Grey Highlands presently owns and operates a water distribution system and sanitary sewer system in Markdale, a sanitary sewer system in Flesherton, a sanitary sewer system in Amik-Talisman and a water distribution system in Kimberley-Amik-Talisman.

The Municipality of Grey Highlands began investigating the expansion of its municipal infrastructure in 2012 to provide reasonable water and wastewater servicing to its existing communities of Markdale, Flesherton, Kimberley, Amik, Eugenia and Beaver Valley and for future development. This investigation was complete through the preparation of this 2017 Water and Wastewater Servicing Master Plan.

As per a Municipal Class Environmental Assessment, an approved process under the Environmental Assessment Act, Master Plan Approach #2 was utilized for preparation of this Master Plan, which addresses the first two (2) phases of the Municipal Class EA process. The Master Planning process under Approach #2 has been completed for this Master Plan, whereby the level of investigation, consultation and documentation are sufficient to fulfill the requirements for Schedule B projects within. As well, Final Public Notice for the Master Plan will become the "Notice of Completion" for the Schedule B projects within.

On January 23, 2012, WSP Canada Inc. (formally GENIVAR Inc.) presented the 2012 Draft Master Plan to the Municipality of Grey Highlands. Upon completion of the presentation and detailed discussion, WSP Canada Inc. was requested to prepare a second report regarding an outline of recommended sewage and water serving for Phase 1 of the Master Plan Study area, which includes the Village of Markdale (including extension into West Grey to the West and North), Kimberly, Amik and Talisman, Beaver Valley Ski Club to County Road 32, Grey Road 12 and 30 Corridor from Markdale to Grey Road 32, and Grey Road 30 Corridor from Beaver Valley Ski Club to Grey Road 13. As a result, the March 2012 "Outline of Recommended Sewage and Water Servicing for Phase 1 of the Master Plan", was prepared and submitted to the Municipality.

On August 15, 2012, WSP Canada Inc. and Municipality of Grey Highlands met with the Ministry of the Environment and Climate Change (MOECC), County of Grey, and Niagara Escarpment Commission, regarding the 2012 Draft Master Plan and additional outline report concerning Phase 1. Based on discussions during the meeting, there was general consensus that the 2012 Draft Master Plan would need to be updated to provide more detail regarding the potential upgrades at the Markdale Wastewater Treatment Plant and the Amik-Talisman Wastewater Treatment Plant.

At the same August 15, 2012 meeting, WSP Canada Inc. presented potential optimization options for the Markdale Wastewater Treatment Plant, as opposed to the upgrades documented in the 2012 Draft Master Plan. The potential optimization option specifically discussed was regarding increasing the current Markdale Wastewater Treatment Plants hydraulic capacity to 1,720 m^3/day, by discharge to the Rapid Infiltration Basins during the winter period (year round discharge). Based on this discussion, the Municipality provided direction that they would like to proceed with this option for continuous year round

discharge to the Rapid Infiltration Basin, whereby the Master Plan would be updated to include this recommended option. As well, the Municipality provided direction to WSP to not review the Amik-Talisman Wastewater Treatment Plant further under the Master Plan. A separate EA would be completed for potential future upgrades to the Amik-Talisman Wastewater Treatment Plant at a later date.

Following the above meetings, the 2012 Draft Master Plan finalization was put on hold until revisited in late 2016 for completion. Base on the discussions with the MOECC in 2012, and subsequently in late 2016 and early 2017, this updated 2017 Master Plan focused on two (2) projects as follows:

1) New Markdale Water Storage Facility; and

2) Optimization of the Existing Markdale Wastewater Treatment Plant.

Through further discussions with the Municipality of Grey Highlands in late 2016, the Kimberley-Amik-Talisman water treatment plant would remain in use, whereby the proposed New Markdale Water Storage Facility would service Markdale only.

As well, the feasibility of re-rating the existing Markdale Wastewater Treatment Plant from 1,122 m^3/d to 1,722 m^3/d was evaluated within this updated 2017 Master Plan. This involved a review of the facility's historical performance and a review of the facility's existing design against the MOECC's Design Guidelines for Sewage Works (2008).

In the end, this Master Plan provides an outline of the framework for planning future projects and developments (i.e. sewage and water) for existing and future land use. Through long range infrastructure planning, the Municipality can comprehensively identify future needs and establish viable infrastructure options.

TABLE OF CONTENTS

1 BACKGROUND INFORMATION 1

1.1 BACKGROUND HISTORY 1

1.2 PROBLEM DEFINITION 1

2 PROJECT PHASING 4

2.1 THREE PROJECT PHASES 4

2.2 SUB-AREAS FOR SERVICING 4

3 PHYSICAL DESCRIPTION OF THE STUDY AREA AND INVENTORY OF THE NATURAL, SOCIAL AND ECONOMIC ENVIRONMENT 7

3.1 INVENTORY OF NATURAL ENVIRONMENT 7

3.2 SOURCE WATER PROTECTION 8

3.3 INVENTORY OF SOCIAL-ECONOMIC AND CULTURAL ENVIRONMENT 8

3.4 ARCHAEOLOGICAL RESOURCES 9

3.5 BUILT HERITAGE/CULTURAL HERITAGE LANDSCAPES 9

4 ASSESSMENT OF EXISTING AND FUTURE POPULATION 10

5 ASSESSMENT OF EXISTING AND FUTURE 20 YR AND 50 YR WATER DEMANDS, WATER STORAGE AND SEWAGE FLOWS 12

5.1 EXISTING WATER DEMANDS, WATER STORAGE AND SEWAGE FLOWS 12

5.1.1 MARKDALE – WATER TREATMENT AND WATER STORAGE 12

5.1.2 MARKDALE – SEWAGE FLOWS 13

5.1.3 FLESHERTON – SEWAGE FLOWS 13

5.1.4 KIMBERLEY AMIK-TALISMAN – WATER TREATMENT AND WATER STORAGE 13

5.1.5 AMIK-TALISMAN – SEWAGE FLOWS 14

5.2 FUTURE WATER DEMANDS (20 YR AND 50 YR) 14
5.3 FUTURE WATER STORAGE (20 YR AND 50 YR) 16
5.4 FUTURE SEWAGE FLOWS (20 YR AND 50 YR) 17
6 ALTERNATIVE SOLUTIONS 20
6.1 WATER TREATMENT 20
6.2 WATER STORAGE FACILITIES 23
6.3 FIRE FLOW WATER DISTRIBUTION NETWORK MODELLING 24
6.4 WATER DISTRIBUTION AREAS 27
6.5 WASTEWATER TREATMENT 31
6.6 SANITARY SEWER AREAS AND SEWAGE PUMPING STATIONS 33
7 ASSESSMENT OF ALTERNATIVE SOLUTIONS 38
7.1 ASSESSMENT OF NATURAL, SOCIAL AND ECONOMIC IMPACT OF ALTERNATIVE SOLUTIONS 38
7.2 ESTIMATED CAPITAL COSTS OF ALTERNATIVE SOLUTIONS 38
8 IDENTIFICATION OF THE PREFERRED SOLUTION 40
8.1 WATER TREATMENT, WATER STORAGE AND WATER DISTRIBUTION 40
8.2 WASTEWATER TREATMENT, SEWAGE PUMPING STATION AND SANITARY SEWER COLLECTION SYSTEM 40
8.3 ENVIRONMENTAL IMPACT ASSESSMENT OF PREFERRED ALTERNATIVE AND MITIGATION MEASURE 41
8.4 REVISIONS TO PREFERRED SOLUTION (PART 1) 41
8.4.1 REVISIONS TO PROPOSED PHASE 1 SERVICING – WATER SUPPLY 42
8.4.2 REVISIONS TO PROPOSED PHASE 1 SERVICING – SEWAGE SERVICING 45
8.5 REVISIONS TO PREFERRED SOLUTION (PART 2) 48
8.6 REVISIONS TO PREFERRED SOLUTION (PART 3) 48

8.6.1 REVISIONS TO PROPOSED PHASE 1 SERVICING – NEW MARKDALE WATER STORAGE FACILITY 48
8.6.2 REVISIONS TO PROPOSED PHASE 1 SERVICING – OPTIMIZATION OF THE EXISTING MARKDALE WASTEWATER TREATMENT PLANT 49
8.6.2.1 EXISTING LAGOON FACILITY AND RAPID INFILTRATION BASINS 49
8.6.2.2 HISTORICAL PERFORMANCE OF THE LAGOON FACILITY 50
8.6.2.3 DESIGN GUIDELINES FOR AERATED LAGOONS 51
8.6.2.4 DESIGN GUIDELINES FOR RAPID INFILTRATION BASINS 52
8.6.2.5 CONSULTATION WITH THE MOECC 53
8.6.2.6 CONCLUSIONS 54

9 FINANCIAL IMPACT AND FINANCING ALTERNATIVES 55

10 CONSULTATION WITH REVIEW AGENCIES AND THE PUBLIC 56

10.1 2011 – 2013 CONSULTATION 56

10.2 2016-2017 CONSULTATION 58

11 POST-CONSTRUCTION MONITORING 59

TABLES

Table 1.2	Existing Problem Areas
Table 3.1	Summary of Species at Risk Potentially Located within Proposed Project Area
Table 5.1	Water Treatment, Water Storage and Sewage Treatment Capacity Summary
Table 5.2	Existing and Future Water Demands
Table 5.4	Existing and Future Sewage Flows
Table 6.1	Summary of Design Water Demands – Water Treatment Plant Alternatives
Table 6.2	Summary of Potential New Water Storage Facilities (All Alternatives)
Table 6.5	Summary of Design Sewage Flows – Wastewater Treatment Plant Alternatives
Table 7.2A	Summary of Capital Costs for Water Alternative Solutions
Table 7.2B	Summary of Capital Costs for Sewage Alternative Solutions
Table 7.2C	Recommended Watermain Improvements – Markdale
Table 8.1A	Cost Estimate for Alternative W.6 – Water (20 Year Design Requirement)
Table 8.1B	Cost Estimate for Sub Phase PI-1 – Markdale – Preferred Alternative W.6 – New Elevated Water Storage Facility Only
Table 8.1C	Annual Operation and Maintenance Cost Estimate – Alternative W.6
Table 8.2A	Cost Estimate for Alternative S.4 – Sewage (20 Year Design Requirement)
Table 8.2B	Annual Operation and Maintenance Cost Estimate – Alternative S.4
Table 8.3	Summary of Environmental Impacts and Proposed Mitigation Measures for Preferred Alternatives - W.6 and S.4
Table 8.6A	Existing Infrastructure at the Markdale Wastewater Treatment Plant
Table 8.6B	Historical Effluent Quality Data from Lagoon Cell No. 2
Table 8.6C	Lagoon Evaluation
Table 8.6D	Existing Effluent Objectives and Effluent Limits
Table 8.6E	Proposed Effluent Objectives and Effluent Limits
Table 10.0A	Summary of Consultation with Review Agencies and the Public (2011-2013)
Table 10.0B	Summary of Consultation with First Nations (2011-2013)
Table 10.0C	Summary of Meetings with First Nations (2011-2013)

FIGURES

Figure 1.1 Location Plan, Key Features and Existing Water and Sanitary Infrastructure

Figure 2.1 Proposed Main Phases

Figure 2.2 Proposed Sub-Areas for Servicing

Figure 3.1 Land Use Designations

Figure 6.2 Potential Location for New Water Storage Facilities

Figure 8.1 Preferred Solution for Water Treatment, Water Storage and Water Distribution – Alternative W.6

Figure 8.2 Preferred Solution for Wastewater Treatment, Sewage Pumping Station and Sanitary Sewer Collection – Alternative S.4

Figure 8.4A Preferred Solution for Water Treatment, Water Storage and Water Distribution – Alternative W.6 - Phase 1

Figure 8.4B Preferred Solution for Wastewater Treatment, Sewage Pumping Station and Sanitary Sewer Collection – Alternative S.4 – Phase 1

APPENDICES

Appendix A Archaeological and Built Heritage/Cultural Heritage Landscapes Screenings

Appendix B Existing Maps of Water and Sanitary Sewer Systems

Appendix C Existing, Future 20 and 50 Year Water Demands – Breakdown Calculations

Appendix D Existing, Future 20 and 50 Year Sewage Flows – Breakdown Calculations

Appendix E Capture Zone Information – Existing Markdale Supply Wells, Existing and Potential New Well Locations

Appendix F Proposed Water Storage Facility Options

Appendix G Water Storage Facility Sizing Calculations

Appendix H Preliminary Fire Flow Water Distribution Network Modelling Output Mapping

Appendix I Proposed Water Treatment Plant Service Areas for Alternatives

Appendix J Proposed Wastewater Treatment Service Areas for Alternatives

Appendix K Summary Tables - Natural, Social and Economic Impacts of the Proposed Water and Sewage Alternatives

Appendix L Capital Cost Tables for Alternative Solutions

Appendix M Public and Government Agency Consultation Documents

Appendix N Other Agendas, Meeting Minutes and Presentations

1 BACKGROUND INFORMATION

1.1 BACKGROUND HISTORY

The Municipality of Grey Highlands is situated in Grey County and is made up of the former Townships of Artemesia, Euphrasia, Osprey and the Villages of Markdale and Flesherton. The Municipality of Grey Highlands presently owns and operates a water distribution system and sanitary sewer system in Markdale, a sanitary sewer system in Flesherton, a sanitary sewer system in Amik-Talisman and a water distribution system in Kimberley-Amik-Talisman.

The Markdale water system currently consists of two (2) water treatment pump stations, namely the Isla Street Pump Station (utilizes water from Well No. 1) and the Eliza Street Pump Station (utilizes water from Well No. 3 and Well No. 4). The Markdale water system also includes a water storage standpipe, which is located adjacent to the Eliza Street Pump Station. The Markdale sanitary sewer system consists of gravity collection combined with pumping from two (2) sewage pumping stations (County Road 12 SPS and Grayview Drive SPS), to the wastewater treatment plant. The Markdale Wastewater Treatment Plant currently consists of one (1) primary aeration cell, one (1) secondary aeration cell and eight (8) rapid infiltration basins. Treated effluent is discharged to the Rocky Saugeen River.

The Flesherton sanitary sewer system consists of gravity collection combined with pumping from one (1) sewage pumping station to the wastewater treatment plant. The Flesherton Wastewater Treatment Plant currently consists of one (1) hydrological treatment/dosing pond, two (2) sand filters, one (1) aerated sludge storage and one (1) effluent storage pond. Treated effluent is discharged to the Boyne River. No water distribution system is currently in place in Flesherton.

The Amik-Talisman sanitary sewer system consists of gravity collection to the wastewater treatment plant. The Amik-Talisman Wastewater Treatment Plant consists of one (1) facultative lagoon cell, one (1) intermediate aeration lagoon cell and a spray aeration area for the effluent. The Kimberley-Amik-Talisman water system consists of a water treatment plant/booster station and water storage below the plant.

Figure 1.1 shows a location plan for the Municipality of Grey Highlands showing a generalized view of the proposed study area for the Water and Wastewater Servicing Master Plan. **Figure 1.1** also provides an overview of the key features for the existing water and sanitary infrastructure for Markdale, Flesherton, Kimberley, Amik, Eugenia and the Beaver Valley within the Municipality of Grey Highlands.

1.2 PROBLEM DEFINITION

The Municipality of Grey Highlands has begun investigating the expansion of its municipal infrastructure to provide reasonable water and wastewater servicing to its existing communities of Markdale, Flesherton, Kimberley, Amik, Eugenia and Beaver Valley and for future development. A summary of the existing problem areas within these communities is provided in **Table 1.2**.

EXISTING AMIK WASTEWATER TREATMENT FACILITIES

AMIK

EXISTING KIMBERLEY - AMIK - TALISMAN WATER STORAGE FACILITY

EXISTING KIMBERLEY - AMIK - TALISMAN WATER TREATMENT PLANT

GREY RD 7

GREY ROAD 12

KIMBERLEY

THE BLUE MOUNTAINS - EUPHRASIA TOWNLINE

N

BEAVER VALLEY SKI CLUB

EUPHRASIA - HOLLAND TOWNLINE

ROCKY SAUGEEN RIVER

GREY ROAD 30

GREY ROAD 13

HIGHWAY 10

LAKE EUGENIA

EXISTING MARKDALE WASTEWATER TREATMENT FACILITIES

MARKDALE

EXISTING MARKDALE WATER STORAGE FACILITY

EXISTING MARKDALE WATER TREATMENT PLANT (ISLA ST. PH)

EXISTING MARKDALE WATER TREATMENT PLANT (ELIZA ST. PH)

GREY ROAD 32

BEAVER RIVER

EUGENIA

PART OF PROPOSED STUDY AREA WITHIN THE MUNICIPALITY OF WEST GREY

GREY ROAD 12

HIGHWAY 10

GREY ROAD 4

ARTEMESIA - GLENELG TOWNLINE

EXISTING FLESHERTON WASTEWATER TREATMENT FACILITES

FLESHERTON

LEGEND

PROPOSED STUDY AREA

MUNICIPAL BOUNDARY

0 0.5 1 2 3 4 5

Kilometres

LOCATION PLAN
PROPOSED STUDY AREA
WATER & WASTEWATER SERVICING MASTER PLAN
MUNICIPALITY OF GREY HIGHLANDS

PROJECT:	111-13229-00
DATE:	MAY 2016
SCALE:	1:75,000
DRAWN:	JET
APPROVED:	CW

WSP

1450 1st AVENUE WEST, SUITE 101
OWEN SOUND, ONTARIO CANADA N4K 6W2
PHONE: 519 376-7612 - FAX: 519 376-8008 - WWW.WSPGROUP.COM

FIGURE: 1.1

Document Path: G:\20111\OS\117 - Linear\111-13229-00 - Grey Highlands\GIS\2016 Figures\FIG1.1_LocationPlan_ProposedStudyArea_RevMay2016.mxd

TABLE 1.2
EXISTING PROBLEM AREAS
MARKDALE - FLESHERTON - KIMBERLEY - AMIK – EUGENIA – BEAVER VALLEY

WATER AND WASTEWATER SERVICING MASTER PLAN
MARKDALE-FLESHERTON-KIMBERLEY-AMIK-EUGENIA-BEAVER VALLEY
MUNICIPALITY OF GREY HIGHLANDS

111-13229-00

Location	Category	Existing Problem Areas
Markdale	Water Storage Standpipe	- Height of existing water storage standpipe does not provide for distribution pressures in all areas of Markdale, as required to Ministry of the Environment Guidelines. - Limited available storage capacity for future development in Markdale.
	Water Distribution System	- Distribution pressures in some areas of Markdale do not meet Ministry of Environment Guidelines. - Insufficient fire flow availability in the downtown area of Markdale.
	Wastewater Treatment Plant	- Limited available operating capacity for future development in Markdale.
Flesherton	Individual Well Supply	- No fire flow protection. - Less protection of source of drinking water in comparison to communal water system.
Kimberley	Individual Septic Systems	- Less water quality protection of the Beaver River and its tributaries.
Amik-Talisman	Amik Wastewater Treatment Plant	- Limited available operating capacity for future development in Amik-Talisman area.
Eugenia	Individual Wells and Septic Systems	- No fire flow protection. - Less protection of source of drinking water in comparison to communal water system. - Less water quality protection of Eugenia Lake.
Beaver Valley	Individual Wells and Septic Systems	- No fire flow protection - Water quality survey of individual wells completed in 2001 showed 56% of test results did not meet Ontario Drinking Water Quality Standards (ODWQS). - Less protection of source of drinking water in comparison to communal water system. - Less water quality protection of the Beaver River and its tributaries.

Markdale

The capacity of the current Markdale Wastewater Treatment Plant needs to be increased to allow for future development within the community. The existing Markdale water storage standpipe and trunk watermains require upgrading to increase fire flows to the downtown area and increase pressures at individual homes and commercial establishments to meet Ministry of the Environment guidelines. The Municipality of Grey Highlands has studied the problem and considered options, including construction of a new water storage facility or booster pumping station to provide higher pressure, as well as additional watermains and watermain looping to significantly increase fire flow availability in the areas affected.

Flesherton

The built-up area in Flesherton is presently using individual wells for water supply. A communal water system would provide a more protected source of drinking water and fire flows.

Kimberley

Kimberley does not have a communal sewage system and the existing lots are serviced by septic systems. A communal sewage system would provide better water quality protection for the Beaver River and its tributaries in the Kimberley area.

Eugenia

Homes and cottages in the Eugenia area are serviced by individual wells and septic systems. A communal water system would provide a safer water supply and would also provide fire flow. A communal sewage system would provide better water quality protection of Eugenia Lake and allow for increased development.

Beaver Valley

Many of the developed lots (homes/chalets) near the Beaver Valley Ski Club are serviced by individual wells and septic systems. A water quality survey carried out in January, 2001 of homes in the Beaver Valley ski area showed that out of 64 homes tested, 36 water samples (over 56%) did not meet the Ontario Drinking Water Quality Standards (ODWQS). A communal water system would provide better quality water and safer water than the existing wells. Fire flows would also be provided. A communal wastewater system servicing the Beaver Valley Ski Club area would provide better water quality protection of the Beaver River and its tributaries.

As a result of the above identified problem areas, the Municipality of Grey Highlands has begun the process of developing a Master Plan with three (3) main phases (several sub-phases within each phase) for a regional water and wastewater servicing area encompassing the existing developed areas of Markdale, Flesherton, Kimberley, Amik, Eugenia and Beaver Valley. The Master Plan provides an outline of the framework for planning future projects and developments (i.e. sewage and water) for existing and future land use. Through long range infrastructure planning, the Municipality can comprehensively identify future needs and establish viable infrastructure options.

As per a Municipal Class Environmental Assessment, an approved process under the Environmental Assessment Act, the Master Plan Approach #2 was utilized and will address the first two (2) phases of the

Municipal Class EA process. The Master Planning process will be completed whereby the level of investigation, consultation and documentation are sufficient to fulfill the requirements for Schedule B projects within. As well, Final Public Notice for the Master Plan will become the "Notice of Completion" for the Schedule B projects within.

The two (2) Schedule B projects within the Master Plan are as follows:

1) Optimization of the Existing Markdale Wastewater Treatment Plant; and

2) New Markdale Water Storage Facility.

2 PROJECT PHASING

2.1 THREE PROJECT PHASES

The proposed Master Plan for the Municipality of Grey Highlands is broken down into three (3) main phases (Phase 1, Phase 2 and Phase 3) for the framework for providing sewage and water servicing to existing developed areas and planned future projects and developments for a 20 year period (50 years for water storage). The phases are ordered by the number of priority as per recommendations and per requirements of the Municipality of Grey Highlands. The two (2) Schedule B projects within the Master Plan are included under Phase 1 (highest priority). The three (3) phases for the Master Plan include the following:

Phase 1

- Village of Markdale
- Extension into West Grey including properties to the west and south of Markdale
- Grey Road 12 corridor from Markdale, along Grey Road 30 corridor through Beaver Valley, and north into Kimberley and Amik

Phase 2

- Village of Flesherton
- Highway 10 corridor west from Flesherton to Markdale

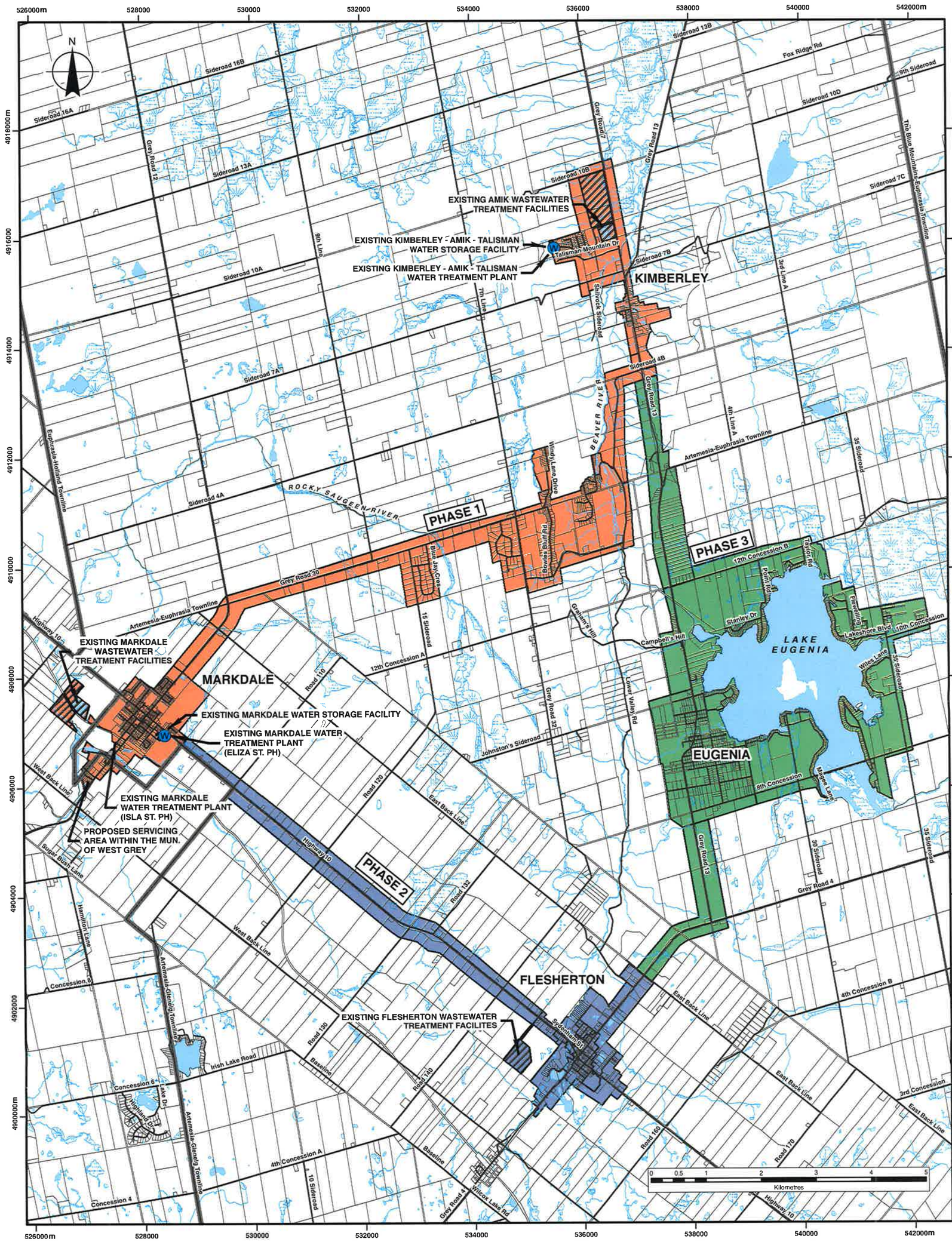
Phase 3

- Village of Eugenia and Eugenia Lake
- Grey Road 13 and 4 corridor from Eugenia south to Flesherton
- Grey Road 13 corridor north from Eugenia to Grey Road 30

Figure 2.1 shows the proposed three (3) main phases for the water and wastewater servicing are under the Master Plan for the Municipality of Grey Highlands.

2.2 SUB-AREAS FOR SERVICING

Within each main phase of the proposed Master Plan are several sub-phases. The sub-phases allow for the municipality to outline specific framework for planning future projects and developments and seeing costs associated with providing water and wastewater servicing at the various sub-phases over time. Each main phase includes the following sub-phase areas for servicing:



LEGEND

- PROPOSED SERVICING PHASE - PHASE 1
- PROPOSED SERVICING PHASE - PHASE 2
- PROPOSED SERVICING PHASE - PHASE 3
- MUNICIPAL WATER/SEWAGE FACILITIES
- MUNICIPAL BOUNDARY
- PROPERTY PARCEL
- WATERBODY
- WETLAND - PERMANENT
- EXISTING WATER STORAGE FACILITY

PROPOSED MAIN PHASES
WATER & WASTEWATER SERVICING MASTER PLAN
MUNICIPALITY OF GREY HIGHLANDS

PROJECT:	111-13229-00
DATE:	FEB 2016
SCALE:	1:65,000
DRAWN:	JET
APPROVED:	CW

WSP
1450 1st AVENUE WEST, SUITE 101
OWEN SOUND, ONTARIO CANADA N4K 6W2
PHONE: 519 376-7612 - FAX: 519 376-8008 - WWW.WSPGROUP.COM

FIGURE: 2.1

Phase 1

Phase P1-1

- Village of Markdale including extension into West Grey
- Includes Extension into West Grey including properties to the west and south of Markdale i.e. Phase P1-1A (some isolated Grey Highlands lots are also included)
- Includes the two (2) Schedule B projects within the Master Plan:

  1) Optimization of the Existing Markdale Wastewater Treatment Plant; and

  2) New Markdale Water Storage Facility.

Phase P1-2

- Kimberley, Amik and Talisman.

Phase P1-3

- Beaver Valley Ski Club to County Road 32.

Phase P1-4

- Grey Road 12 and 30 corridor from Markdale to County Road 32.

Phase P1-5

- Grey Road 30 corridor from Beaver Valley Ski Club to Grey Road 13.

Phase 2

Phase P2-1

- Village of Flesherton (existing sewage service area).

Phase P2-2

- Built-up areas in Flesherton beyond the existing sanitary sewers.

Phase P2-3

- Highway 10 corridor from Markdale to Road 120.

Phase P2-4

- Highway 10 corridor from Road 120 to Flesherton.

Phase 3

Phase P3-1

- Hamlet of Eugenia.

Phase P3-2

- Eugenia Lake area.

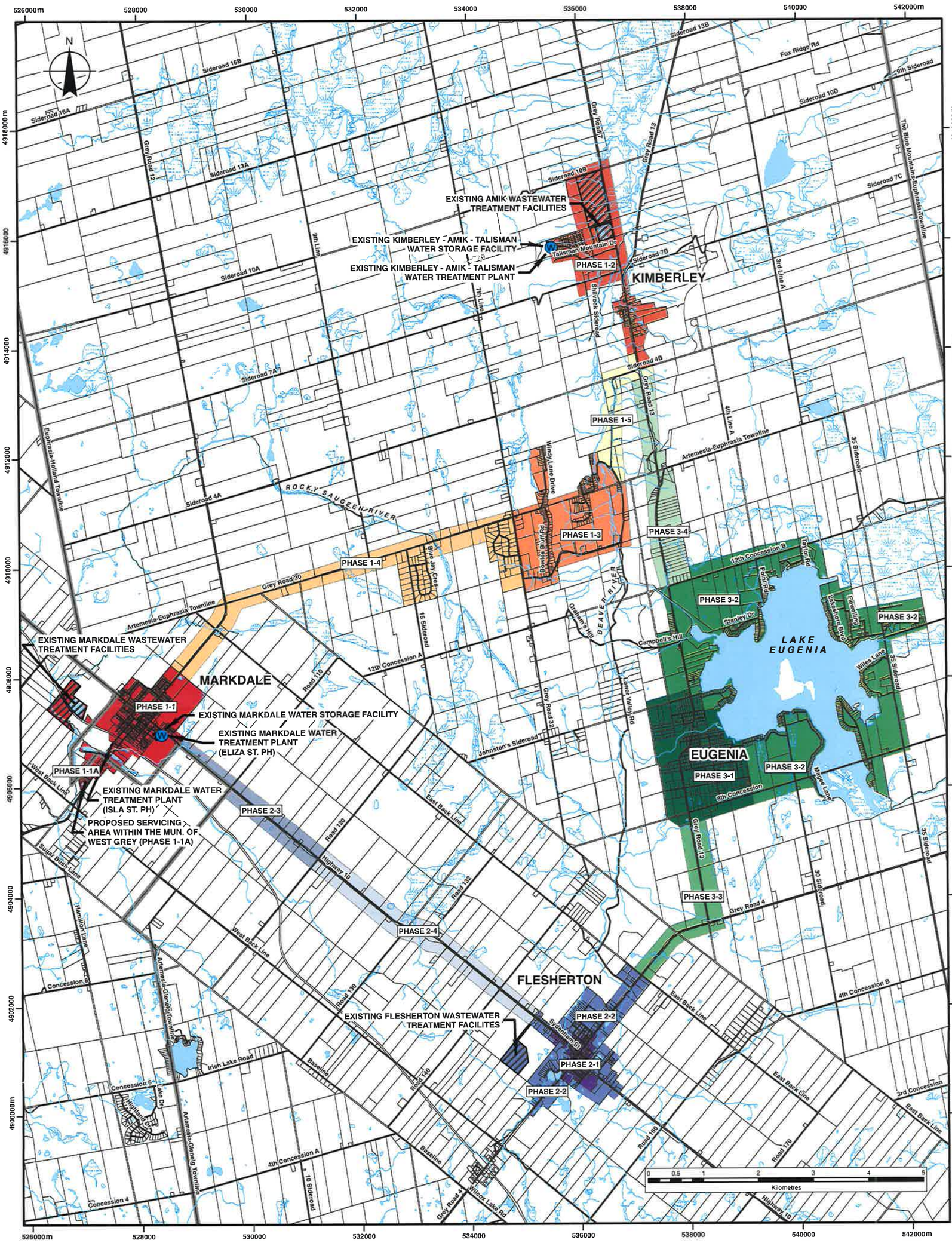
Phase P3-3

- Grey Road 4 and 13 corridor from Flesherton to Hamlet of Eugenia.

Phase P3-4

- Grey Road 13 corridor from Eugenia to intersection of County Road 30 at Kimberley.

Figure 2.2 shows the proposed sub-phases within the main three (3) phases for the water and wastewater servicing Master Plan for the Municipality of Grey Highlands.



LEGEND

- MUNICIPAL WATER/SEWAGE FACILITIES
- MUNICIPAL BOUNDARY
- PROPERTY PARCEL
- WETLAND - PERMANENT
- WATERBODY
- EXISTING WATER STORAGE FACILITY

PROPOSED SERVICING PHASE/AREA

PHASE 1

- PHASE 1-1 & PHASE 1-1A
- PHASE 1-2
- PHASE 1-3
- PHASE 1-4
- PHASE 1-5

PHASE 2

- PHASE 2-1
- PHASE 2-2
- PHASE 2-3
- PHASE 2-4

PHASE 3

- PHASE 3-1
- PHASE 3-2
- PHASE 3-3
- PHASE 3-4

PROPOSED SUB-AREAS FOR SERVICING
WATER & WASTEWATER SERVICING MASTER PLAN
MUNICIPALITY OF GREY HIGHLANDS

PROJECT:	111-13229-00
DATE:	FEB 2016
SCALE:	1:65,000
DRAWN:	JET
APPROVED:	CW

WSP
1450 1st AVENUE WEST, SUITE 101
OWEN SOUND, ONTARIO CANADA N4K 6W2
PHONE: 519 376-7612 - FAX: 519 376-8008 - WWW.WSPGROUP.COM

FIGURE: 2.2

3 PHYSICAL DESCRIPTION OF THE STUDY AREA AND INVENTORY OF THE NATURAL, SOCIAL AND ECONOMIC ENVIRONMENT

3.1 INVENTORY OF NATURAL ENVIRONMENT

The majority of land use in the proposed servicing phases for the Water and Wastewater Servicing Master Plan include residential, seasonal/residential, commercial/retail and farm land. Additional land use includes vacant residential lots, industrial manufacturing, institutional and government.

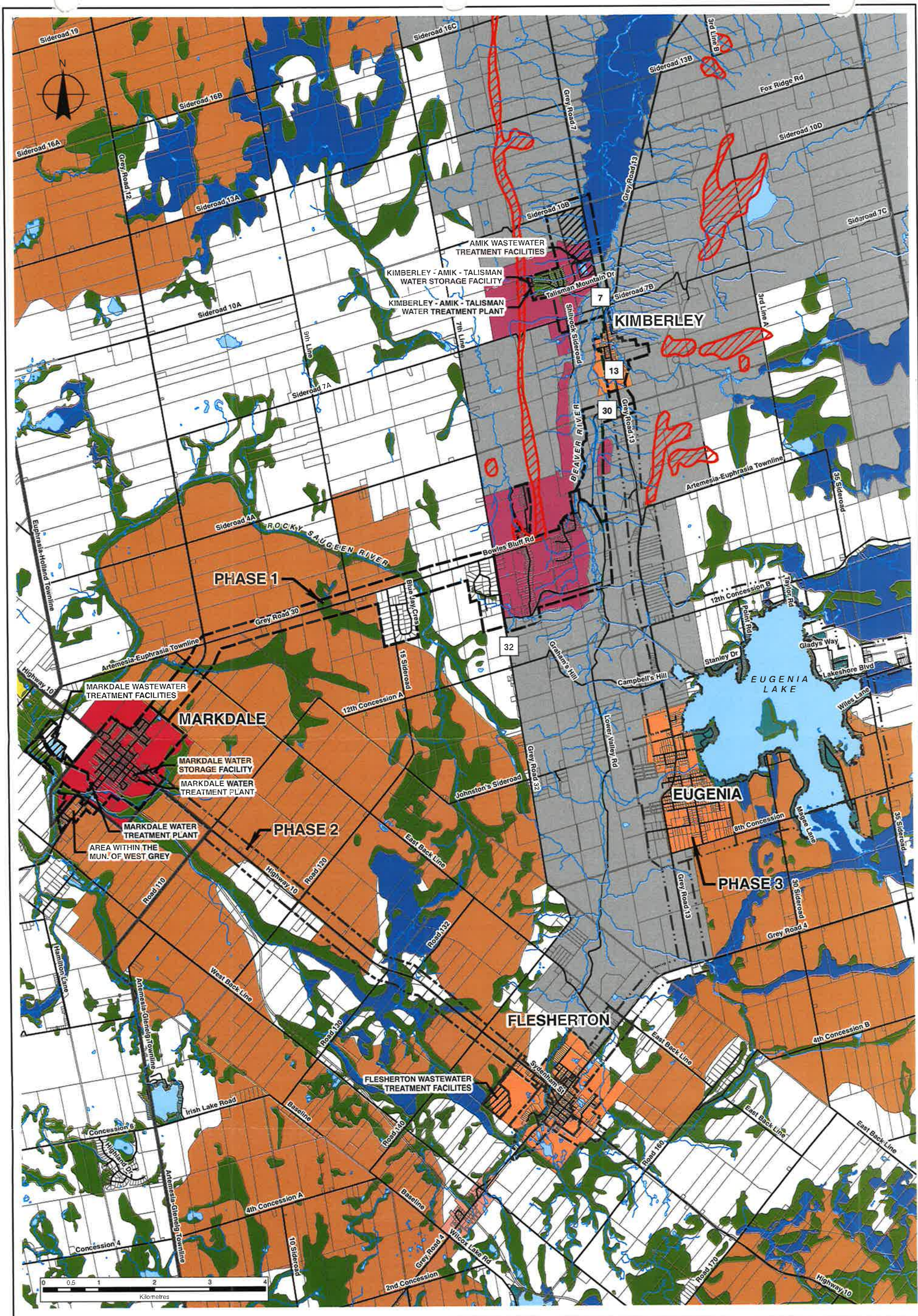
Conservation areas within the proposed servicing phases include the Eugenia Falls Conservation area located within Phase 3-1 - Eugenia along Grey Road 13. Two (2) additional conservation areas are located bordering the proposed servicing phases, including the Flesherton Management Area (off Highland Drive) and the Black Creek Management Area (located northeast of Eugenia Lake along 12th Concession B). No Ontario provincial park or national park is located within the vicinity of the proposed servicing phases. A portion of the proposed servicing phases is within the Niagara Escarpment Plan area, namely from Flesherton north through Eugenia and up to Kimberley.

A review was completed using Base Map Data provided by the County of Grey, whereby land use designations were taken from the Official Plan Amendment No. 80, Schedule A, Map 2. This information has been shown on **Figure 3.1.** Through review of **Figure 3.1**, it can be seen that areas within the proposed servicing phases are within the Niagara Escarpment Plan area. As well, provincially significant wetland and hazard lands intersect several locations of the proposed servicing phases. KARST areas have also been shown on **Figure 3.1**. KARST areas in the proposed servicing phases are generally in Eugenia surrounding the lake and up near Bowles Bluff Road.

A Species at Risk search was conducted on the Environment Canada's SARA website with respect to the proposed servicing phases. A second Species at Risk search was conducted on the Ontario SARO website, which tracks and maintains data on at risk species in Ontario. As per review of the SARA website, twenty-two (23) species at risk were identified as being potentially located in the proposed servicing phases. On the SARA website, no site specific information was available concerning the species at risk. As per the review of the SARO website, twenty-six (26) species at risk were found in the proposed servicing phases.

Through review of the Species at Risk identified as potentially located within the proposed servicing phases, it is felt that none of these species will likely be affected by development of the proposed servicing phases.

Refer to **Table 3.1**, which summarizes the Species at Risk potentially located within the proposed servicing phases.



LEGEND

PROPOSED SERVICE AREA/PHASE

- PHASE 1
- PHASE 2
- PHASE 3
- MUNICIPAL WATER/SEWAGE FACILITIES
- MUNICIPAL BOUNDARY
- PROPERTY PARCEL
- WATERBODY
- SPECIAL POLICY AREA (KARST) *

LAND USE DESIGNATIONS*

- Agricultural
- Rural
- Primary Settlement Area
- Secondary Settlement Area
- Tertiary Settlement Area
- Inland Lakes & Shoreline
- Recreational Resort Area
- Space Extensive Industrial
- Hazard Lands
- Provincially Significant Wetlands
- Niagara Escarpment Plan Area
- Escarpment Recreation Area

* NOTE: BASE MAP DATA PROVIDED BY THE COUNTY OF GREY. THE LAND USE DESIGNATIONS AND SPECIAL POLICY AREA ARE SOURCED FROM THE GREY COUNTY OFFICAL PLAN SCHEDULE A, MAP 2 AND APPENDIX A, MAP 2, JUNE 25, 2013.

LAND USE DESIGNATIONS
WATER AND WASTEWATER SERVICING MASTER PLAN
MARKDALE - FLESHERTON- KIMBERLEY - AMIK - EUGENIA - BEAVER VALLEY
MUNICIPALITY OF GREY HIGHLANDS

PROJECT:	111-13229-00
DATE:	APR 2016
SCALE:	1:65,000
DRAWN:	JET
APPROVED:	CW

WSP
1450 1st AVENUE WEST, SUITE 101
OWEN SOUND, ONTARIO CANADA N4K 6W2
PHONE: 519 376-7612 - FAX 519 376-8008 - WWW.WSPGROUP.COM

FIGURE NO.: 3.1

TABLE 3.1
SUMMARY OF SPECIES AT RISK POTENTIALLY LOCATED WITHIN PROPOSED PROJECT AREA

WATER AND WASTEWATER SERVICING MASTER PLAN
MARKDALE-FLESHERTON-KIMBERLEY-AMIK-EUGENIA-BEAVER VALLEY
MUNICIPALITY OF GREY HIGHLANDS

111-13229-00

Species at Risk – Environment Canada's SARA Website and Ontario's SARO Website

Name of Species	Scientific Name	Taxonomic Group	Status	Local Distribution	Habitat
Monarch Butterfly	Danaus plexippus	Arthropods	SARA: Special Concern COSEWIC: Special Concern SARO: Special Concern COSSARO: Special Concern	Grey County	Milkweed and wildflowers, abandoned farmland, along roadsides, and other open spaces where these plants grow
Rusty-Patched Bumble Bee	*Bombus affinis*	Arthropods	SARA: Endangered COSEWIC: Endangered SARO: Endangered COSSARO: Not Listed	Grey County	Open habitat such as mixed farmland, urban settings, savannah, open woods and sand dunes
Bald Eagle	Haliaeetus leucocephalus	Birds	SARA: No Status COSEWIC: Special Concern SARO: Special Concern COSSARO: Special Concern	Grey County	Forest areas near major lakes or rivers
Barn Swallow	Hirundo Rustica	Birds	SARA: No Status COSEWIC: Threatened SARO: Threatened COSSARO: Not Listed	Grey County	Man-made open structures such as open barns and under bridges and culverts
Black Tern	Chlidonias Niger	Birds	SARA: No Status COSEWIC: Special Concern SARO: Special Concern COSSARO: Special Concern	Grey County	Shallow marshes, especially in cattails
Bobolink	Dolichonyx oryzivorus	Birds	SARA: No Status COSEWIC: Threatened SARO: Threatened COSSARO: Threatened	Grey County	Dense grasses, such as hayfields

Name of Species	Scientific Name	Taxonomic Group	Status	Local Distribution	Habitat
Cerulean Warbler	Dendroica cerulea	Birds	SARA: Endangered COSEWIC: Special Concern COSSARO: Special Concern	Grey County	Mature deciduous forests that feature large, tall trees and an open understorey
Eastern Meadowlark	Sturnella magna	Birds	SARA: No Status COSEWIC: Threatened SARO: Threatened COSSARO: Not Listed	Grey County	Moderately tall grasslands, such as pastures and hayfields, but are also found in alfalfa fields, weedy borders of croplands, roadsides, orchards, airports, shrubby overgrown fields, or other open areas
Henslow's Sparrow	Ammodramus henslowii	Birds	SARA: Endangered COSEWIC: Endangered SARO: Endangered COSSARO: Threatened	Grey County	Extensive, dense, tall grasslands, but also found in abandoned farm fields, pastures, and wet meadows
King Rail	Rallus elegans	Birds	SARA: Endangered COSEWIC: Endangered SARO: Endangered COSSARO: Threatened	Grey County	Densely vegetated freshwater marshes with open shallow water that merges with shrubby areas, sometimes in smaller isolated marshes but more often in coastal wetlands
Least Bittern	Ixobrychus exilis	Birds	SARA: Special Concern COSEWIC: Non-Active SARO: Threatened COSSARO: Threatened	Grey County	Marshes dominated by emergent vegetation surrounded by areas of open water
Loggerhead Shrike	Lanius ludovicianus excubitorides	Birds	SARA: Endangered COSEWIC: Endangered SARO: Endangered COSSARO: Threatened	Grey County	Open ranges with occasional trees and shrubs that provide nesting sites and perches

Name of Species	Scientific Name	Taxonomic Group	Status	Local Distribution	Habitat
Louisiana Waterthrush	Seiurus motacilla	Birds	SARA: Special Concern COSEWIC: Threatened SARO: Special Concern COSSARO: Special Concern	Grey County	Steep, forested ravines with fast-flowing streams, with preference to running water, especially clear, coldwater streams, but also less frequently inhabits heavily wooded, deciduous swamps having large pools of open water
Peregrine Falcon	Falco peregrinus	Birds	SARA: Special Concern COSEWIC: Special Concern SARO: Special Concern COSSARO: Threatened	Grey County	Tall, steep cliff ledges close to large bodies of water, but also found on ledges of tall buildings in urban areas
Northern Brook Lamprey	*Ichthyomyzon fossor*	Fish	SARA: Special Concern COSEWIC: Special Concern SARO: Special Concern COSSARO: Special Concern	Grey County	Clear, slow-moving coolwater streams with soft substrates such as silt and sand, with spawning adults found in fast-flowing riffles of rock or gravel
Redside Dace	*Clinostomus elongatus*	Fish	SARA: Special Concern COSEWIC: Endangered SARO: Endangered COSSARO: Threatened	Grey County	Typically found in pools and slow-moving areas of small streams and headwaters with a gravel bottom and overhanging grasses and shrubs
American Badger	Taxidea taxus jacksoni	Mammals	SARA: Endangered COSEWIC: Endangered SARO: Endangered COSSARO: Endangered	Grey County	Open habitats, grasslands and agricultural fields
Gray Fox	Urocyon cinereoargenteus	Mammals	SARA: Threatened COSEWIC: Threatened SARO: Threatened COSSARO: Threatened	Grey County	Deciduous forests and marshes

Name of Species	Scientific Name	Taxonomic Group	Status	Local Distribution	Habitat
Northern Myotis	Myotis septentrionalis	Mammals	SARA: Endangered COSEWIC: Endangered SARO: Endangered COSSARO: Endangered	Grey County	Roosting in caves, primarily in coniferous forests
Blanding's Turtle	Emydoidea blandingii	Reptiles	SARA: Threatened COSEWIC: Threatened SARO: Threatened COSSARO: Not Listed	Grey County	In or within 100 metres of shallow water, usually in large wetlands and shallow lakes with lots of water plants
Eastern Ribbonsnake	Thamnophis sauritus	Reptiles	SARA: Special Concern COSEWIC: Special Concern SARO: Special Concern COSSARO: Special Concern	Grey County	Close to water, especially in marshes, congregating in underground burrows or rock crevices to hibernate
Massasauga Rattlesnake	Sistrurus catenatus	Reptiles	SARA: No Status COSEWIC: Threatened SARO: Threatened COSSARO: Threatened	Grey County	Tall grass prairie, bogs, marshes, shorelines, forests and alvars
Milksnake	Lampropeltis triangulum	Reptiles	SARA: Special Concern COSEWIC: Special Concern SARO: Special Concern COSARO: Special Concern	Southern Canada	Prairies, pastures, and hayfields, to rocky hillsides and a wide variety of forest types
Northern Map Turtle	Graptemys geographica	Reptiles	SARA: Special Concern COSEWIC: Special Concern SARO: Special Concern COSSARO: Special Concern	Grey County	Rivers and lakeshores, especially with rocks and deadheads
Snapping Turtle	*Chelydra serpentina*	Reptiles	SARA: Special Concern COSEWIC: Special Concern SARO: Special Concern COSSARO: Not Listed	Grey County	Shallow waters with soft mud and leaf litter
Spotted Turtle	Clemmys guttata	Reptiles	SARA: Endangered COSEWIC: Endangered SARO: Endangered COSSARO: Endangered	Grey County	Shallow, slow moving water of ponds, bogs, marshes, ditches, woodland streams and shallow bays

Name of Species	Scientific Name	Taxonomic Group	Status	Local Distribution	Habitat
American Ginseng	Panax quinquefolius	Vascular Plants	SARA: Endangered COSEWIC: Endangered SARO: Endangered COSSARO: Endangered	Grey County	Rich, moist, undisturbed deciduous woods with neutral soil. Warm and well-drained areas
American-Hart's-Tongue Fern	Asplenium scolopendrium	Vascular Plants	SARA: Special Concern COSEWIC: Special Concern SARO: Special Concern COSSARO: Special Concern	Southern Ontario, closely associated with the Niagara Escarpment	Damp crevices and on mossy, rock outcrops
Butternut	Juglans cinerea	Vascular Plants	SARA: Endangered COSEWIC: Endangered SARO: Endangered COSSARO: Endangered	Southern Ontario	Flood plains. Grows best in rich, moist, and well-drained soils often found along streams. It may also be found on well-drained gravel sites, especially those made up of limestone
Eastern prairie fringed-orchid	*Platanthera leucophaea*	Vascular Plants	SARA: Endangered COSEWIC: Endangered SARO: Endangered COSSARO: Endangered	Grey County	Found in wet prairies, fens, bogs, and occasionally old fields
Tuberous indian-plantain	Arnoglossum plantagineum	Vascular Plants	SARA: Special Concern COSEWIC: Special Concern SARO: Special Concern COSSARO: Special Concern	Grey County	Open sunny areas in wet, calcium-rich meadows or shoreline fens, including along river banks and in wetlands near Lake Huron

SARA: Species at Risk Act

COSEWIC: the Committee on the Status of Endangered Wildlife in Canada. This is a committee of experts that assesses and designates which wild species are in some danger of disappearing from Canada.

SARO: Species at Risk in Ontario

COSSARO: the Committee on the Status of Species at Risk in Ontario. This is a committee of experts that assesses and designated which species are at risk in Ontario as per the Endangered Species Act.

As defined by SARA and COSEWIC:

Special Concern: a wildlife species that may become a threatened or an endangered species because of a combination of biological characteristics and identified threats.
Threatened: a wildlife species that is likely to become an endangered species if nothing is done to reverse the factors leading to its extirpation or extinction.
Endangered: a wildlife species facing imminent extirpation or extinction.

As defined by SARO and COSSARO:

Special Concern: A species that lives in the wild in Ontario, is not endangered or threatened, but may become threatened or endangered because of a combination of biological characteristics and identified threats.
Threatened: A species that lives in the wild in Ontario, is not endangered, but is likely to become endangered if steps are not taken to address factors threatening to lead to its extinction or extirpation.
Endangered: A species that lives in the wild in Ontario but is facing imminent extinction or extirpation.

3.2 SOURCE WATER PROTECTION

Source Water Protection for the entire proposed servicing phases is not discussed in this report.

In relation to the proposed two (2) Schedule B projects within the Master Plan, the optimization of the existing Markdale Wastewater Treatment Plant would not require any physical upgrades.

As well, the facility is located outside of the Wellhead Protection Area for Markdale.

For the construction of the proposed new Markdale Water Storage Facility, the location would be adjacent to the existing water storage standpipe and municipal wells #3 and 4.

Neither of the two (2) Schedule B projects are felt to pose a drinking water threat. The construction of the proposed new Markdale Water Storage Facility and decommissioning of the existing water storage standpipe will require mitigation methods to prevent deleterious substances from entering surface and groundwater, sediment and erosion control, stabilization of any waste materials and stormwater management. However, the construction activities are temporary and none to minimal residual effects are likely, provided recommended mitigation measures are implemented (see **Section 8.3** for more details).

3.3 INVENTORY OF SOCIAL-ECONOMIC AND CULTURAL ENVIRONMENT

Village of Markdale

Markdale was founded in 1846 and settling began in approximately 1849. It was incorporated into a village in 1888 with a thriving business center. By 1896, electricity lighting was installed, a water works system was in place in 1905 and street paving in 1933.

Downtown Markdale still retains a “turn of the century” feel while offering contemporary products and services. The village is serviced by approximately 36 retail stores currently.

The Markdale area has become a favourite among artists, artesians and professional craftspersons attracted by its reasonable real estate prices. The village serves the needs of a large agricultural community with cattle, sheep and grain as the chief crops. Nearby to the east is Beaver Valley with excellent ski slopes and recreational and conference facilities. There is also a network of bed and breakfast hotels established within the village and surrounding area. The Markdale and surrounding area is suitable for many types of enterprise including small business, predominantly in industrial development.

Village of Flesherton

The Village of Flesherton is home to many art galleries, craft studios, antiques stores, unique eateries and interesting historic architecture. The area is known for its Nordic and downhill skiing, fishing, mountain biking and road cycling. The Beaver Valley, Saugeen River and Eugenia Falls are all local natural features within the Flesherton area. The Village of Flesherton is nearby to the Bruce Trail including two (2) hiking areas within the village. A multitude of small resorts, bed and breakfasts and commercial businesses are present to support tourism along Highway 10 from Orangeville, up to Owen Sound.

Eugenia

Eugenia is a small community located just north of Flesherton and approximately 1 ½ hours north of Toronto. It is best known for its hidden lake called Lake Eugenia and Eugenia Falls as well as the Beaver River. Eugenia in modern times has become a cottage region due to its lake and proximity to Toronto with the boom starting in the mid 1950's as locals began to take advantage of the lake. The Eugenia Lake area attracts numerous fishermen due to the range of fish available in the lake. As well, it is a popular location for naturalists and cottages with the Bruce Trail running through the village and a large number of additional trails and nature preserves present.

Kimberley

Kimberley is a small community located just north of Eugenia. In the heart of the Beaver Valley, Kimberley is the put-in point for the Beaver River Canoe Route, 20 km upstream of Heathcote, and provides easy access to the Bruce Trail. Located within Kimberley are a bed and breakfast, winery, general store and restaurant.

3.4 ARCHAEOLOGICAL RESOURCES

Archaeological screening for the two (2) Schedule B projects within the Master Plan was completing using the Ministry of Tourism, Culture and Sport (MTCS) document "Criteria for Evaluating Archaeological Potential". Based on review of this document, the two (2) Schedule B projects in Phase P1-1 of the Master Plan (Optimization of the existing Markdale Wastewater Treatment Plant and New Markdale Water Storage Facility) do not require the associated evaluation checklist to be completed, as the properties associated for each project have been previously disturbed. Refer to **Appendix A** for a copy of the completed evaluation checklists.

MTCS archaeological evaluation checklists for sewer and water servicing projects within other sub-phases of this Master Plan, have not been completed. These evaluations would be completed in the future if and when associated Class EA's are completed for those phased projects.

3.5 BUILT HERITAGE/CULTURAL HERITAGE LANDSCAPES

Built Heritage and Cultural Heritage Landscapes screening for the two (2) Schedule B projects within the Master Plan was completing using the Ministry of Tourism, Culture and Sport (MTCS) document "Criteria for Evaluating Potential for Built Heritage Resources and Cultural Heritage Landscapes". Based on review of this document, the two (2) Schedule B projects in Phase P1-1 of the Master Plan (Optimization of the existing Markdale Wastewater Treatment Plant and New Markdale Water Storage Facility) showed that each property associated had a low potential for built heritage or cultural heritage landscape. As a result, Heritage Impact Assessment is concluded to not be required. Refer to **Appendix A** for a copy of the completed evaluation checklists.

MTCS heritage and cultural evaluation checklists for sewer and water servicing projects within other sub-phases of this Master Plan, have not been completed. These evaluations would be completed in the future if and when associated Class EA's are completed for those phased projects.

4 ASSESSMENT OF EXISTING AND FUTURE POPULATION

An assessment of existing and future population for the Municipality of Grey Highlands was completed by reviewing two (2) reports which include population projections. The two (2) reports include the following:

1. Grey County Growth Management Strategy – Growth Management Strategy Report, submitted by Malone Given Parsons Ltd., April 2008.

2. Amendment No. 80 to the County of Grey Official Plan (5-Year Review), Grey County Planning & Development Department, 2009 (County of Grey Official Plan, adopted May 6, 1997).

Based on the review of the Growth Management Strategy Report, 2008, the following was found:

Population Projections for Grey Highlands

Year	Population
2006	9,800
2011	10,700
2016	11,500
2021	12,400
2026	12,900
2031	13,400

- Over **25 year** period, average annual growth increase is **1.26%**

Based on the review of Amendment No. 80 to the County of Grey Official Plan (5-Year Review), 2009, the following was found:

Year	Population
2006	9,800
2011	10,700
2016	11,500
2021	12,400
2026	12,900

- Over **20 year** period, average annual growth increase is **1.38%**

Based on discussions with the Municipality of Grey Highlands in 2012, and through review of the average annual growth increase estimated at 1.26% and 1.38% respectively in the two (2) referenced reports, it was felt that a 1% annual growth rate was more favourable and more realistic. As a result, a 1% annual growth rate was utilized in the Master Plan for population projections. Refer to **Section 5.0** for more details.

In 2016, the Municipality of Grey Highlands reduced the utilized annual growth rate from 1.0% to 0.5%. The 0.5% was used for Phase P1-1 in Markdale only, for the 21-50 year growth rate for water storage requirement calculations.

A second review was completed for selecting a population per equivalent residential unit for utilization in the Master Plan. As per information provided by the Municipality of Grey Highlands for the number of households and population of Grey Highlands in 2006, official numbers were 9,480 people per 5,142 homes or approximately 1.84 persons per household. Through discussion with the Municipality of Grey Highlands, it was decided to use a number of 2.2 persons per household in the Master Plan, to provide a buffer for varying types of future development.

5 ASSESSMENT OF EXISTING AND FUTURE 20 YR AND 50 YR WATER DEMANDS, WATER STORAGE AND SEWAGE FLOWS

5.1 EXISTING WATER DEMANDS, WATER STORAGE AND SEWAGE FLOWS

Table 5.1 summarizes information concerning the existing water treatment, water storage, and sewage treatment infrastructure for Markdale, Flesherton and Kimberley-Amik-Talisman in the Municipality of Grey Highlands. The table shows the specific design capacities, along with average daily flows and max day flows for recent operation years for the facilities.

5.1.1 MARKDALE – WATER TREATMENT AND WATER STORAGE

Based on the information provided in **Table 5.1**, the following is concluded:

- From 2006 to 2010, the average day water demand decreased from 1,575 m^3/day (2006) to 929 m^3/day (2010).
- The Chapman's Ice Cream facility fire occurred in September, 2009, which resulted in the lower water demand between 2009 and 2010. As of 2011, the new Chapman's Ice Cream facility in Markdale has been constructed and is operating.
- From 2006 to 2008, the max day flow decreased from was 2,721 m^3/day (2006) to 1,486 m^3/day (2008). In 2009, when the Chapman's fire occurred, the max day demand increased substantially to 4,850 m^3/day. In 2010, the max day demand was lower again at 1,664 m^3/day. The max day flow increased again in 2011 to 2,659 m^3/day, and then went down and up again until the current 2015 value of 2,781 m^3/day. It is noted that the 2015 value represents a date (November 25) where the Markdale standpipe was refilled after maintenance work was completed.

Through review of the design capacities for the water production wells in Markdale, the current total production capacity available is 5,990 m^3/day (based on reduced capacity of Well #3). At the 2015 max day water demand of 2,781 m^3/day, the production wells are currently being used at approximately 46% capacity. During the Chapman's fire in 2009, at the max day water demand of 4,850 m^3/day, the production wells were utilized at approximately 81% capacity.

The existing Markdale water storage standpipe has a usable capacity of 1,861 m^3. Based on the lowest average day value (after the Chapman's fire) of 1,060 m^3/day (2013), the existing water storage has a turnover rate of approximately 1.76 days, which is considered good. Refer to **Appendix B** for a map showing the existing Markdale Water System and its key features.

TABLE 5.1
WATER TREATMENT, WATER STORAGE AND SEWAGE TREATMENT CAPACITY SUMMARY

WATER AND WASTEWATER SERVICING MASTER PLAN
MARKDALE-FLESHERTON-KIMBERLEY-AMIK-EUGENIA-BEAVER VALLEY
MUNICIPALITY OF GREY HIGHLANDS

111-13229-00

Category	Location	Design Capacity (m^3/day)	Average Day Flow (m^3/day)	Max. Day Flow (m^3/day)
Water Treatment	Markdale - Isla Street PS - Well#1 - Eliza Street PS - Well#3 - Well#4 Kimberley Amik-Talisman Water Treatment Plant	 2,619 2,291** 1,080 1,185	2006 – 1,575 2007 – 1,205 2008 – 1,127 2009 – 996 2010 – 929 2011 – 1,174 2012 – 1,150 2013 – 1, 060 2014 – 1,148 2015 – 1,214 2006 – 143 2007 – 144 2008 – 100 2009 – 79 2010 – 79 2011 – 54 2012 – 68 2012 – 52 2014 – 39 2015 – 57	2006 – 2,721 2007 – 1,910 2008 – 1,486 2009 – 4,850* 2010 – 1,664 2011 – 2,659 2012 – 1,979 2013 – 1,931 2014 –2,286 2015 – 2,781**** 2006 – 372 2007 – 371 2008 – 392 2009 – 248 2010 – 275 2011 – 179 2012 – 223 2013 – 169 2014 – 113 2015 – 200
Water Storage	Markdale (Standpipe adjacent to Eliza Street PS) Kimberley Amik-Talisman (Storage Tanks below WTP)	1,861 (usable storage) 870	N/A	N/A
Sewage Treatment	Markdale Wastewater Treatment Plant	1,122	2006 – 882 2007 – 771 2008 – 864 2009 – 702 2010 – 647 2011 – 853 2012 – 809 2013 – 795	N/A

			2014 – 842 2015 – 744	
	Flesherton Wastewater Treatment Plant	419	2006 – 146 2007 – 127 2008 – 166 2009 – 155 2010 – 142 2011 – 154 2012 – 130 2013 – 168 2014 – 158 2015 – 135	
	Amik-Talisman Wastewater Treatment Plant	249***	2006 – 216 2007 – 215 2008 – 241 2009 – 152 2010 – 108 2011 – 94 2012 – 74 2013 – 86 2014 – 75 2015 – 87	

*Chapmans fire occurred ** Reduced capacity of 2,291 m^3/day until well fully developed to 2,782 m^3/day *** Future upgraded capacity 431 m^3/day
**** Standpipe refilled after maintenance completed

5.1.2 MARKDALE – SEWAGE FLOWS

Based on the information provided in **Table 5.1**, the following is concluded:

- From 2006 to 2015, the average day sewage flow increased and decreased from a low of 647 m^3/day (2010) to a high of 882 m^3/day (2006).
- The Chapman's Ice Cream facility fire which occurred in September, 2009, resulted in lower water demand between 2009 and 2010, and thus less sewage production. As of 2011, the new Chapman's Ice Cream facility in Markdale has been constructed and is operating. The average day sewage respectively for 2009 to 2010, did decrease by a large amount compared to the average day sewage flow of 886 m^3/day in 2008.

Through review of the design capacity for the sewage treatment plant in Markdale, the current treatment capacity available is 1,122 m^3/day. At the 2015 average day sewage flow of 744 m^3/day, the plant is currently being used at approximately 66% capacity. Refer to **Appendix B** for a map showing the existing Markdale Sanitary Sewer System and its key features.

5.1.3 FLESHERTON – SEWAGE FLOWS

Based on the information provided in **Table 5.1,** the following is concluded:

- The average day sewage flow from 2006 to 2015 varied from the highest of 168 m^3/day (2013) to the lowest of 127 m^3/day (2007).

Through review of the design capacity for the sewage treatment plant in Flesherton, the current treatment capacity available is 419 m^3/day. At the current 2015 average day sewage flow of 135 m^3/day, the plant is currently being used at approximately 32% capacity. Refer to **Appendix B** for a map showing the existing Flesherton Sanitary Sewer System and its key features.

5.1.4 KIMBERLEY AMIK-TALISMAN – WATER TREATMENT AND WATER STORAGE

Based on the information provided in **Table 5.1,** the following is concluded:

- The average day water demand from 2006 to 2015 decreased from 143 m^3/day (2006) to 57 m^3/day (2015).
- The max day water demands from 2006 to 2014 decreased from 372 m^3/day (2006) to 200 m^3/day (2015). The Talisman ski resort has been out of operation since 2011, which has resulted in less water usage.

Through review of the design capacity for the Kimberley Amik-Talisman Water Treatment Plant, the current treatment capacity available is 1,185 m^3/day. At the current 2015 max day water demand of 200 m^3/day, the plant is currently being used at approximately 17% capacity. At the highest max day water demand of 392 m^3/day (2008), the plant was utilized at approximately 33% capacity.

The existing Kimberley Amik-Talisman water storage (below WTP) has a usable capacity of 870 m^3. Based on the lowest average day flow of 39 m^3/day (2010), the existing water storage has a turnover rate

of approximately 22 days, which is considered very high (recommended to be between 3-5 days). Refer to **Appendix B** for a map showing the existing Kimberley Amik-Talisman Water System and its key features.

5.1.5 AMIK-TALISMAN – SEWAGE FLOWS

Based on the information provided in **Table 5.1,** the following is concluded:

- The average day sewage flow from 2006 to 2015 varied from the highest of 241 m^3/day (2008) to the lowest of 87 m^3/day (2012).

Through review of the design capacity for the Amik-Talisman Sewage Treatment Plant, the current treatment capacity is 249 m^3/day. At the current 2015 average day sewage flow of 87 m^3/day, the plant is currently being used at approximately 35% capacity. At the highest average day sewage flow of 241 m^3/day (2008), the plant would have been utilized at approximately 96% capacity. The future upgraded capacity of the plant is 431 m^3/day or 73% more capacity than the current plant. Based on the 2015 average day sewage flow of 87 m^3/day, the future upgraded plant would be utilized at approximately 20% capacity. Refer to **Appendix B** for a map showing the existing Amik-Talisman Sanitary Sewer System and its key features.

5.2 FUTURE WATER DEMANDS (20 YR AND 50 YR)

Table 5.2 overleaf provides a summary of calculated estimated existing, future 20 year and 50 year water demands for all sub-phases within the water and wastewater servicing Master Plan. Individual breakdown calculations for each sub-phase can be found in **Appendix C**.

For the 2016 existing water demands for sub-phases **Phase P1-1 and Phase P1-2** (only existing phases with water service), the following parameters were utilized to calculate the estimated number of residential equivalent units, estimated average day water demand and population equivalent:

Phase P1-1 – Markdale (Includes P1-1A extension to West Grey)

- For normal residential and Chapman's Ice Cream, 375 L/cap.d flow at 2.2 persons/unit was utilized (including 100 L/cap.d lawn watering and water loss).

- For remaining water user types (i.e. hospital, school, commercial, etc.), 450 L/cap.d flow at 2.2 persons/unit was utilized.

Based on the above parameters, the 2016 estimated average day water demand for Phase P1-1 was calculated to be 1,227 m^3/day. This value is within the range of the average day water demand values found for the operating years after the Chapman's Ice Cream fire. Chapman's is currently at an estimated average day water demand of 600 m^3/day.

Phase P1-2 – Kimberley, Amik and Talisman

- For normal residential, 275 L/cap.d flow at 2.2 persons/unit was utilized.

- For Talisman and remaining commercial, 450 L/cap.d flow at 2.2 persons/unit was utilized.

TABLE 5.2
EXISTING AND FUTURE WATER DEMANDS

WATER AND WASTEWATER SERVICING MASTER PLAN
MARKDALE-FLESHERTON-KIMBERLEY-AMIK-EUGENIA-BEAVER VALLEY
MUNICIPALITY OF GREY HIGHLANDS

111-13229-00

		Existing			Future 20 Years (1 to 20 Years)		Future 50 Years (21 to 50 Years)		Total in 20 Years			Total in 50 Years		
		No. of Residential Equivalent Units	Average Day Water Demand (m^3/day)	Population Equivalent	No. of Residential Equivalent Units	Average Day Water Demand (m^3/day)	No. of Residential Equivalent Units	Average Day Water Demand (m^3/day)	No. of Residential Equivalent Units	Average Day Water Demand (m^3/day)	Population Equivalent	No. of Residential Equivalent Units	Average Day Water Demand (m^3/day)	Population Equivalent
PHASE I														
PI-1	Markdale - Includes extention to West Grey	1457	1227	3206	950	941	534	529	2407	2168	5295	2942	2697	6471
PI-2	Kimberley, Amik, Talisman	227	160	499	105	104	115	114	332	264	730	447	378	983
PI-3	Beaver Valley Ski Club to County Road 32	0	0	0	301	298	105	104	301	298	662	406	402	893
PI-4	County Road 32 Along County Road 30 to Markdale	0	0	0	130	129	45	45	130	129	286	175	174	385
PI-5	County Roads 13 and 30 from Kimberley to Beaver Valley Ski Club	0	0	0	14	14	5	5	14	14	31	19	19	42
TOTAL PHASE I		**1684**	**1387**	**3705**	**1500**	**1486**	**804**	**797**	**3184**	**2873**	**7005**	**3989**	**3670**	**8774**
PHASE II														
PII-1	Flesherton - Existing Sewage Service Area	0	0	0	315	201	0	0	315	201	693	315	201	693
PII-2	Built-up areas at Flesherton beyond existing sanitary sewers	0	0	0	288	204	100	99	288	204	634	388	303	854
PII-3	Highway 10 corridor from Road 120 to Markdale	0	0	0	22	22	8	8	22	22	48	30	30	66
PII-4	Highway 10 corridor from Road 120 to Flesherton	0	0	0	55	54	19	19	55	54	121	74	73	163
TOTAL PHASE II		**0**	**0**	**0**	**680**	**481**	**127**	**126**	**680**	**481**	**1496**	**807**	**607**	**1775**
PHASE III														
PIII-1	Eugenia - Hamlet	0	0	0	407	403	142	140	407	403	895	549	543	1208
PIII-2	Eugenia Lake	0	0	0	615	609	214	212	615	609	1353	829	821	1824
PIII-3	County Roads 4 and 13 from Flesherton to Eugenia	0	0	0	17	17	6	6	17	17	37	23	23	51
PIII-4	County Road 13 from Eugenia to County Road 30	0	0	0	65	64	23	22	65	64	143	88	86	194
TOTAL PHASE III		**0**	**0**	**0**	**1104**	**1093**	**385**	**380**	**1104**	**1093**	**2429**	**1489**	**1473**	**3276**
TOTAL PHASES I, II and III		**1684**	**1387**	**3705**	**3284**	**3060**	**1316**	**1303**	**4968**	**4447**	**10930**	**6285**	**5750**	**13826**

Based on the above parameters, the 2016 estimated average day water demand for Phase P1-2 was calculated to be 160 m^3/day. This value is significantly higher than the range of average day water demand values found for the operating years of 2009 to 2015, as seen in **Table 5.1**. This is likely due to the Talisman ski resort not being in operation.

For the **Future 20 Year** (2016 – 2036) water demands for each sub-phase, the following parameters were utilized to calculate the estimated number of residential equivalent units, estimated average day water demand and population equivalent:

Phase P1-1 – Markdale (Includes P1-1A extension to West Grey)

- For the Future 20 year (2016 – 2036) period, the existing known future developments were only included (i.e. future subdivisions, other vacant residential, commercial, industrial, etc.).
- All average day water demands were calculated using 450 L/cap.d flow at 2.2 persons/unit.
- The future 20 year additional average day water demand for Chapman's Ice Cream is estimated at 340 m^3/day.

Phases P1-2 to P1-5

- For the Future 20 year (2016 – 2036) period, existing developments were only included (i.e. existing residential, commercial, industrial, etc.).
- All average day water demands were calculated using 450 L/cap.d flow at 2.2 persons/unit.

Phases P2-1 to P2-2

- For the Future 20 year (2016 – 2036) period, existing developments were only included (i.e. existing residential, commercial, industrial, etc.).
- For existing residential, commercial, and schools, 275 L/cap.d flow at 2.2 persons/unit was utilized.
- For the remaining existing developments, 450 L/cap.d flow at 2.2 persons/unit was utilized.

Phases P2-3 to P3-4

- For the Future 20 year (2016 – 2036) period, existing developments were only included (i.e. existing residential, commercial, industrial, etc.).
- All average day water demands were calculated using 450 L/cap.d flow at 2.2 persons/unit.

For the **Future 50 Year** (2036 – 2056) water demands for each sub-phase, the following parameters were utilized to calculate the estimated number of residential equivalent units, estimated average day water demand and population equivalent:

Phase P1-1 – Markdale (Includes P1-1A extension to West Grey)

- For the Future 50 year (2036 – 2056) period, future developments were estimated at an increase of 0.5% in residential equivalent units every year (based on sum of existing residential equivalent units and future 20 year units, minus flows for Chapman's Ice Cream).
- All average day water demands were calculated using 450 L/cap.d flow at 2.2 persons/unit.
- The future 50 year additional average day water demand for Chapman's Ice Cream is estimated at 300 m^3/day (i.e. future 20 year plus 50 year = 340 m^3/day + 300 m^3/day = 640 m^3/day).

Phases P1-2 to P3-4 (All Remaining)

- For the Future 50 year (2036 – 2056) period, future developments estimated at an increase of 1% in residential equivalent units every year.
- Phase P2-1 has no future 50 year development as Phase P2-2 is for expansion into the remaining areas of Flesherton beyond the existing sanitary sewers in place.

5.3 FUTURE WATER STORAGE (20 YR AND 50 YR)

Based on the proposed sub-phases within the main three (3) phases for the water and wastewater servicing Master Plan, various options for new water storage facilities to service future water demands are possible.

As mentioned earlier in this report, the existing Markdale water storage facility (standpipe) requires upgrading to help increase current fire flows to the downtown area and increase pressures at individual homes and commercial establishments to meet Ministry of the Environment (MOE) guidelines. This project is being completed as a Schedule B project within this Master Plan under Phase P1-1 (highest priority).

With the future 20 year and 50 year water demands for Markdale (Phase P1-1) and the potential to service additional phases under the Master Plan, the construction of a new elevated glass-fused to steel water storage facility in Markdale is recommended. The location of the new water storage facility would be adjacent to the existing standpipe in Markdale, as this location has the highest elevation in Markdale. The existing standpipe would be decommission and not utilized.

In Flesherton, which presently uses individual wells for water supply, a water system utilizing new local wells and a water storage facility would allow for pressures to meet MOE guidelines and for fire flows to be provided. If a water system was constructed, a glass-fused to steel on-ground water storage facility could be constructed at the highest elevation location in Flesherton, which is adjacent and on part of the property for the existing sewage treatment plant.

For homes and cottages in the Hamlet of Eugenia and in the surrounding lake area, currently serviced by individual wells, a water system utilizing new local wells and a water storage facility would allow for pressures to meet MOE guidelines and for fire flows to be provided. If a water system was constructed, an elevated glass-fused to steel water storage facility could be constructed at the highest elevation location in Eugenia, at the east end of Napoleon Street.

In Kimberley, in combination with the various options for new water storage facilities in the other communities, the existing Kimberley Amik-Talisman water storage facility would be recommended to still be utilized for water storage.

Refer to **Section 6.2** for more details.

5.4 FUTURE SEWAGE FLOWS (20 YR AND 50 YR)

Table 5.4 overleaf provides a summary of calculated estimated existing, future 20 year and 50 year sewage flows for all sub-phases within the water and wastewater servicing Master Plan. Individual breakdown calculations for each sub-phase can be found in **Appendix D**.

For the 2016 existing sewage flows for sub-phases **Phase P1-1, Phase P1-2 and Phase P2-1** (only existing phases with sanitary service), the following parameters were utilized to calculate the estimated number of residential equivalent units, estimated average day sewage flow and population equivalent:

Phase P1-1 – Markdale (Includes P1-1A extension to West Grey)

- For normal residential and Chapman's Ice Cream, 275 L/cap.d flow at 2.2 persons/unit was utilized (includes infiltration).
- For remaining sewage flow user types (i.e. hospital, school, commercial, etc.), 450 L/cap.d flow at 2.2 persons/unit was utilized.

Based on the above parameters, the 2016 estimated average day sewage flow for Phase P1-1 was calculated to be 988 m^3/day. This value is slightly higher than the range of average day sewage flow values found for the operating years prior to the Chapman's Ice Cream fire. It should be noted that Chapman's Ice Cream is currently billed at an estimated 135 residential equivalent units or an average day sewage flow of 82 m^3/day, where in reality, Chapman's is currently at an estimated average day sewage flow of 500 m^3/day or 826 residential equivalent units. As well, Chapman's is only approved to have sewage flows of 360 m^3/day, where they are currently exceeding their limit by approximately 39%.

Phase P1-2 – Kimberley, Amik and Talisman

- For Amik and Talisman, 650 L/cap.d flow at 2.2 persons/unit was utilized (includes excessive infiltration).
- For Beaver Valley, 450 L/cap.d flow at 2.2 persons/unit was utilized.

Based on the above parameters, the 2016 estimated average day water demand for Phase P1-2 was calculated to be 217 m^3/day. This value is within the range of the average day sewage flows found for the operating years of 2006 to 2010 seen in **Table 5.1.** This value is quite a bit higher than the average day sewage flows found in 2011 to 2015, likely due to Talisman ski resort not being in operation.

TABLE 5.4
EXISTING AND FUTURE SEWAGE FLOWS

WATER AND WASTEWATER SERVICING MASTER PLAN
MARKDALE-FLESHERTON-KIMBERLEY-AMIK-EUGENIA-BEAVER VALLEY
MUNICIPALITY OF GREY HIGHLANDS

111-13229-00

		Existing			Future 20 Years (1 to 20 Years)		Future 50 Years (21 to 50 Years)		Total in 20 Years			Total in 50 Years		
		No. of Residential Equivalent Units	Estimated Sewage Flow (m^3/day)	Population Equivalent	No. Of Residential Equivalent Units	Estimated Sewage Flow (m^3/day)	No. of Residential Equivalent Units	Estimated Sewage Flow (m^3/day)	No. of Residential Equivalent Units	Estimated Sewage Flow (m^3/day)	Population Equivalent	No. of Residential Equivalent Units	Estimated Sewage Flow (m^3/day)	Population Equivalent
PHASE I														
PI-1	Markdale - Includes extention to West Grey	1536	988	3380	970	961	750	743	2506	1949	5513	3256	2692	7163
PI-2	Kimberley, Amik, Talisman	153	217	337	208	206	126	124	361	423	794	487	547	1071
PI-3	Beaver Valley Ski Club to County Road 32	0	0	0	301	298	105	104	301	298	662	406	402	893
PI-4	County Road 32 Along County Road 30 to Markdale	0	0	0	130	129	45	45	130	129	286	175	174	385
PI-5	County Roads 13 and 30 from Kimberley to Beaver Valley Ski Club	0	0	0	14	14	5	5	14	14	31	19	19	42
TOTAL PHASE I		**1689**	**1205**	**3717**	**1623**	**1608**	**1031**	**1021**	**3312**	**2813**	**7286**	**4343**	**3834**	**9555**
PHASE II														
PII-1	Flesherton - Existing Sewage Service Area	288	174	634	27	27	0	0	315	201	693	315	201	693
PII-2	Built-up areas at Flesherton beyond existing sanitary sewers	0	0	0	288	204	100	99	288	204	634	388	303	854
PII-3	Highway 10 corridor from Road 120 to Markdale	0	0	0	22	22	8	8	22	22	48	30	30	66
PII-4	Highway 10 corridor from Road 120 to Flesherton	0	0	0	55	54	19	19	55	54	121	74	73	163
TOTAL PHASE II		**288**	**174**	**634**	**392**	**307**	**127**	**126**	**680**	**481**	**1496**	**807**	**607**	**1775**
PHASE III														
PIII-1	Eugenia - Hamlet	0	0	0	407	403	142	140	407	403	895	549	543	1208
PIII-2	Eugenia Lake	0	0	0	615	609	214	212	615	609	1353	829	821	1824
PIII-3	County Roads 4 and 13 from Flesherton to Eugenia	0	0	0	17	17	6	6	17	17	37	23	23	51
PIII-4	County Road 13 from Eugenia to County Road 30	0	0	0	65	64	23	22	65	64	143	88	86	194
TOTAL PHASE III		**0**	**0**	**0**	**1104**	**1093**	**385**	**380**	**1104**	**1093**	**2429**	**1489**	**1473**	**3276**
TOTAL PHASES I, II and III		**1977**	**1379**	**4351**	**3119**	**3008**	**1543**	**1527**	**5096**	**4387**	**11211**	**6639**	**5914**	**14606**

Phase P2-1 – Flesherton

- For residential, schools and commercial, 275 L/cap.d flow at 2.2 persons/unit was utilized (includes infiltration).

Based on the above parameters, the 2016 estimated average day water demand for Phase P2-1 was calculated to be 174 m^3/day. This value is slightly higher than the range of average day sewage flow values found for the operating years of 2006 to 2015 seen in **Table 5.1.**

For the **Future 20 Year** (2016 – 2036) sewage flows for each sub-phase, the following parameters were utilized to calculate the estimated number of residential equivalent units, estimated average day sewage flow and population equivalent:

Phase P1-1 – Markdale (Includes P1-1A extension to West Grey)

- For the Future 20 year (2016 – 2036) period, the existing known future developments were only included (i.e. future subdivisions, other vacant residential, commercial, industrial, etc.).
- All average day sewage flows were calculated using 450 L/cap.d flow at 2.2 persons/unit.
- The future 20 year additional average day sewage flow for Chapman's Ice Cream is estimated at 340 m^3/day.

Phases P1-2 to P2-1

- For the Future 20 year (2016 – 2036) period, existing developments were only included (i.e. existing residential, commercial, industrial, etc.).
- All average day sewage flows were calculated using 450 L/cap.d flow at 2.2 persons/unit.

Phases P2-2

- For the Future 20 year (2016 – 2036) period, existing developments were only included (i.e. existing residential, commercial, industrial, etc.).
- For existing residential, commercial, and schools, 275 L/cap.d flow at 2.2 persons/unit was utilized.
- For the remaining existing developments, 450 L/cap.d flow at 2.2 persons/unit was utilized**.**

Phases P2-3 to P3-4

- For the Future 20 year (2016 – 2036) period, existing developments were only included (i.e. existing residential, commercial, industrial, etc.).
- All average day sewage flows were calculated using 450 L/cap.d flow at 2.2 persons/unit.

For the **Future 50 Year** (2036 – 2056) sewage flows for each sub-phase, the following parameters were utilized to calculate the estimated number of residential equivalent units, estimated average day sewage flow and population equivalent:

Phase P1-1 – Markdale (Includes P1-1A extension to West Grey)

- For the Future 50 year (2036 – 2056) period, future developments were estimated at an increase of 1% in residential equivalent units every year (based on sum of existing residential equivalent units and future 20 year units, minus flows for Chapman's Ice Cream).
- All average day sewage flows were calculated using 450 L/cap.d flow at 2.2 persons/unit.
- The future 50 year additional average day sewage flow for Chapman's Ice Cream is estimated at 300 m^3/day (i.e. future 20 year plus 50 year = 340 m^3/day + 300 m^3/day = 640 m^3/day).

Phases P1-2 to P3-4 (All Remaining)

- For the Future 50 year (2036 – 2056) period, future developments estimated at an increase of 1% in residential equivalent units every year.
- Phase P2-1 has no future 50 year development as Phase P2-2 is for expansion into the remaining areas of Flesherton beyond the existing sanitary sewers in place.

6 ALTERNATIVE SOLUTIONS

6.1 WATER TREATMENT

Eight (8) alternatives for implementation of upgraded and new water treatment and water production facilities phased water servicing under the Master Plan were reviewed. The proposed eight (8) alternatives for water treatment and water production match up exactly with the proposed eight (8) alternatives for water storage and water distribution as discussed in **Section 6.2** and **6.4** respectively.

The following **Table 6.1** provides a summary of the design water demands for the various water treatment plant alternatives, including average day flow and maximum day flow for existing, future 20 year and future 50 year water demands. Information in this table was provided from **Table 5.2**. The maximum day water demands shown in **Table 5.2** were calculated based on using the Maximum Day Peaking Factors as per the "2008 MOE Design Guidelines for Drinking Water Systems." The maximum day factors ranged from 1.9 for equivalent populations over 10,000 to 2.75 for equivalent populations between 500 and 1,000. Future 20 year maximum day water demands were utilized for sizing the proposed water treatment and water production alternatives. Refer to **Appendix E** for capture zone information for the existing Markdale production wells as per Figure 3.25 from the 2005-2006 Groundwater Technical Study, Saugeen Valley-Grey Sauble-Northern Bruce Source Protection Region, Conestoga-Rovers & Associates. Refer to **Appendix E** for a figure showing the location of the existing supply wells in Markdale and potential locations for new supply wells.

Alternative 1 – Markdale Water Treatment Plant and Kimberley-Amik-Talisman Water Treatment Plant:

- Utilize existing Isla Street Pump Station (Well #1 – 2,619 m^3/day) and Eliza Street Pump Station (Well #3 – 2,782 m^3/day (upgraded capacity) and Well #4 – 1,080 m^3/day). Available capacity if largest well (Well #3) out of operation is 3,699 m^3/day.

- Construction of two (2) additional water treatment and pumping stations in Markdale to pump water into the distribution system including installation of two (2) new high capacity wells (+/- 2,111 m^3/day, one (1) at each station) at two (2) potential new well locations. Future 20 year maximum day water demand is estimated at 7,921 m^3/day, therefore a deficit of 4,222 m^3/day (2 x 2,111 m^3/day) is present compared to current capacity with largest well (Well #3) out of operation.

- Utilize the Kimberley-Amik-Talisman Water Treatment Plant at its current capacity of 1,185 m^3/day. Future 20 year maximum day water demand is estimated at 765 m^3/day.

Alternative 2 – Markdale Water Treatment Plant, Kimberley-Amik Water Treatment Plant, <u>New</u> Flesherton Water Treatment Plant and <u>New</u> Eugenia Water Treatment Plant

- Utilize existing Isla Street Pump Station (Well #1 – 2,619 m^3/day) and Eliza Street Pump Station (Well #3 – 2,782 m^3/day (upgraded capacity) and Well #4 – 1,080 m^3/day). Available capacity if largest well (Well #3) out of operation is 3,699 m^3/day.

- Construction of one (1) additional water treatment and pumping station in Markdale to pump water into the distribution system including installation of one (1) new high capacity well (+/- 1,535

TABLE 6.1
SUMMARY OF DESIGN WATER DEMANDS - WATER TREATMENT PLANT ALTERNATIVES

WATER AND WASTEWATER SERVICING MASTER PLAN
MARKDALE-FLESHERTON-KIMBERLEY-AMIK-EUGENIA-BEAVER VALLEY
MUNICIPALITY OF GREY HIGHLANDS

111-13229-00

Alternative	Water Treatment Plant	Existing		20 Year		50 Year	
		Average Day Water Demand (m^3/day)	Maximum Day Water Demand (m^3/day)	Average Day Water Demand (m^3/day)	Maximum Day Water Demand (m^3/day)	Average Day Water Demand (m^3/day)	Maximum Day Water Demand (m^3/day)
1	Markdale WTP (PI-1, PI-3, PI-4, PII-1, PII-2, PII-3, PII-4, PIII-1, PIII-2, PIII-3 and PIII-4)	1,227	2,454	4,169	7,921	5,567	10,577
	Kimberley, Amik, Talisman WTP (PI-2 and PI-5)	160	440	278	765	397	993
2	Markdale WTP (PI-1, PI-3, PI-4 and PII-3)	1,227	2,454	2,617	5,234	3,517	7,034
	Kimberley, Amik, Talisman WTP (PI-2 and PI-5)	160	440	278	765	397	993
	Flesherton WTP (PII-1, PII-2 and PII-4)	0	0	459	1,148	577	1,443
	Eugenia WTP (PIII-1, PIII-2, PIII-3 and PIII-4)	0	0	1,093	2,459	1,473	2,946
3	Markdale WTP (PI-1, PI-3, PI-4, PII-1, PII-2, PII-3 and PII-4)	1,227	2,454	3,076	6,152	4,094	8,188
	Kimberley, Amik, Talisman WTP (PI-2 and PI-5)	160	440	278	765	397	993
	Eugenia WTP (PIII-1, PIII-2, PIII-3 and PIII-4)	0	0	1,093	2,459	1,473	2,946
4	Markdale WTP (PI-1, PI-3, PI-4, and PII-3)	1,227	2,454	2,617	5,234	3,517	7,034
	Kimberley, Amik, Talisman WTP (PI-2 and PI-5)	160	440	278	765	397	993
	Flesherton WTP (PII-1, PII-2, PII-4, PIII-1, PIII-2, PIII-3 and PIII-4)	0	0	1,552	3,104	2,050	4,100
5	Markdale WTP (PI-1, PI-2, PI-3, PI-4, PI-5, PII-1, PII-2, PII-3 and PII-4)	1,387	2,774	3,354	6,708	4,491	8,533
	Eugenia WTP (PIII-1, PIII-2, PIII-3 and PIII-4)	0	0	1,093	2,459	1,473	2,946
6	Markdale WTP (PI-1, PI-2, PI-3, PI-4, PI-5 and PII-3)	1,387	2,774	2,895	5,790	3,914	7,828
	Flesherton WTP (PII-1, PII-2, PII-4, PIII-1, PIII-2, PIII-3 and PIII-4)	0	0	1,552	3,104	2,050	4,100
7	Markdale WTP (PI-1, PI-2, P1-3, PI-4, PI-5, PII-1, PII-2, PII-3, PII-4, PIII-1, PIII-2, PIII-3 and PIII-4)	1,387	2,774	4,447	8,449	5,964	11,332
7A	Markdale WTP (PI-1, PI-2, P1-3, PI-4, PI-5, PII-1, PII-2, PII-3, PII-4, PIII-1, PIII-2, PIII-3 and PIII-4)	1,387	2,774	4,447	8,449	5,964	11,332

m^3/day) at a potential new well location. Future 20 year maximum day water demand is estimated at 5,234 m^3/day, therefore a deficit of 1,535 m^3/day is present compared to current capacity with largest well (Well #3) out of operation.

- Utilize the Kimberley-Amik-Talisman Water Treatment Plant at its current capacity of 1,185 m^3/day. Future 20 year maximum day water demand is estimated at 765 m^3/day.

- New water treatment plant and pumping station constructed in Flesherton including the installation of one (1) or two (2) new high capacity wells (+/- 1,148 m^3/day total)

- New water treatment plant and pumping station constructed in Eugenia including the installation of two (2) new high capacity wells (+/- 2,459 m^3/day total)

Alternative 3 – Markdale Water Treatment Plant, Kimberley-Amik Water Treatment Plant, and <u>New</u> Eugenia Water Treatment Plant

- Utilize existing Isla Street Pump Station (Well #1 – 2,619 m^3/day) and Eliza Street Pump Station (Well #3 – 2,782 m^3/day (upgraded capacity) and Well #4 – 1,080 m^3/day). Available capacity if largest well (Well #3) out of operation is 3,699 m^3/day.

- Construction of one (1) additional water treatment and pumping station in Markdale to pump water into the distribution system including installation of one (1) new high capacity well (+/- 2,453 m^3/day) at a potential new well location. Future 20 year maximum day water demand is estimated at 6,152 m^3/day, therefore a deficit of 2,453 m^3/day is present compared to current capacity with largest well (Well #3) out of operation.

- Utilize the Kimberley-Amik-Talisman Water Treatment Plant at its current capacity of 1,185 m^3/day. Future 20 year maximum day water demand is estimated at 765 m^3/day.

- New water treatment plant and pumping station constructed in Eugenia including the installation of two (2) new high capacity wells (+/- 2,459 m^3/day total)

Alternative 4 – Markdale Water Treatment Plant, Kimberley-Amik Water Treatment Plant, and <u>New</u> Flesherton Water Treatment Plant

- Utilize existing Isla Street Pump Station (Well #1 – 2,619 m^3/day) and Eliza Street Pump Station (Well #3 – 2,782 m^3/day (upgraded capacity) and Well #4 – 1,080 m^3/day). Available capacity if largest well (Well #3) out of operation is 3,699 m^3/day.

- Construction of one (1) additional water treatment and pumping station in Markdale to pump water into the distribution system including installation of one (1) new high capacity well (+/- 1,535 m^3/day) at a potential new well location. Future 20 year maximum day water demand is estimated at 5,234 m^3/day, therefore a deficit of 1,535 m^3/day is present compared to current capacity with largest well (Well #3) out of operation.

- Utilize the Kimberley-Amik-Talisman Water Treatment Plant at its current capacity of 1,185 m^3/day. Future 20 year maximum day water demand is estimated at 765 m^3/day.

- New water treatment plant and pumping station constructed in Flesherton including the installation of two (2) new high capacity wells (+/- 3,104 m^3/day total)

Alternative 5 – Markdale Water Treatment Plant and New Eugenia Water Treatment Plant

- Utilize existing Isla Street Pump Station (Well #1 – 2,619 m^3/day) and Eliza Street Pump Station (Well #3 – 2,782 m^3/day (upgraded capacity) and Well #4 – 1,080 m^3/day). Available capacity if largest well (Well #3) out of operation is 3,699 m^3/day.

- Construction of two (2) additional water treatment and pumping stations in Markdale to pump water into the distribution system including installation of two (2) new high capacity wells (+/- 1,505 m^3/day, one (1) at each station) at two (2) potential new well locations. Future 20 year maximum day water demand is estimated at 6,708 m^3/day, therefore a deficit of 3,009 m^3/day (2 x 1,505 m^3/day) is present compared to current capacity with largest well (Well #3) out of operation.

- New water treatment plant and pumping station constructed in Eugenia including the installation of two (2) new high capacity wells (+/- 2,459 m^3/day total)

- The Kimberley-Amik-Talisman Water Treatment Plant would be decommissioned, however the existing water storage and booster pumping capabilities would remain in operation.

Alternative 6 – Markdale Water Treatment Plant and New Flesherton Water Treatment Plant

- Utilize existing Isla Street Pump Station (Well #1 – 2,619 m^3/day) and Eliza Street Pump Station (Well #3 – 2,782 m^3/day (upgraded capacity) and Well #4 – 1,080 m^3/day). Available capacity if largest well (Well #3) out of operation is 3,699 m^3/day.

- Construction of one (1) additional water treatment and pumping station in Markdale to pump water into the distribution system including installation of one (1) new high capacity well (+/- 2,091 m^3/day) at a potential new well location. Future 20 year maximum day water demand is estimated at 5,790 m^3/day, therefore a deficit of 2,091 m^3/day is present compared to current capacity with largest well (Well #3) out of operation.

- New water treatment plant and pumping station constructed in Flesherton including the installation of two (2) new high capacity wells (+/- 3,104 m^3/day total)

- The Kimberley-Amik-Talisman Water Treatment Plant would be decommissioned; however the existing water storage and booster pumping capabilities would remain in operation.

Alternative 7 – Markdale Water Treatment Plant

- Utilize existing Isla Street Pump Station (Well #1 – 2,619 m^3/day) and Eliza Street Pump Station (Well #3 – 2,782 m^3/day (upgraded capacity) and Well #4 – 1,080 m^3/day). Available capacity if largest well (Well #3) out of operation is 3,699 m^3/day.

- Construction of two (2) additional water treatment and pumping stations in Markdale to pump water into the distribution system including installation of two (2) new high capacity wells (+/- 2,375 m^3/day, one (1) at each station) at two (2) potential new well locations. Future 20 year

maximum day water demand is estimated at 8,449 m^3/day, therefore a deficit of 4,750 m^3/day (2 x 2,375 m^3/day) is present compared to current capacity with largest well (Well #3) out of operation.

- The Kimberley-Amik-Talisman Water Treatment Plant would be decommissioned; however the existing water storage and booster pumping capabilities would remain in operation.

Alternative 7A – Markdale Water Treatment Plant (Includes proposed trunk watermain connection west of existing Kimberley WTP)

- Utilize existing Isla Street Pump Station (Well #1 – 2,619 m^3/day) and Eliza Street Pump Station (Well #3 – 2,782 m^3/day (upgraded capacity) and Well #4 – 1,080 m^3/day). Available capacity if largest well (Well #3) out of operation is 3,699 m^3/day.

- Construction of two (2) additional water treatment and pumping stations in Markdale to pump water into the distribution system including installation of two (2) new high capacity wells (+/- 2,375 m^3/day, one (1) at each station) at two (2) potential new well locations. Future 20 year maximum day water demand is estimated at 8,449 m^3/day, therefore a deficit of 4,750 m^3/day (2 x 2,375 m^3/day) is present compared to current capacity with largest well (Well #3) out of operation.

- The Kimberley-Amik-Talisman Water Treatment Plant would be decommissioned; however the existing water storage and booster pumping capabilities would remain in operation.

6.2 WATER STORAGE FACILITIES

Eight (8) alternatives for implementation of new water storage facilities for the phased water servicing under the Master Plan were reviewed.

The following **Table 6.2** provides a summary of the potential new water storage facilities for all eight (8) alternatives. All alternatives include the decommissioning of the existing Markdale Water Standpipe, whereby at least one (1) option for a new Markdale water storage facility must be completed.

As per **Table 6.2**, in Markdale for example, there are six (6) shown option sizes for a new water storage facility based on the sub-phases being serviced. Additionally, for Water Treatment Alternative No. 1 for example, only one (1) new water storage facility is proposed i.e. Option No. 2. For Water Treatment Alternative No. 2, three (3) water storage facilities are proposed, which include Option No.1 in Markdale, Option No. 9 in Flesherton and Option No. 7 in Eugenia.

Figure 6.2 provides a map of the proposed locations for new water storage facilities at Markdale, Flesherton and Eugenia. The proposed locations for the new water storage facilities are at the highest elevations within each specific area. The proposed water storage facility type for the options presented for Markdale is for a glass-fused to steel elevated water storage tank, which would sit on top of a concrete pedestal. For Flesherton, the proposed water storage facility type for the options presented is also for a glass-fused to steel water storage tank, except it would be an on-ground tank as opposed to an elevated tank. For Eugenia, the proposed water storage facility type for the options presented is for a glass-fused to steel elevated water storage tank, similar to Markdale.

TABLE 6.2
SUMMARY OF POTENTIAL NEW WATER STORAGE FACILITIES (ALL ALTERNATIVES)

WATER AND WASTEWATER SERVICING MASTER PLAN
MARKDALE-FLESHERTON-KIMBERLEY-AMIK-EUGENIA-BEAVER VALLEY
MUNICIPALITY OF GREY HIGHLANDS

111-13229-00

Option #	Water Storage Facility	Type of Storage	Design Year	Top Water Elevation (m)	Top of Emergency Storage and Fire Storage Elevation (m)	Bottom of Fire Storage Elevation (m)	Base Elevation (m)	Total Usable Storage (m^3)	Fire Storage (m^3)
1	Markdale (PI-1, PI-2, PI-3, PI-4, PI-5, PII-1, PII-2, PII-3, PII-4, PIII-1, PIII-2, PIII-3 and PIII-4)	New Glass-Fused - To-Steel Elevated Storage	50	488.00	478.12	464.06	436.65	6511	2376
		New Glass-Fused - To-Steel Elevated Storage	20	488.00	478.12	464.06	436.65	5192	2041
2	Markdale (PI-1, PI-3, PI-4, PII-1, PII-2, PII-3, PII-4, PIII-1, PIII-2, PIII-3 and PIII-4)	New Elevated Glass-Fused -To-Steel Tank	50	488.00	478.12	464.06	436.65	6275	2376
		New Elevated Glass-Fused -To-Steel Tank	20	488.00	478.12	464.06	436.65	5027	2041
3	Markdale (PI-1, PI-2, PI-3, PI-4, PI-5, PII-1, PII-2, PII-3 and PII-4)	New Elevated Glass-Fused -To-Steel Tank	50	488.00	478.12	464.06	436.65	5218	2041
		New Elevated Glass-Fused -To-Steel Tank	20	488.00	478.12	464.06	436.65	4648	2041
4	Markdale (PI-1, PI-3, PI-4 PII-1, PII-2, PII-3 and PII-4)	New Glass-Fused - To-Steel Elevated Storage	50	488.00	478.12	464.06	436.65	5110	2041
		New Glass-Fused - To-Steel Elevated Storage	20	488.00	478.12	464.06	436.65	4069	1717
5	Markdale (PI-1, PI-2, PI-3, PI-4, PI-5 and PII-3)	New Elevated Glass-Fused -To-Steel Tank	50	488.00	478.12	464.06	436.65	4998	2041
		New Elevated Glass-Fused -To-Steel Tank	20	488.00	478.12	464.06	436.65	3956	1717
6	Markdale (PI-1, PI-3, PI-4 and PII-3)	New Elevated Glass-Fused -To-Steel Tank	50	488.00	478.12	464.06	436.65	4750	2041
		New Elevated Glass-Fused -To-Steel Tank	20	488.00	478.12	464.06	436.65	3782	1717
7	Eugenia (PIII-1, PIII-2, PIII-3 and PIII-4)	New Elevated Glass-Fused -To-Steel Tank	50	488.00	478.12	464.06	450.00	1911	792
		New Elevated Glass-Fused -To-Steel Tank	20	488.00	478.12	464.06	450.00	1623	684
8	Flesherton (PII-1, PII-2, PII-4, PIII-1, PIII-2, PIII-3 and PIII-4)	New On-Ground Glass-Fused -To-Steel Tank	50	488.00	482.02	478.00	478.00	2577	1037
		New On-Ground Glass-Fused -To-Steel Tank	20	488.00	482.29	478.00	478.00	2095	900
9	Flesherton (PII-1, PII-2, and PII-4)	New On-Ground Glass-Fused -To-Steel Tank	50	488.00	482.90	478.00	478.00	1162	569
		New On-Ground Glass-Fused -To-Steel Tank	20	488.00	483.31	478.00	478.00	1070	569

	Number of New Water Storage Facilities Required	Option #
Alternative #1	1	2
Alternative #2	3	6, 9 and 7
Alternative #3	2	4 and 7
Alternative #4	2	6 and 8
Alternative #5	2	3 and 7
Alternative #6	2	5 and 8
Alternative #7	1	1
Alternative #7A	1	1

EXISTING KIMBERLEY - AMIK - TALISMAN WATER STORAGE FACILITY

EXISTING MARKDALE WATER STORAGE FACILITY AND PROPOSED LOCATION OF THE NEW MARKDALE ELEVATED WATER STORAGE FACILITY (BASE 436.65 m)

PROPOSED LOCATION OF THE NEW EUGENIA ELEVATED WATER STORAGE FACILITY (BASE 450 m)

PROPOSED LOCATION OF THE FLESHERTON ON GROUND WATER STORAGE FACILITY (BASE 478 m)

LEGEND

- MUNICIPAL BOUNDARY
- PROPERTY PARCEL
- WATERBODY
- RIVER/STREAM
- MUNICIPAL WATER/SEWAGE FACILITIES
- EXISTING WATER STORAGE FACILITY
- PROPOSED WATER STORAGE FACILITY
- AREAS WITH ELEVATION >= 450 m
- Highest Elevation in Phase (m)
- Lowest Elevation in Phase (m)

POTENTIAL LOCATION FOR NEW WATER STORAGE FACILITIES
WATER & WASTEWATER SERVICING MASTER PLAN
MUNICIPALITY OF GREY HIGHLANDS

PROJECT:	111-13229-00
DATE:	MAY 2016
SCALE:	1:65,000
DRAWN:	JET
APPROVED:	CW

WSP
1450 1st AVENUE WEST, SUITE 101
OWEN SOUND, ONTARIO CANADA N4K 6W2
PHONE: 519 376-7612 - FAX 519 376-8008 - WWW.WSPGROUP.COM

FIGURE: 6.2

All of the new water storage facility options are based on a Top Water Elevation of 488.00 m. As well, each water storage facility option allows for 40 PSI static pressure at all locations within the Master Plan service area that are below 450.00 m elevation, when the water level is at the top of the emergency storage level. Additionally, 20 PSI static pressure should be available under the same parameters at a water level at the bottom of the fire storage level. Some areas, specifically surrounding Eugenia Lake (Refer to **Figure 6.2**) have elevations acceding 450.0 m in elevation. These areas would not be able to be provided 20 PSI at the bottom of the fire storage level.

Tables are provided in **Appendix F** showing the proposed water storage facilities for each water treatment alternative.

For Water Treatment Alternatives 1 to 4, the existing in-ground water storage facility at Kimberley is proposed to be maintained in operation. Refer to **Appendix G** for sizing calculations for the various proposed water storage facilities based on the MOECC guidelines for fire storage, equalization storage and emergency storage.

6.3 FIRE FLOW WATER DISTRIBUTION NETWORK MODELLING

Fire flow hydraulic modelling was completed for three (3) scenarios for the proposed communal water system under the Master Plan.

A summary of the output results from the hydraulic modelling (for select nodal locations only for each scenario), are provided in **Appendix H**. The three (3) hydraulic modelling scenarios completed are as follows:

Alternative 2

- New water storage reservoirs provided in:
    1. Markdale
    2. Flesherton
    3. Eugenia
- The existing Kimberley inground reservoir and booster pumps were included in the model.
- 300 mm dia. trunk watermain connection to all locations (including Kimberley, Amik and Talisman).

Alternative 6

- New water storage reservoirs provided in:
    1. Markdale
    2. Flesherton

- The Eugenia area was included in the hydraulic model, however a new water storage facility in Eugenia was not included.
- The existing Kimberley inground reservoir and booster pumps were included in the model.
- 300 mm dia. trunk watermain connection to all locations (including Kimberley, Amik and Talisman).

Alternative 6A

- New water storage reservoirs provided in:
    1. Markdale
    2. Flesherton
- The Eugenia area was not included in the hydraulic model.
- The existing Kimberley inground reservoir and booster pumps were included in the model.
- 300 mm dia. trunk watermain connection to all locations (including Kimberley, Amik and Talisman).

A hydraulic modelling output map for **Alternative 6.A** only is provided in **Appendix H**. Nodal locations showing fire flows are similar for **Alternative 2** and **Alternative 6** in reference to the modelling output for **Alternative 6A**.

Alternative 2

- Fire flows in Markdale ranged from 6,100 L/min. (1,342 IGPM) at Node J-59 on Lawler Drive (at Main Street), to 11,500 L/min. (2,530 IGPM) at Node J-5 at the south end of Toronto Street.
- In Flesherton, fire flows ranged from 2,200 L/min. (616 IGPM) at Node J-100 on Campbell Street to 3,800 L/min. (836 IGPM) at Node J-62 located downtown at Collingwood Street and Beachell Street.
- In the Beaver Valley area, fire flows were much lower ranging from 1,800 L/min. (396 IGPM) at Node J-187 at the west end of Mary B's Lane to 2,500 L/min. (550 IGPM) at the intersection of Beaver Trail and B.V. River Road (adjacent to Ski Club).
- Similar low fire flow values were seen for Kimberley-Amik-Talisman, with 1,600 L/min. (352 IGPM) found at Node J-211 in downtown Kimberley, 2,700 L/min. (594 IGPM) at Node J-221 at the west end of Amik Crescent, and 1,600 L/min. (352 IGPM) at Node J-260, adjacent to Talisman Mountain Resort.
- In the hamlet of Eugenia, the downtown fire flow was found to be at approximately 2,000 L/min. (462 IGPM).

Alternative 6

- No new water storage reservoir in Eugenia was included in the hydraulic modelling.
- Fire flow values remained relatively the same in Markdale and Amik, due to the close proximity to the new proposed water storage reservoir in Markdale and the existing water storage and booster pumping location in Amik.
- Fire flows in Flesherton, Kimberley, Talisman, Beaver Valley and Eugenia all reduced significantly, many to below 1,000 L/min. (220 IGPM).

Alternative 6A

- The hamlet of Eugenia and the surrounding Eugenia Lake area (Phase P3-1 to P3-4) was not included in the hydraulic modelling.
- Fire flows in Markdale increased in comparison to **Alternative 2**.
- Fire flows at Node J-59 on Lawler Drive increased to 8,500 L/min. (1,670 IGPM).
- Fire flows at Node J-5 on Main Street at the south end of Toronto Street increased to 12,600 L/min. (2,772 IGPM)
- Fire flows at Node J-38 at the intersection of Toronto Street and Main Street (downtown) increased from 10,400 L/min. (2,288 IGPM) to 14,500 L/min. (3,190 IGPM).
- In Flesherton, fire flows increased to 2,500 L/min. (550 IGPM) at Node J-100 on Campbell Street and to 5,500 L/min. (1,210 IGPM) at Node J-62 downtown at Collingwood Street and Beachell Street.
- In the Beaver Valley area, fire flows increased slightly from 1,965 L/min. (432 IGPM) at Node J-187 at the west end of Mary B's Lane and to 2,700 L/min. (593 IGPM) at the intersection of Beaver Trail and B.V. River Road (adjacent to Ski Club).
- A large increase in fire flow was seen for Kimberley, with 2,700 L/min. (593 IGPM), found at Node J-211 in downtown Kimberley.
- A decreased value was found at the west end of Amik Crescent at approximately 2,354 L/min. (518 IGPM).
- A significant increase in fire flow was seen at Node J-260, adjacent to the Talisman Mountain Resort, at 3,300 L/min. (726 IGPM).

Based on the hydraulic modelling completed, it can be seen that **Alternative 6A** produces the highest fire flow capabilities for all areas including Markdale, Flesherton, Kimberley-Amik-Talisman and Beaver Valley, without including the hamlet of Eugenia or Eugenia Lake (Phase P3-1 to P3-4). For **Alternative 2**, with Eugenia included, the addition of the Eugenia water storage facility does provide for better fire flows in the Flesherton, Beaver Valley, Kimberley-Talisman area, compared to **Alternative 6**. However, a

minimum of 500 IGPM can still not be met in certain areas of Beaver Valley, Kimberley, Talisman and within the hamlet of Eugenia. As per **Alternative 6A**, all fire flow nodes as referenced in **Appendix H** are in excess of 500 IGPM, except for Node J-187 at the west end of Mary B's Lane.

6.4 WATER DISTRIBUTION AREAS

Eight (8) alternatives for implementation of water distribution areas for the phased water servicing under the Master Plan were reviewed.

Figures are provided in **Appendix I** showing details of the proposed water distribution areas within the overall communal water system for the Master Plan. Please note that Alternative 7 and Alternative 7A are both the same except Alternative 7A includes a proposed trunk watermain connection west of existing Kimberley WTP. Each water distribution area under each alternative is serviced by the shown water treatment plant (either existing or proposed).

Alternative 1 – Markdale Water Treatment Plant and Kimberley-Amik-Talisman Water Treatment Plant:

- Provide water servicing from Markdale to Flesherton and to Beaver Valley area, Flesherton to Eugenia, and from Eugenia to Kimberley. This service area would require 300 mm dia. trunk along Highway 10, Grey Road 4, Grey Road 13, Grey Road 12 and Grey Road 30. The service area would float on the proposed new Markdale water storage facility where pressure reducing valves would be required at the escarpment near Bowles Bluff Road (Phase P1-3), and along Grey Road 13 (Phase P3-4).

- A booster pumping station would be required to be constructed in Kimberley at a low location, after the pressure reducing valves, to boost pressure to the water treatment plant.

- The existing Kimberley water treatment plant, water storage and booster station would be utilized. Grey Road 13 and 7 (Phase P1-2) through Kimberley and along Lanktree Drive and Talisman Blvd (to the existing plant) and along Grey Road 30 (Phase P1-5) would have 300 mm dia. trunk watermain required, servicing the low lands of the Beaver Valley River. The Phase P1-2 service area would require pressure reducing valves.

- Provide 200 mm dia. watermain constructed across the existing easement from the intersection of Bowles Bluff Road and Windy Lane Drive to Beaver Trail.

Alternative 2 – Markdale Water Treatment Plant, Kimberley-Amik Water Treatment Plant, <u>New</u> Flesherton Water Treatment Plant and <u>New</u> Eugenia Water Treatment Plant

- Provide water servicing from Markdale to the east end of Phase P2-3 and to Beaver Valley area (Phase P1-3). This service area would require 300 mm dia. trunk watermain along Highway 10, Grey Road 12 and Grey Road 30. The service area would float on the proposed new Markdale water storage facility where pressure reducing valves would be required at the escarpment near Bowles Bluff Road (Phase P1-3).

- A booster pumping station would be required to be constructed in Kimberley at a low location, after the pressure reducing valves, to boost pressure to the water treatment plant.

- Provide water servicing from Flesherton to the west end of Phase P2-4 and north end of Phase P2-2. The service area would float on the proposed new Flesherton water storage facility. This service area would require 300 mm dia. trunk watermain along Highway 10 and on Grey Road 4. 300 mm dia. would also be required from Highway 10 to the proposed location of the new Flesherton water storage facility.

- Provide water servicing from Eugenia to the south end of Phase P3-3, to the north end of Phase P3-4 and to Phase P3-2 (homes surrounding Eugenia Lake). The service area would float on the proposed new Eugenia water storage facility. This service area would require 300 mm dia. trunk watermain along Grey Road 13. Pressure reducing valves would be required along Grey Road 13 in Phase P3-4. 300 mm dia. would also be required from Grey Road 13 to the proposed location of the new Eugenia water storage facility.

- The existing Kimberley water treatment plant, water storage and booster station would be utilized. Grey Road 13 and 7 (Phase P1-2) through Kimberley and along Lanktree Drive and Talisman Blvd (to the existing plant) and along Grey Road 30 (Phase P1-5) would have 300 mm dia. trunk watermain required, servicing the low lands of the Beaver Valley River. The Phase P1-2 service area would require pressure reducing valves.

- Provide 200 mm dia. watermain constructed across the existing easement from the intersection of Bowles Bluff Road and Windy Lane Drive to Beaver Trail.

Alternative 3 – Markdale Water Treatment Plant, Kimberley-Amik Water Treatment Plant, and <u>New</u> Eugenia Water Treatment Plant

- Provide water servicing from Markdale to Flesherton and to Beaver Valley area (Phase P1-3). This service area would require 300 mm dia. trunk watermain along Highway 10, Grey Road 4, Grey Road 12 and Grey Road 30. The service area would float on the proposed new Markdale water storage facility where pressure reducing valves would be required at the escarpment near Bowles Bluff Road (Phase P1-3).

- A booster pumping station would be required to be constructed in Kimberley at a low location, after the pressure reducing valves, to boost pressure to the water treatment plant.

- Provide water servicing from Eugenia to the south end of Phase P3-3, to the north end of Phase P3-4 and to Phase P3-2 (homes surrounding Eugenia Lake). The service area would float on the proposed new Eugenia water storage facility. This service area would require 300 mm dia. trunk watermain along Grey Road 13. Pressure reducing valves would be required along Grey Road 13 in Phase P3-4. 300 mm dia. would also be required from Grey Road 13 to the proposed location of the new Eugenia water storage facility.

- The existing Kimberley water treatment plant, water storage and booster station would be utilized. Grey Road 13 and 7 (Phase P1-2) through Kimberley and along Lanktree Drive and Talisman Blvd (to the existing plant) and along Grey Road 30 (Phase P1-5) would have 300 mm dia. trunk watermain required, servicing the low lands of the Beaver Valley River. The Phase P1-2 service area would require pressure reducing valves.

- Provide 200 mm dia. watermain constructed across the existing easement from the intersection of Bowles Bluff Road and Windy Lane Drive to Beaver Trail.

Alternative 4 – Markdale Water Treatment Plant, Kimberley-Amik Water Treatment Plant, and New Flesherton Water Treatment Plant

- Provide water servicing from Markdale to the east end of Phase P2-3 and to Beaver Valley area (Phase P1-3). This service area would require 300 mm dia. trunk watermain along Highway 10, Grey Road 12 and Grey Road 30. The service area would float on the proposed new Markdale water storage facility where pressure reducing valves would be required at the escarpment near Bowles Bluff Road (Phase P1-3).

- A booster pumping station would be required to be constructed in Kimberley at a low location, after the pressure reducing valves, to boost pressure to the water treatment plant.

- Provide water servicing from Flesherton to the west end of Phase P2-4 and through to Eugenia to the south end of Phase P3-3, to the north end of Phase P3-4 and to Phase P3-2 (homes surrounding Eugenia Lake). The service area would float on the proposed new Flesherton water storage facility. This service area would require 300 mm dia. trunk watermain along Highway 10, Grey Road 4 and Grey Road 13. Pressure reducing valves would be required along Grey Road 13 in Phase P3-4. 300 mm dia. would also be required from Highway 10 to the proposed location of the new Flesherton water storage facility.

- The existing Kimberley water treatment plant, water storage and booster station would be utilized. Grey Road 13 and 7 (Phase P1-2) through Kimberley and along Lanktree Drive and Talisman Blvd (to the existing plant) and along Grey Road 30 (Phase P1-5) would have 300 mm dia. trunk watermain required, servicing the low lands of the Beaver Valley River. The Phase P1-2 service area would require pressure reducing valves.

- Provide 200 mm dia. watermain constructed across the existing easement from the intersection of Bowles Bluff Road and Windy Lane Drive to Beaver Trail.

Alternative 5 – Markdale Water Treatment Plant and New Eugenia Water Treatment Plant

- Provide water servicing from Markdale to Flesherton and to the Beaver Valley area into Kimberley. This service area would require 300 mm dia. trunk watermain along Highway 10, Grey Road 4, Grey Road 13, Grey Road 7, Grey Road 12, Grey Road 30 and along Lanktree Drive and Talisman Blvd (to the existing Kimberley plant). The service area would float on the proposed new Markdale water storage facility where pressure reducing valves would be required at the escarpment near Bowles Bluff Road (Phase P1-3).

- A booster pumping station would be required to be constructed in Kimberley at a low location, after the pressure reducing valves, to boost pressure to the water treatment plant.

- The Kimberley-Amik-Talisman Water Treatment Plant would be decommissioned; however the existing water storage and booster pumping capabilities would remain in operation.

- Provide water servicing from Eugenia to the south end of Phase P3-3, to the north end of Phase P3-4 and to Phase P3-2 (homes surrounding Eugenia Lake). The service area would float on the

proposed new Eugenia water storage facility. This service area would require 300 mm dia. trunk watermain along Grey Road 13. Pressure reducing valves would be required along Grey Road 13 in Phase P3-4. 300 mm dia. would also be required from Grey Road 13 to the proposed location of the new Eugenia water storage facility.

- Provide 200 mm dia. watermain constructed across the existing easement from the intersection of Bowles Bluff Road and Windy Lane Drive to Beaver Trail.

Alternative 6 – Markdale Water Treatment Plant and New Flesherton Water Treatment Plant

- Provide water servicing from Markdale to the east end of Phase P2-3 and to the Beaver Valley area into Kimberley. This service area would require 300 mm dia. trunk watermain along Highway 10, Grey Road 13, Grey Road 7, Grey Road 12, Grey Road 30 and along Lanktree Drive and Talisman Blvd (to the existing Kimberley plant). The service area would float on the proposed new Markdale water storage facility where pressure reducing valves would be required at the escarpment near Bowles Bluff Road (Phase P1-3).

- A booster pumping station would be required to be constructed in Kimberley at a low location, after the pressure reducing valves, to boost pressure to the water treatment plant.

- The Kimberley-Amik-Talisman Water Treatment Plant would be decommissioned; however the existing water storage and booster pumping capabilities would remain in operation.

- Provide water servicing from Flesherton to the west end of Phase P2-4 and through to Eugenia to the south end of Phase P3-3, to the north end of Phase P3-4 and to Phase P3-2 (homes surrounding Eugenia Lake). The service area would float on the proposed new Flesherton water storage facility. This service area would require 300 mm dia. trunk watermain along Highway 10, Grey Road 4 and Grey Road 13. Pressure reducing valves would be required along Grey Road 13 in Phase P3-4. 300 mm dia. would also be required from Highway 10 to the proposed location of the new Flesherton water storage facility.

- Provide 200 mm dia. watermain constructed across the existing easement from the intersection of Bowles Bluff Road and Windy Lane Drive to Beaver Trail.

Alternative 7 – Markdale Water Treatment Plant

- Provide water servicing from Markdale to all areas within the Master Plan service area. This service area would require 300 mm dia. trunk watermain along Highway 10, Grey Road 4, Grey Road 13, Grey Road 7, Grey Road 12, Grey Road 30 and along Lanktree Drive and Talisman Blvd (to the existing Kimberley plant). The service area would float on the proposed new Markdale water storage facility where pressure reducing valves would be required at the escarpment near Bowles Bluff Road (Phase P1-3) and along Grey Road 13 in Phase P3-4.

- A booster pumping station would be required to be constructed in Kimberley at a low location, after the pressure reducing valves, to boost pressure to the water treatment plant.

- The Kimberley-Amik-Talisman Water Treatment Plant would be decommissioned; however the existing water storage and booster pumping capabilities would remain in operation.

- Provide 200 mm dia. watermain constructed across the existing easement from the intersection of Bowles Bluff Road and Windy Lane Drive to Beaver Trail.

Alternative 7A – Markdale Water Treatment Plant (Includes proposed trunk watermain connection west of existing Kimberley WTP)

- Provide water servicing from Markdale to all areas within the Master Plan service area. This service area would require 300 mm dia. trunk watermain along Highway 10, Grey Road 4, Grey Road 13, Grey Road 7, Grey Road 12, Grey Road 30 and along Lanktree Drive and Talisman Blvd (to the existing Kimberley plant). The service area would float on the proposed new Markdale water storage facility where pressure reducing valves would be required at the escarpment near Bowles Bluff Road (Phase P1-3) and along Grey Road 13 in Phase P3-4.

- A booster pumping station would be required to be constructed in Kimberley at a low location, after the pressure reducing valves, to boost pressure to the water treatment plant.

- The Kimberley-Amik-Talisman Water Treatment Plant would be decommissioned; however the existing water storage and booster pumping capabilities would remain in operation.

- Alternative 7 and Alternative 7A are both the same except Alternative 7A includes a proposed 300 mm dia. trunk watermain from the intersection of Grey Road 30 and 7th Line, travelling north on 7th Line, west on Sideroad 7A, across the top of the escarpment to the existing Kimberley distribution system.

- Provide 200 mm dia. watermain constructed across the existing easement from the intersection of Bowles Bluff Road and Windy Lane Drive to Beaver Trail.

6.5 WASTEWATER TREATMENT

Four (4) alternatives for implementation of upgrades to the three (3) existing wastewater plants (Markdale, Flesherton and Amik-Talisman) under the Master Plan were reviewed. The proposed four (4) alternatives for upgrading the plants match up exactly with the proposed four (4) alternatives for the sanitary sewer areas and sewage pumping station as discussed in **Section 6.6**. Optimization of the existing Markdale Wastewater Treatment is discussed in **Section 8.0**. Under the Draft 2012 Master Plan, this alternative for upgrading the Markdale Wastewater Treatment Plant was not included. The following information is based on information from the Draft 2012 Master Plan, which for all alternatives, provided for expansion of the existing Markdale Wastewater Treatment Plant.

The following **Table 6.5** provides a summary of the design sewage flows for the various wastewater treatment alternatives, including average day sewage flow for existing, future 20 year and future 50 year. Information in this table was provided from **Table 5.4**. Future 20 year average day sewage flows were utilized in formulating the below information.

Alternative 1 – Markdale Wastewater Treatment Plant, Amik-Talisman Wastewater Treatment Plant, Flesherton Wastewater Treatment Plant

- Expand the existing Markdale Wastewater Treatment Plant to increase the current rated capacity of 1,122 m^3/day to the future 20 year average day sewage flow estimated at 2,398 m^3/day (highest 20 year flow required).

TABLE 6.5
SUMMARY OF DESIGN SEWAGE FLOWS - WASTEWATER TREATMENT PLANT ALTERNATIVES

WATER AND WASTEWATER SERVICING MASTER PLAN
MARKDALE-FLESHERTON-KIMBERLEY-AMIK-EUGENIA-BEAVER VALLEY
MUNICIPALITY OF GREY HIGHLANDS

111-13229-00

Alternative	Wastewater Treatment Plants	Existing Sewage Flow (m^3/day)	20 Year Flow (m^3/day)	50 Year Flow (m^3/day)
1	Markdale WWTP (Includes PI-1, PI-3, PI-4 and PII-3)	988	2,398	3,207
	Amik WWTP (Includes PI-2, PI-5, PIII-1, PIII-2, PIII-3 and PIII-4)	217	1,530	2,039
	Flesherton WWTP (Includes PII-1, PII-2 and PII-4)	174	459	577
2	Markdale WWTP (Includes PI-1, PI-3, PI-4 and PII-3)	988	2,398	3,207
	Amik WWTP (Includes PI-2, PI-5 and PIII-4)	217	501	652
	Flesherton WWTP (Includes PII-1, PII-2, PII-4, PIII-1, PIII-2 and PIII-3)	174	1,488	1,964
3	Markdale WWTP (Includes PI-1 and PII-3)	988	1,971	2,631
	Amik WWTP (Includes PI-2, P1-3, PI-5 and PIII-4)	217	799	1,054
	Flesherton WWTP (Includes PII-1, PII-2, PII-4, PIII-1, PIII-2 and PIII-3)	174	1,488	1,964
4	Markdale WWTP (Includes PI-1 and PII-3)	988	1,971	2,631
	Amik WWTP (Includes PI-2, P1-3, PI-5, PIII -1, PIII-2 and PIII-4)	217	1,811	2,418
	Flesherton WWTP (Includes PII-1, PII-2 and PII-4)	174	459	577

- Expand the existing Amik-Talisman Wastewater Treatment Plant to increase the current rated capacity of 249 m^3/day to 1,811 m^3/day (highest 20 year flow required under **Alternative 4**). 20 year flow required for **Alternative 1** is 1,530 m^3/day.

- The existing Flesherton Wastewater Treatment Plant at its current rated capacity of 419 m^3/day should be optimized to allow for additional treatment capacity to meet the future 20 year average day sewage flow estimated at 459 m^3/day.

Alternative 2 - Markdale Wastewater Treatment Plant, Amik-Talisman Wastewater Treatment Plant, Flesherton Wastewater Treatment Plant

- Expand the existing Markdale Wastewater Treatment Plant to increase the current rated capacity of 1,122 m^3/day to the future 20 year average day sewage flow estimated at 2,398 m^3/day (same as under **Alternative #1**).

- Expand the existing Amik-Talisman Wastewater Treatment Plant to increase is existing treatment capacity of 249 m^3/day to 431 m^3/day, as previous approved by Certificate of Approval. Provide optimization of existing future wastewater treatment plant capacity of 431 m^3/day, to allow for 20 year flow of 501 m^3/day**.**

- Expand the existing Flesherton Wastewater Treatment Plant to increase its existing treatment capacity of 419 m^3/day to 1,488 m^3/day (highest 20 year flow required).

Alternative 3 – Markdale Wastewater Treatment Plant, Amik-Talisman Wastewater Treatment Plant, Flesherton Wastewater Treatment Plant

- Expand the existing Markdale Wastewater Treatment Plant to increase its existing treatment capacity of 1,122 m ^{3}/day to 2,398 m^3/day (same as under **Alternative 1 and 2**). 20 year flow required for this alternative is 1,971 m^3/day.

- Expand the existing Amik-Talisman Wastewater Treatment Plant to increase its existing treatment capacity of 249 m^3/day to 1,811 m^3/day (highest 20 year flow required under **Alternative 4**). 20 year flow required for this alternative is 799 m^3/day.

- Expand the existing Flesherton Wastewater Treatment Plant to increase its existing treatment capacity of 419 m^3/day to 1,488 m^3/day (highest 20 year flow required)

Alternative 4 – Markdale Wastewater Treatment Plant, Amik-Talisman Wastewater Treatment Plant, Flesherton Wastewater Treatment Plant

- Expand the existing Markdale Wastewater Treatment Plant to increase its existing treatment capacity of 1,122 m^3/day to 2,398 m^3/day (same as under **Alternative 1, 2 and 3**). 20 year flow required for this alternative is 1,971 m^3/day.

- Expand the existing Amik-Talisman Wastewater Treatment Plant to increase its existing treatment capacity of 249 m^3/day to 1,811 m^3/day (highest 20 year flow required).

- The existing Flesherton Wastewater Treatment Plant at its current rated capacity of 419 m^3/day should be optimized to allow for additional treatment capacity to meet the future 20 year average day sewage flow estimated at 459 m^3/day.

6.6 SANITARY SEWER AREAS AND SEWAGE PUMPING STATIONS

Four (4) alternatives with the implementation of sanitary sewer collection areas for the phased water servicing under the Master Plan were reviewed. Figures are provided in **Appendix J** showing details of the proposed sanitary sewer collection areas in the overall communal sanitary sewer system for the Master Plan.

It should be noted that for **Alternative 3**, Phase P1-4 has not been included. For **Alternative 4**, Phase P1-4 and Phase 3-3 were not included.

Alternative 1 – Markdale Wastewater Treatment Plant, Amik-Talisman Wastewater Treatment Plant, Flesherton Wastewater Treatment Plant

Markdale Wastewater Treatment Plant

- A sewage pumping station (SPS#1) would be required at the east end of Phase P1-3, at the intersection of Beaver Trail and Grey Road 30 to pump collected sewage from the Beaver Valley Ski Club and lower beaver valley area. Sewage would be pumped by forcemain up the escarpment to a location near the intersection of Grey Road 30 and Bowles Bluff Road.

- Sewage would then flow by gravity to the intersection of Bowles Bluff Road and Windy Lane Drive.

- At the intersection of Bowles Bluff Road and Windy Lane Drive, a second sewage pumping station (SPS#2) would be located approximately. Additional sewage by gravity flow would be collected at this location from Windy Lane Drive. As well, additional sewage would be collected by gravity from the Blue Jay Cresent subdivision and along the corridor from the intersection of Grey Road 30 and Grey Road 12, back to the sewage pumping station (SPS#2) at the intersection of Bowles Bluff Road and Windy Lane Drive.

- All collected sewage at the Bowles Bluff Road and Windy Lane Drive station (SPS#2) would be pumped by forcemain to the intersection of Grey Road 30 and Grey Road 12, whereby sewage would flow be gravity the remaining distance to Markdale for connection into the existing sanitary sewer system.

- For Phase P2-3, sewage would be pumped by forcemain utilizing individual low pressure grinder pumps for all service connections to the existing sanitary sewer system in Markdale.

- For Phase P1-1A, sewage would be pumped by forcemain utilizing individual low pressure grinder pumps.

Amik-Talisman Wastewater Treatment Plant

- For Phase P3-3, sewage would be pumped by forcemain utilizing individual low pressure grinder pumps for all service connections to approximately the intersection of Grey Road 13 and the 8th Concession.

- Sewage within the Hamlet of Eugenia and around Eugenia Lake would flow by gravity to sewage pumping station (SPS#3), located near Grey Road 13 and the 8th Concession. The sewage pumping station (SPS#3) would pump sewage by forcemain to the intersection of Grey Road 13 and 12th Concession B (Phase P3-4 adjacent).

- The collected sewage and sewage in Phase P3-4 would flow be gravity to the intersection of Grey Road 30 and Grey Road 13.

- For Phase P1-5, sewage would be pumped by forcemain utilizing individual low pressure grinder pumps for all service connections to the intersection of Grey Road 30 and Grey Road 13.

- From the intersection Grey Road 30 and Grey Road 13, all sewage would flow by gravity to approximately the intersection of Grey Road 13 and Side Road 7B.

- From the intersection of Grey Road 13 and Side Road 7B, a sewage pumping station (SPS#4) would pump the sewage by forcemain to the Amik-Talisman Wastewater Treatment Plant.

Flesherton Wastewater Treatment Plant

- For Phase P2-4, sewage would be pumped by forcemain utilizing individual low pressure grinder pumps for all service connections directly to the Flesherton Wastewater Treatment Plant.

- For Phase P2-2, north, south, east and west, sewage would flow be gravity to the existing sanitary sewer system in Flesherton.

Alternative 2 – Markdale Wastewater Treatment Plant, Amik-Talisman Wastewater Treatment Plant, Flesherton Wastewater Treatment Plant

Markdale Wastewater Treatment Plant

- A sewage pumping station (SPS#1) would be required at the east end of Phase P1-3, at the intersection of Beaver Trail and Grey Road 30 to pump collected sewage from the Beaver valley Ski Club and lower beaver valley area. Sewage would be pumped by forcemain up the escarpment to a location near the intersection of Grey Road 30 and Bowles Bluff Road.

- Sewage would then flow by gravity to the intersection of Bowles Bluff Road and Windy Lane Drive.

- At the intersection of Bowles Bluff Road and Windy Lane Drive, a second sewage pumping station (SPS#2) would be located approximately. Additional sewage by gravity flow would be collected at this location from Windy Lane Drive. As well, additional sewage would be collected by gravity from the Blue Jay Cresent subdivision and along the corridor from the intersection of

Grey Road 30 and Grey Road 12, back to the sewage pumping station (SPS#2) at the intersection of Bowles Bluff Road and Windy Lane Drive.

- All collected sewage at the Bowles Bluff Road and Windy Lane Drive station (SPS#2) would be pumped by forcemain to the intersection of Grey Road 30 and Grey Road 12, whereby sewage would flow be gravity the remaining distance to Markdale for connection into the existing sanitary sewer system.

- For Phase P2-3, sewage would be pumped by forcemain utilizing individual low pressure grinder pumps for all service connections to the existing sanitary sewer system in Markdale.

- For Phase P1-1A, sewage would be pumped by forcemain utilizing individual low pressure grinder pumps.

Amik-Talisman Wastewater Treatment Plant

- The collected sewage in Phase P3-4 would flow by gravity to the intersection of Grey Road 30 and Grey Road 13.

- For Phase P1-5, sewage would be pumped by forcemain utilizing individual low pressure grinder pumps for all service connections to the intersection of Grey Road 30 and Grey Road 13.

- From the intersection Grey Road 30 and Grey Road 13, all sewage would flow by gravity to approximately the intersection of Grey Road 13 and Side Road 7B.

- From the intersection of Grey Road 13 and Side Road 7B, a sewage pumping station (SPS#4) would pump the sewage by forcemain to the Amik-Talisman Wastewater Treatment Plant.

Flesherton Wastewater Treatment Plant

- Sewage within the Hamlet of Eugenia and around Eugenia Lake would flow by gravity to sewage pumping station (SPS#3), located near Grey Road 13 and the 8th Concession. For Phase P3-3, sewage would be pumped by forcemain utilizing individual low pressure grinder pumps for all service connections to approximately the intersection of Grey Road 13 and the 8th Concession.

- The sewage pumping station (SPS#3) would pump sewage by forcemain to the intersection of Grey Road 4 and Greenery Lane.

- Sewage would then flow by gravity through Phase P2-2 (north) to the existing sanitary sewer system in Flesherton.

- For Phase P2-2, south, east and west, sewage would flow be gravity to the existing sanitary sewer system in Flesherton.

- For Phase P2-4, sewage would be pumped by forcemain utilizing individual low pressure grinder pumps for all service connections directly to the Flesherton Wastewater Treatment Plant.

Alternative 3 – Markdale Wastewater Treatment Plant, Amik-Talisman Wastewater Treatment Plant, Flesherton Wastewater Treatment Plant

Markdale Wastewater Treatment Plant

- For Phase P2-3, sewage would be pumped by forcemain utilizing individual low pressure grinder pumps for all service connections to the existing sanitary sewer system in Markdale.

- For Phase P1-1A, sewage would be pumped by forcemain utilizing individual low pressure grinder pumps.

Amik-Talisman Wastewater Treatment Plant

- A sewage pumping station (SPS#1) would be required at the east end of Phase P1-3, at the intersection of Beaver Trail and Grey Road 30 to pump collected sewage from the Beaver valley Ski Club, lower beaver valley area, Bowles Bluff Road, Windy Lane Drive areas, and Phase 1-5, where sewage would be pumped by forcemain utilizing individual low pressure grinder pumps for all service connections.

- Sewage would be pumped (SPS#1) by forcemain up to the intersection of Grey Road 30 and Grey Road 13.

- The collected sewage in Phase P3-4 would flow by gravity to the intersection of Grey Road 30 and Grey Road 13.

- From the intersection Grey Road 30 and Grey Road 13, all sewage would flow by gravity to approximately the intersection of Grey Road 13 and Side Road 7B.

- From the intersection of Grey Road 13 and Side Road 7B, a sewage pumping station (SPS#2) would pump the sewage by forcemain to the Amik-Talisman Wastewater Treatment Plant.

Flesherton Wastewater Treatment Plant

- Sewage within the Hamlet of Eugenia and around Eugenia Lake would flow by gravity to sewage pumping station (SPS#3), located near Grey Road 13 and the 8th Concession. For Phase P3-3, sewage would be pumped by forcemain utilizing individual low pressure grinder pumps for all service connections to approximately the intersection of Grey Road 13 and the 8th Concession.

- The sewage pumping station (SPS#3) would pump sewage by forcemain to the intersection of Grey Road 4 and Greenery Lane.

- Sewage would then flow by gravity through Phase P2-2 (north) to the existing sanitary sewer system in Flesherton.

- For Phase P2-2, south, east and west, sewage would flow be gravity to the existing sanitary sewer system in Flesherton.

- For Phase P2-4, sewage would be pumped by forcemain utilizing individual low pressure grinder pumps for all service connections directly to the Flesherton Wastewater Treatment Plant.

Alternative 4 – Markdale Wastewater Treatment Plant, Amik-Talisman Wastewater Treatment Plant, Flesherton Wastewater Treatment Plant

Markdale Wastewater Treatment Plant

- For Phase P2-3, sewage would be pumped by forcemain utilizing individual low pressure grinder pumps for all service connections to the existing sanitary sewer system in Markdale.

- For Phase P1-1A, sewage would be pumped by forcemain utilizing individual low pressure grinder pumps.

Amik-Talisman Wastewater Treatment Plant

- A sewage pumping station (SPS#1) would be required at the east end of Phase P1-3, at the intersection of Beaver Trail and Grey Road 30 to pump collected sewage from the Beaver valley Ski Club, lower beaver valley area, Bowles Bluff Road, Windy Lane Drive areas, and Phase 1-5, where sewage would be pumped by forcemain utilizing individual low pressure grinder pumps for all service connections.

- Sewage would be pumped (SPS#1) by forcemain up to the intersection of Grey Road 30 and Grey Road 13.

- Sewage within the Hamlet of Eugenia and around Eugenia Lake would flow by gravity to sewage pumping station (SPS#3), located near Grey Road 13 and the 8th Concession. The sewage pumping station (SPS#3) would pump sewage by forcemain to the intersection of Grey Road 13 and 12th Concession B (Phase P3-4 adjacent).

- The collected sewage in Phase P3-4 would flow by gravity to the intersection of Grey Road 30 and Grey Road 13.

- From the intersection Grey Road 30 and Grey Road 13, all sewage would flow by gravity to approximately the intersection of Grey Road 13 and Side Road 7B.

- From the intersection of Grey Road 13 and Side Road 7B, a sewage pumping station (SPS#2) would pump the sewage by forcemain to the Amik-Talisman Wastewater Treatment Plant.

Flesherton Wastewater Treatment Plant

- For Phase P2-4, sewage would be pumped by forcemain utilizing individual low pressure grinder pumps for all service connections directly to the Flesherton Wastewater Treatment Plant.

- For Phase P2-2, north, south, east and west, sewage would flow be gravity to the existing sanitary sewer system in Flesherton.

7 ASSESSMENT OF ALTERNATIVE SOLUTIONS

7.1 ASSESSMENT OF NATURAL, SOCIAL AND ECONOMIC IMPACT OF ALTERNATIVE SOLUTIONS

Please refer to **Appendix K** for summary tables of the natural, social and economic impacts of the proposed water and sewage alternatives respectively.

Various natural environmental impacts are associated with all of the water and sewage alternative solutions presented. The disadvantages associated with the alternative solutions however are insignificant in comparison to the capital costs associated.

On a social level, alternatives for both sewer and water are similar with respect to advantages and disadvantages.

For the proposed water alternatives, **Alternative W.4** has the lowest economic impact with respect to capital costs. It also has the least expensive alternative for the construction of a new water storage facility in Markdale. As well, the smallest distribution system for Markdale is proposed under this alternative. **Alternative W.6** has the second lowest economic impact with respect to capital costs. Its capital costs are slightly higher as its proposed new water storage facility in Markdale is larger than the option included in **Alternative W.4**.

Alternatives W.3, W.5, W.2 and W.7A as presented, have substantial higher economic impact in terms of capital costs in comparison to the four (4) lower cost water alternatives. This in mainly attributed to more proposed new water storage facilities being require and additional water production (new wells) and treatment facilities being required. For **Alternative W.7A**, there is also additional cost to provide the proposed second trunk watermain connection to the west of the existing water treatment plant in Kimberley along the escarpment.

For the proposed sewer alternatives, **Alternative S.4** has the lowest capital cost, with **Alternative S.3** being the second lowest. **Alternative S.4** has the least quantity of gravity main and forcemain, along with the least expensive costs for upgrades to the existing wastewater treatment plants.

7.2 ESTIMATED CAPITAL COSTS OF ALTERNATIVE SOLUTIONS

Refer **Appendix L** for costing tables for each water and sewage alternative solution, showing breakdown costs associated with each grouping of sub-phases under each alternative. These costing tables were prepared in 2012 as per of the Draft Master Plan, and have not been revised as per the updated 2017 Master Plan.

Table 7.2A summarizes the estimated capital costs for the presented alternative solutions for water, as per the costing tables in **Appendix L**. **Table 7.2B** summarizes the estimated capital costs for the presented alternative solutions for sewage similarly. The capital costs shown include costs for engineering design, contract administration, engineering disbursement, and materials testing/soil

Table 7.2A
SUMMARY OF CAPITAL COSTS FOR WATER ALTERNATIVE SOLUTIONS

WATER AND WASTEWATER SERVICING MASTER PLAN
MARKDALE-FLESHERTON-KIMBERLEY-AMIK-EUGENIA-BEAVER VALLEY
MUNICIPALITY OF GREY HIGHLANDS

Alternative No.	Alternative Description	Capital Breakdown Cost (2012)	Total Capital Cost
W.1	Markdale (PI-1, PI-3, PI-4, PII-1, PII-2, PII-3, PII-4, PIII-1, PIII-2, PIII-3 and PIII-4)	$33,304,000.00	$37,596,000.00
	Kimberley, Amik, Talisman (PI-2 and PI-5)	$4,292,000.00	
W.2	Markdale (PI-1, PI-3, PI-4 and PII-3)	$17,549,000.00	$41,780,000.00
	Kimberley, Amik, Talisman (PI-2 and PI-5)	$4,292,000.00	
	Flesherton (PII-1, PII-2 and PII-4)	$7,180,000.00	
	Eugenia (PIII-1, PIII-2, PIII-3 and PIII-4)	$12,759,000.00	
W.3	Markdale (PI-1, PI-3, PI-4, PII-1, PII-2, PII-3 and PII-4)	$22,957,000.00	$40,008,000.00
	Kimberley, Amik, Talisman (PI-2 and PI-5)	$4,292,000.00	
	Eugenia (PIII-1, PIII-2, PIII-3 and PIII-4)	$12,759,000.00	
W.4	Markdale (PI-1, PI-3, PI-4, and PII-3)	$17,549,000.00	$37,009,000.00
	Kimberley, Amik, Talisman (PI-2 and PI-5)	$4,292,000.00	
	Flesterton (PII-1, PII-2, PII-4, PIII-1, PIII-2, PIII-3 and PIII-4)	$15,168,000.00	
W.5	Markdale (PI-1, PI-2, PI-3, PI-4, PI-5, PII-1, PII-2, PII-3 and PII-4)	$28,864,000.00	$41,623,000.00
	Eugenia (PIII-1, PIII-2, PIII-3 and PIII-4)	$12,759,000.00	
W.6	Markdale (PI-1, PI-2, PI-3, PI-4, PI-5 and PII-3)	$22,117,000.00	$37,285,000.00
	Flesherton (PII-1, PII-2, PII-4, PIII-1, PIII-2, PIII-3 and PIII-4)	$15,168,000.00	
W.7	Markdale (PI-1, PI-2, P1-3, PI-4, PI-5, PII-1, PII-2, PII-3, PII-4, PIII-1, PIII-2, PIII-3 and PIII-4)	$37,903,000.00	$37,903,000.00
W.7A	Markdale (PI-1, PI-2, P1-3, PI-4, PI-5, PII-1, PII-2, PII-3, PII-4, PIII-1, PIII-2, PIII-3 and PIII-4)	$41,945,000.00	$41,945,000.00

Table 7.2B
SUMMARY OF CAPITAL COSTS FOR SEWAGE ALTERNATIVE SOLUTIONS

WATER AND WASTEWATER SERVICING MASTER PLAN
MARKDALE-FLESHERTON-KIMBERLEY-AMIK-EUGENIA-BEAVER VALLEY
MUNICIPALITY OF GREY HIGHLANDS

Alternative No.	Alternative Description	Capital Breakdown Cost (2012)	Total Capital Cost
S.1	Markdale (PI-1, PI-3, PI-4 and PII-3)	$24,466,000.00	$49,973,000.00
	Amik (PI-2, PI-5, PIII-1, PIII-2, PIII-3, and PIII-4)	$19,399,000.00	
	Flesherton (PII-1, PII-2 and PII-4)	$6,108,000.00	
S.2	Markdale (PI-1, PI-3, PI-4 and PII-3)	$24,466,000.00	$53,568,000.00
	Amik (PI-2, PI-5 and PIII-4)	$8,711,000.00	
	Flesherton (PII-1, PII-2, PII-4, PIII-1, PIII-2, and PIII-3)	$20,391,000.00	
S.3	Markdale (PI-1 and PII-3)	$10,016,000.00	$47,942,000.00
	Amik (PI-2, PI-3, PI-5 and PIII-4)	$17,535,000.00	
	Flesherton (PII-1, PII-2, PII-4, PIII-1, PIII-2, and PIII-3)	$20,391,000.00	
S.4	Markdale (PI-1 and PII-3)	$10,016,000.00	$39,311,000.00
	Amik (PI-2, PI-3, PI-5, PIII-1, PIII-2 and PIII-4)	$23,187,000.00	
	Flesherton (PII-1, PII-2 and PII-4)	$6,108,000.00	

inspection allowances, etc. **Costs for expansion to existing and potential future sanitary and water infrastructure is not included (i.e. sanitary sewer and watermain on individual streets, sanitary and water services to meet existing and 20 year design requirements, and expansion into the Municipality of West Grey, etc.).**

Recommended capital costs for additional upgrades to the water distribution system in Markdale are not included in **Table 7.2A**, but are shown in **Table 7.2C**. There are existing problems in the Markdale water distribution system, partly to do with the existing water standpipe, and others to do with the size of existing watermains and distribution of water during fire flow conditions. A number of watermains need to be upgraded in Markdale to satisfy in-town fire flow demands. The recommended waterman improvements are proposed to be completed under **Phase P1-1** of the Master Plan (under any alternative solution for water). As well, under all alternative solutions for water, the existing well pumps for the Isla Street Pump Station and Eliza Street Pump Station would have to be upgraded under **Phase P1-1** to be able to be utilized with any of the proposed options for a future water storage facility in Markdale.

TABLE 7.2C

RECOMMENDED WATERMAIN IMPROVEMENTS - MARKDALE

WATER AND WASTEWATER SERVICING MASTER PLAN
MARKDALE-FLESHERTON-KIMBERLEY-AMIK-EUGENIA-BEAVER VALLEY
MUNICIPALITY OF GREY HIGHLANDS

Street	From	To	Type of Pipe	Length of Main (m)	Existing Pipe Diameter (mm)	Age (years)	Proposed Main Diameter (mm)	Estimated Cost (per m)	Total Estimated Project Cost
Argyle	Main	Lorne	CI	172	100 (Main St to Isla St) 150 mm (Isla St to Cavan St)	>80	250	$500	$86,000
Lorne	Argyle	Toronto	CI	148	150	>80	250	$500	$74,000
								Total	**$160,000**

8 IDENTIFICATION OF THE PREFERRED SOLUTION

8.1 WATER TREATMENT, WATER STORAGE AND WATER DISTRIBUTION

Various feasible alternative solutions were considered for addressing phased expansion of water production, water treatment, water storage and water distribution servicing under the Master Plan for the Municipality of Grey Highlands. Based on the technical, social, environmental impact, and financial evaluation of the eight (8) alternative solutions presented for water servicing, **Alternative W.6** was considered the most suitable design alternative.

Figure 8.1 shows an overview of the recommended water servicing **Alternative W.6.**

As per comments from the Municipality of Grey Highlands, during a review of the Draft Master Plan at a council meeting on January 23, 2012, **Table 8.1A** was completed to provide a detailed cost breakdown for the total capital cost, including costs for distribution system watermain, water services and expansion into the Municipality of West Grey for the 20 year design requirements. These items were not included in the costing tables found in **Appendix L** for any alternative. As well, it should be noted that in addition to added cost items in **Table 8.1A**, some existing item costing has been modified in comparison to the original **Table W.6** as found in **Appendix L**. **Table 8.1A** represents 2012 costing, as completed under the Draft Master Plan and has not been revised as per the updated 2017 Master Plan.

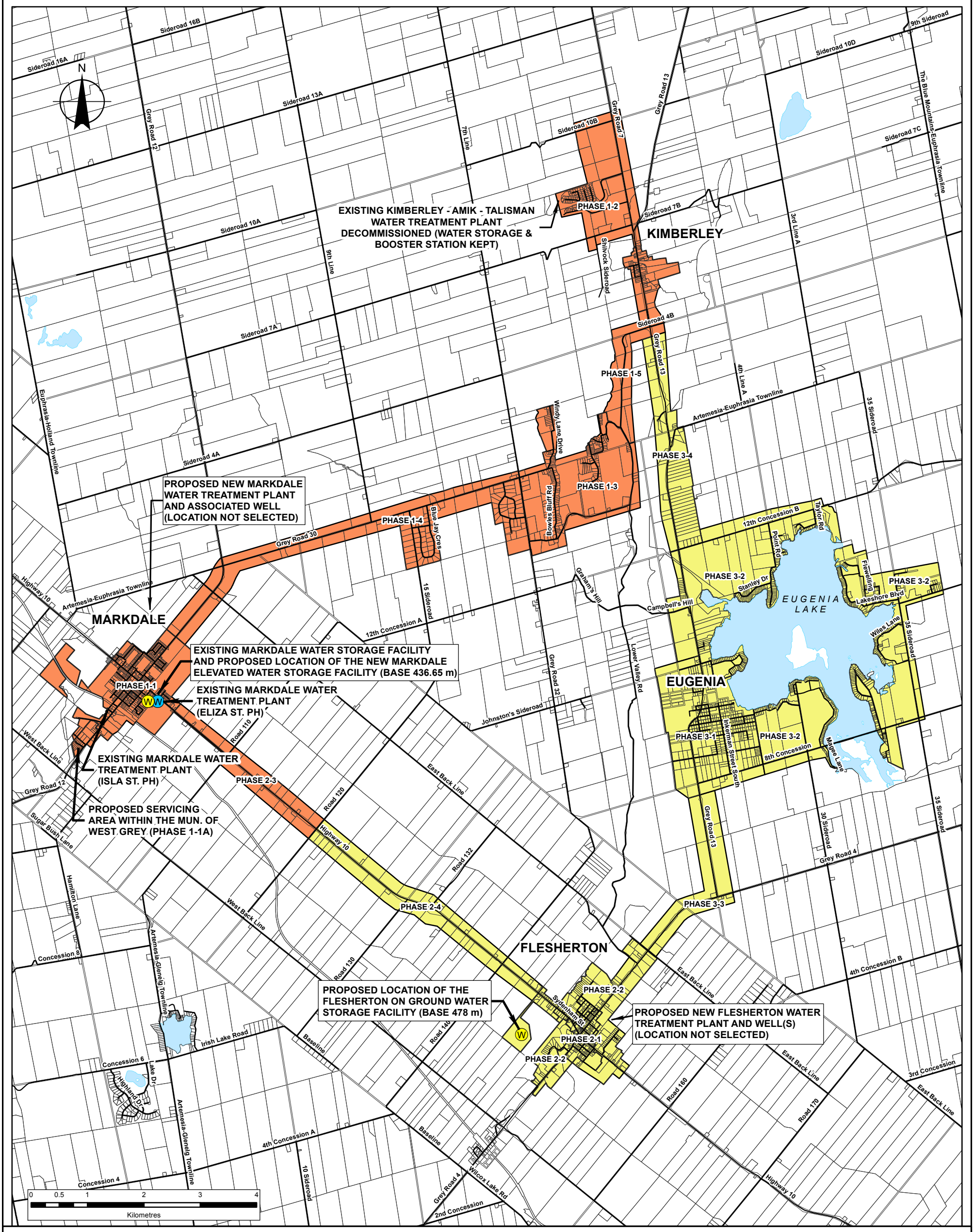
Table 8.1B shows the estimated cost to complete the proposed new elevated water storage facility in Markdale (Note: this cost is included in **Table 8.1A**). As discussed at the council meeting on January 23, 2012, the recommended 50 year design size for the new elevated water storage facility was reduced from 5,000 m^3 to 3,725 m^3, due to the potential available water storage at the Kimberley water treatment plant (approximately 1,279 m^3). As a result, the estimated cost to complete the new elevated water storage facility was reduced accordingly in **Table 8.1B** (and **Table 8.1A**); in comparison to **Table W.6** in **Appendix L**. **Table 8.1B** represents 2012 costing, as completed under the Draft Master Plan and has not been revised as per the updated 2017 Master Plan.

Table 8.1C shows estimated operation and maintenance costs (2012) for **Alternative W.6**, if all components of the recommended alternative were implemented.

8.2 WASTEWATER TREATMENT, SEWAGE PUMPING STATION AND SANITARY SEWER COLLECTION SYSTEM

Various feasible alternative solutions were considered for addressing phased expansion of sewage pumping, wastewater treatment, and sanitary sewer collection servicing under the Master Plan for the Municipality of Grey Highlands. Based on the technical, social, environmental impact, and financial evaluation of the three (3) alternative solutions presented for sanitary servicing, **Alternative S.4** was considered the most suitable design alternative.

Figure 8.2 shows an overview of the recommended water servicing **Alternative S.4.**



Design Water Demands - Water Treatment Plant - Alternative 6

WATER AND WASTEWATER SERVICING MASTER PLAN
MARKDALE-FLESHERTON-KIMBERLEY-AMIK-EUGENIA-BEAVER VALLEY
MUNICIPALITY OF GREY HIGHLANDS

111-13229-00

Water Treatment Plant	Existing		20 Year		50 Year	
	Average Day Water Demand (m^3/day)	Maximum Day Water Demand (m^3/day)	Average Day Water Demand (m^3/day)	Maximum Day Water Demand (m^3/day)	Average Day Water Demand (m^3/day)	Maximum Day Water Demand (m^3/day)
Markdale WTP (P1-1, P1-2, P1-3, P1-4, P1-5 and P2-3)	1,387	2,774	2,895	5,790	3,914	7,828
Flesherton WTP (P2-1, P2-2 and P2-4, P3-1, P3-2, P3-3 and P3-4)	0	0	1,552	3,104	2,050	4,100

LEGEND

- MARKDALE WTP PROPOSED SERVICE AREA
- FLESHERTON WTP PROPOSED SERVICE AREA *
- PROPERTY PARCEL
- EXISTING WATER STORAGE FACILITY
- PROPOSED WATER STORAGE FACILITY

* NOTE: THE LOCATION OF THE PROPOSED FLESTHERTON WATER TREATMENT PLANT IS TBD.

PREFERRED SOLUTION FOR WATER TREATMENT, WATER STORAGE AND WATER DISTRIBUTION
ALTERNATIVE - W.6
MUNICIPALITY OF GREY HIGHLANDS
WATER AND WASTEWATER MASTER PLAN

WSP
1450 1st AVENUE WEST, SUITE 101
OWEN SOUND, ONTARIO CANADA N4K 6W2
PHONE: 519 376-7612 - FAX: 519 376-8008 - WWW.WSPGROUP.COM

DESIGN	CW
DRAWN	JET
APPROVED	CW
DATE	MAY 2016
SCALE	SEE SCALE BAR
FILE No.	111-13229-00
FIG. No.	8.1

Table 8.1A: Cost Estimate for Alternative W.6 - Water (20 Year Design Requirements)

WATER AND WASTEWATER SERVICING MASTER PLAN
MARKDALE-FLESHERTON-KIMBERLEY-AMIK-EUGENIA-BEAVER VALLEY
MUNICIPALITY OF GREY HIGHLANDS

Capital Cost Estimate (Class C)					
2012 Constant Dollars					**March 2012**
Item #	**Item Description**	**Unit**	**Qty**	**Unit Cost**	**Total**
Markdale (PI-1, P1-1A, PI-2, PI-3, PI-4, PI-5 and PII-3)					
	Construction				
1.0	**Mobilization/Demobilization**	L.S.	100%	$300,000.00	$300,000.00
2.0	**Site Work**				
2.1	Clearing and grubbing, topsoiling, hydro seeding, and restoration	L.S.	100%	$450,000.00	$450,000.00
2.2	Site development work at new water treatment plant and pumphouse	L.S.	100%	$100,000.00	$100,000.00
2.3	Site development work at new water storage facility)	L.S.	100%	$50,000.00	$50,000.00
2.4	Site development work at new booster pumping station	L.S.	100%	$100,000.00	$100,000.00
2.5	3 Phase hydro and Bell service connection at new water treatment plant and pumphouse	L.S.	100%	$20,000.00	$20,000.00
2.6	3 Phase hydro and Bell service connection at new water storage facility	L.S.	100%	$20,000.00	$20,000.00
2.7	3 Phase hydro and Bell service connection at new booster pumping station	L.S.	100%	$20,000.00	$20,000.00
2.8	Decommission existing Markdale Standpipe	L.S.	100%	$30,000.00	$30,000.00
2.9	Decommission Kimberley-Amik-Talisman WTP	L.S.	100%	$30,000.00	$30,000.00
2.10	Conversion of raw water storage tanks to treated water storage tanks (Kimberley-Amik-Talisman WTP)	L.S.	100%	$30,000.00	$30,000.00
2.11	Asphalt removal and restoration	m	6,494	$250.00	$1,623,500.00
3.0	**New Supply Well Construction (PI-4)**				
3.1	Drill and install new supply well	L.S.	100%	$40,000.00	$40,000.00
4.0	**Watermain Construction**				
4.1	300 mm ⌀ watermain (trunk main)	m	16,236	$350.00	$5,682,600.00
4.2	300 mm ⌀ watermain (trunk main across easement at Bowles Bluff Road to Beaver Trail	m	815	$300.00	$244,500.00
4.3	200 mm ⌀ watermain (distribution main)	m	17,066	$250.00	$4,266,500.00
4.4	Services (20 Year - Residential Equivalent) **Note: Chapman's not included**	ea.	1136	$3,500.00	$3,976,000.00
4.5	Pressure reducing valve chambers	L.S.	100%	$75,000.00	$75,000.00

Table 8.1A: Cost Estimate for Alternative W.6 - Water (20 Year Design Requirements)

WATER AND WASTEWATER SERVICING MASTER PLAN
MARKDALE-FLESHERTON-KIMBERLEY-AMIK-EUGENIA-BEAVER VALLEY
MUNICIPALITY OF GREY HIGHLANDS

Capital Cost Estimate (Class C)					
2012 Constant Dollars					**March 2012**
Item #	**Item Description**	**Unit**	**Qty**	**Unit Cost**	**Total**
4.6	Hydrants	ea.	195	$4,500.00	$877,500.00
4.7	Rock removal	m^3	1700	$165.00	$280,500.00
5.0	**New Water Treatment Plant and Pumphouse (PI-4)**				
5.1	Construct new water treatment plant and pumphouse	L.S.	100%	$1,000,000.00	$1,000,000.00
6.0	**New Booster Pumping Station (PI-2)**				
6.1	Construction of new booster pumping station	L.S.	100%	$500,000.00	$500,000.00
7.0	**New Water Storage Facility (P1-1)**				
7.1	Construction of new glass-fused to steel elevated water storage facility (3,725 m^3) (50 year design)	L.S.	100%	$3,500,000.00	$3,500,000.00
8.0	**Environmental Works**				
8.1	Erosion control	L.S.	100%	$140,000.00	$140,000.00
9.0	**Bonding & Insurance**	L.S.	100%	$510,000.00	$510,000.00
10.0	**Allowances**				
11.1	Soils investigation prior to Construction	L.S.	100%	$75,000.00	$75,000.00
11.2	Rock Blast Survey	L.S.	100%	$10,000.00	$10,000.00
11.3	Startup	L.S.	100%	$60,000.00	$60,000.00
	Subtotal Construction Cost				$24,011,100.00
	Construction Contingency	%	10%		$2,401,110.00
	Total Construction Cost				$26,412,210.00
12.0	**Additional Construction Work (Includes Contingency, Engineering, Allowances and Other Non-Construction Costs)**				
12.1	Argyle Street watermain upgrade to 250 mm dia.	m	172	$500.00	$86,000.00
12.2	Lorne Street watermain upgrade to 250 mm dia.	m	148	$500.00	$74,000.00
12.3	Upgrade well pump at Isla Street PS	L.S.	100%	$50,000.00	$50,000.00
12.4	Upgrade well pumps at Eliza Street PS	L.S.	100%	$75,000.00	$75,000.00
	Subtotal Construction Cost				$285,000.00
Sub-Phase PI-1A - Markdale Connections to West Grey Lots					
13.0	**Additional Construction Work (Includes Contingency, Engineering, Allowances and Other Non-Construction Costs)**				

Table 8.1A: Cost Estimate for Alternative W.6 - Water (20 Year Design Requirements)

WATER AND WASTEWATER SERVICING MASTER PLAN
MARKDALE-FLESHERTON-KIMBERLEY-AMIK-EUGENIA-BEAVER VALLEY
MUNICIPALITY OF GREY HIGHLANDS

Capital Cost Estimate (Class C)					
2012 Constant Dollars					**March 2012**
Item #	**Item Description**	**Unit**	**Qty**	**Unit Cost**	**Total**
13.1	Clearing and grubbing, topsoiling, hydro seeding, and restoration	L.S.	100%	$15,000.00	$15,000.00
13.2	Main Street (West Grey/Grey Highlands) new 200 mm dia. watermain	m	774	$350.00	$270,900.00
13.3	Ford's Drive (West Grey/Grey Highlands) new 200 mm dia. watermain	m	299	$350.00	$104,650.00
13.4	Glenwood Pl (West Grey) new 200 mm dia. watermain	m	183	$350.00	$64,050.00
13.5	Highway 10 (West Grey/Grey Highlands) new 200 mm dia. watermain	m	85	$350.00	$29,750.00
13.6	Services (West Grey/Grey Highlands)	ea.	43	$4,500.00	$193,500.00
13.7	Hydrants	ea.	8	$5,500.00	$44,000.00
	Subtotal Construction Cost				$721,850.00
	Overall Total Construction Cost				$27,419,060.00
	Non-Construction				
14.0	**Engineering Design**	%	7%		$1,848,854.70
15.0	**Contract Administration**	%	8%		$2,112,976.80
16.0	**Engineering Disbursement**	%	1.2%		$316,946.52
17.0	**Master Plan Study**	L.S.	100%	$50,000.00	$50,000.00
18.0	**Approvals (CofA, Zoning, NEC, etc.)**	L.S.	100%	$75,000.00	$75,000.00
19.0	**Full Development of Well #3**	L.S.	100%	$25,000.00	$25,000.00
20.0	**EA for New Well(s)**	L.S.	100%	$100,000.00	$100,000.00
21.0	**Test Pump of New Well(s)**	L.S.	100%	$35,000.00	$35,000.00
22.0	**Aquifer Evaluation Report for New Well(s)**	L.S.	100%	$50,000.00	$50,000.00
23.0	**Materials Testing Allowance and Soils Inspection during construction**	L.S.	100%	$90,000.00	$90,000.00
	Total Non-Construction Cost				$4,703,778.02
	Total Project Cost for **PI-1, P1-1A, PI-2, PI-3, PI-4, PI-5 and PII-3**				$32,122,838.02

Flesherton (PII-1, PII-2, PII-4, PIII-1, PIII-2, PIII-3 and PIII-4)

Table 8.1A: Cost Estimate for Alternative W.6 - Water (20 Year Design Requirements)

WATER AND WASTEWATER SERVICING MASTER PLAN
MARKDALE-FLESHERTON-KIMBERLEY-AMIK-EUGENIA-BEAVER VALLEY
MUNICIPALITY OF GREY HIGHLANDS

	Construction				
1.0	**Mobilization/Demobilization**	L.S.	100%	$500,000.00	$500,000.00
2.0	**Site Work**				
2.1	Clearing and grubbing, topsoiling, hydro seeding, and restoration	L.S.	100%	$750,000.00	$750,000.00
2.2	Site development work at new water storage facility	L.S.	100%	$50,000.00	$50,000.00
2.3	Site development work at new water treatment plant and pumphouse	L.S.	100%	$100,000.00	$100,000.00
2.4	3 Phase hydro and Bell service connection at new water storage facility	L.S.	100%	$20,000.00	$20,000.00
2.5	3 Phase hydro and Bell service connection at new water treatment plant and pumphouse	L.S.	100%	$20,000.00	$20,000.00
3.0	**New Supply Well (PII-1 or PII-2)**				
3.1	Install new supply well(s)	L.S.	100%	$75,000.00	$75,000.00
4.0	**Watermain Construction**				
4.1	300 mm ⌀ watermain (trunk main)	m	21,781	$350.00	$7,623,350.00
4.2	200 mm ⌀ watermain (distribution main)	m	45,574	$250.00	$11,393,500.00
4.3	Services (20 Year - Residential Equivalent)	ea.	1762	$3,500.00	$6,167,000.00
4.4	Pressure reducing valve chambers	L.S.	100%	$50,000.00	$50,000.00
4.5	Hydrants	ea.	375	$4,500.00	$1,687,500.00
4.6	Rock removal	m^3	2000	$165.00	$330,000.00
5.0	**New Water Treatment Plant and Pumphouse (PII-1 or PII-2)**				
5.1	Construct new water treatment plant and pumphouse	L.S.	100%	$1,000,000.00	$1,000,000.00
6.0	**New Water Storage Facility (PII-2)**				
6.1	Construction of new glass-fused to steel on-ground water storage facility	L.S.	100%	$700,000.00	$700,000.00
7.0	**Environmental Works**				
7.1	Erosion control	L.S.	100%	$200,000.00	$200,000.00
8.0	**Bonding & Insurance**	L.S.	100%	$680,000.00	$680,000.00
9.0	**Allowances**				
9.1	Soils investigation prior to Construction	L.S.	100%	$125,000.00	$125,000.00
9.2	Rock Blast Survey	L.S.	100%	$10,000.00	$10,000.00
9.3	Startup	L.S.	100%	$75,000.00	$75,000.00
	Subtotal Construction Cost				$31,556,350.00

Table 8.1A: Cost Estimate for Alternative W.6 - Water (20 Year Design Requirements)

WATER AND WASTEWATER SERVICING MASTER PLAN
MARKDALE-FLESHERTON-KIMBERLEY-AMIK-EUGENIA-BEAVER VALLEY
MUNICIPALITY OF GREY HIGHLANDS

	Construction Contingency	%	10%		$3,155,635.00
	Total Construction Cost				$34,711,985.00
	Non-Construction				
10.0	**Engineering Design**	%	7%		$2,429,838.95
11.0	**Contract Administration**	%	8%		$2,776,958.80
12.0	**Engineering Disbursement**	%	1.2%		$416,543.82
13.0	**Approvals (CofA, Zoning, NEC, etc.)**	L.S.	100%	$80,000.00	$80,000.00
14.0	**EA for New Well(s)**	L.S.	100%	$100,000.00	$100,000.00
15.0	**Test Pump of New Well(s)**	L.S.	100%	$35,000.00	$35,000.00
16.0	**Aquifer Evaluation Report for New Well(s)**	L.S.	100%	$50,000.00	$50,000.00
17.0	**Materials Testing Allowance and Soils Inspection during construction**	L.S.	100%	$150,000.00	$150,000.00
	Total Non-Construction Cost				$6,038,341.57
	Total Project Cost for **PII-1, PII-2, PII-4, PIII-1, PIII-2, PIII-3 and PIII-4**				$40,750,326.57
	Total Project Cost for Alternative W.6				$72,873,164.59

Table 8.1B: Cost Estimate for Sub-Phase PI-1 - Markdale
Preferred Alternative W.6 - Water

WATER AND WASTEWATER SERVICING MASTER PLAN
MARKDALE-FLESHERTON-KIMBERLEY-AMIK-EUGENIA-BEAVER VALLEY
MUNICIPALITY OF GREY HIGHLANDS

Capital Cost Estimate (Class C)					
2012 Constant Dollars					**February 2012**
Item #	**Item Description**	**Unit**	**Qty**	**Unit Cost**	**Total**
Sub-Phase PI-1 - Markdale - New Elevated Storage Facility Only					
	Construction				
1.0	**Mobilization/Demobilization**	L.S.	100%	$25,000.00	$25,000.00
2.0	**Site Work**				
2.1	Clearing and grubbing, topsoiling, hydro seeding, and restoration	L.S.	100%	$10,000.00	$10,000.00
2.2	Site development work at new water storage facility	L.S.	100%	$50,000.00	$50,000.00
2.3	3 Phase hydro and Bell service connection at new water storage facility	L.S.	100%	$20,000.00	$20,000.00
2.4	Decommission existing Markdale Standpipe	L.S.	100%	$30,000.00	$30,000.00
3.0	**New Water Storage Facility**				
3.1	Construction of new glass-fused to steel elevated water storage facility (3725 m^3)	L.S.	100%	$3,500,000.00	$3,500,000.00
4.0	**Environmental Works**				
4.1	Erosion control	L.S.	100%	$2,500.00	$2,500.00
5.0	**Bonding & Insurance**	L.S.	100%	$80,000.00	$80,000.00
6.0	**Allowances**				
6.1	Soils investigation prior to Construction	L.S.	100%	$5,000.00	$5,000.00
6.2	Startup	L.S.	100%	$5,000.00	$5,000.00
	Subtotal Construction Cost				$3,727,500.00
	Construction Contingency	%	10%		$372,750.00
	Total Construction Cost				$4,100,250.00
	Non-Construction				
7.0	**Engineering Design**	%	7%		$287,017.50
8.0	**Contract Administration**	%	8%		$328,020.00
9.0	**Engineering Disbursement**	%	1.2%		$49,203.00
10.0	**Approvals (CofA, Zoning, etc.)**	L.S.	100%	$5,000.00	$5,000.00

Table 8.1B: Cost Estimate for Sub-Phase PI-1 - Markdale
Preferred Alternative W.6 - Water

WATER AND WASTEWATER SERVICING MASTER PLAN
MARKDALE-FLESHERTON-KIMBERLEY-AMIK-EUGENIA-BEAVER VALLEY
MUNICIPALITY OF GREY HIGHLANDS

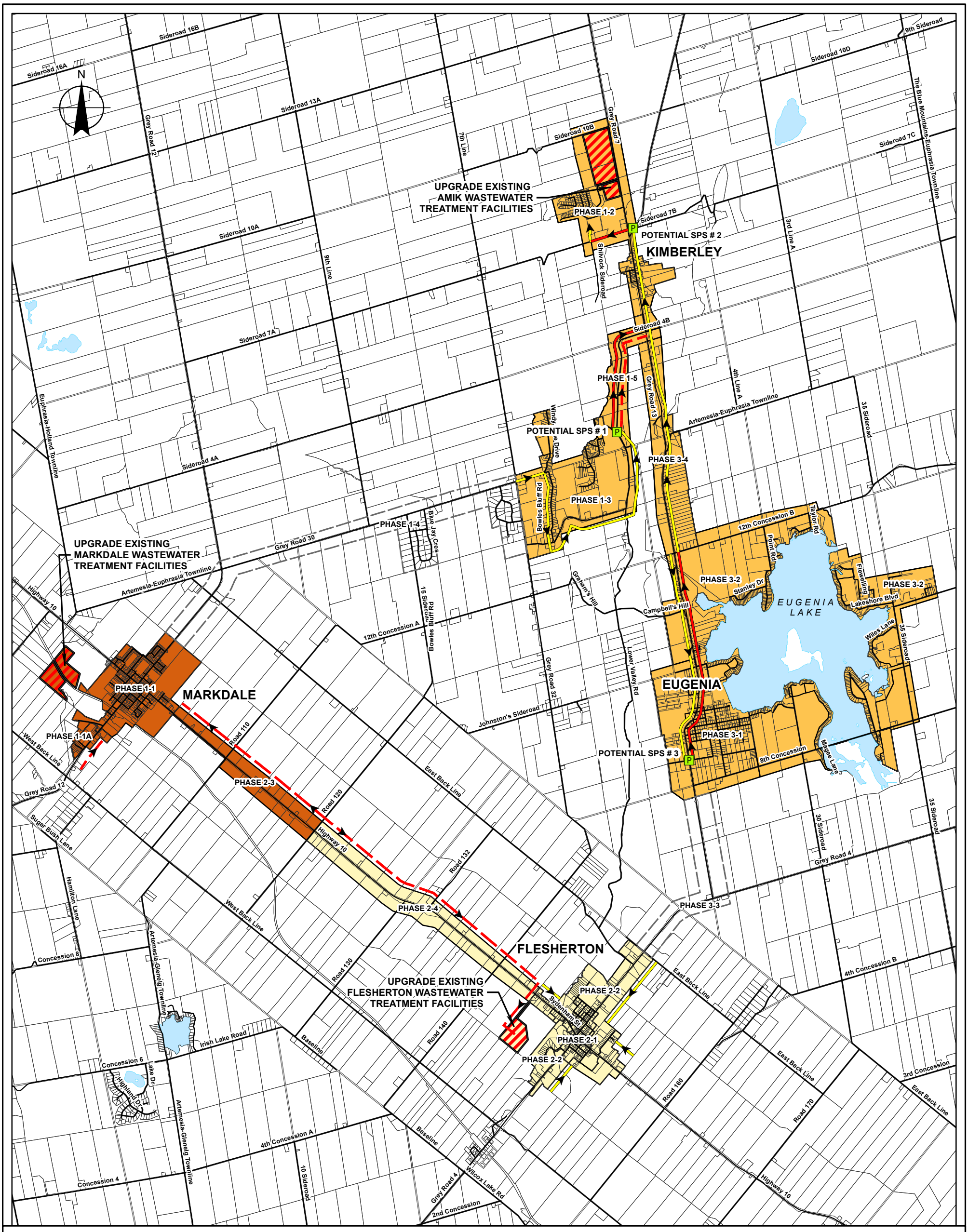
Capital Cost Estimate (Class C)					
2012 Constant Dollars					**February 2012**
Item #	**Item Description**	**Unit**	**Qty**	**Unit Cost**	**Total**
11.0	**Materials Testing Allowance and Soils Inspection during construction**	L.S.	100%	$5,000.00	$5,000.00
	Total Non-Construction Cost				$674,240.50
	Total Cost for Construction of New Elevated Water Storage Facility - P1-1				$4,774,490.50

Table 8.1C
Annual Operation and Maintenance Cost Estimate
Alternative W.6

Water and Wastewater Servicing Master Plan
Markdale-Flesherton-Kimberley-Amik-Eugenia-Beaver Valley
Municipality of Grey Highlands

111-13229-00

Item Description	Quantity	Unit	Unit Cost	Total
Water Treatment and Pumping Station Operation (Four (4) qualified operators - 7.5hrs/day @ $40/hr)	365	days	$1,200	$438,000
Bacti and Chlorine residual samples in the water distribution and at the water treatment plants	52	weeks	$500	$26,000
Maintain daily record books	365	days	$75	$27,375
Train four (4) Operators to be qualified for Water Treatment and Distribution, and maintain yearly training	4	-	$7,500	$30,000
Check and carry out routine maintenance on equipment including pumps, pressure gauges, valves, analysers and water meters	100%	L.S.	$225,000	$225,000
Flush dead ends in distribution system	100%	L.S.	$50,000	$50,000
Maintenance of water distribution system including piping and valves and repair watermain breaks	100%	L.S.	$100,000	$100,000
Laboratory analysis costs for weekly, quarterly and yearly chemical sampling	100%	L.S.	$50,000	$50,000
Sodium hypochlorite	100%	L.S.	$7,500	$7,500
Replace UV lamps, ballasts, quartz sleeves	100%	L.S.	$15,000	$15,000
Hydro for heating, pumping, UV lamps and Filtration Equipment	100%	L.S.	$75,000	$75,000
Generator set - fuel and maintenance	100%	L.S.	$5,000	$5,000
Water storage maintenance - inspection every 5 years	100%	L.S.	$5,000	$5,000
Reserve fund for significant expenses/repairs (i.e. pump replacement, etc.)	100%	L.S.	$400,000	$400,000
Total Estimated Annual O & M Cost				**$1,453,875**



Design Sewage Flows- Alternative 4 (Phase 1-4 and 3-3 not Serviced)

WATER AND WASTEWATER SERVICING MASTER PLAN
MARKDALE-FLESHERTON-KIMBERLEY-AMIK-EUGENIA-BEAVER VALLEY
MUNICIPALITY OF GREY HIGHLANDS

111-13229-00

Wastewater Treatment Plants	Existing Sewage Flow (m^3/day)	20 Year Flow (m^3/day)	50 Year Flow (m^3/day)
Markdale WWTP (Includes P1-1 and P2-3)	988	1,971	2,631
Amik WWTP (Includes P1-2, P1-3, P1-5, P3-1, P3-2 AND P3-4)	217	1,811	2,418
Flesherton WWTP (Includes P2-1, P2-2 AND P2-4)	174	459	577

LEGEND

- MUNICIPAL WASTEWATER FACILITY
- MARKDALE WWTP PROPOSED SERVICE AREA
- AMIK WWTP PROPOSED SERVICE AREA
- FLESHERTON WWTP PROPOSED SERVICE AREA
- PHASE 1-4 AND 3-3 (NOT SERVICED UNDER ALTERNATIVE 4)
- PROPERTY PARCEL

PROPOSED WASTEWATER MAINS

- FORCEMAIN (SPS)
- FORCEMAIN (WITH GRINDER PUMPS)
- GRAVITY MAIN
- P POTENTIAL LOCATION FOR SEWAGE PUMP STATION (APPROX.)
- DIRECTION OF FLOW

0 0.5 1 2 3 4
Kilometres

PREFERRED SOLUTION FOR WASTEWATER TREATEMENT, SEWAGE PUMPING STATION AND SANITARY SEWER COLLECTION ALTERNATIVE - S.4
MUNICIPALITY OF GREY HIGHLANDS
WATER AND WASTEWATER MASTER PLAN

WSP
1450 1st AVENUE WEST, SUITE 101
OWEN SOUND, ONTARIO CANADA N4K 6W2
PHONE: 519 376-7612 - FAX: 519 376-8008 - WWW.WSPGROUP.COM

DESIGN	CW
DRAWN	JET
APPROVED	CW
DATE	MAY 2016
SCALE	SEE SCALE BAR
FILE No.	111-13229-00
FIG. No.	8.2

Table 8.2A: Cost Estimate for Alternative S.4 - Sewage (20 Year Design Requirements)

WATER AND WASTEWATER SERVICING MASTER PLAN
MARKDALE-FLESHERTON-KIMBERLEY-AMIK-EUGENIA-BEAVER VALLEY
MUNICIPALITY OF GREY HIGHLANDS

Capital Cost Estimate (Class C)					
2012 Constant Dollars					**March 2012**
Item #	**Item Description**	**Unit**	**Qty**	**Unit Cost**	**Total**
Markdale (PI-1, PI-1A and PII-3)					
	Construction				
1.0	**Mobilization/Demobilization**	L.S.	100%	$125,000.00	$125,000.00
2.0	**Site Work**				
2.1	Clearing and grubbing, topsoiling, hydro seeding, and restoration	L.S.	100%	$125,000.00	$125,000.00
2.2	Site development work at existing WWTP	L.S.	100%	$100,000.00	$100,000.00
3.0	**Gravity Main and Forcemain Construction**				
3.1	200 mm ⌀ gravity main	m	5,695	$250.00	$1,423,750.00
3.2	Services (20 Year - Residential Equivalent) **Note: Chapman's not included**	ea.	5 84	$3,500.00	$2,044,000.00
3.3	Manholes (1200 mm ⌀)	ea.	54	$6,500.00	$351,000.00
3.4	100 mm ⌀ forcemain (Grinder Pumps)	m	3,272	$200.00	$654,400.00
3.5	Low Pressure Grinder Pump Systems	ea.	22	$6,500.00	$143,000.00
4.0	**Upgrades to Existing Wastewater Treatment Plant**				
4.1	Potential upgrades consisting of new aeration cells, aeration equipment, rapid infiltration basins, control building upgrades to increase treatment design capacity to meet estimated 20 year flows	L.S.	100%	$6,000,000.00	$6,000,000.00
4.2	Purchase of adjacent land to accommodate construction of upgrades to the existing WWTP	L.S.	100%	$400,000.00	$400,000.00
5.0	**Environmental Works**				
5.1	Erosion control	L.S.	100%	$25,000.00	$25,000.00
6.0	**Bonding & Insurance**	L.S.	100%	$250,000.00	$250,000.00
7.0	**Allowances**				
7.1	Soils investigation prior to Construction	L.S.	100%	$15,000.00	$15,000.00
7.2	Startup of existing upgraded WWTP and forcemain including commissioning, reports and manuals	L.S.	100%	$15,000.00	$15,000.00
	Subtotal Construction Cost				$11,671,150.00
	Construction Contingency	%	10%		$1,167,115.00

Table 8.2A: Cost Estimate for Alternative S.4 - Sewage (20 Year Design Requirements)

WATER AND WASTEWATER SERVICING MASTER PLAN
MARKDALE-FLESHERTON-KIMBERLEY-AMIK-EUGENIA-BEAVER VALLEY
MUNICIPALITY OF GREY HIGHLANDS

Capital Cost Estimate (Class C)					
2012 Constant Dollars					**March 2012**
Item #	**Item Description**	**Unit**	**Qty**	**Unit Cost**	**Total**
	Total Construction Cost				$12,838,265.00
	Sub-Phase PI-1A - Markdale Connections to West Grey Lots				
	Construction				
8.0	**Construction Work (Includes Contingency, Engineering, Allowances and Other Non-Construction Costs)**				
8.1	Clearing and grubbing	L.S.	100%	$10,000.00	$10,000.00
8.2	Topsoiling, hydro seeding, and restoration	L.S.	100%	$5,000.00	$5,000.00
8.3	Main Street (West Grey/Grey Highlands) new 100 mm dia. forcemain	m	1,026	$250.00	$256,500.00
8.4	Ford's Drive (West Grey/Grey Highlands) new 100 mm dia. forcemain	m	2 99	$250.00	$74,750.00
8.5	Glenwood Pl (West Grey) new 100 mm dia. forcemain	m	1 83	$250.00	$45,750.00
8.6	Highway 10 (West Grey/Grey Highlands) new 200 mm dia. sanitary sewer	m	85	$250.00	$21,250.00
8.7	Services (West Grey/Grey Highlands)	ea.	7	$4,500.00	$31,500.00
8.8	Services with Low Pressure Grinder Pump Systems (West Grey/Grey Highlands)	ea.	36	$7,500.00	$270,000.00
8.9	Manholes	ea.	1	$7,500.00	$7,500.00
	Subtotal Construction Cost				$722,250.00
	Overall Total Construction Cost				$13,560,515.00
	Non-Construction				
9.0	**Engineering Design**	%	7.0%		$898,678.55
10.0	**Contract Administration**	%	8.0%		$1,027,061.20
11.0	**Engineering Disbursement**	%	1.2%		$154,059.18
12.0	**Master Plan Study**	L.S.	100%	$16,667.00	$16,667.00
13.0	**Approvals (CofA, Zoning, etc.)**	L.S.	100%	$10,000.00	$10,000.00
14.0	**Materials Testing Allowance and Soils Inspection during construction**	L.S.	100%	$20,000.00	$20,000.00
	Total Non-Construction Cost				$2,126,465.93
	Total Project Cost for PI-1, PI-1A and PII-3				$15,686,980.93
	Amik (PI-2, PI-3, PI-5, PIII-1, PIII-2 and PIII-4)				

Table 8.2A: Cost Estimate for Alternative S.4 - Sewage (20 Year Design Requirements)

WATER AND WASTEWATER SERVICING MASTER PLAN
MARKDALE-FLESHERTON-KIMBERLEY-AMIK-EUGENIA-BEAVER VALLEY
MUNICIPALITY OF GREY HIGHLANDS

Capital Cost Estimate (Class C)					
2012 Constant Dollars					**March 2012**
Item #	**Item Description**	**Unit**	**Qty**	**Unit Cost**	**Total**
	Construction				
1.0	**Mobilization/Demobilization**	L.S.	100%	$500,000.00	$500,000.00
2.0	**Site Work**				
2.1	Clearing and grubbing, topsoiling, hydro seeding, and restoration	L.S.	100%	$750,000.00	$750,000.00
2.2	Site development work at new sewage pumping station sites	L.S.	100%	$300,000.00	$300,000.00
2.3	Site development work at existing WWTP	L.S.	100%	$100,000.00	$100,000.00
2.4	3 Phase hydro and Bell service connection at new sewage pumping stations	L.S.	100%	$60,000.00	$60,000.00
2.6	Asphalt removal and restoration	m	9,430	$250.00	$2,357,500.00
3.0	**Gravity Main and Forcemain Construction**				
3.1	200 mm ⌀ gravity main	m	56,356	$250.00	$14,089,000.00
3.2	Services (20 Year - Residential Equivalent)	ea.	1596	$3,500.00	$5,586,000.00
3.3	Manholes (1200 mm ⌀)	ea.	4 70	$6,500.00	$3,055,000.00
3.4	100 mm ⌀ forcemain (SPS)	m	8,496	$200.00	$1,699,200.00
3.5	100 mm ⌀ forcemain (Grinder Pumps)	m	2,135	$200.00	$427,000.00
3.5	Services with Low Pressure Grinder Pump Systems	ea.	14	$6,500.00	$91,000.00
3.6	Rock removal	m^3	3700	$165.00	$610,500.00
4.0	**New Sewage Pumping Station #1 (PI-2)**				
4.1	Construction of sewage pumping station	L.S.	100%	$370,000.00	$370,000.00
5.0	**New Sewage Pumping Station #2 (PI-3)**				
5.1	Construction of sewage pumping station	L.S.	100%	$370,000.00	$370,000.00
6.0	**New Sewage Pumping Station #3 (PIII-1)**				
6.1	Construction of sewage pumping station	L.S.	100%	$370,000.00	$370,000.00
7.0	**Upgrades to Existing Wastewater Treatment Plant**				
7.1	Potential upgrades consisting of new raw sewage pumping station to existing cells, algae control, control building with phosphorous removal, free water surface wetlands and additional subsurface flow wetlands to increase treatment design capacity to meet estimated 20 year flows	L.S.	100%	$4,000,000.00	$4,000,000.00

Table 8.2A: Cost Estimate for Alternative S.4 - Sewage (20 Year Design Requirements)

WATER AND WASTEWATER SERVICING MASTER PLAN
MARKDALE-FLESHERTON-KIMBERLEY-AMIK-EUGENIA-BEAVER VALLEY
MUNICIPALITY OF GREY HIGHLANDS

Capital Cost Estimate (Class C)					
2012 Constant Dollars					**March 2012**
Item #	**Item Description**	**Unit**	**Qty**	**Unit Cost**	**Total**
8.0	**Environmental Works**				
8.1	Erosion control	L.S.	100%	$200,000.00	$200,000.00
9.0	**Bonding & Insurance**	L.S.	100%	$775,000.00	$775,000.00
10.0	**Allowances**				
10.1	Soils investigation prior to Construction	L.S.	100%	$125,000.00	$125,000.00
10.2	Rock Blast Survey	L.S.	100%	$10,000.00	$10,000.00
10.3	Startup	L.S.	100%	$75,000.00	$75,000.00
	Subtotal Construction Cost				$35,920,200.00
	Construction Contingency	%	10%		$3,592,020.00
	Total Construction Cost				$39,512,220.00
	Non-Construction				
11.0	**Engineering Design**	%	7.0%		$2,765,855.40
12.0	**Contract Administration**	%	8.0%		$3,160,977.60
13.0	**Engineering Disbursement**	%	1.2%		$474,146.64
14.0	**Master Plan Study**	L.S.	100%	$16,667.00	$16,667.00
15.0	**Approvals (CofA, Zoning, etc.)**	L.S.	100%	$80,000.00	$80,000.00
16.0	**Materials Testing Allowance and Soils Inspection during construction**	L.S.	100%	$150,000.00	$150,000.00
	Total Non-Construction Cost				$6,647,646.64
	Total Project Cost for PI-2, PI-3, PI-5, PIII-1, PIII-2 and PIII-4				$46,159,866.64
	Flesherton (PII-1, PII-2 and PII-4)				
	Construction				
1.0	**Mobilization/Demobilization**	L.S.	100%	$100,000.00	$100,000.00
2.0	**Site Work**				
2.1	Clearing and grubbing, topsoiling, hydro seeding, and restoration	L.S.	100%	$150,000.00	$150,000.00
2.2	Site development work at existing WWTP	L.S.	100%	$100,000.00	$100,000.00

Table 8.2A: Cost Estimate for Alternative S.4 - Sewage (20 Year Design Requirements)

WATER AND WASTEWATER SERVICING MASTER PLAN
MARKDALE-FLESHERTON-KIMBERLEY-AMIK-EUGENIA-BEAVER VALLEY
MUNICIPALITY OF GREY HIGHLANDS

Capital Cost Estimate (Class C)					
2012 Constant Dollars					**March 2012**
Item #	**Item Description**	**Unit**	**Qty**	**Unit Cost**	**Total**
2.3	Asphalt removal and restoration	m	7,038	$250.00	$1,759,500.00
3.0	**Gravity Sewage Main and Forcemain Construction**				
3.1	200 mm ⌀ gravity main	m	7,038	$250.00	$1,759,500.00
3.2	Services (20 Year - Residential Equivalent)	ea.	3 15	$3,500.00	$1,102,500.00
3.3	Manholes (1200 mm ⌀)	ea.	59	$6,500.00	$383,500.00
3.4	100 mm ⌀ forcemain (Grinder Pumps)	m	4,926	$200.00	$985,200.00
3.5	Services with Low Pressure Grinder Pump Systems	ea.	55	$6,500.00	$357,500.00
4.0	**Upgrades to Existing Wastewater Treatment Plant**				
4.1	Optimization of existing WWTP capacity of 419 m^3/day to meet estimated 20 year flow of 459 m^3/day	L.S.	100%	$400,000.00	$400,000.00
5.0	**Environmental Works**				
5.1	Erosion control	L.S.	100%	$20,000.00	$20,000.00
6.0	**Bonding & Insurance**	L.S.	100%	$160,000.00	$160,000.00
7.0	**Allowances**				
7.1	Soils investigation prior to Construction	L.S.	100%	$20,000.00	$20,000.00
7.2	Startup	L.S.	100%	$20,000.00	$20,000.00
	Subtotal Construction Cost				$7,317,700.00
	Construction Contingency	%	10%		$731,770.00
	Total Construction Cost				$8,049,470.00
	Non-Construction				
8.0	**Engineering Design**	%	7.0%		$563,462.90
9.0	**Contract Administration**	%	8.0%		$643,957.60
10.0	**Engineering Disbursement**	%	1.2%		$96,593.64
11.0	**Master Plan Study**	L.S.	100%	$16,667.00	$16,667.00
12.0	**Approvals (CofA, Zoning, etc.)**	L.S.	100%	$20,000.00	$20,000.00
13.0	**Materials Testing Allowance and Soils Inspection during construction**	L.S.	100%	$20,000.00	$20,000.00
	Total Non-Construction Cost				$1,360,681.14
	Total Project Cost for PII-1, PII-2 and PII-4				$9,410,151.14
	Total Project Cost for Alternative S.4				$71,256,998.71

Table 8.2B
Annual Operation and Maintenance Cost Estimate
Alternative S.4

Water and Wastewater Servicing Master Plan
Markdale-Flesherton-Kimberley-Amik-Eugenia-Beaver Valley
Municipality of Grey Highlands

111-13229-00

Item Description	Quantity	Unit	Unit Cost	Total
Waterwater Treatment and Pumping Station Operation (Four (4) qualified operators - 6.5hrs/day @ $40/hr)	365	days	$1,040	$379,600
Maintain daily record books	365	days	$75	$27,375
Train four (4) Operators to be qualified for Wastewater Treatment, and maintain yearly training	4	-	$7,500	$30,000
Check and carry out routine maintenance on equipment including pumps, valves, etc.	100%	L.S.	$225,000	$225,000
Maintenance of sanitary sewer system	100%	L.S.	$100,000	$100,000
Laboratory analysis costs	100%	L.S.	$30,000	$30,000
Replace UV lamps, ballasts, quartz sleeves	100%	L.S.	$5,000	$5,000
Hydro for heating, pumping, UV lamps, etc.	100%	L.S.	$100,000	$100,000
Generator set - fuel and maintenance	100%	L.S.	$5,000	$5,000
Reserve fund for significant expenses/repairs (i.e. pump replacement, etc.)	100%	L.S.	$400,000	$400,000
Total Estimated Annual O & M Cost				**$1,301,975**

As per comments from the Municipality of Grey Highlands, during a review of the Draft Master Plan at a council meeting on January 23, 2012, **Table 8.2A** was completed to provide a detailed cost breakdown for the total capital cost, including costs for distribution system sanitary sewer, sanitary services and expansion into the Municipality of West Grey for the 20 year design requirements. These items were not included in the costing tables found in **Appendix L** for any alternative. As well, it should be noted that in addition to added cost items in **Table 8.2A**, some existing item costing has been modified in comparison to the original **Table S.4** as found in **Appendix L**. **Table 8.2A** represents 2012 costing, as completed under the Draft Master Plan and has not been revised as per the updated 2017 Master Plan.

Table 8.2B shows estimated operation and maintenance costs (2012) for **Alternative S.4**, if all components of the recommended alternative were implemented.

8.3 ENVIRONMENTAL IMPACT ASSESSMENT OF PREFERRED ALTERNATIVE AND MITIGATION MEASURE

Table 8.3 provides a statement of potential impacts of the preferred alternative (sewer and water) concerning areas such as surface water, groundwater, soil and sediment, noise and vibration, fish and aquatic life, vegetation, etc. As per the table, proposed mitigation methods are documented where a potential impact has been identified.

Based on the potential impacts and proposed mitigation methods identified, the likelihood and significance of residual effects from the proposed construction activities are minimal to insignificant, provided that the recommended mitigation measures are implemented. Construction activities are medium to large in magnitude and have a larger geographical extent, however, they are temporary and would be completed in small phases. There is likely to be no residual permanent adverse effects to the environment.

8.4 REVISIONS TO PREFERRED SOLUTION (PART 1)

On January 23, 2012, WSP Canada Inc. (formally GENIVAR Inc.) presented the 2012 Draft Master Plan to the Municipality of Grey Highlands. Upon completion of the presentation and detailed discussion, WSP Canada Inc. was requested to prepare a second report regarding an outline of recommended sewage and water serving for **Phase 1** of the Master Plan only. A draft copy of this report was submitted to the Municipality in March 2012.

Information within the March 2012 “Outline of Recommended Sewage and Water Servicing for Phase 1 of the Master Plan”, has been incorporated into the updated 2017 Master Plan. Based on this information, the preferred alternatives for sewage and water within the Master Plan, would focus only on the Phase 1 work, where the Phase 2 and 3 projects would not be reviewed any further. The proposed future infrastructure under Phase 1 represents a 5 year plan for implementation by the Municipality, where by Phase 2 and 3 would not be completed for the foreseeable future.

The extent of the revised recommended Phase 1 work is discussed further in **Sections 8.4.1 and 8.4.2**.

TABLE 8.3
SUMMARY OF ENVIRONMENTAL IMPACTS AND PROPOSED MITIGATION MEASURES
FOR PREFERRED ALTERNATIVES - W.6 AND S.4
WATER AND WASTEWATER SERVICING MASTER PLAN
MARKDALE-FLESHERTON-KIMBERLEY-AMIK-EUGENIA-BEAVER VALLEY
MUNICIPALITY OF GREY HIGHLANDS

Environmental Component Potentially Affected	Proposed Mitigation	Likelihood of Residual Effect	Significance of Residual Effect
Surface Water, Groundwater, Soil & Sediments • All construction activities for this project will potentially disturb soil and sediments and erosion of soils. • Construction and associated project activities may potentially affect various creeks (water crossings) through the disturbance and release of soils and sediment, causing impact on the water quality.	• All materials and equipment used for the purpose of site preparation and project completion shall be operated and stored in a manner that prevents any deleterious substance (e.g. petroleum products, silt, etc.) from entering surface and groundwater. • Sediment and erosion control measures shall be implemented prior to work and maintained during work. • Stabilize any waste materials and/or materials needed for project work to prevent them from entering and impacting any watercourse. • Minimize disturbance to existing vegetation so as to limit disturbance to soils and/or sediments. • Disturbed areas should be stabilized and revegetated as soon as possible (or upon project completion as required) and restored to a predisturbed state. • Stormwater management is necessary so as to avoid erosion and runoff, and to avoid subsequent impacts to water quality (i.e. sedimentation, runoff of contaminants, etc.).	None to minimal residual affects are likely, provided recommended mitigation measures are implemented.	Construction activities are temporary and would be completed in phases. There is no residual permanent adverse effect expected.
Air Quality/Climate Change • Construction and associated project activities with the use of machinery will release dust and/or silt particles and emissions into the air affecting air quality.	• Cover or wet down project materials as necessary to prevent release of fine particulates into the air. • Vehicles, machinery and equipment should be in good repair, equipped with emission controls, as applicable, and operated within regulatory requirements.	Some residual increase in air emissions and dust particles is expected during construction.	Construction activities are temporary and would be completed in phases. There is no residual permanent adverse effect expected.
Noise/Vibration • Construction and associated project activities with the use of machinery will create noise and vibrations potentially to disturbing adjacent landowners and the local wildlife.	• Employ appropriate noise control measures. • Vehicles, machinery and equipment should be in good repair, as applicable, and operated within regulatory requirements.	Some residual increase in noise and vibrations is expected during construction.	Construction activities are temporary and will be completed in phases. There is no residual permanent adverse effect expected.

Environmental Component Potentially Affected	Proposed Mitigation	Likelihood of Residual Effect	Significance of Residual Effect
Residential, Institutional, Commercial and Industrial • Construction and associated project activities may potentially affect and inconvenience adjacent property owners and building owners	• Notification should be provided to public agencies and adjacent owners of construction scheduling. • Emergency program will be implemented to ensure quick solution to problems. • Consultation should be completed with public agencies and adjacent land owners regarding temporary access routes. • Ensure access for emergency response vehicles and personnel at all times.	None to minimal residual effects are likely, provided mitigation measures are implemented	Construction activities are temporary and will be completed in phases. There is no residual permanent adverse effect expected.
Agricultural • Construction and associated project activities may potentially affect agricultural land by disruption of field access and disturbance of livestock by noise and dust.	• Cover or wet down project materials as necessary to prevent release of fine particulates into the air. • Employ appropriate noise control measures • Equipment should be in good repair, equipped with emission controls, as applicable, and operateed within regulatory requirements • Severance of farm property should be minimized and alternative access points should be provided for access by land owners at critical times	Some residual increase in air emissions, dust particles and noise is expected during construction.	Construction activities are temporary and will be completed in phases. There is no residual permanent adverse effect expected.
Vegetation, Wildlife/Habitat, Species at Risk and Migratory Birds • Construction and associated project activities will damage and remove vegetation along the construction path for sewage and watermain, as well at the location of proposed buildings. Wetland exists within the project area. • Construction and associated activities will slightly change the terrain and topography of the project area. • Construction and associated activities may disturb federal and provincially related species at risk. Some site specific species at risk are documented in the project area. • Construction and associated activities may disturb migratory birds that potentially exist near the project area.	• Minimize disturbance to existing vegetation. • Standard tree protection measures should be implemented as necessary. • Disturbed areas should be stabilized and re-vegetated as soon as possible (or upon project completion as required) and restored to a predisturbed state. Native grasses, shrubs, etc. can be planted to mach existing species growing on site. • According to applicable species at risk legislation, do not kill, harm, or harvest any federal or provincial listed species at risk. Should a species or its critical habitat be encountered, measures are to be implemented to avoid destruction, injury or interference with the species, its residence and/or its habitat (e.g. through siting, timing or design changes). • If the foregoing cannot be avoided, the Proponent should cease work and contact Environment Canada, Environmental Policy & Assessment Division, Great Lakes & Corporate Affairs Office, Ontario Region, P.O. Box 5050, 867 Lakeshore Road, Burlington, ON, L7R 4A6, (905)336-4950 to discuss management options to minimize, reduce or control adverse effects or compensatory mitigation and environmental effects monitoring.	Some temporary residual effects are expected.	Construction activities are temporary and will be completed in phases. There is no residual permanent adverse effect expected.

Environmental Component Potentially Affected	Proposed Mitigation	Likelihood of Residual Effect	Significance of Residual Effect
Fish and Fish Habitat • Construction and associated activities could disturb the aquatic ecosystem in various creeks (water crossings) with the release of sediment/soils or chemicals into the watercourse.	• Sediment and erosion control measures should be implemented prior to work and maintained during the work phase, to prevent entry of sediment into the water. • All necessary repairs should be made if any damage is discovered or if these measures are not effective at controlling erosion and sedimentation. • All materials and equipment used for the purpose of site preparation and project completion should be operated and stored in a manner that prevents any deleterious substance (i.e. petroleum products, silt, etc.) from entering the water. • Measures should be used to prevent deleterious substances, such as new concrete, grout, ditch sediment and preservatives from entering the watercourse. • Disturbed areas should be vegetated by planting and seeding preferably native trees, shrubs or grasses and covered with mulch to prevent soil erosion and to help seeds germinate.	Residual effect on fish habitat in creeksis not expected, provided recommended mitigation measures are implemented.	Construction activities are temporary and will be completed in phases. There is no residual permanent adverse effect expected.
Human Health & Safety • Construction and associated activities through the use of machinery may release dust particles and emissions possibly affecting human health.	• The Minister or his representatives are allowed unimpeded access to the site for inspection and/or monitoring purposes. • Adequate safety barriers and signs for safety of workers and public. The contractor will be required to implement a Health and Safety Plan (OHSA 1990). • All workers involved in construction, and installation activities, etc. must wear appropriate protective equipment (e.g. safety boots, hard hats, protective eye wear, safety vests as appropriate). • An individual trained in Emergency First Aid/CPR will be present at all times and have access to appropriate First Aid materials during all project related activities.	Minor residual, increase in emissions and dust particles is expected during the construction phase	Construction activities are temporary and will be completed in phases. There is no residual permanent adverse effect expected.
Spills • Construction and associated activities through the use of machinery may result in spill or leak of petroleum and/or other substances from vehicles into the soil and/or watercourse.	• Re-fuelling activities (machinery, vehicles, etc.) or activities involving deleterious substances should be undertaken well away from watercourses. • Develop a spill prevention and contingency plan and keep at site. • Proper spill management equipment (i.e. spill kit) should be located on site at all times during project. Immediately clean and contain spills in accordance with provincial regulatory requirements. • Immediately contain and clean up spills in accordance with provincial regulatory requirements and contingency plan. • Report spills to Ontario Spills Action Centre at 1-800-268-6060.	No residual affects, provided recommended mitigation measures are implemented	Construction activities are temporary and will be completed in phases. There is no residual permanent adverse effect expected.

8.4.1 REVISIONS TO PROPOSED PHASE 1 SERVICING – WATER SUPPLY

As per the selected water servicing **Alternative W.6**, for Phase 1, the proposed water supply infrastructure within the 2017 Master Plan, has been revised and broken down into the following sub-phases:

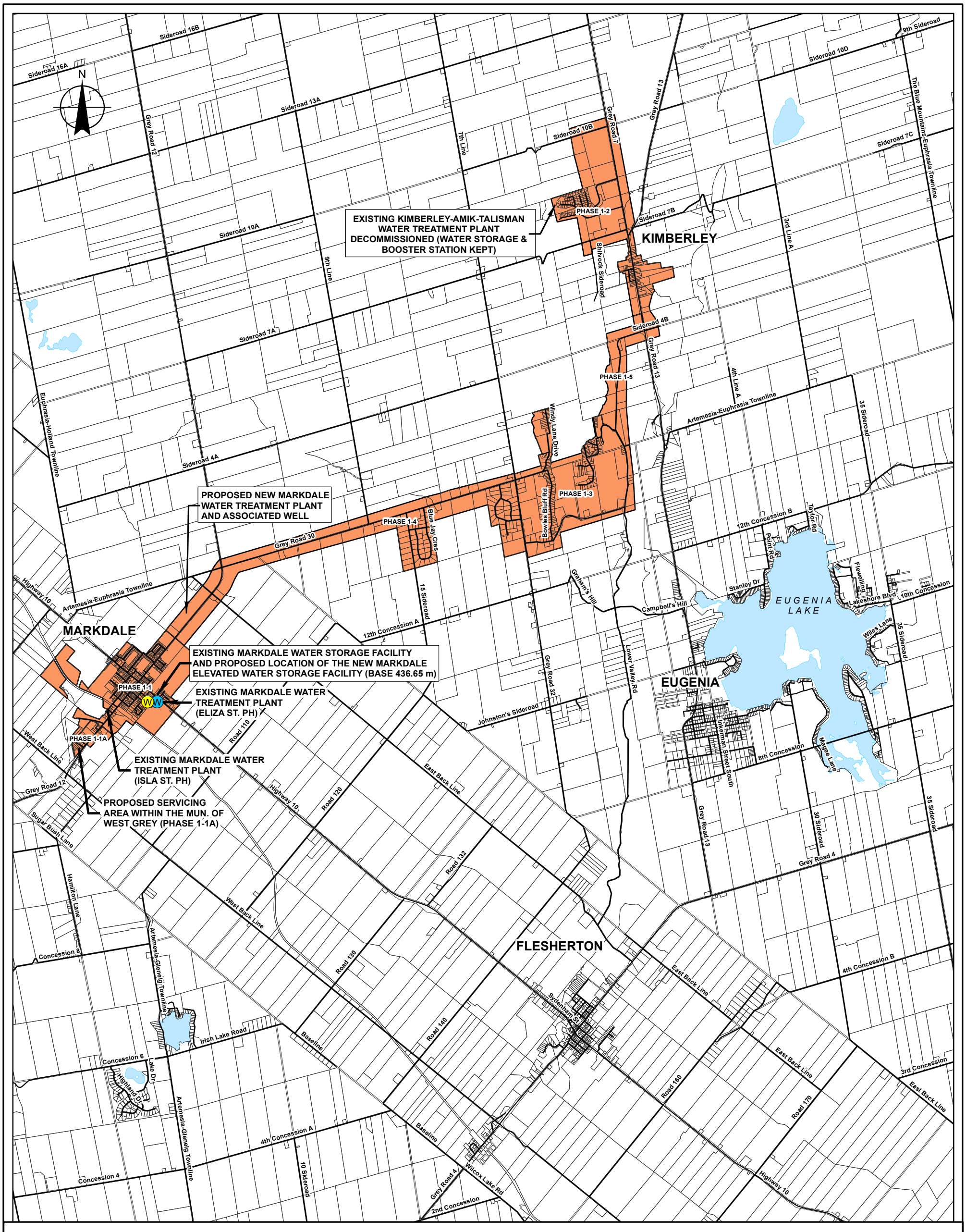
- Phase P1-1: Village of Markdale
- Phase P1-1A: Extension into West Grey including properties to the West and South of Markdale (some isolated Grey Highlands lots are also included)
- Phase P1-2: Kimberly, Amik and Talisman
- Phase P1-3: Beaver Valley Ski Club to County Road 32
- Phase P1-4: Grey Road 12 and 30 Corridor from Markdale to Grey Road 32
- Phase P1-5: Grey Road 30 Corridor from Beaver Valley Ski Club to Grey Road 13

Refer to **Figure 8.4A** for details.

Water Supply and Treatment

The following water supply and treatment infrastructure is proposed:

- Utilize existing Isla Street Pump Station in Markdale - Well #1 Capacity – 2,619 m^3/day. Well pump would have to be upgraded to meet height requirements for the proposed new water storage facility.
- Utilize existing Eliza Street Pump Station in Markdale - Well #3 Capacity – 2,291 m^3/day (current capacity). The existing Well #3 would be developed further to increase its capacity to 2,782 m^3/day. The well pump would also have to be upgraded to meet height requirements for the proposed new water storage facility.
- Utilize existing Eliza Street Pump Station in Markdale - Well #4 Capacity – 1,080 m^3/day. Well pump would have to be upgraded to meet height requirements for the proposed new water storage facility.
- Recommended to construct one (1) additional water treatment and pumping station in Markdale to pump water into the distribution system, including installation of one (1) new high capacity well (approximately 400 IGPM or 2,619 m^3/day). Location approximately 450 m east on Grey Road 12 into Phase P1-4.
    - With all existing wells in operation in Markdale (Well #1, #3 – upgraded capacity, and Well #4), the overall capacity is 6,481 m^3/day. The 20 year maximum day demand of 5,746 m^3/day (Phase P1-1 to P1-5), can be met by all three (3) wells in operation. However, if say the largest capacity well (Well #3), is out of operation for several weeks (i.e. only Well #1 and #4 in operation), the available capacity would only be 3,699 m^3/day.



LEGEND

- PROPERTY PARCEL
- MARKDALE WTP PROPOSED SERVICE AREA
- EXISTING WATER STORAGE FACILITY
- PROPOSED WATER STORAGE FACILITY

PREFERRED SOLUTION FOR WATER TREATMENT, WATER STORAGE AND WATER DISTRIBUTION
ALTERNATIVE - W.6 - PHASE 1
MUNICIPALITY OF GREY HIGHLANDS
WATER AND WASTEWATER MASTER PLAN

WSP
1450 1st AVENUE WEST, SUITE 101
OWEN SOUND, ONTARIO CANADA N4K 6W2
PHONE: 519 376-7612 - FAX: 519 376-8008 - WWW.WSPGROUP.COM

DESIGN	CW
DRAWN	JET
APPROVED	CW
DATE	MAY 2016
SCALE	SEE SCALE BAR
FILE No.	111-13229-00
FIG. No.	8.4A

This amount cannot meet the 20 year maximum day demand of 5,746 m^3/day. As a result, it is recommended that an additional water treatment plant and well be constructed in the next 20 years, with a well capacity of approximately 2,619 m^3/day (400 IGPM). With this capacity combined with Well #1 and #4, we have a capacity of 6,318 m^3/day (with Well #3 out of operation), which will meet the 20 year maximum day demand of 5,746 m^3/day.

- The Kimberley-Amik-Talisman Water Treatment Plant would be decommissioned. The existing water storage and booster pumping capabilities would remain in operation.

Water Storage

The following water storage infrastructure is proposed:

- New Markdale Elevated Glass-Fused-To-Steel Storage Facility
- Design Year: 50
- Top Water Elevation (m): 488.00
- Base Elevation (m): 436.65
- Total Usable Storage (m^3): 3,725

  The Total Usable Storage for the new Markdale water storage facility originally calculated for Alternative W.6 in the Master Plan, was 5,000 m^3 (which included Phase P2-3 demands). As per the available storage at the existing Kimberley-Amik-Talisman water treatment plant being approximately 1,279 m^3 (as discussed below), the 5,000 m^3 storage capacity can be reduced by this amount to a new Total Usable Storage of 3,725 m^3.

- The existing Markdale water storage tower would be decommissioned under Phase P1-1. The entire Phase 1 service area would float on the proposed new Markdale water storage facility.
- The existing 870 m^3 of water storage at Kimberley-Amik-Talisman in the tanks under the existing water treatment plant will remain in use. An additional 409 m^3 of storage can be utilized by reconfiguring the use of the existing three (3) raw water storage tanks on-site. The total available storage capacity would then be approximately 1,279 m^3.

Water Distribution, Pressure Reducing Valves, Hydrants, Booster Station and Local Watermains

The following water distribution, pressure reducing valves, hydrants, booster station and local watermain infrastructure is proposed:

Phase P1-1:

- Approximately 1,706 m of 300 mm dia. trunk watermain, to replace existing smaller diameter watermain and provide new watermain.
- Approximately 320 m of 250 mm dia. distribution watermain, to replace existing smaller diameter watermain.

- Approximately 6,159 m of 200 mm dia. distribution watermain, to replace existing smaller diameter watermain and provide new watermain.

- Existing hydrants and services to be utilized with replacement watermain. New hydrants and new services to be provided with new watermain.

Phase P1-1A:

- Approximately 1,341 m of 200 mm dia. distribution watermain to service West Grey/Grey Highlands lots along Grey Road 12 south and Highway 10 west.

- New hydrants and new services to be provided with new watermain. Some isolated Grey Highlands lots will be serviced as well.

Phase P1-2:

- Approximately 3,941 m of 300 mm dia. trunk watermain, to replace existing smaller diameter watermain and provide new watermain.

- Approximately 582 m of 200 mm dia. distribution watermain.

- Existing hydrants and services to be utilized with replacement watermain. New hydrants and new services to be provided with new watermain.

- Pressure reducing valves will be required at the bottom of the escarpment in Kimberley.

- A booster pumping station would be required to be constructed in Kimberley at a low location, after the pressure reducing valves, to boost pressure back up to minimal requirements at the homes adjacent to the existing water treatment plant water storage.

Phase P1-3:

- Approximately 2,408 m of new 300 mm dia. trunk watermain. No existing watermain is in place. 815 m of the trunk watermain would cross the existing easement from the intersection of Bowles Bluff Road and Windy Lane Drive to Beaver Trail. No hydrants to be provided along the easement route.

- Approximately 6,001 m of new 200 mm dia. distribution watermain. No existing watermain is in place.

- New hydrants and new services to be provided with new watermain.

- Pressure reducing valves will be required down the escarpment from Bowles Bluff Road.

Phase P1-4:

- Approximately 7,038 m of new 300 mm dia. trunk watermain. No existing watermain is in place.

- Approximately 4,788 m of new 200 mm dia. distribution watermain. No existing watermain is in place.
- New hydrants and new services to be provided with new watermain.

Phase P1-5:

- Approximately 2,135 m of new 300 mm dia. trunk watermain. No existing watermain is in place.
- New hydrants and new services to be provided with new watermain.

Water Services

The following water servicing infrastructure is proposed:

Existing: 1684

Future: 1500

Total: 3184 (Residential Equivalent Units)

- 20 Year Increase in Residential Equivalent Units: 89%
- Increase Per Year: 3.24%

Note: For the 20 year design period, only potential development sites were utilized (i.e. future subdivisions, commercial, industrial, vacant lots, etc.), which has resulted in the high 3.24% yearly increase for this period (similar for sewage).

8.4.2 REVISIONS TO PROPOSED PHASE 1 SERVICING – SEWAGE SERVICING

As per the selected sewage servicing **Alternative S.4**, for Phase 1, the proposed sewage servicing infrastructure within the 2017 Master Plan, has been revised and broken down into the following sub-phases:

- Phase P1-1: Village of Markdale
- Phase P1-1A: Extension into West Grey including Properties to the West and South of Markdale (some isolated Grey Highlands lots are also included)
- Phase P1-2: Kimberly, Amik and Talisman
- Phase P1-3: Beaver Valley Ski Club, County Road 32
- Phase P1-5: Grey Road 30 Corridor from Beaver Valley Ski Club to Grey Road 13

Phase 1-4 is **not** to be serviced.

Refer to **Figure 8.4B** for details.

UPGRADE EXISTING AMIK WASTEWATER TREATMENT FACILITIES

UPGRADE EXISTING MARKDALE WASTEWATER TREATMENT FACILITIES

KIMBERLEY

MARKDALE

FLESHERTON

EUGENIA

EUGENIA LAKE

POTENTIAL SPS # 1

POTENTIAL SPS # 2

PHASE 1-1

PHASE 1-1A

PHASE 1-2

PHASE 1-3

PHASE 1-4

PHASE 1-5

Sideroad 16B
Sideroad 16A
Sideroad 13A
Grey Road 12
Sideroad 10A
Sideroad 7A
Sideroad 4A
9th Line
7th Line
Sideroad 10B
Grey Road 7
Sideroad 10D
9th Sideroad
The Blue Mountains-Euphrasia Townline
Sideroad 7C
Sideroad 7B
Shilvock Sideroad
3rd Line A
Sideroad 4B
Grey Road 13
4th Line A
Artemesia-Euphrasia Townline
35 Sideroad
Windy Lane Drive
Bowles Bluff Rd
Euphrasia-Holland Townline
Grey Road 30
Blue Jay Cres
15 Sideroad
Bowles Bluff Rd
Graham's Hill
Campbell's Hill
12th Concession B
Taylor Rd
Point Rd
Flewelling Dr
Stanley Dr
Lakeshore Blvd
10th Concession
Wiles Lane
Lower Valley Rd
Grey Road 32
Johnston's Sideroad
Inkerman Street South
8th Concession
Magee Lane
30 Sideroad
Grey Road 4
Highway 10
Artemesia-Euphrasia Townline
12th Concession A
West Back Line
Grey Road 12
Sugar Bush Lane
Hamilton Lane
Concession 8
Road 110
Highway 10
Road 120
East Back Line
Road 132
Road 130
Road 140
Road 160
Road 170
Sydenham Street
4th Concession B
3rd Concession
2nd Concession
Concession 6
Concession 4
Irish Lake Road
Lake Dr
Highland Dr
Artemesia-Glenelg Townline
4th Concession A
10 Sideroad
Baseline
Grey Road 4
Wilcox Lake Rd

LEGEND

- MARKDALE WWTP PROPOSED SERVICE AREA
- AMIK WWTP PROPOSED SERVICE AREA
- MUNICIPAL WASTEWATER FACILITY
- PROPERTY PARCEL
- P — POTENTIAL LOCATION FOR SEWAGE PUMP STATION (APPROX.)

PROPOSED SEWER MAINS

- NEW - Forcemain from Sewage Pumping Station
- NEW - Forcemain with Grinder Pumps
- REPLACEMENT - Forcemain with Grinder Pumps
- NEW - Gravity Sewer Main
- DIRECTION OF FLOW

0 0.5 1 2 3 4
Kilometres

PREFERRED SOLUTION FOR WASTEWATER TREATEMENT, SEWAGE PUMPING STATION AND SANITARY SEWER COLLECTION ALTERNATIVE - S.4 - PHASE 1
MUNICIPALITY OF GREY HIGHLANDS
WATER AND WASTEWATER MASTER PLAN

WSP
1450 1st AVENUE WEST, SUITE 101
OWEN SOUND, ONTARIO CANADA N4K 6W2
PHONE: 519 376-7612 - FAX: 519 376-8008 - WWW.WSPGROUP.COM

DESIGN	CW
DRAWN	JET
APPROVED	CW
DATE	MAY 2016
SCALE	SEE SCALE BAR
FILE No.	111-13229-00
FIG. No.	8.4B

Wastewater Treatment

The following wastewater treatment infrastructure is proposed:

Phase P1-1:

- Expand the existing Markdale Wastewater Treatment Plant to increase its existing treatment capacity of 1,122 m^3/day to the 20 year average day flow of 1,949 m^3/day (Phase P1-1 and P1-1A).

Phase 1-2:

- Expand the existing Amik-Talisman Wastewater Treatment Plant to increase its existing treatment capacity of 249 m^3/day to the 20 year average day flow of 735 m^3/day (Phase P1-2, P1-3 and P1-5).

Sanitary Sewer Collection and Sewage Pumping Stations

The following sanitary sewer collection and pumping station infrastructure is proposed:

Phase P1-1

- No existing sanitary sewer to be replaced.
- Approximately 5,695 m of new 200 mm dia. sanitary sewer.
- New manholes and new services to be provided with sanitary sewer.

Phase P1-1A:

- Approximately 85 m of 200 mm dia. sanitary sewer to service West Grey/Grey Highlands lots on Highway 10 west.
- New manholes and new services to be provided with sanitary sewer.
- 1,508 m of 100 mm dia. forcemain utilizing individual low pressure grinder pumps for all service connections to pump to Phase P1-1 from Grey Road 12, Ford's Drive and Glenwood Place.
- Flushing manholes to be provided for forcemain.

Phase P1-2:

- No existing sanitary sewer to be replaced.
- Approximately 2,963 m of new 200 mm dia. sanitary sewer.
- New sewage pumping station SPS#1 located at Side Road 7A and Grey Road 13 to pump by 691 m of 100 mm dia. forcemain to Shilvock Side Road. Gravity flow of sewage would proceed to the wastewater treatment plant.

- New manholes and new services to be provided with sanitary sewer. Flushing manholes to be provided for forcemain.

Phase P1-3:

- Approximately 6,745 m of new 200 mm dia. sanitary sewer. 815 m of the sanitary sewer would cross the existing easement from the intersection of Bowles Bluff Road and Windy Lane Drive to Beaver Trail.
- New sewage pumping station SPS #2 located at east end of Phase P1-3, at the intersection of Beaver Trail and Grey Road 30 to pump collected sewage from the Beaver Valley Ski Club, Bowles Bluff Road, Windy Lane Drive areas by 2,135 m of 100 mm dia. forcemain through Phase P1-5 to Phase P1-2. Gravity flow of sewage would proceed to SPS #1.
- New manholes and new services to be provided with sanitary sewer. Flushing manholes to be provided for forcemain.

Phase P1-5:

- 2,135 m of 100 mm dia. forcemain utilizing individual low pressure grinder pumps for all service connections to pump to Phase P1-2. Sewage combines with SPS #2 pumped flow to flow by gravity to SPS #1.
- Flushing manholes to be provided for forcemain.

Sewage Services

The following sanitary servicing infrastructure is proposed:

Existing: 1689

Future: 1493

Total: 3182 (Residential Equivalent Units)

- 20 Year Increase in Residential Equivalent Units: 88%
- Increase Per Year: 3.22%

8.5 REVISIONS TO PREFERRED SOLUTION (PART 2)

On August 15, 2012, WSP Canada Inc. and Municipality of Grey Highlands met with the Ministry of the Environment and Climate Change (MOECC), County of Grey, and Niagara Escarpment Commission, regarding the 2012 Draft Master Plan and additional outline report concerning Phase 1. The letter from the MOECC regarding their review of the Draft Master Plan, dated July 16, 2012 is provided in **Appendix M**.

Based on discussions during the meeting, there was general consensus that the 2012 Draft Master Plan would need to be updated to provide more detail regarding the potential upgrades at the Markdale Wastewater Treatment Plant under and the Amik-Talisman Wastewater Treatment Plant under **Alternative S.4.** Minutes from this meeting are provided in **Appendix N**.

At the same meeting, WSP Canada Inc. presented potential optimization options for the Markdale Wastewater Treatment Plant, as opposed to the current potential upgrades documented in the 2012 Draft Master Plan. One of the potential optimization options noted was to increase the current plant hydraulic capacity to 1,720 m^3/day, by discharge to the Rapid Infiltration Basins during the winter period (year round discharge). The Municipality noted that they would like to proceed with this option for continuous year round discharge to the Rapid Infiltration Basin, whereby the Master Plan would be updated to include this recommended option within the **Alternative S.4**. There was general consensus at the meeting that data must be provided and presented in the Master Plan to make the case for the "need" for increasing the capacity and to year round discharge. There was discussion concerning Class EA requirements for the optimization of the Markdale Wastewater Treatment Plant. As per comments from the MOECC, the optimization would require a Schedule B Class EA, which would be part of the Master Plan. It was noted by the MOECC that a Schedule C Class EA would not be required.

Based on the additional information that the MOECC required in the Master Plan regarding the potential upgrades at that Amik-Talisman Wastewater Treatment Plant under **Alternative S.4**, the Municipality provided direction to WSP to not include any further information. A separate EA would have to be completed for potential future upgrades to the Amik-Talisman Wastewater Treatment Plant.

8.6 REVISIONS TO PREFERRED SOLUTION (PART 3)

Base on the discussions with the MOECC in 2012, and subsequently in late 2016/early 2017, this updated 2017 Master Plan has been updated further regarding the two (2) Schedule B projects as follows:

1) New Markdale Water Storage Facility; and

2) Optimization of the Existing Markdale Wastewater Treatment Plant.

8.6.1 REVISIONS TO PROPOSED PHASE 1 SERVICING – NEW MARKDALE WATER STORAGE FACILITY

Through further discussions with the Municipality of Grey Highlands, the Kimberley-Amik-Talisman water treatment plant would remain in use, whereby the Phase P1-1 New Markdale Water Storage Facility would service Markdale only, not in combination with existing and potential revised water storage at the Kimberley-Amik-Talisman water treatment plant.

Water Storage

The following water storage infrastructure is proposed for Phase P1-1 for Markdale only:

- New Markdale Elevated Glass-Fused-To-Steel Storage Facility
- Design Year: 50
- Top Water Elevation (m): 488.00
- Base Elevation (m): 436.65
- Total Usable Storage (m^3): 3,725 (similar to Revised Size indicated under **Section 8.4.1**)

8.6.2 REVISIONS TO PROPOSED PHASE 1 SERVICING – OPTIMIZATION OF THE EXISTING MARKDALE WASTEWATER TREATMENT PLANT

The feasibility of re-rating the existing Markdale Wastewater Treatment Plant from 1,122 m3/d to 1,722 m3/d was evaluated. This involved a review of the facility's historical performance and a review of the facility's existing design against the MOECC's Design Guidelines for Sewage Works (2008).

The sections below discuss the approach followed to determine the feasibility of re-rating the facility.

8.6.2.1 EXISTING LAGOON FACILITY AND RAPID INFILTRATION BASINS

The Markdale Wastewater Treatment Plant (WWTP) is an aerated facultative lagoon facility consisting of two (2) lagoons (Cell No.1 and Cell No. 2) in series. Treated effluent at the end of Cell No. 2 is pumped into the rapid infiltration basins (RIBs). The effluent seeps into the groundwater table and eventually combines with the Rocky Saugeen River. **Table 8.6A** below describes characteristics of the two (2) lagoon cells.

The facility was upgraded in 2014. The upgrades included the installation of additional aerators/mixers and modification to the existing rapid infiltration basins to allow for year round operation (i.e. continuous discharge). Operation of the upgraded facility began June 2015. The facility is operated under ECA #9378-9M2RLX, issued August 13, 2014.

Table 8.6A Existing Infrastructure at the Markdale Wastewater Treatment Plant

DESIGN PARAMETERS	CELL #1	CELL #2
Bottom Elevation	403.3m	402.8m
Top of Berm	407.5m	407.3m

DESIGN PARAMETERS	CELL #1	CELL #2
Normal Operating Level	406.9m	406.8m
Surface Area at Normal Operating Levels	1.398 ha	6.274 ha
Volume	39,908 m^3	220,570 m^3
Aeration	Two (2) 15 HP blowers and One (1) 5 HP blower	
Alum Addition	20,000 L storage tank with chemical addition at influent structure to Cell #1 or interconnecting manhole between Cell #1 and Cell #2	
Effluent Pumping Station	Two (2) 5 HP Submersible pumps to transfer Cell #2 effluent to the RIBs	

The eight (8) rapid infiltration basins are constructed in the existing stoned, silty, sand and gravel native soil. Each basin is approximately 56 metres long by 6 metres wide and approximately 0.6 metres deep. The bottom of the RIBs is covered with approximately 0.15 metres of sand.

Currently, the standard operation at the facility is to load two (2) RIBs at a total flow rate of 1,000 m^3/d for seven days. After seven days the two (2) RIBs are rested and re-tilled if required and two (2) other RIBs are loaded. As demonstrated by current operations, each RIB can reliably accommodate a flow of approximately 500 m^3/d.

8.6.2.2 HISTORICAL PERFORMANCE OF THE LAGOON FACILITY

Table below shows the historical effluent quality data compared to the existing effluent limits from the facility's Certificate of Approval from the MOECC.

Table 8.6B Historical Effluent Quality Data from Lagoon Cell No. 2

PARAMETER	2013	2014	2015	2016	AVERAGE	EFFLUENT LIMITS
cBOD5 (mg/L)	5.5	2.36	5.1	4.6	4.39	25.0
TSS (mg/L)	13.4	10.39	4.9	3.2	7.97	30.0

PARAMETER	2013	2014	2015	2016	AVERAGE	EFFLUENT LIMITS
TP (mg/L)	0.22	0.17	0.09	0.22	0.18	1.0
pH	7.94	8.16	8.11	8.10	8.08	6.0 – 9.5

As shown in **Table 8.6B**, the facility is performing well and with effluent well below the effluent quality limits.

8.6.2.3 DESIGN GUIDELINES FOR AERATED LAGOONS

To demonstrate that the facility has more capacity than its ECA rated capacity, the design characteristics of the existing lagoon system were compared to the MOECC guidelines in the *Design Guidelines for Sewage Works* (MOECC, 2008). The critical parameters and the recommended values used to size an aerated lagoon capable of providing secondary treatment are:

- Organic Loading Rate = 0.031 – 0.048 kg BOD_5 /m^3/d
    - Defined as the amount of BOD_5 that the lagoon can treat in a given volume
- Depth = 3 to 4.6 m
- Hydraulic Retention Time (HRT) in Aerated Lagoon = 4 to 5 days
    - Defined as the average length of time that the sewage spends in the aerated lagoons
- Minimum HRT after aeration to achieve disinfection = 30 days

Furthermore, the following equation can be used to determine the hydraulic retention time in the lagoon facility required to reduce BOD concentration to a desired effluent concentration (WEF, 2003).

$$\frac{C_n}{C_o} = \frac{1}{\left[1 + \frac{k * HRT}{n}\right]^n}$$

Where: C_n = effluent BOD_5 in cell n (mg/L)
C_o = influent BOD_5 (mg/L)
k = first-order reaction rate constant (0.14 for a lagoon temperature of 1 ^oC
HRT = Hydraulic Retention Time (days)
n = number of cells in series (2 at the Markdale WWTP)

Assuming C_n is the effluent objective of 20 mg/L and knowing the influent BOD_5 averages 175 mg/L, the HRT can be calculated.

$$\frac{20}{175} = \frac{1}{\left[1 + \frac{(0.14) * HRT}{2}\right]^2}$$

$HRT = 23.5\ days$ (minimum required HRT to achieve the desired level of BOD reduction)

Table 8.6C below compares the design characteristics of the existing lagoon system against the MOECC guidelines and the HRT derived using the formula above considering the proposed average day flow of 1,722 m^3/d.

Table 8.6C - Lagoon Evaluation

PARAMETER	2008 GUIDELINES	EXISTING WORKS	COMMENT
Lagoon Organic Loading Rate (OLR)	0.031 – 0.048 kg BOD_5 /m^3/d	Influent BOD_5 = 175 mg/L Average Daily Flow (ADF) = 1,722 m^3/d BOD_5 Loading = (Influent BOD_5)*(ADF) = 301 kg/d Total Area = 7.67 ha OLR = (BOD_5 Loading)/(Total Area) = 39.3 kg/ha/d	Meets Minimum Requirements
Hydraulic Retention Time (HRT)	4 to 5 days (Minimum) 30 Days (Disinfection)	Volume = 260,478 m^3 @ High Water Level HRT = (Volume)/(ADF) = 151.2 days	Meets Minimum Requirements
Hydraulic Retention Time (HRT)	23.5 days (WEF)	HRT = 151.2 days (High Water Level)	Meets Minimum Requirements
Depth	3 to 4.6 m	Cell # 1, D = 3.58 m Cell #2, D = 3.9 m	Within Typical Range

8.6.2.4 DESIGN GUIDELINES FOR RAPID INFILTRATION BASINS

The MOECC does not provide guidelines for the design of rapid infiltration basins (RIB).

However, historical use of the RIBs at the Markdale WWTP shows that each basin can accommodate a flow of at least 500 m^3/d. Therefore, four (4) RIBs would be able to accommodate the proposed capacity of 1,722 m^3/d. The operation of the RIBs would be rotated such that four basins would be loaded for seven days while the other four (4) are resting.

8.6.2.5 CONSULTATION WITH THE MOECC

WSP sent a preliminary ECA consultation letter MOECC to inform them of the proposed re-rating and the effluent objectives and limits of the Markdale Wastewater Treatment Plant (See back of **Appendix M**).

The only effluent criterion that was proposed to be changed was the total phosphorus limit. The total phosphorus limit was lowered to ensure that the total phosphorus effluent loadings to the receiving stream do not change.

Table 8.6D and **Table 8.7E** show the existing and proposed effluent objectives and limits respectively.

Table 8.6D - Existing Effluent Objectives and Effluent Limits

EFFLUENT PARAMETER	EFFLUENT OBJECTIVES	EFFLUENT LIMITS	
	AVERAGE CONCENTRATION (MG/L)	AVERAGE CONCENTRATION (MG/L)	AVERAGE LOADINGS (KG/D)
CBOD5	20.0	25.0	28.1
TSS	25.0	30.0	33.7
TP	0.8	1.0	1.12
pH	pH to the effluent to be maintained between 6.0 and 9.5 inclusive, at all times		

Table 8.6E – Proposed Effluent Objectives and Effluent Limits

EFFLUENT PARAMETER	EFFLUENT OBJECTIVES	EFFLUENT LIMITS	
	AVERAGE CONCENTRATION (MG/L)	AVERAGE CONCENTRATION (MG/L)	AVERAGE LOADINGS (KG/D)
CBOD5	20.0	25.0	43.0
TSS	25.0	30.0	51.6
TP	0.5	0.65	1.12
pH	pH to the effluent to be maintained between 6.0 and 9.5 inclusive, at all times		

The MOECC responded to the preliminary ECA consultation letter (See response in back of **Appendix M**), indicating that the proposed increase in design capacity is generally acceptable following two conditions:

- The effluent concentration limit on total phosphorus is lowered such that the total phosphorus loading is capped, and;
- The environmental monitoring program in the current ECA remains in force.

This letter was included as an attachment to the ECA amendment request (currently in for approval).

As shown in **Table 8.6B**, the lagoons have historically discharged TP concentrations less than 0.5 mg/L, as low as 0.09 mg/L. Therefore, it is expected that even with an increased influent flow of 1,722 m^3/d, the facility would be able to meet the reduced TP limit of 0.55 mg/L.

8.6.2.6 CONCLUSIONS

The Municipality of Grey Highlands Wastewater Master Plan has identified the need to increase the capacity of the Markdale WWTP from 1,122 m^3/d to 1,722 m^3/d.

The RIBs have been reliably operated at a flow of 500 m^3/d per basin. Therefore, four (4) of the eight (8) RIBs would be able to accommodate the proposed flow of 1,722 m^3/d. The RIBS would be rotated to operate four basins for seven days and then rested for seven days.

After review of the existing lagoon facility's operation and historical effluent quality data, it is our recommendation that there is sufficient capacity in the existing lagoon facility to accommodate the additional flow while maintaining the desired treatment performance.

An amendment to Environmental Compliance Application has been submitted to the MOECC and is currently under review (Fall 2017).

9 FINANCIAL IMPACT AND FINANCING ALTERNATIVES

The estimated project cost for the proposed new water tower in Markdale is $4,775,000.00, as documented in **Table 8.1B** (2012 costs).

In 2018 costs, the estimated project cost for the proposed new water tower in Markdale is $4,900,000.00 (2% inflation used, contingency reduced from 10% to 5%, and engineering reduced from 15% to 11% including disbursements absorbed into cost). Land purchasing costs and upgrades to water treatment plant pumphouses are not included.

For the proposed optimization of the Markdale Lagoons, no capital costs or increased operation costs are anticipated. However, further consultation with the MOECC is required concerning the currently submitted ECA application for approval.

10 CONSULTATION WITH REVIEW AGENCIES AND THE PUBLIC

10.1 2011 – 2013 CONSULTATION

Government Agency Consultants

The following government agencies were contacted with regard to the Master Plan by way of letter on June 15, 2011.

1) Ministry of the Environment, Toronto
2) Ministry of the Environment, Owen Sound
3) Ministry of the Environment, London
4) Ministry of Natural Resources, Owen Sound
5) Ministry of Agriculture & Rural Affairs
6) Ministry of Municipal Affairs & Housing
7) Ministry of Transportation, Owen Sound
8) Ministry of Aboriginal Affairs
9) Indian & Northern Affairs Canada, Toronto
10) Grey Bruce Health Unit
11) Saugeen Valley Conservation Authority
12) Grey Sauble Conservation Authority
13) Township of Melancthon
14) Town of Collingwood
15) Township of Clearview
16) Township of Southgate
17) Municipality of West Grey
18) Township of Chatsworth
19) Municipality of Meaford

20) Town of The Blue Mountains

21) County of Dufferin

22) County of Simcoe

23) County of Bruce

24) County of Grey

25) Saugeen First Nation

26) Chippewas of Nawash Unceded First Nation

The following government agencies were contacted with regard to the Master Plan by way of letter on August 24, 2011 after the first public consultation meeting on June 28, 2011. The below First Nation entities were recommended to be contacted by Ministry of Aboriginal Affairs by letter received by WSP Canada Inc. (formerly GENIVAR Inc.) on August 10, 2011.

1) Indian & Northern Affairs Canada, Gatineau, QC

2) Métis Nation of Ontario Head Office

3) Historic Saugeen Métis

4) Great Lakes Métis Council

5) Chippewas of Rama

6) Beausoleil First Nation

7) Chippewas of Georgiana Island

The Ministry of Tourism, Culture and Sport (MTCS) was provided a letter regarding the Master Plan on April 25, 2013.

Please refer to **Appendix M,** which includes the letters sent to the First Nation entities for all dates, the letter to the MTCS and the Notice of Commencement and Problem Definition for the Master Plan. By way of the sent letters, the above agencies were requested to notify WSP Canada Inc. of any comments they had concerning the proposed Master Plan.

A summary of the comments received can be found in **Table 10.0A**. Refer to **Appendix M** for the comments received.

Public Notices

A Public Notice was provided in the Markdale Standard on May 31, 2011 (See **Appendix M**) notifying the public of a public consultation meeting on June 28, 2011 to receive input and background information from the public concerning the proposed Master Plan. Based on the public consultation meeting on June 28, 2011, several comments were received by WSP Canada Inc. Based on the received comments, the

public is for the most part in agreement with the proposal for a regional water and wastewater system under the Master Plan. Refer to **Table 10.0A** for a summary of the comments received from the public meeting. Refer to **Appendix M** for a copy of the agenda for the meeting, the presentation to the public, comments received from the public, as well as the attendance sheet for the public meeting held.

Additional First Nations Notifications

First Nation entities were notified on June 8, 2012 by letter that a draft version of the Master Plan could be downloaded from the Municipality of Grey Highlands. Refer to **Appendix M** for copies of the letters sent to the First nation entities.

After meeting with the MOECC on August 15, 2012, WSP proceeded to initiate meetings with the local First Nations to satisfy the Master Plan requirements. These First Nations included the Saugeen Ojibway First Nation/Chippewas of Nawash Unceded First Nation, Historic Saugeen Metis and Great Lakes Metis Council. A summary of correspondence (in addition to **Table 10.0A**), with the First Nations in 2011-2013 is provided in **Table 10.0B**. A summary of the meetings is provided in **Table 10.0C**. Correspondence related to **Table 10.0B** and **10.0C** is also provided in **Appendix M**.

Also included in **Appendix M** is a signed and executed Memorandum of Understanding dated July 14, 2014 between the Saugeen Ojibway Nation and the Municipality of Grey Highlands regarding aboriginal consultation for this Master Plan. Based on the Memorandum, the Municipality opted to not proceed with an Archaeological Stage 1 for the Markdale Water Tower and Markdale Lagoon Optimization projects within the Master Plan. Future projects will require consultation with the Saugeen Ojibway Nation regarding archaeological Stage 1 assessments.

10.2 2016-2017 CONSULTATION

A Public Notice was provided for the Phase 2 Public meeting in the Markdale Standard and by letter on April 3, 2017 (see **Appendix M** for copy of the notice). The notice addressed the continuation of the Master Plan, whereby the two (2) Schedule B projects within, would be presented with their recommended preferred solutions. The notice was sent to all contacts within the updated 2017 Contact List provided in **Appendix M**. E-mails and faxes were sent to the First Nation entities regarding the notice for the Phase 2 Public Meeting (see **Appendix M**).

Prior to the Phase 2 Public Meeting, some comments were received regarding updating the project Contact List (see **Appendix M** for comments). The updates were provided to the 2017 Contact List. Refer to **Appendix M** for a copy of the Phase 2 Public meeting, agenda, presentation to public, example comment sheet, attendance sheet, and comments received after the meeting. Comments were received from the MTCS and the MOECC. The MTCS reiterated their prior comments from 2013. The MOECC commented on First Nation consultation and its requirement for the project. As well, the MOECC commented on providing a Source Water Protection section in the Master Plan. This section was completed and provided in the 2017 Master Plan.

After the Phase 2 Public Meeting on April 10, 2017, e-mails and faxes were sent to the First Nation entities, which included a copy of the presentation for comment. Comments were only received from the Historic Saugeen Metis, who had no issues in relation to the two (2) Schedule B projects (see **Appendix M** for e-mails).

TABLE 10.0A
SUMMARY OF CONSULTATION WITH REVIEW AGENCIES AND THE PUBLIC (2011-2013)
WATER AND WASTEWATER SERVICING MASTER PLAN
MARKDALE-FLESHERTON-KIMBERLEY-AMIK-EUGENIA-BEAVER VALLEY
MUNICIPALITY OF GREY HIGHLANDS

111-13229-00

Master Plan Consultation	Comment Date	Comment Type	Company/Agency Name	Comments/Concerns
Initial Letters and Notice sent out June 15, 2011 and August 24, 2011. Ministry of Tourism, Culture and Sport letter sent April 25, 2013	June 28, 2011	Email	Resident	• Based on the single public comment received, this individual was very supportive of the consolidation of the various water/wastewater systems in the proposed Master Plan study area. It was felt that a consolidated system would ensure safe and reliable supply and services in a cost-effective manner and is a practical way of addressing population growth in the area over the coming years.
	July 12, 2011	Letter	Ministry of Municipal Affairs & Housing	• The Ministry noted that the proposed water and wastewater Master Plan should ensure that water and wastewater management issues are examined for appropriate size and type to accommodate present and future requirements, can be sustained by the water resources upon which they rely, located and designed in accordance with provincial standards, are financially viable, comply with all other regulatory requirements, promote water conservation and water use efficiency and protect human health and the natural environment.

Master Plan Consultation	Comment Date	Comment Type	Company/Agency Name	Comments/Concerns
	August 10, 2011	Letter	Ministry of Aboriginal Affairs	• The letter from the Ministry noted various First Nations and additional communities, which appear to be in the project area, which could be impacted by the project. It was recommended that the listed First Nations and other communities be contacted concerning the proposed Master Plan.
	September 1, 2011	Email	Historic Saugeen Metis (HSM)	• The HSM greatly supports the projects intentions and goals to provide safe and reliable drinking water to the citizens of Grey Highlands, enhancing the environment through water quality protection and increase safety through fire flow. • The HSM's main concerns regarding the project involve archaeological activities as well as protecting the environmental integrity of the lands and waters of the HSM territory. • The HSM looks forward to being part of the planning process and reviewing preliminary study information as well as the final Master Plan when completed.
	September 16, 2011	Letter	Chippewas of Rama First Nation	• Comments of letter state that the information submitted has been forwarded to the First Nations' Barrister & Solicitor for further review and response and that any further information to be sent concerning the Master Plan is to be forwarded to this location.
	July 6, 2012	Letter	Grey Bruce Health Unit	• The Grey Bruce Health Unit supports the plan as outlines in the draft Mater Plan, stating that the plan reflect current best practice in sewage

Master Plan Consultation	Comment Date	Comment Type	Company/Agency Name	Comments/Concerns
				management and is generally aligned with the goals of Public Health.
	July 10, 2012	Letter	Niagara Escarpment Commission (NEC)	• The NEC comments that the draft Master Plan includes phasing within the boundaries of the Niagara Escarpment Plan (NEP), and also within the Escarpment Natural Area, where only "essential" utilities are permitted. This includes the Amik subdivision, Talisman, Kimberley, the Beaver Valley Ski Club, and Bowles Bluffs area. The NEC supports the proposed servicing occurring within both the NEP and Escarpment Natural Area, noting that future development must occur in accordance with the provisions of the NEP, regardless of availability of servicing.
	July 16, 2012	Letter	Ministry of the Environment and Climate Change (MOECC)	• The MOECC requests that the baseline conditions of the existing aquatic environment be characterized to assist in assessing the potential environmental impact of the proposed servicing. • The MOECC note that the Amik-Talisman proposed artificial wetland overlaps with an existing natural wetland, and that they cannot support the use of any natural wetland for treatment of wastewater. • The MOECC comment that the Beaver River watershed is a high quality water resource, requiring effluent limits significantly more stringent than those currently approved for land application of lagoon sewage. • The MOECC requests that further efforts are

Master Plan Consultation	Comment Date	Comment Type	Company/Agency Name	Comments/Concerns
				made to consult First Nations communities with interests in the proposed servicing areas. First Nations and Métis communities should be given opportunity to review the proposed project, and any concern identified should be addressed and documented in the environmental report. • The MOECC request that the information contained in section 3.0 be moved to section 3.2, and that section 3.0 of the report should include information of the environmental circumstances such as the Beaver-Boyne, including Lake Eugenia, and Saugeen Rivers, including tributaries, recharge/discharge areas, wetlands, forests, and karst topography. • The MOECC recommends that the report "Outline of Recommended Sewage and Water Servicing for Phase 1 of the Master Plan" be inserted into a new section after section 8 in the Master Plan.
	July 18, 2012	Letter	Corporation of the County of Grey	• The County comments that some of the proposed servicing areas do not correspond with areas designated for growth by the County, Municipality, and Niagara Escarpment Plan. The County recommends that the proposed servicing areas consider the growth projections of the County's Growth Management Study, noting that some growth projections were not quite realized due to the recession. • The County comments that servicing proposed under/adjacent to county roads is subject to approval by the County transportation

Master Plan Consultation	Comment Date	Comment Type	Company/Agency Name	Comments/Concerns
				Department, and must be located outside of the ditches and roadways/shoulders and coordinated with utility companies. • The County recommends that the Ministry of Environment, First Nations communities, and any other agency with interest in the project be consulted. • The County recommends a meeting with the County and Municipal Planning Departments, MOE, and NEC to discuss the Master Servicing Plan and its correlation with land use planning documents.
	July 18/19, 2012	Email and Letter	Historic Saugeen Metis (HSM)	• Preservation of natural features and environmental resources during phasing, and monitoring post-construction to determine success of remedial actions • Provide HSM any natural heritage studies and archeological assessments • HSM requested a meeting to discuss the preferred alternative
	May 8, 2013	Email and Letter	Ministry of Tourism, Culture, and Sport	• MTCS recommends that details of the historical settlements of Eugenia and Flesherton be provided, similar to those provided for Markdale. • Screening for Archaeological Potential to be completed, and Archaeological Assessment to be completed if required.

Master Plan Consultation	Comment Date	Comment Type	Company/Agency Name	Comments/Concerns
	May 21, 2013	Letter	Beaver Valley Ski Club (BVSC)	• Screening for Built Heritage and Cultural Heritage Landscapes to be completed, and assessment to be completed if required. • The BVSC considers the potential for municipal servicing in the Beaver Valley area as an environmental cost effective approach to provided consistent water and wastewater services. The club supports the initiative of the proposed Master Plan.
Phase 1 Public Meeting (June 28, 2011)	Various Dates		N/A	• The Beaver Valley Ratepayers Association (BVRA) identifies the Beaver Valley area as a growth area, which is stressed and needs municipal servicing for the area, given the existing water problems and increased pressure and impact of water wells and septic systems in the fragile karstic environment. They feel that the initiative of the proposed Master Plan will go a long way towards addressing the concerns of the existing water quality and quantity issues. • Based on comments received, the public is for the most part in general agreement with the proposal for a regional water and wastewater system under the proposed Master Plan. • General feeling is that the areas of Markdale and Flesherton should be addressed first, starting in Markdale. • There was general consensus that definitive cost numbers should be available in the future

Master Plan Consultation	Comment Date	Comment Type	Company/Agency Name	Comments/Concerns
				for review by the public. • There was some resistance to extending the water and wastewater system to the Beaver Valley area as many of the lots are rural lots with existing well and septic system. On the other hand, there was high concern from some about new development plans, specifically in the Beaver Valley area, whereby many new wells and septic tanks would be built in the area, providing substantial risks to the existing wells and the sensitive groundwater management area because of karst. • There was some concern that the regional sewer system component of the proposed Master Plan would create further expansion to the lagoon system within Markdale, which was considered unsatisfactory. • There were some comments regarding the extension of natural gas to service areas of Eugenia to Kimberley, Beaver Valley and Talisman Ski Resorts and Amik Village to coincide with the water and sanitary service expansion. • The Municipality of West Grey would like the opportunity to discuss possible partnership in relation to the Grey Highlands water and wastewater servicing Master Plan in order to potentially service West Grey properties on the west, north and south boundaries of Markdale.

TABLE 10.0B
SUMMARY OF CONSULTATION WITH FIRST NATIONS (2011-2013)
WATER AND WASTEWATER SERVICING MASTER PLAN
MARKDALE-FLESHERTON-KIMBERLEY-AMIK-EUGENIA-BEAVER VALLEY
MUNICIPALITY OF GREY HIGHLANDS

111-13229-00

Community Consulted	Comment Date	Issues/Concerns Identified by Community	Response Date	Response and Resolution of Issues/Concerns
Historic Saugeen Metis (HSM)	07/18/2012	Preservation of natural features and environmental resources during phasing, and monitoring post-construction to determine success of remedial actions	11/19/ 2012	Meeting date of December 11, 2012 was set.
		Provide HSM any natural heritage studies and archeological assessments		
		HSM requested a meeting to discuss the preferred alternative		
Great Lakes Metis (GLM)	06/26/2013	Preservation of Species at risk, Hart's Tongue Fern and Butternut	07/11/2013	The Draft Water and Sewer Servicing Master Plan will outline measure for protection of species at risk, specifically the Hart's Tongues Fern and Butternut.
		Potential for archeological presence		General archeological assessments are to be included in the Master Plan.
		Ability to access shorelines of waterways		Information contained in letter to Grey Highlands by GLM with regards to access to waterways and waterbodies within the municipality will be included.
		Request receipt of any available archeological reports		Upon completion of any archeological reports prepared for the master plan, a copy will be forwarded to the Metis Nation of Ontario.

Community Consulted	Comment Date	Issues/Concerns Identified by Community	Response Date	Response and Resolution of Issues/Concerns
		Monitoring of waste water pre and post construction.		The Municipality will continue to collect wastewater quality and quantity data in the proposed sewer servicing areas including preparation of an annual report. This monitoring will be continued post-construction.
		Request an outline of the requirements and protocol for employee operator training for both Municipal employees and contractor personnel.		An outline of employee training requirements for both The Municipality and contractor (for the servicing work) will be completed.

TABLE 10.0C
SUMMARY OF MEETINGS WITH FIRST NATIONS (2011-2013)
WATER AND WASTEWATER SERVICING MASTER PLAN
MARKDALE-FLESHERTON-KIMBERLEY-AMIK-EUGENIA-BEAVER VALLEY
MUNICIPALITY OF GREY HIGHLANDS

111-13229-00

Date	Group	Agenda	Minutes	Correspondence Content
Dec 11/2012	Historic Saugeen Metis	None Official	None Official	• Email from HSM regarding meeting date and time (November 20, 2012)
Dec 18, 2012	Chippewas of Nawash / SON	None Official	None Official	• Email from SON regarding meeting date and time (December 3, 2012) • Outline of project sent to SON prior to meeting (December 6, 2012).
Jan 24, 2013	Great Lakes Metis	Yes	Yes	• Issuing of Minutes (GLM) • Email response to concerns in Minutes by Genivar (now WSP)
Apr 24, 2013	Chippewas of Nawash / SON	None Official	None Official	• Email to SON from Genivar (now WSP), requesting comments regarding comments on draft Master Plan as discussed at meeting on April 24, 2013.

11 POST-CONSTRUCTION MONITORING

Following the completion of construction, environmental monitoring shall be continued to ensure the preservation of natural resources and to determine the success of remedial actions taken during and after construction in the project area. The following is a list of post-construction environmental monitoring mitigation measures:

- Following completion of each project, the proponent will evaluate the effectiveness of site restoration and reclamation works.
- Evaluate the success rate, survivability and general health of existing vegetated and newly planted areas.
- Monitor survivability of the re-vegetation, examining all restored areas, documenting failures in reseeding.

PREPARED BY



_____

Chris Wilson, P. Eng.
Team Leader – Municipal Infrastructure
CSW/lem

Appendix A

ARCHAEOLOGICAL AND BUILT HERITAGE/CULTURAL HERITAGE LANDSCAPES SCREENINGS

Ontario

Ministry of Tourism, Culture and Sport

Programs & Services Branch
401 Bay Street, Suite 1700
Toronto ON M7A 0A7

Print Form Clear Form

Criteria for Evaluating Archaeological Potential

A Checklist for the Non-Specialist

The **purpose of the checklist** is to determine:

- if a property(ies) or project area may contain archaeological resources i.e., have archaeological potential
- it includes all areas that may be impacted by project activities, including – but not limited to:
  - the main project area
  - temporary storage
  - staging and working areas
  - temporary roads and detours

Processes covered under this checklist, such as:

- *Planning Act*
- *Environmental Assessment Act*
- *Aggregates Resources Act*
- *Ontario Heritage Act* – Standards and Guidelines for Conservation of Provincial Heritage Properties

Archaeological assessment

If you are not sure how to answer one or more of the questions on the checklist, you may want to hire a licensed consultant archaeologist (see page 4 for definitions) to undertake an archaeological assessment.

The assessment will help you:

- identify, evaluate and protect archaeological resources on your property or project area
- reduce potential delays and risks to your project

Note: By law, archaeological assessments **must** be done by a licensed consultant archaeologist. Only a licensed archaeologist can assess – or alter – an archaeological site.

What to do if you:

- **find an archaeological resource**

  If you find something you think may be of archaeological value during project work, you must – by law – stop all activities immediately and contact a licensed consultant archaeologist

  The archaeologist will carry out the fieldwork in compliance with the *Ontario Heritage Act* [s.48(1)].

- **unearth a burial site**

  If you find a burial site containing human remains, you must immediately notify the appropriate authorities (i.e., police, coroner's office, and/or Registrar of Cemeteries) and comply with the *Funeral, Burial and Cremation Services Act*.

Other checklists

Please use a separate checklist for your project, if:

- you are seeking a Renewable Energy Approval under Ontario Regulation 359/09 – separate checklist
- your Parent Class EA document has an approved screening criteria (as referenced in Question 1)

Please refer to the Instructions pages when completing this form.

 © Queen's Printer for Ontario, 2015

Project or Property Name

Markdale Lagoons

Project or Property Location (upper and lower or single tier municipality)

Markdale, Ontario

Proponent Name

Municipality of Grey Highlands

Proponent Contact Information

Screening Questions

	Yes	No
1. Is there a pre-approved screening checklist, methodology or process in place?	☐	☑

If Yes, please follow the pre-approved screening checklist, methodology or process.

If No, continue to Question 2.

	Yes	No
2. Has an archaeological assessment been prepared for the property (or project area) and been accepted by MTCS?	☐	☑

If Yes, do **not** complete the rest of the checklist. You are expected to follow the recommendations in the archaeological assessment report(s).

The proponent, property owner and/or approval authority will:

- summarize the previous assessment
- add this checklist to the project file, with the appropriate documents that demonstrate an archaeological assessment was undertaken e.g., MTCS letter stating acceptance of archaeological assessment report

The summary and appropriate documentation may be:

- submitted as part of a report requirement e.g., environmental assessment document
- maintained by the property owner, proponent or approval authority

If No, continue to Question 3.

	Yes	No
3. Are there known archaeological sites on or within 300 metres of the property (or the project area)?	☐	☑
4. Is there Aboriginal or local knowledge of archaeological sites on or within 300 metres of the property (or project area)?	☐	☑
5. Is there Aboriginal knowledge or historically documented evidence of past Aboriginal use on or within 300 metres of the property (or project area)?	☐	☑
6. Is there a known burial site or cemetery on the property or adjacent to the property (or project area)?	☐	☑
7. Has the property (or project area) been recognized for its cultural heritage value?	☐	☑

If Yes to any of the above questions (3 to 7), do **not** complete the checklist. Instead, you need to hire a licensed consultant archaeologist to undertake an archaeological assessment of your property or project area.

If No, continue to question 8.

	Yes	No
8. Has the entire property (or project area) been subjected to recent, extensive and intensive disturbance?	☑	☐

If Yes to the preceding question, do **not** complete the checklist. Instead, please keep and maintain a summary of documentation that provides evidence of the recent disturbance.

An archaeological assessment is not required.

If No, continue to question 9.

	Yes	No
9. Are there present or past water sources within 300 metres of the property (or project area)?	☐	☐

If Yes, an archaeological assessment is required.

No, continue to question 10.

	Yes	No
10. Is there evidence of two or more of the following on the property (or project area)?	☐	☐

- elevated topography
- pockets of well-drained sandy soil
- distinctive land formations
- resource extraction areas
- early historic settlement
- early historic transportation routes

If Yes, an archaeological assessment is required.

If No, there is low potential for archaeological resources at the property (or project area).

The proponent, property owner and/or approval authority will:

- summarize the conclusion
- add this checklist with the appropriate documentation to the project file

The summary and appropriate documentation may be:

- submitted as part of a report requirement e.g., under the *Environmental Assessment Act, Planning Act* processes
- maintained by the property owner, proponent or approval authority

Ontario

Ministry of Tourism, Culture and Sport

Programs & Services Branch
401 Bay Street, Suite 1700
Toronto ON M7A 0A7

Clear Form Print Form

Criteria for Evaluating Potential for Built Heritage Resources and Cultural Heritage Landscapes

A Checklist for the Non-Specialist

The **purpose of the checklist** is to determine:

- if a property(ies) or project area:
  - is a recognized heritage property
  - may be of cultural heritage value
- it includes all areas that may be impacted by project activities, including – but not limited to:
  - the main project area
  - temporary storage
  - staging and working areas
  - temporary roads and detours

Processes covered under this checklist, such as:

- *Planning Act*
- *Environmental Assessment Act*
- *Aggregates Resources Act*
- *Ontario Heritage Act* – Standards and Guidelines for Conservation of Provincial Heritage Properties

Cultural Heritage Evaluation Report (CHER)

If you are not sure how to answer one or more of the questions on the checklist, you may want to hire a qualified person(s) (see page 5 for definitions) to undertake a cultural heritage evaluation report (CHER).

The CHER will help you:

- identify, evaluate and protect cultural heritage resources on your property or project area
- reduce potential delays and risks to a project

Other checklists

Please use a separate checklist for your project, if:

- you are seeking a Renewable Energy Approval under Ontario Regulation 359/09 – separate checklist
- your Parent Class EA document has an approved screening criteria (as referenced in Question 1)

Please refer to the Instructions pages for more detailed information and when completing this form.

 © Queen's Printer for Ontario, 2015

Project or Property Name

Markdale Water Tower

Project or Property Location (upper and lower or single tier municipality)

Grey Highlands, Ontario

roponent Name

Municipality of Grey Highlands

Proponent Contact Information

Screening Questions

	Yes	No
1. Is there a pre-approved screening checklist, methodology or process in place?	☐	☑

If Yes, please follow the pre-approved screening checklist, methodology or process.

If No, continue to Question 2.

Part A: Screening for known (or recognized) Cultural Heritage Value

	Yes	No
2. Has the property (or project area) been evaluated before and found **not** to be of cultural heritage value?	☐	☑

If Yes, do **not** complete the rest of the checklist.

The proponent, property owner and/or approval authority will:

- summarize the previous evaluation and
- add this checklist to the project file, with the appropriate documents that demonstrate a cultural heritage evaluation was undertaken

The summary and appropriate documentation may be:

- submitted as part of a report requirement
- maintained by the property owner, proponent or approval authority

If No, continue to Question 3.

	Yes	No
3. Is the property (or project area):		
a. identified, designated or otherwise protected under the *Ontario Heritage Act* as being of cultural heritage value?	☐	☑
b. a National Historic Site (or part of)?	☐	☑
c. designated under the *Heritage Railway Stations Protection Act*?	☐	☑
d. designated under the *Heritage Lighthouse Protection Act*?	☐	☑
e. identified as a Federal Heritage Building by the Federal Heritage Buildings Review Office (FHBRO)?	☐	☑
f. located within a United Nations Educational, Scientific and Cultural Organization (UNESCO) World Heritage Site?	☐	☑

If Yes to any of the above questions, you need to hire a qualified person(s) to undertake:

- a Cultural Heritage Evaluation Report, if a Statement of Cultural Heritage Value has not previously been prepared or the statement needs to be updated

If a Statement of Cultural Heritage Value has been prepared previously and if alterations or development are proposed, you need to hire a qualified person(s) to undertake:

- a Heritage Impact Assessment (HIA) – the report will assess and avoid, eliminate or mitigate impacts

If No, continue to Question 4.

Part B: Screening for Potential Cultural Heritage Value

	Yes	No
4. Does the property (or project area) contain a parcel of land that:		
a. is the subject of a municipal, provincial or federal commemorative or interpretive plaque?	☐	☑
b. has or is adjacent to a known burial site and/or cemetery?	☐	☑
c. is in a Canadian Heritage River watershed?	☐	☑
d. contains buildings or structures that are 40 or more years old?	☐	☑

Part C: Other Considerations

	Yes	No
5. Is there local or Aboriginal knowledge or accessible documentation suggesting that the property (or project area):		
a. is considered a landmark in the local community or contains any structures or sites that are important in defining the character of the area?	☐	☑
b. has a special association with a community, person or historical event?	☐	☑
c. contains or is part of a cultural heritage landscape?	☐	☑

If Yes to one or more of the above questions (Part B and C), there is potential for cultural heritage resources on the property or within the project area.

You need to hire a qualified person(s) to undertake:

- a Cultural Heritage Evaluation Report (CHER)

If the property is determined to be of cultural heritage value and alterations or development is proposed, you need to hire a qualified person(s) to undertake:

- a Heritage Impact Assessment (HIA) – the report will assess and avoid, eliminate or mitigate impacts

If No to all of the above questions, there is low potential for built heritage or cultural heritage landscape on the property.

The proponent, property owner and/or approval authority will:

- summarize the conclusion
- add this checklist with the appropriate documentation to the project file

The summary and appropriate documentation may be:

- submitted as part of a report requirement e.g. under the *Environmental Assessment Act, Planning Act* processes
- maintained by the property owner, proponent or approval authority

Ontario

Ministry of Tourism, Culture and Sport

Programs & Services Branch
401 Bay Street, Suite 1700
Toronto ON M7A 0A7

Clear Form Print Form

Criteria for Evaluating Potential for Built Heritage Resources and Cultural Heritage Landscapes

A Checklist for the Non-Specialist

The **purpose of the checklist** is to determine:

- if a property(ies) or project area:
  - is a recognized heritage property
  - may be of cultural heritage value
- it includes all areas that may be impacted by project activities, including – but not limited to:
  - the main project area
  - temporary storage
  - staging and working areas
  - temporary roads and detours

Processes covered under this checklist, such as:

- *Planning Act*
- *Environmental Assessment Act*
- *Aggregates Resources Act*
- *Ontario Heritage Act* – Standards and Guidelines for Conservation of Provincial Heritage Properties

Cultural Heritage Evaluation Report (CHER)

If you are not sure how to answer one or more of the questions on the checklist, you may want to hire a qualified person(s) (see page 5 for definitions) to undertake a cultural heritage evaluation report (CHER).

The CHER will help you:

- identify, evaluate and protect cultural heritage resources on your property or project area
- reduce potential delays and risks to a project

Other checklists

Please use a separate checklist for your project, if:

- you are seeking a Renewable Energy Approval under Ontario Regulation 359/09 – separate checklist
- your Parent Class EA document has an approved screening criteria (as referenced in Question 1)

Please refer to the Instructions pages for more detailed information and when completing this form.

 © Queen's Printer for Ontario, 2015

Project or Property Name

MarkdaleWastewater Lagoons

Project or Property Location (upper and lower or single tier municipality)

Markdale, Ontario

roponent Name

Municipality of Grey Highlands

Proponent Contact Information

Screening Questions

	Yes	No
1. Is there a pre-approved screening checklist, methodology or process in place?	☐	☑

If Yes, please follow the pre-approved screening checklist, methodology or process.

If No, continue to Question 2.

Part A: Screening for known (or recognized) Cultural Heritage Value

	Yes	No
2. Has the property (or project area) been evaluated before and found **not** to be of cultural heritage value?	☐	☑

If Yes, do **not** complete the rest of the checklist.

The proponent, property owner and/or approval authority will:

- summarize the previous evaluation and
- add this checklist to the project file, with the appropriate documents that demonstrate a cultural heritage evaluation was undertaken

The summary and appropriate documentation may be:

- submitted as part of a report requirement
- maintained by the property owner, proponent or approval authority

If No, continue to Question 3.

	Yes	No
3. Is the property (or project area):		
a. identified, designated or otherwise protected under the *Ontario Heritage Act* as being of cultural heritage value?	☐	☑
b. a National Historic Site (or part of)?	☐	☑
c. designated under the *Heritage Railway Stations Protection Act*?	☐	☑
d. designated under the *Heritage Lighthouse Protection Act*?	☐	☑
e. identified as a Federal Heritage Building by the Federal Heritage Buildings Review Office (FHBRO)?	☐	☑
f. located within a United Nations Educational, Scientific and Cultural Organization (UNESCO) World Heritage Site?	☐	☑

If Yes to any of the above questions, you need to hire a qualified person(s) to undertake:

- a Cultural Heritage Evaluation Report, if a Statement of Cultural Heritage Value has not previously been prepared or the statement needs to be updated

If a Statement of Cultural Heritage Value has been prepared previously and if alterations or development are proposed, you need to hire a qualified person(s) to undertake:

- a Heritage Impact Assessment (HIA) – the report will assess and avoid, eliminate or mitigate impacts

If No, continue to Question 4.

Part B: Screening for Potential Cultural Heritage Value

	Yes	No
4. Does the property (or project area) contain a parcel of land that:		
a. is the subject of a municipal, provincial or federal commemorative or interpretive plaque?	☐	☑
b. has or is adjacent to a known burial site and/or cemetery?	☐	☑
c. is in a Canadian Heritage River watershed?	☐	☑
d. contains buildings or structures that are 40 or more years old?	☐	☑

Part C: Other Considerations

	Yes	No
5. Is there local or Aboriginal knowledge or accessible documentation suggesting that the property (or project area):		
a. is considered a landmark in the local community or contains any structures or sites that are important in defining the character of the area?	☐	☑
b. has a special association with a community, person or historical event?	☐	☑
c. contains or is part of a cultural heritage landscape?	☐	☑

If Yes to one or more of the above questions (Part B and C), there is potential for cultural heritage resources on the property or within the project area.

You need to hire a qualified person(s) to undertake:

- a Cultural Heritage Evaluation Report (CHER)

If the property is determined to be of cultural heritage value and alterations or development is proposed, you need to hire a qualified person(s) to undertake:

- a Heritage Impact Assessment (HIA) – the report will assess and avoid, eliminate or mitigate impacts

If No to all of the above questions, there is low potential for built heritage or cultural heritage landscape on the property.

The proponent, property owner and/or approval authority will:

- summarize the conclusion
- add this checklist with the appropriate documentation to the project file

The summary and appropriate documentation may be:

- submitted as part of a report requirement e.g. under the *Environmental Assessment Act, Planning Act* processes
- maintained by the property owner, proponent or approval authority

Appendix B

EXISTING MAPS OF WATER AND SANITARY SEWER SYSTEMS

FORMER TOWNSHIP OF GLENELG

FORMER TOWNSHIP OF ARTEMESIA

FORMER VILLAGE OF MARKDALE

WELL No.1
ISLA ST. WATER TREATMENT PLANT

WELL No.2
TERRA DR. WATER SUPPLY, TREATMENT AND PUMPING STATION (DECOMMISSIONED)

WELLS No.3 & No.4
AND ELIZA STREET WATER TREATMENT PLANT

WATER TOWER

WELL #3

WELL #4

ISLA ST.

TERRA DR.

HILL ST.

CAVAN ST.

MAIN ST.

MARK ST.

VICTORIA ST.

UPLANDS DR.

BRACKENBURY ST.

GEORGE ST.

CORNE ST.

FAIRWAY HEIGHTS

GRAYVIEW DRIVE

MARGARET ST.

ELIZABETH AVE.

ARGYLE ST.

WALKER ST.

RADFORD ST.

EDITH AVE.

LAMLER DR.

CEMETERY

COMMUNITY COMPLEX

MUNICIPAL PARK

PUBLIC SCHOOL

SENIOR CITIZENS COMPLEX

NORDIC FURNITURE

GLASGOW ST.

SCOTLAND ST.

MCDUFF ST.

WELLINGTON ST.

CENTRE ST.

TORONTO ST.

HERBERT AVE.

HERBERT AVE.

CAMBRAI RD.

CAMBRAI RD.

QUEEN ST.

ELIZA ST.

ARMSTRONG DRIVE

CLIFFTON ST.

C.P.R.

TRIBUTARY OF SAUGEEN RIVER

TRIBUTARY OF SAUGEEN RIVER

LEGEND

- VALVE
- FIRE HYDRANT
- PVC 200 (1994) — WATERMAIN TYPE, DIAMETER, (YEAR)
- TOWN BOUNDARY

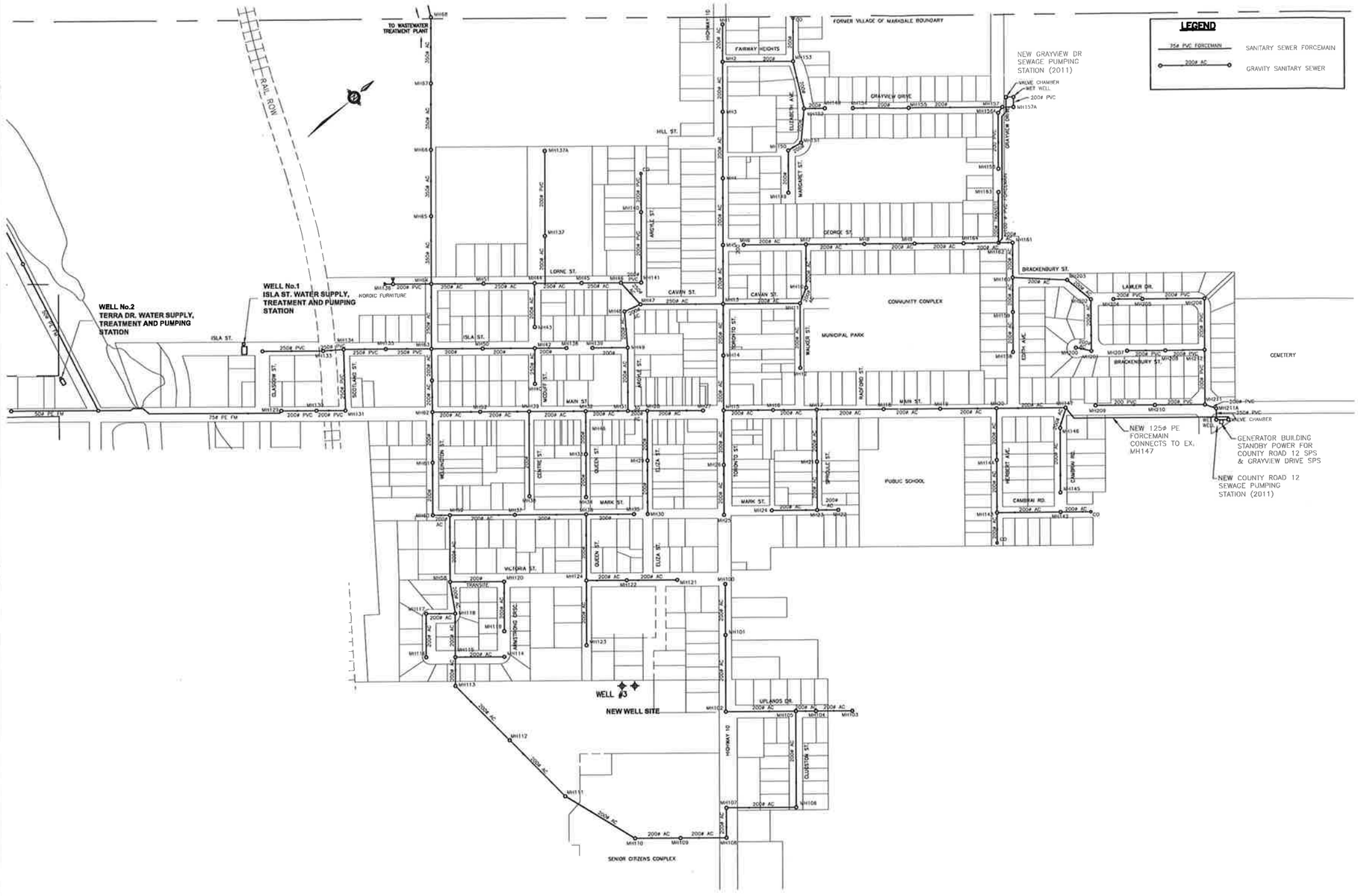
EXISTING MARKDALE WATER SYSTEM
WATER & WASTE WATER SERVICING MASTER PLAN
MUNICIPALITY OF GREY HIGHLANDS

DESIGN	CSW
DRAWN	EK
APPROVED	MRS
DATE	NOV. 2015
SCALE	NTS
FILE No.	111-13229-00
FIG. No.	5.1A

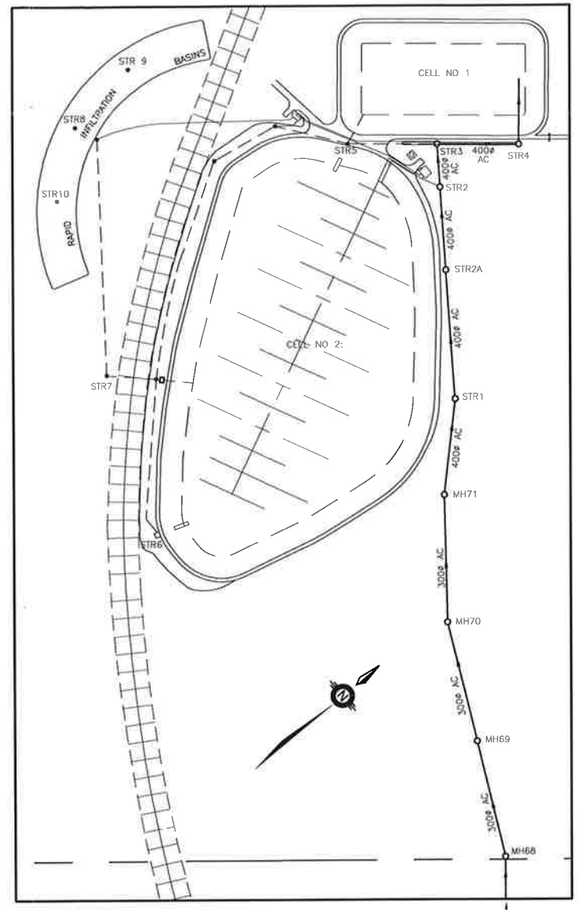
WSP
101-1450 1st AVENUE W
OWEN SOUND (ONTARIO) CANADA N4K 6W2
TEL.: 519-376-7612 | FAX: 519-376-8008 | WWW.WSPGROUP.COM

COPYRIGHT © WSP INC.

PLOTTED Wednesday, May 11, 2016 2:21:58 PM
wg May 11, 2016 - 2:21pm
C:\2011\05\117 - ...11-13229-00 - Grey Highlands\Reports\Water & Wastewater Servicing Master Plan - Jan 2016\Master Plan\Figur\FIGURE-5.1



SANITARY SEWAGE COLLECTION SYSTEM



MARKDALE SEWAGE TREATMENT PLANT
N T S

FROM SANITARY SEWER COLLECTION SYSTEM

NOTE: THE LOCATION OF MANHOLES 138, 136, 148, 154, 156, 204 AND 207 ARE ASSUMED AS NO INFORMATION IS AVAILABLE (DATA TO BE CONFIRMED IN THE FIELD).

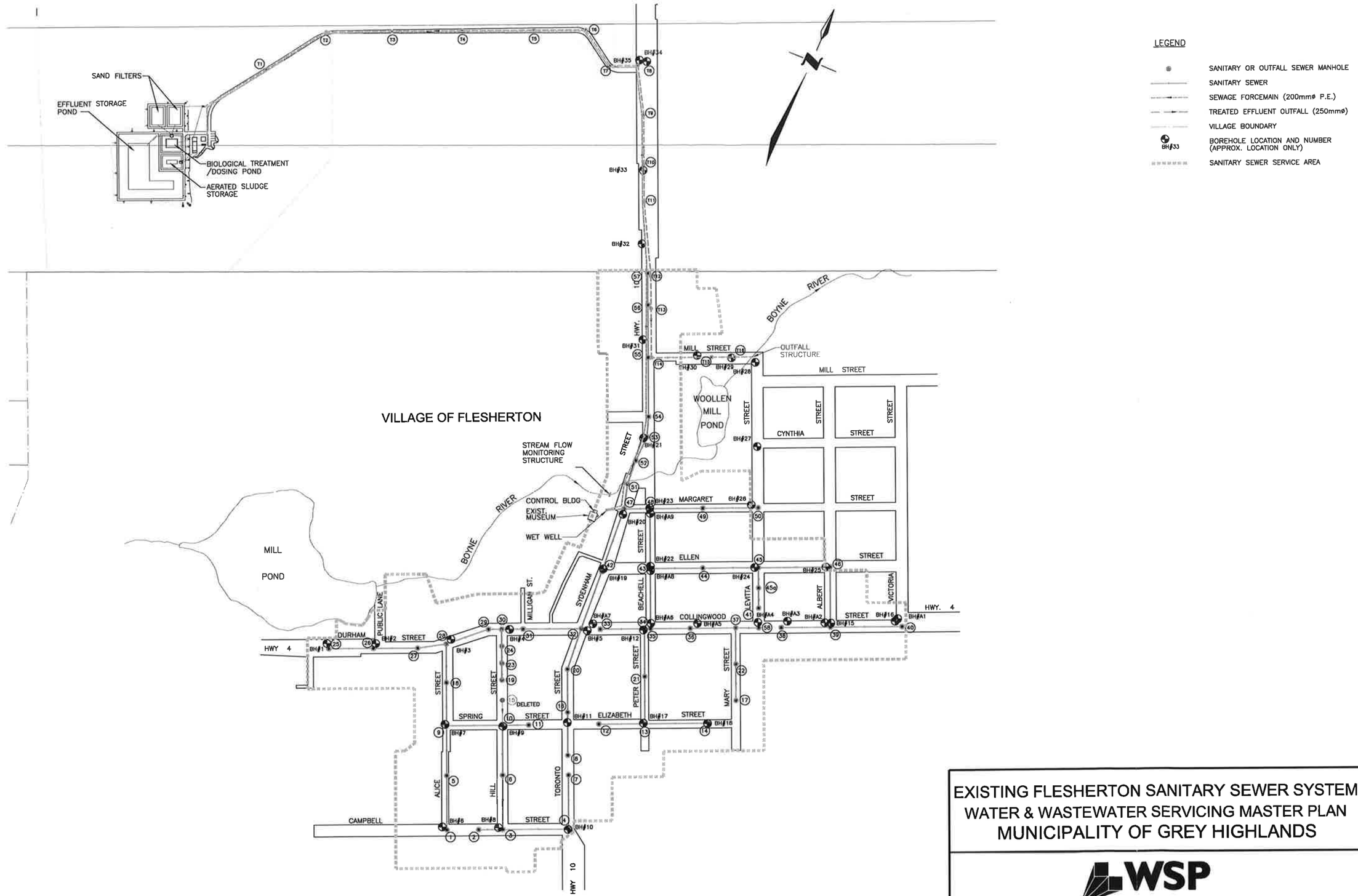
EXISTING MARKDALE SANITARY SEWER SYSTEM
WATER & WASTE WATER SERVICING MASTER PLAN
MUNICIPALITY OF GREY HIGHLANDS

WSP
101-1450 1st AVENUE W
OWEN SOUND (ONTARIO) CANADA N4K 6W2
TEL.: 519-376-7612 | FAX: 519-376-8008 | WWW.WSPGROUP.COM

DESIGN	CSW
DRAWN	EK/DPD
APPROVED	MRS
DATE	NOV. 2015
SCALE	NTS
FILE No.	111-13229-00
FIG. No.	FIG 5.1B

C:\2011\OS\117 - ...11-13229-00 - Grey Highlands\Reports\Water & Wastewater Servicing Master Plan\DWG\...dwg Apr 13, 2016 - 1:40pm

COPYRIGHT © WSP INC.



LEGEND

- SANITARY OR OUTFALL SEWER MANHOLE
- SANITARY SEWER
- SEWAGE FORCEMAIN (200mmø P.E.)
- TREATED EFFLUENT OUTFALL (250mmø)
- VILLAGE BOUNDARY
- BH#33 BOREHOLE LOCATION AND NUMBER (APPROX. LOCATION ONLY)
- SANITARY SEWER SERVICE AREA

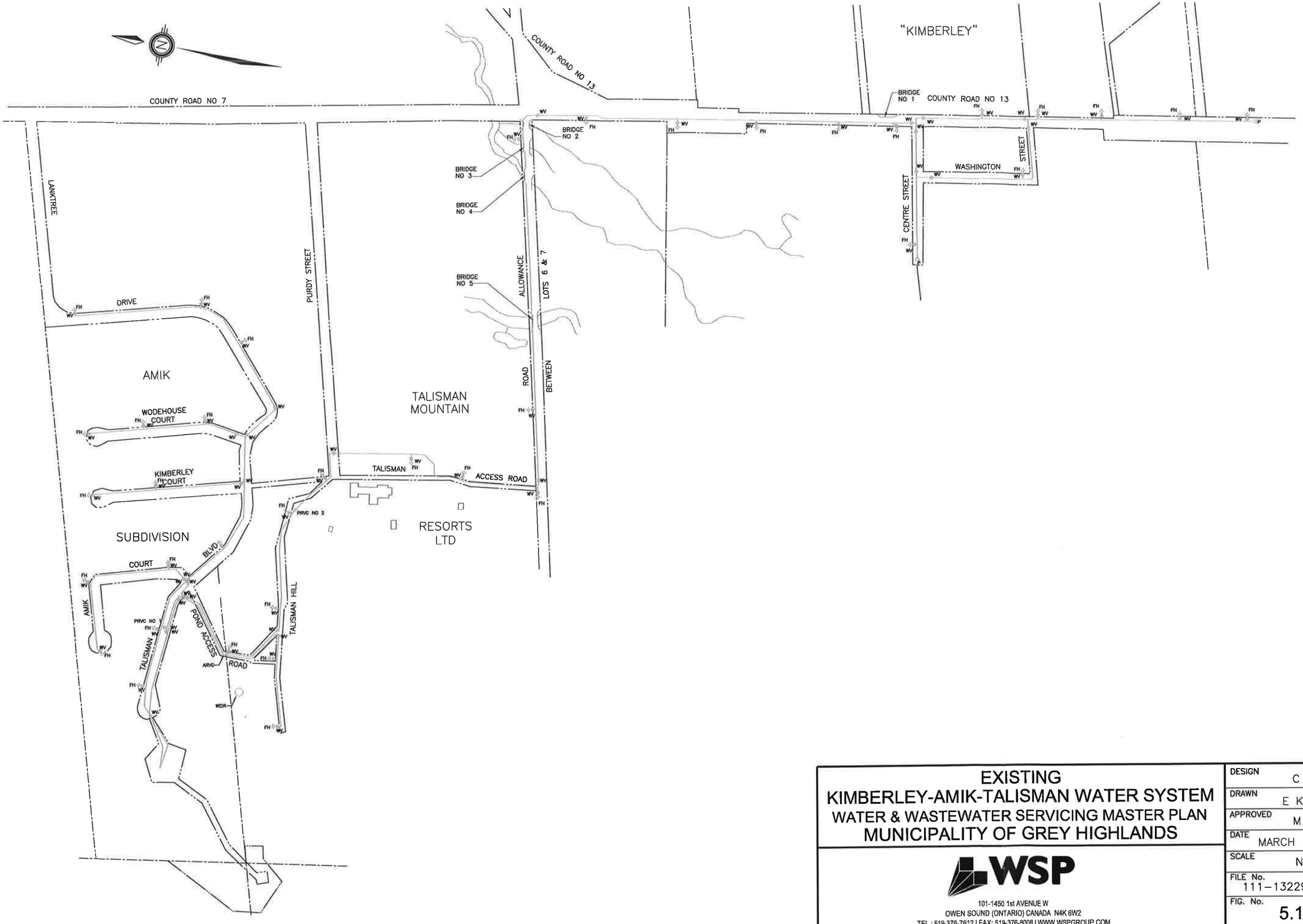
EXISTING FLESHERTON SANITARY SEWER SYSTEM
WATER & WASTEWATER SERVICING MASTER PLAN
MUNICIPALITY OF GREY HIGHLANDS

DESIGN	C S W
DRAWN	E K
APPROVED	M R S
DATE	NOV 2011
SCALE	N T S
FILE No.	111-13229-00
FIG. No.	5.1C

WSP
101-1450 1st AVENUE W
OWEN SOUND (ONTARIO) CANADA N4K 6W2
TEL.: 519-376-7612 | FAX: 519-376-8008 | WWW.WSPGROUP.COM

COPYRIGHT © WSP INC.

D:\2011\05\117 - Durham\111-13229-00 - Grey Highlands\Reports\Water & Wastewater Servicing Master Plan - Jan 2015\Master Plan\Figures\FIGURE 5.1C.dwg May 11, 2016 - PLOTTED: Wednesday, May 11, 2016 1:40:18 PM



EXISTING
KIMBERLEY-AMIK-TALISMAN WATER SYSTEM
WATER & WASTEWATER SERVICING MASTER PLAN
MUNICIPALITY OF GREY HIGHLANDS

WSP
101-1450 1st AVENUE W
OWEN SOUND (ONTARIO) CANADA N4K 6W2
TEL.: 519-376-7612 | FAX: 519-376-8008 | WWW.WSPGROUP.COM

DESIGN	C S W
DRAWN	E K/JLK
APPROVED	M R S
DATE	MARCH 2012
SCALE	N T S
FILE No.	111-13229-00
FIG. No.	5.1D

COPYRIGHT © WSP INC.

G:\2011\05\117 - 111-13229-00 - Grey Highlands\Reports\Water & Wastewater Servicing Master Plan - Jan 2016\Master Plan\Figur\FIGURE-5.1D.dgn
May 11, 2016 - PLOTTED Wednesday, May 11, 2016 1:42:38 PM



EXISTING AMIK SEWAGE WORKS
WATER & WASTEWATER SERVICING MASTER PLAN
MUNICIPALITY OF GREY HIGHLANDS

DESIGN	C S W
DRAWN	J L K
APPROVED	M R S
DATE	NOV 2011
SCALE	AS SHOWN
FILE No.	111-13229-00
FIG. No.	5.1E

WSP
101-1450 1st AVENUE W
OWEN SOUND (ONTARIO) CANADA N4K 6W2
TEL.: 519-376-7612 | FAX: 519-376-8008 | WWW.WSPGROUP.COM

COPYRIGHT © WSP INC.

Appendix C

EXISTING, FUTURE 20 AND 50 YEAR WATER DEMANDS – BREAKDOWN CALCULATIONS

Table 20B-I-1
Water Demands P1-1

WATER AND WASTEWATER SERVICING MASTER PLAN
MARKDALE-FLESHERTON-KIMBERLEY-AMIK-EUGENIA-BEAVER VALLEY
MUNICIPALITY OF GREY HIGHLANDS

111-13229-00

	Water User	Estimated No. of Residential Equivalent Units	Estimated Average Day Water Demand* (m^3/day)	Population Equivalent	Comments
Existing - 2015					
P1-1-E1	Normal Residential***	579	478	1274	
P1-1-E2	Chapman's Ice Cream***	727	600	1599	
P1-1-E3	Grey Gables Long-Term Care Facility	25	25	55	
P1-1-E4	Markdale Hospital	6	6	13	
P1-1-E5	Beavercrest School	7	6	14	
P1-1-E6	Steven's Restaurant	4	4	9	
P1-1-E7	Other Commercial	110	109	241	
TOTAL EXISTING		**1457**	**1227**	**3206**	
Future - 1 to 20 Years					
P1-1-F1	Existing Vacant Residential	28	28	62	
P1-1-F2	Existing Vacant Commercial	10	10	22	
P1-1-F3	Existing Industrial	1	1	2	
P1-1-F4	Extension to Municipality of West Grey	40	40	88	
P1-1-F5	Dimakos Subdivision	59	58	130	
P1-1-F6	Lasanti Subdivision - Phase 1	99	98	218	
P1-1-F7	Lasanti Subdivision - Phase 2	260	257	572	
P1-1-F8	Golf Course/Soccer Field Subdivisions	92	91	202	
P1-1-F9	Chapman's Ice Cream	343	340	755	340 m^3/day estimated
P1-1-F10	Tim Hortons	18	18	40	
TOTAL FUTURE - 1 TO 20 YEARS		**950**	**941**	**2090**	
Future - 21 to 50 Years**					
P1-1-FF1	Chapman's Ice Cream	303	300	667	300 m^3/day estimated
P1-1-FF2	Development 21 to 50 years	231	229	508	Based on existing + 1-20 year development (minus Chapman's)
TOTAL FUTURE - 21 TO 50 YEARS		**534**	**529**	**1175**	

* 450 L/cap.d @ 2.2 persons/unit

** 0.5% Increase in Residential Equivalent Units per Year

*** 375 L/cap.d @ 2.2 persons/unit (includes 100 L/cap.d for lawn watering and water loss)

Table 20B-I-2
Water Demands P1-2

WATER AND WASTEWATER SERVICING MASTER PLAN
MARKDALE-FLESHERTON-KIMBERLEY-AMIK-EUGENIA-BEAVER VALLEY
MUNICIPALITY OF GREY HIGHLANDS

111-13229-00

	Water User	Estimated No. of Residential Equivalent Units	Estimated Average Day Water Demand* (m^3/day)	Population Equivalent	Comments
Existing - 2015					
P1-2-E1	Residential***	168	101.64	369.60	
P1-2-E2	Talisman	50	49.50	110.00	
P1-2-E3	Other Commercial	9	8.91	19.80	
TOTAL EXISTING		**227**	**160**	**499**	
Future - 1 to 20 Years					
P1-2-F1	Existing Vacant Residential	8	7.92	17.60	
P1-2-F2	Existing Vacant Industrial	1	0.99	2.20	
P1-2-F3	Existing Farm	1	0.99	2.20	
-2-F4	Existing Residential	4	3.96	8.80	
P1-2-F5	Existing Seasonal/Recreational	7	6.93	15.40	
P1-2-F6	Existing Golf course	2	1.98	4.40	Two (2) parcels of overall golf course (4 in total)
P1-2-F7	Existing Ski Resort	2	1.98	4.40	Two (2) parcel of overall ski resort (2 in total)
P1-2-F8	Existing Industrial	1	0.99	2.20	
P1-2-F9	Future Bedview Development	5	4.95	11.00	
P1-2-F10	Future Fox Ridge Estates (Talisman)	28	27.72	61.60	
P1-2-F11	Future Trail's Edge (Talisman)	46	45.54	101.20	
TOTAL FUTURE - 1 TO 20 YEARS		**105**	**104**	**231**	
Future - 21 to 50 Years**					
P1-2-FF1	Development 21 to 50 years	115	114.33	254.07	Based on existing + 1-20 year development
TOTAL FUTURE - 21 TO 50 YEARS		**115**	**114**	**254**	

* 450 L/cap.d @ 2.2 persons/unit

** 1% Increase in Residential Equivalent Units per Year

*** 275 L/cap.d @ 2.2 persons/unit

Table 20B-I-3
Water Demands P1-3

WATER AND WASTEWATER SERVICING MASTER PLAN
MARKDALE-FLESHERTON-KIMBERLEY-AMIK-EUGENIA-BEAVER VALLEY
MUNICIPALITY OF GREY HIGHLANDS

111-13229-00

	Water User	Estimated No. of Residential Equivalent Units	Estimated Average Day Water Demand* (m^3/day)	Population Equivalent	Comments
Existing - 2015					
P1-3-E1	None	0.00	-	-	No existing water system in place
TOTAL EXISTING		**0.00**	-	-	
Future - 1 to 20 Years					
P1-3-F1	Existing Vacant Residential	32	31.68	70.40	
P1-3-F2	Existing Farm	3	2.97	6.60	
P1-3-F3	Existing Residential	49	48.51	107.80	
P1-3-F4	Existing Seasonal/Recreational	153	151.47	336.60	
P1-3-F5	Existing Ski Resort (Beaver Valley Ski Club)	3	2.97	6.60	3 lots shown i.e. **not** residential equivalent units
P1-3-F6	Future Beaver Vally Ski Club	4	3.96	8.80	
P1-3-F7	Future Beaver Valley Village (Keiner)	45	44.55	99.00	
P1-3-F8	Future Beaver Vally Woodlands	12	11.88	26.40	
TOTAL FUTURE - 1 TO 20 YEARS		**301**	**298**	**662**	
Future - 21 to 50 Years**					
P1-3-FF1	Development 21 to 50 years	105	103.66	230.35	
TOTAL FUTURE - 21 TO 50 YEARS		**105**	**104**	**230**	

* 450 L/cap.d @ 2.2 persons/unit

** 1% Increase in Residential Equivalent Units per Year

Table 20B-I-4
Water Demands P1-4

WATER AND WASTEWATER SERVICING MASTER PLAN
MARKDALE-FLESHERTON-KIMBERLEY-AMIK-EUGENIA-BEAVER VALLEY
MUNICIPALITY OF GREY HIGHLANDS

111-13229-00

	Water User	Estimated No. of Residential Equivalent Units	Estimated Average Day Water Demand* (m^3/day)	Population Equivalent	Comments
Existing - 2015					
P1-4-E1	None	0	-	-	No existing water system in place
TOTAL EXISTING		**0**	-	-	
Future - 1 to 20 Years					
P1-4-F1	Existing Vacant Residential	28	27.72	61.60	
P1-4-F2	Existing Farm	25	24.75	55.00	
P1-4-F3	Existing Residential	63	62.37	138.60	
P1-4-F4	Existing Seasonal/Recreational	14	13.86	30.80	
TOTAL FUTURE - 1 TO 20 YEARS		**130**	**129**	**286**	
Future - 21 to 50 Years**					
P1-4-FF1	Development 21 to 50 years	45	44.77	99.48	
TOTAL FUTURE - 21 TO 50 YEARS		**45**	**45**	**99**	

* 450 L/cap.d @ 2.2 persons/unit

** 1% Increase in Residential Equivalent Units per Year

Table 20B-I-5
Water Demands P1-5

WATER AND WASTEWATER SERVICING MASTER PLAN
MARKDALE-FLESHERTON-KIMBERLEY-AMIK-EUGENIA-BEAVER VALLEY
MUNICIPALITY OF GREY HIGHLANDS

111-13229-00

	Water User	Estimated No. of Residential Equivalent Units	Estimated Average Day Water Demand* (m^3/day)	Population Equivalent	Comments
Existing - 2015					
P1-5-E1	None	0	-	-	No existing water system in place
TOTAL EXISTING		**0**	-	-	
Future - 1 to 20 Years					
P1-5-F1	Existing Vacant Residential	1	0.99	2.20	
-5-F2	Existing Vacant Commercial	1	0.99	2.20	
P1-5-F3	Existing Farm	2	1.98	4.40	
P1-5-F4	Existing Residential	4	3.96	8.80	
P1-5-F5	Existing Seasonal/Recreational	6	5.94	13.20	
TOTAL FUTURE - 1 TO 20 YEARS		**14**	**14**	**31**	
Future - 21 to 50 Years**					
P1-5-FF1	Development 21 to 50 years	5	4.82	10.71	
TOTAL FUTURE - 21 TO 50 YEARS		**5**	**5**	**11**	

* 450 L/cap.d @ 2.2 persons/unit

** 1% Increase in Residential Equivalent Units per Year

Table 20B-II-1
Water Demands P2-1

WATER AND WASTEWATER SERVICING MASTER PLAN
MARKDALE-FLESHERTON-KIMBERLEY-AMIK-EUGENIA-BEAVER VALLEY
MUNICIPALITY OF GREY HIGHLANDS

111-13229-00

	Water User	Estimated No. of Residential Equivalent Units	Estimated Average Day Water Demand* (m^3/day)	Population Equivalent	Comments
Existing - 2015					
P2-1-E1	None	0	-	-	No existing water system in place
TOTAL EXISTING		**0**	-	-	
Future - 1 to 20 Years					
P2-1-F1	Existing Vacant Residential	27	26.73	59.40	
P2-1-F2	Existing Residential**	215	129.77	471.90	
P2-1-F3	Existing Macphail Public School**	15	9.08	33.00	15 units is currently billed. WSP estimates that the number of units should be 23 units (525 students/staff in 2007, BWSB Website)
P2-1-F4	Existing Other Commercial**	59	35.39	128.70	
TOTAL FUTURE - 1 TO 20 YEARS		**315**	**201**	**693**	
Future - 21 to 50 Years					
P2-1-FF1	None	0	-	-	Future expansion of water system included in Phase II-2
TOTAL FUTURE - 21 TO 50 YEARS		**0**			

* 450 L/cap.d @ 2.2 persons/unit

** 275 L/cap.d @ 2.2 persons/unit

Table 20B-II-2
Water Demands P2-2

WATER AND WASTEWATER SERVICING MASTER PLAN
MARKDALE-FLESHERTON-KIMBERLEY-AMIK-EUGENIA-BEAVER VALLEY
MUNICIPALITY OF GREY HIGHLANDS

111-13229-00

	Water User	Estimated No. of Residential Equivalent Units	Estimated Average Day Water Demand* (m^3/day)	Population Equivalent	Comments
Existing - 2015					
P2-2-E1	None	0	-	-	No existing water system in place
TOTAL EXISTING		**0**	-	-	
Future - 1 to 20 Years					
P2-2-F1	Existing Grey Highlands SS***	73	44.17	160.60	WSP estimates that the number of units should be 73 units (1091 students/staff in 2007, BWSB website)
P2-2-F2	Existing Vacant Residential	48	47.52	105.60	
P2-2-F3	Existing Vacant Commercial	3	2.97	6.60	
P2-2-F4	Existing Farm	6	5.94	13.20	
P2-2-F5	Existing Residential***	106	64.13	233.20	
P2-2-F6	Existing Seasonal/Recreational	6	5.94	13.20	
P2-2-F7	Existing Commercial***	32	19.36	70.40	Includes three (3) retail over 10,000 s.f., three (3) automative shop, one (1) motel and one (1) funeral home
P2-2-F8	Existing Industrial	3	2.97	6.60	
P2-2-F9	Existing Sports Complex	4	3.96	8.80	
P2-2-F10	Future Gas Station	6	5.94	13.20	Municipality to clarify if the Gas Station and Drive Thru are combined
P2-2-F11	Future Drive Thru	1	0.99	2.20	
TOTAL FUTURE - 1 TO 20 YEARS		**288**	**204**	**634**	
Future - 21 to 50 Years**					
P2-2-FF1	Development 21 to 50 years	100	99.18	220.40	
TOTAL FUTURE - 21 TO 50 YEARS		**100**	**99**	**220**	

* 450 L/cap.d @ 2.2 persons/unit

** 1% Increase in Residential Equivalent Units per Year

*** 275 L/cap.d @ 2.2 persons/unit

Table 20B-II-3
Water Demands P2-3

WATER AND WASTEWATER SERVICING MASTER PLAN
MARKDALE-FLESHERTON-KIMBERLEY-AMIK-EUGENIA-BEAVER VALLEY
MUNICIPALITY OF GREY HIGHLANDS

111-13229-00

	Water User	Estimated No. of Residential Equivalent Units	Estimated Average Day Water Demand* (m^3/day)	Population Equivalent	Comments
Existing - 2015					
P2-3-E1	None	0	-	-	No existing water system in place
TOTAL EXISTING		**0**	-	-	
Future - 1 to 20 Years					
P2-3-F1	Existing Farm	15	14.85	33.00	
P2-3-F2	Existing Residential	7	6.93	15.40	
TOTAL FUTURE - 1 TO 20 YEARS		**22**	**22**	**48**	
Future - 21 to 50 Years**					
P2-3-FF1	Development 21 to 50 years	8	7.58	16.84	
TOTAL FUTURE - 21 TO 50 YEARS		**8**	**8**	**17**	

* 450 L/cap.d @ 2.2 persons/unit

** 1% Increase in Residential Equivalent Units per Year

Table 20B-II-4
Water Demands P2-4

WATER AND WASTEWATER SERVICING MASTER PLAN
MARKDALE-FLESHERTON-KIMBERLEY-AMIK-EUGENIA-BEAVER VALLEY
MUNICIPALITY OF GREY HIGHLANDS

111-13229-00

	Water User	Estimated No. of Residential Equivalent Units	Estimated Average Day Water Demand* (m^3/day)	Population Equivalent	Comments
Existing - 2015					
P2-4-E1	None	0	-	-	No existing water system in place
TOTAL EXISTING		**0**	-	-	
Future - 1 to 20 Years					
P2-4-F1	Existing Vacant Residential	2	1.98	4.40	
P2-4-F2	Existing Vacant Commercial	1	0.99	2.20	
P2-4-F3	Existing Farm	22	21.78	48.40	
P2-4-F4	Existing Residential	14	13.86	30.80	
P2-4-F5	Existing B&B	3	2.97	6.60	
P2-4-F6	Existing Commercial	5	4.95	11.00	Includes one (1) retail over 10,000 s.f. and one (1) automative shop
P2-4-F7	Existing Industrial	4	3.96	8.80	One (1) warehouse
P2-4-F8	Existing Other	4	3.96	8.80	One (1) place of worship
TOTAL FUTURE - 1 TO 20 YEARS		**55**	**54**	**121**	
Future - 21 to 50 Years**					
P2-4-FF1	Development 21 to 50 years	19	18.94	42.09	
TOTAL FUTURE - 21 TO 50 YEARS		**19**	**19**	**42**	

* 450 L/cap.d @ 2.2 persons/unit

** 1% Increase in Residential Equivalent Units per Year

Table 20B-III-1
Water Demands P3-1

WATER AND WASTEWATER SERVICING MASTER PLAN
MARKDALE-FLESHERTON-KIMBERLEY-AMIK-EUGENIA-BEAVER VALLEY
MUNICIPALITY OF GREY HIGHLANDS

111-13229-00

	Water User	Estimated No. of Residential Equivalent Units	Estimated Average Day Water Demand* (m^3/day)	Population Equivalent	Comments
Existing - 2015					
P3-1-E1	None	0	-	-	No existing water system in place
TOTAL EXISTING		**0**	-	-	
Future - 1 to 20 Years					
P3-1-F1	Existing Vacant Residential	156	154.44	343.20	
P3-1-F2	Existing Vacant Commercial	1	0.99	2.20	
P3-1-F3	Existing Farm	4	3.96	8.80	
)-1-F4	Existing Residential	165	163.35	363.00	
P3-1-F5	Existing Mobile Home	7	6.93	15.40	One (1) or more mobile homes per parcel
P3-1-F6	Existing Seasonal/Recreational	49	48.51	107.80	
P3-1-F7	Existing Commercial	16	15.84	35.20	Includes three (3) retail over 10,000 s.f. and one (1) restaurant
P3-1-F8	Existing Industrial	1	0.99	2.20	
P3-1-F9	Existing Other	8	7.92	17.60	Two (2) places of worship
TOTAL FUTURE - 1 TO 20 YEARS		**407**	**403**	**895**	
Future - 21 to 50 Years**					
P3-1-FF1	Development 21 to 50 years	142	140.16	311.46	
TOTAL FUTURE - 21 TO 50 YEARS		**142**	**140**	**311**	

* 450 L/cap.d @ 2.2 persons/unit

** 1% Increase in Residential Equivalent Units per Year

Table 20B-III-2
Water Demands P3-2

WATER AND WASTEWATER SERVICING MASTER PLAN
MARKDALE-FLESHERTON-KIMBERLEY-AMIK-EUGENIA-BEAVER VALLEY
MUNICIPALITY OF GREY HIGHLANDS

111-13229-00

	Water User	Estimated No. of Residential Equivalent Units	Estimated Average Day Water Demand* (m^3/day)	Population Equivalent	Comments
Existing - 2015					
P3-2-E1	None	0.00	-	-	No existing water system in place
TOTAL EXISTING		**0.00**	-	-	
Future - 1 to 20 Years					
P3-2-F1	Existing Vacant Residential	77	76.23	169.40	
P3-2-F2	Existing Farm	21	20.79	46.20	
P3-2-F3	Existing Residential	124	122.76	272.80	
P3-2-F4	Existing Mobile Home	9	8.91	19.80	One (1) or more mobile homes per parcel
P3-2-F5	Existing Seasonal/Recreational	339	335.61	745.80	
P3-2-F6	Existing Commercial	7	6.93	15.40	One (1) cottage resort
P3-2-F7	Existing Other	4	3.96	8.80	One (1) place of worship
P3-2-F8	Future East Mountain	34	33.66	74.80	
TOTAL FUTURE - 1 TO 20 YEARS		**615**	**609**	**1353**	
Future - 21 to 50 Years**					
P3-2-FF1	Development 21 to 50 years	214	211.79	470.64	
TOTAL FUTURE - 21 TO 50 YEARS		**214**	**212**	**471**	

* 450 L/cap.d @ 2.2 persons/unit

** 1% Increase in Residential Equivalent Units per Year

Table 20B-III-3
Water Demands P3-3

WATER AND WASTEWATER SERVICING MASTER PLAN
MARKDALE-FLESHERTON-KIMBERLEY-AMIK-EUGENIA-BEAVER VALLEY
MUNICIPALITY OF GREY HIGHLANDS

111-13229-00

	Water User	Estimated No. of Residential Equivalent Units	Estimated Average Day Water Demand* (m^3/day)	Population Equivalent	Comments
Existing - 2015					
P3-3-E1	None	0	-	-	No existing water system in place
TOTAL EXISTING		**0**	-	-	
Future - 1 to 20 Years					
P3-3-F1	Existing Vacant Residential	1	0.99	2.20	
P3-3-F2	Existing Farm	8	7.92	17.60	
P3-3-F3	Existing Residential	4	3.96	8.80	
P3-3-F4	Existing Commercial	4	3.96	8.80	One (1) retail over 10,000 s.f.
TOTAL FUTURE - 1 TO 20 YEARS		**17**	**17**	**37**	
Future - 21 to 50 Years**					
P3-3-FF1	Development 21 to 50 years	6	5.85	13.01	
TOTAL FUTURE - 21 TO 50 YEARS		**6**	**6**	**13**	

* 450 L/cap.d @ 2.2 persons/unit

** 1% Increase in Residential Equivalent Units per Year

Table 20B-III-4
Water Demands P3-4

WATER AND WASTEWATER SERVICING MASTER PLAN
MARKDALE-FLESHERTON-KIMBERLEY-AMIK-EUGENIA-BEAVER VALLEY
MUNICIPALITY OF GREY HIGHLANDS

111-13229-00

	Water User	Estimated No. of Residential Equivalent Units	Estimated Average Day Water Demand* (m^3/day)	Population Equivalent	Comments
Existing - 2015					
P3-4-E1	None	0	-	-	No existing water system in place
TOTAL EXISTING		**0**	-	-	
Future - 1 to 20 Years					
P3-4-F1	Existing Vacant Residential	24	23.76	52.80	
P3-4-F2	Existing Farm	5	4.95	11.00	
P3-4-F3	Existing Residential	20	19.80	44.00	
P3-4-F4	Existing Seasonal/Recreational	16	15.84	35.20	
TOTAL FUTURE - 1 TO 20 YEARS		**65**	**64**	**143**	
Future - 21 to 50 Years*					
P3-4-FF1	Development 21 to 50 years	23	22.38	49.74	
TOTAL FUTURE - 21 TO 50 YEARS		**23**	**22**	**50**	

* 450 L/cap.d @ 2.2 persons/unit

** 1% Increase in Residential Equivalent Units per Year

Appendix D

EXISTING, FUTURE 20 AND 50 YEAR SEWAGE FLOWS – BREAKDOWN CALCULATIONS

Table 20A-I-1
Sewage Use P1-1

WATER AND WASTEWATER SERVICING MASTER PLAN
MARKDALE-FLESHERTON-KIMBERLEY-AMIK-EUGENIA-BEAVER VALLEY
MUNICIPALITY OF GREY HIGHLANDS

111-13229-00

Sewage Generator		Estimated No. of Residential Equivalent Units	Estimated Sewage Flow* (m^3/day)	Population Equivalent	Comments
Existing - 2015					
P1-1-E1	Normal Residential***	559	338.20	1229.80	
P1-1-E2	Chapman's Ice Cream***	826	500	1817.20	
P1-1-E3	Grey Gables Long-Term Care Facility	25	24.75	55.00	
P1-1-E4	Markdale Hospital	6	5.94	13.20	
P1-1-E5	Beavercrest School	7	6.44	14.30	
P1-1-E6	Steven's Restaurant	4	3.96	8.80	
P1-1-E7	Other Commercial	110	108.65	241.45	
TOTAL EXISTING		**1536**	**988**	**3380**	
Future - 1 to 20 Years					
P1-1-F1	Existing Vacant Residential	28	27.72	61.60	
P1-1-F2	Existing Residential on Septics	20	19.80	44.00	
P1-1-F3	Existing Vacant Commercial	10	9.90	22.00	
P1-1-F4	Existing Vacant Industrial	1	0.99	2.20	
P1-1-F5	Extension to Municipality of West Grey	40	39.60	88.00	
P1-1-F6	Dimakos Subdivision	59	58.41	129.80	
P1-1-F7	Lasanti Subdivision - Phase 1	99	98.01	217.80	
P1-1-F8	Lasanti Subdivision - Phase 2	260	257.40	572.00	
P1-1-F9	Golf Course/Soccer Field Subdivisions	92	91.08	202.40	
P1-1-F10	Chapman's Ice Cream	343	340	754.60	340 m^3/day estimated
P1-1-F11	Tim Hortons	18	17.82	39.60	
TOTAL FUTURE - 1 TO 20 YEARS		**970**	**961**	**2134**	
Future - 21 to 50 Years**					
P1-1-FF1	Chapman's Ice Cream	303	300	666.60	300 m^3/day estimated
P1-1-FF2	Development 21 to 50 years	447	442.84	984.09	Based on existing + 1-20 year development (minus Chapman's)
TOTAL FUTURE - 21 TO 50 YEARS		**750**	**743**	**1651**	

* 450 L/cap.d (includes infiltration) @ 2.2 persons/unit

** 1% Increase in Residential Equivalent Units per Year

*** 275 L/cap.d (includes infiltration) @ 2.2 persons/unit

Table 20A-I-2
Sewage Use P1-2

WATER AND WASTEWATER SERVICING MASTER PLAN
MARKDALE-FLESHERTON-KIMBERLEY-AMIK-EUGENIA-BEAVER VALLEY
MUNICIPALITY OF GREY HIGHLANDS

111-13229-00

Sewage Generator		Estimated No. of Residential Equivalent Units	Estimated Sewage Flow (m^3/day)*	Population Equivalent	Comments
Existing - 2015					
P1-2-E1	Beaver Valley	3	2.97	6.60	
P1-2-E2	Amik***	90	128.70	198.00	
P1-2-E3	Talisman***	60	85.80	132.00	
TOTAL EXISTING		**153**	**217**	**337**	
Future - 1 to 20 Years					
P1-2-F1	Existing Vacant Residential	19	18.81	41.80	
P1-2-F2	Existing Vacant Industrial	1	0.99	2.20	
P1-2-F3	Existing Farm	8	7.92	17.60	
P1-2-F4	Existing Residential	49	48.51	107.80	
P1-2-F5	Existing B&B	3	2.97	6.60	
P1-2-F6	Existing Seasonal/Recreational	28	27.72	61.60	
P1-2-F7	Existing Commercial	15	14.85	33.00	Includes one (1) retail over 10,000 s.f., three (3) retail under 10,000 s.f. and one (1) restaurant
P1-2-F8	Existing Golf course	3	2.97	6.60	Three (3) parcels of overall golf course (4 in total)
P1-2-F9	Existing Ski Resort	1	0.99	2.20	One (1) parcel of overall ski resort (2 in total)
P1-2-F10	Existing Industrial	1	0.99	2.20	
P1-2-F11	Existing Community Hall	1	0.99	2.20	
P1-2-F12	Future Bedview Development	5	4.95	11.00	
P1-2-F13	Future Fox Ridge Estates (Talisman)	28	27.72	61.60	
P1-2-F14	Future Trail's Edge (Talisman)	46	45.54	101.20	
TOTAL FUTURE - 1 TO 20 YEARS		**208**	**206**	**458**	
Future - 21 to 50 Years**					
P1-2-FF1	Development 21 to 50 years	126	124.32	276.26	Based on existing + 1-20 year development
TOTAL FUTURE - 21 TO 50 YEARS		**126**	**124**	**276**	

* 450 L/cap.d (includes infiltration) @ 2.2 persons/unit

** 1% Increase in Residential Equivalent Units per Year

*** Existing Amik/Talisman 650 L/cap.d (includes excessive infiltration) @ 2.2 persons/unit

Table 20A-I-3
Sewage Use P1-3

WATER AND WASTEWATER SERVICING MASTER PLAN
MARKDALE-FLESHERTON-KIMBERLEY-AMIK-EUGENIA-BEAVER VALLEY
MUNICIPALITY OF GREY HIGHLANDS

111-13229-00

Sewage Generator		Estimated No. of Residential Equivalent Units	Estimated Sewage Flow (m^3/day)*	Population Equivalent	Comments
Existing - 2015					
P1-3-E1	None	0.00	-	-	No existing sanitary sewer system in place
TOTAL EXISTING		**0.00**	-	-	
Future - 1 to 20 Years					
P1-3-F1	Existing Vacant Residential	32	31.68	70.40	
P1-3-F2	Existing Farm	3	2.97	6.60	
P1-3-F3	Existing Residential	49	48.51	107.80	
P1-3-F4	Existing Seasonal/Recreational	153	151.47	336.60	
P1-3-F5	Existing Ski Resort (Beaver Valley Ski Club)	3	2.97	6.60	3 lots shown i.e. **not** residential equivalent units
P1-3-F6	Future Beaver Vally Ski Club	4	3.96	8.80	
P1-3-F7	Future Beaver Valley Village (Keiner)	45	44.55	99.00	
P1-3-F8	Future Beaver Vally Woodlands	12	11.88	26.40	
TOTAL FUTURE - 1 TO 20 YEARS		**301**	**298**	**662**	
Future - 21 to 50 Years**					
P1-3-FF1	Development 21 to 50 years	105	103.66	230.35	
TOTAL FUTURE - 21 TO 50 YEARS		**105**	**104**	**230**	

* 450 L/cap.d @ 2.2 persons/unit

** 1% Increase in Residential Equivalent Units per Year

Table 20A-I-4
Sewage Use P1-4

WATER AND WASTEWATER SERVICING MASTER PLAN
MARKDALE-FLESHERTON-KIMBERLEY-AMIK-EUGENIA-BEAVER VALLEY
MUNICIPALITY OF GREY HIGHLANDS

111-13229-00

Sewage Generator		Estimated No. of Residential Equivalent Units	Estimated Sewage Flow (m^3/day)*	Population Equivalent	Comments
Existing - 2015					
P1-4-E1	None	0	-	-	No existing sanitary sewer system in place
TOTAL EXISTING		**0**	-	-	
Future - 1 to 20 Years					
P1-4-F1	Existing Vacant Residential	28	27.72	61.60	
P1-4-F2	Existing Farm	25	24.75	55.00	
P1-4-F3	Existing Residential	63	62.37	138.60	
P1-4-F4	Existing Seasonal/Recreational	14	13.86	30.80	
TOTAL FUTURE - 1 TO 20 YEARS		**130**	**129**	**286**	
Future - 21 to 50 Years**					
P1-4-FF1	Development 21 to 50 years	45	44.77	99.48	
TOTAL FUTURE - 21 TO 50 YEARS		**45**	**45**	**99**	

* 450 L/cap.d @ 2.2 persons/unit

** 1% Increase in Residential Equivalent Units per Year

Table 20A-I-5
Sewage Use P1-5

WATER AND WASTEWATER SERVICING MASTER PLAN
MARKDALE-FLESHERTON-KIMBERLEY-AMIK-EUGENIA-BEAVER VALLEY
MUNICIPALITY OF GREY HIGHLANDS

111-13229-00

Sewage Generator		Estimated No. of Residential Equivalent Units	Estimated Sewage Flow (m^3/day)*	Population Equivalent	Comments
Existing - 2015					
P1-5-E1	None	0	-	-	No existing sanitary sewer system in place
TOTAL EXISTING		**0**	-	-	
Future - 1 to 20 Years					
P1-5-F1	Existing Vacant Residential	1	0.99	2.20	
-5-F2	Existing Vacant Commercial	1	0.99	2.20	
P1-5-F3	Existing Farm	2	1.98	4.40	
P1-5-F4	Existing Residential	4	3.96	8.80	
P1-5-F5	Existing Seasonal/Recreational	6	5.94	13.20	
TOTAL FUTURE - 1 TO 20 YEARS		**14**	**14**	**31**	
Future - 21 to 50 Years**					
P1-5-FF1	Development 21 to 50 years	5	4.82	10.71	
TOTAL FUTURE - 21 TO 50 YEARS		**5**	**5**	**11**	

* 450 L/cap.d @ 2.2 persons/unit

** 1% Increase in Residential Equivalent Units per Year

Table 20A-II-1
Sewage Use P2-1

WATER AND WASTEWATER SERVICING MASTER PLAN
MARKDALE-FLESHERTON-KIMBERLEY-AMIK-EUGENIA-BEAVER VALLEY
MUNICIPALITY OF GREY HIGHLANDS

111-13229-00

Sewage Generator		Estimated No. of Residential Equivalent Units	Estimated Sewage Flow (m^3/day)*	Population Equivalent	Comments
Existing - 2015					
P2-1-E1	Residential**	215	129.77	471.90	
P2-1-E2	Macphail Public School**	15	9.08	33.00	15 units is currently billed. WSP estimates that the number of units should be 23 units (525 students/staff in 2007, BWSB Website)
P2-1-E3	Other Commercial**	59	35.39	128.70	
TOTAL EXISTING		**288**	**174**	**634**	
Future - 1 to 20 Years					
P2-1-F1	Existing Vacant Residential	27	26.73	59.40	
TOTAL FUTURE - 1 TO 20 YEARS		**27**	**27**	**59**	
Future - 21 to 50 Years					
P2-1-FF1	None	0	-	-	Future expansion of sanitary sewer included in Phase II-2
TOTAL FUTURE - 21 TO 50 YEARS		**0**			

* 450 L/cap.d (includes infiltration) @ 2.2 persons/unit

** 275 L/cap.d (includes infiltration) @ 2.2 persons/unit

Table 20A-II-2
Sewage Use P2-2

WATER AND WASTEWATER SERVICING MASTER PLAN
MARKDALE-FLESHERTON-KIMBERLEY-AMIK-EUGENIA-BEAVER VALLEY
MUNICIPALITY OF GREY HIGHLANDS

111-13229-00

Sewage Generator		Estimated No. of Residential Equivalent Units	Estimated Sewage Flow (m^3/day)*	Population Equivalent	Comments
Existing - 2015					
P2-2-E1	None	0	-	-	No existing sanitary sewer system in place
TOTAL EXISTING		**0**	-	-	
Future - 1 to 20 Years					
P2-2-F1	Existing Grey Highlands SS***	73	44.17	160.60	WSP estimates that the number of units should be 73 units (1091 students/staff in 2007, BWSB website)
P2-2-F2	Existing Vacant Residential	48	47.52	105.60	
P2-2-F3	Existing Vacant Commercial	3	2.97	6.60	
P2-2-F4	Existing Farm	6	5.94	13.20	
P2-2-F5	Existing Residential***	106	64.13	233.20	
P2-2-F6	Existing Seasonal/Recreational	6	5.94	13.20	
P2-2-F7	Existing Commercial***	32	19.36	70.40	Includes three (3) retail over 10,000 s.f., three (3) automative shop, one (1) motel and one (1) funeral home
P2-2-F8	Existing Industrial	3	2.97	6.60	
P2-2-F9	Existing Sports Complex	4	3.96	8.80	
P2-2-F10	Future Gas Station	6	5.94	13.20	Municipality to clarify if the Gas Station and Drive Thru are combined
P2-2-F11	Future Drive Thru	1	0.99	2.20	
TOTAL FUTURE - 1 TO 20 YEARS		**288**	**204**	**634**	
Future - 21 to 50 Years**					
P2-2-FF1	Development 21 to 50 years	100	99.18	220.40	
TOTAL FUTURE - 21 TO 50 YEARS		**100**	**99**	**220**	

* 450 L/cap.d @ 2.2 persons/unit

** 1% Increase in Residential Equivalent Units per Year

*** 275 L/cap.d (includes infiltration) @ 2.2 persons/unit

Table 20A-II-3
Sewage Use P2-3

WATER AND WASTEWATER SERVICING MASTER PLAN
MARKDALE-FLESHERTON-KIMBERLEY-AMIK-EUGENIA-BEAVER VALLEY
MUNICIPALITY OF GREY HIGHLANDS

111-13229-00

Sewage Generator		Estimated No. of Residential Equivalent Units	Estimated Sewage Flow (m^3/day)*	Population Equivalent	Comments
Existing - 2015					
P2-3-E1	None	0	-	-	No existing sanitary sewer system in place
TOTAL EXISTING		**0**	-	-	
Future - 1 to 20 Years					
P2-3-F1	Existing Farm	15	14.85	33.00	
P2-3-F2	Existing Residential	7	6.93	15.40	
TOTAL FUTURE - 1 TO 20 YEARS		**22**	**22**	**48**	
Future - 21 to 50 Years**					
P2-3-FF1	Development 21 to 50 years	8	7.58	16.84	
TOTAL FUTURE - 21 TO 50 YEARS		**8**	**8**	**17**	

* 450 L/cap.d @ 2.2 persons/unit

** 1% Increase in Residential Equivalent Units per Year

Table 20A-II-4
Sewage Use P2-4

WATER AND WASTEWATER SERVICING MASTER PLAN
MARKDALE-FLESHERTON-KIMBERLEY-AMIK-EUGENIA-BEAVER VALLEY
MUNICIPALITY OF GREY HIGHLANDS

111-13229-00

Sewage Generator		Estimated No. of Residential Equivalent Units	Estimated Sewage Flow (m^3/day)*	Population Equivalent	Comments
Existing - 2015					
P2-4-E1	None	0	-	-	No existing sanitary sewer system in place
TOTAL EXISTING		**0**	-	-	
Future - 1 to 20 Years					
P2-4-F1	Existing Vacant Residential	2	1.98	4.40	
P2-4-F2	Existing Vacant Commercial	1	0.99	2.20	
P2-4-F3	Existing Farm	22	21.78	48.40	
P2-4-F4	Existing Residential	14	13.86	30.80	
P2-4-F5	Existing B&B	3	2.97	6.60	
P2-4-F6	Existing Commercial	5	4.95	11.00	Includes one (1) retail over 10,000 s.f. and one (1) automative shop
P2-4-F7	Existing Industrial	4	3.96	8.80	One (1) warehouse
P2-4-F8	Existing Other	4	3.96	8.80	One (1) place of worship
TOTAL FUTURE - 1 TO 20 YEARS		**55**	**54**	**121**	
Future - 21 to 50 Years**					
P2-4-FF1	Development 21 to 50 years	19	18.94	42.09	
TOTAL FUTURE - 21 TO 50 YEARS		**19**	**19**	**42**	

* 450 L/cap.d @ 2.2 persons/unit

** 1% Increase in Residential Equivalent Units per Year

Table 20A-III-1
Sewage Use P3-1

WATER AND WASTEWATER SERVICING MASTER PLAN
MARKDALE-FLESHERTON-KIMBERLEY-AMIK-EUGENIA-BEAVER VALLEY
MUNICIPALITY OF GREY HIGHLANDS

111-13229-00

Sewage Generator		Estimated No. of Residential Equivalent Units	Estimated Sewage Flow (m^3/day)*	Population Equivalent	Comments
Existing - 2015					
P3-1-E1	None	0	-	-	No existing sanitary sewer system in place
TOTAL EXISTING		**0**	-	-	
Future - 1 to 20 Years					
P3-1-F1	Existing Vacant Residential	156	154.44	343.20	
P3-1-F2	Existing Vacant Commercial	1	0.99	2.20	
P3-1-F3	Existing Farm	4	3.96	8.80	
P3-1-F4	Existing Residential	165	163.35	363.00	
P3-1-F5	Existing Mobile Home	7	6.93	15.40	One (1) or more mobile homes per parcel
P3-1-F6	Existing Seasonal/Recreational	49	48.51	107.80	
P3-1-F7	Existing Commercial	16	15.84	35.20	Includes three (3) retail over 10,000 s.f. and one (1) restaurant
P3-1-F8	Existing Industrial	1	0.99	2.20	
P3-1-F9	Existing Other	8	7.92	17.60	Two (2) places of worship
TOTAL FUTURE - 1 TO 20 YEARS		**407**	**403**	**895**	
Future - 21 to 50 Years**					
P3-1-FF1	Development 21 to 50 years	142	140.16	311.46	
TOTAL FUTURE - 21 TO 50 YEARS		**142**	**140**	**311**	

* 450 L/cap.d @ 2.2 persons/unit

** 1% Increase in Residential Equivalent Units per Year

Table 20A-III-2
Sewage Use P3-2

WATER AND WASTEWATER SERVICING MASTER PLAN
MARKDALE-FLESHERTON-KIMBERLEY-AMIK-EUGENIA-BEAVER VALLEY
MUNICIPALITY OF GREY HIGHLANDS

111-13229-00

Sewage Generator		Estimated No. of Residential Equivalent Units	Estimated Sewage Flow (m^3/day)*	Population Equivalent	Comments
Existing - 2015					
P3-2-E1	None	0.00	-	-	No existing sanitary sewer system in place
TOTAL EXISTING		**0.00**	-	-	
Future - 1 to 20 Years					
P3-2-F1	Existing Vacant Residential	77	76.23	169.40	
P3-2-F2	Existing Farm	21	20.79	46.20	
P3-2-F3	Existing Residential	124	122.76	272.80	
P3-2-F4	Existing Mobile Home	9	8.91	19.80	One (1) or more mobile homes per parcel
P3-2-F5	Existing Seasonal/Recreational	339	335.61	745.80	
P3-2-F6	Existing Commercial	7	6.93	15.40	One (1) cottage resort
P3-2-F7	Existing Other	4	3.96	8.80	One (1) place of worship
P3-2-F8	Future East Mountain	34	33.66	74.80	
TOTAL FUTURE - 1 TO 20 YEARS		**615**	**609**	**1353**	
Future - 21 to 50 Years**					
P3-2-FF1	Development 21 to 50 years	214	211.79	470.64	
TOTAL FUTURE - 21 TO 50 YEARS		**214**	**212**	**471**	

* 450 L/cap.d @ 2.2 persons/unit

** 1% Increase in Residential Equivalent Units per Year

Table 20A-III-3
Sewage Use P3-3

WATER AND WASTEWATER SERVICING MASTER PLAN
MARKDALE-FLESHERTON-KIMBERLEY-AMIK-EUGENIA-BEAVER VALLEY
MUNICIPALITY OF GREY HIGHLANDS

111-13229-00

Sewage Generator		Estimated No. of Residential Equivalent Units	Estimated Sewage Flow (m^3/day)*	Population Equivalent	Comments
Existing - 2015					
P3-3-E1	None	0	-	-	No existing sanitary sewer system in place
TOTAL EXISTING		**0**	-	-	
Future - 1 to 20 Years					
P3-3-F1	Existing Vacant Residential	1	0.99	2.20	
P3-3-F2	Existing Farm	8	7.92	17.60	
P3-3-F3	Existing Residential	4	3.96	8.80	
P3-3-F4	Existing Commercial	4	3.96	8.80	One (1) retail over 10,000 s.f.
TOTAL FUTURE - 1 TO 20 YEARS		**17**	**17**	**37**	
Future - 21 to 50 Years**					
P3-3-FF1	Development 21 to 50 years	6	5.85	13.01	
TOTAL FUTURE - 21 TO 50 YEARS		**6**	**6**	**13**	

* 450 L/cap.d @ 2.2 persons/unit

** 1% Increase in Residential Equivalent Units per Year

Table 20A-III-4
Sewage Use P3-4

WATER AND WASTEWATER SERVICING MASTER PLAN
MARKDALE-FLESHERTON-KIMBERLEY-AMIK-EUGENIA-BEAVER VALLEY
MUNICIPALITY OF GREY HIGHLANDS

111-13229-00

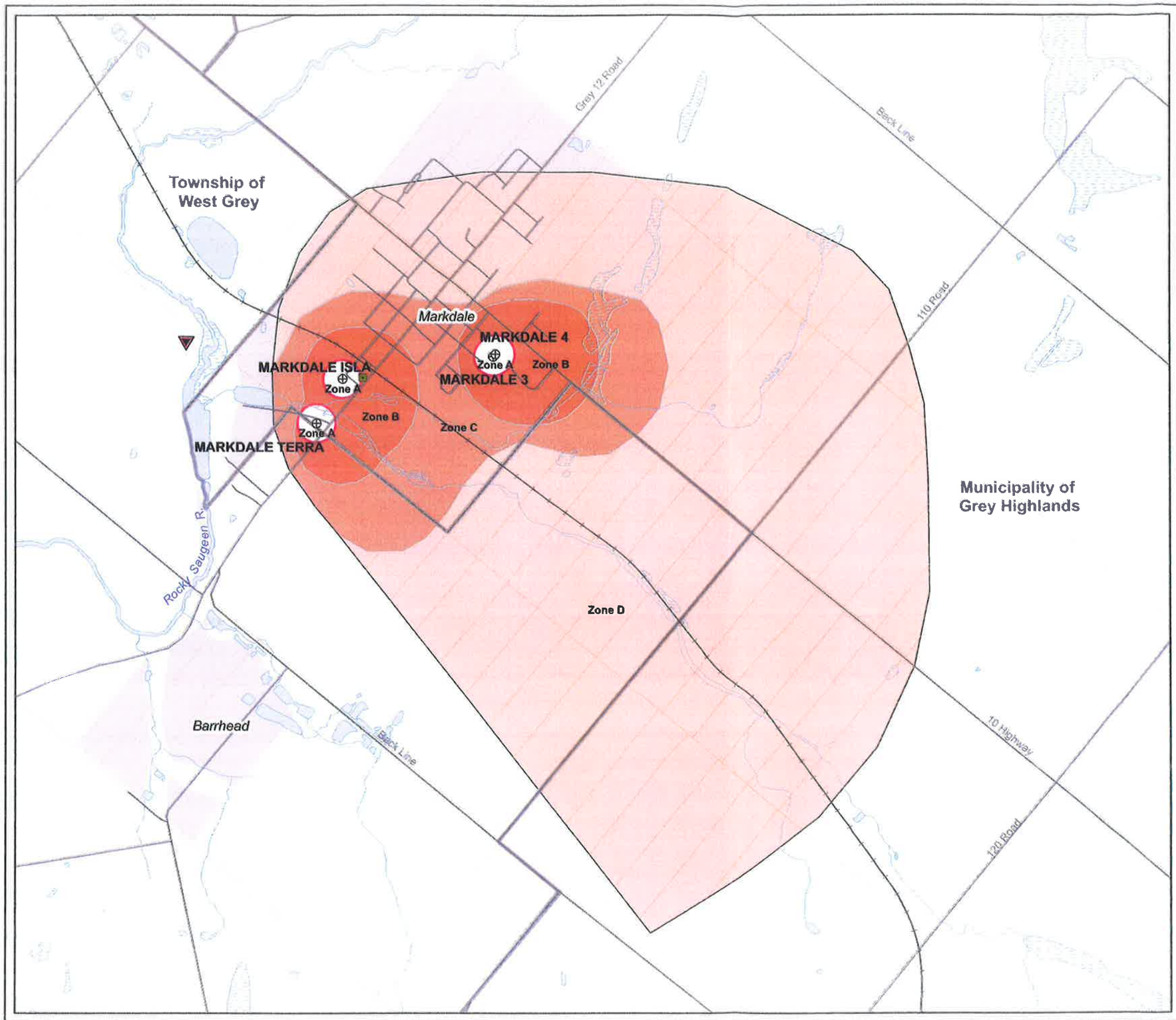
Sewage Generator		Estimated No. of Residential Equivalent Units	Estimated Sewage Flow (m^3/day)*	Population Equivalent	Comments
Existing - 2015					
P3-4-E1	None	0	-	-	No existing sanitary sewer system in place
TOTAL EXISTING		**0**	-	-	
Future - 1 to 20 Years					
P3-4-F1	Existing Vacant Residential	24	23.76	52.80	
P3-4-F2	Existing Farm	5	4.95	11.00	
P3-4-F3	Existing Residential	20	19.80	44.00	
P3-4-F4	Existing Seasonal/Recreational	16	15.84	35.20	
TOTAL FUTURE - 1 TO 20 YEARS		**65**	**64**	**143**	
Future - 21 to 50 Years*					
P3-4-FF1	Development 21 to 50 years	23	22.38	49.74	
TOTAL FUTURE - 21 TO 50 YEARS		**23**	**22**	**50**	

* 450 L/cap.d @ 2.2 persons/unit

** 1% Increase in Residential Equivalent Units per Year

Appendix E

CAPTURE ZONE INFORMATION – EXISTING MARKDALE SUPPLY WELLS AND EXISTING AND POTENTIAL NEW WELL LOCATIONS



SOURCE WATER PROTECTION

Legend

- Municipal Supply Well
- Stand-Alone Distribution System
- Well Supply Pumphouse
- Water Treatment Plant
- Sewage Treatment Plant

Wellhead Protection Area (WHPA)

- Zone A - Pathogen Security Zone
- Zone B - 2 year TOT Capture Zone
- Zone C - 5 year TOT Capture Zone
- Zone D - 25 year TOT Capture Zone
- Total Capture Zone
- Ontario Road Network
- Historic Railroad
- Hydrologic Network
- Lake
- Wetland
- Airport
- Built up Area
- Conservation Lands/Parks
- Lot & Concession
- Municipal Boundary



200 0 200 400 600 800 1,000 1,200 1,400

Metres

1:20,000

Base mapping provided by Saugeen Valley Conservation Authority, 2007. WHPA's provided by Waterloo Hydrogeologic, Inc., 2006. Produced by Conestoga Rovers and Associates, Ltd. Environmental Systems Research Institute, 2007. Data projected to UTM (Zone 17N) NAD 83 under license with the Ontario Ministry of Natural Resources © Queen's Printer for Ontario, 2007.

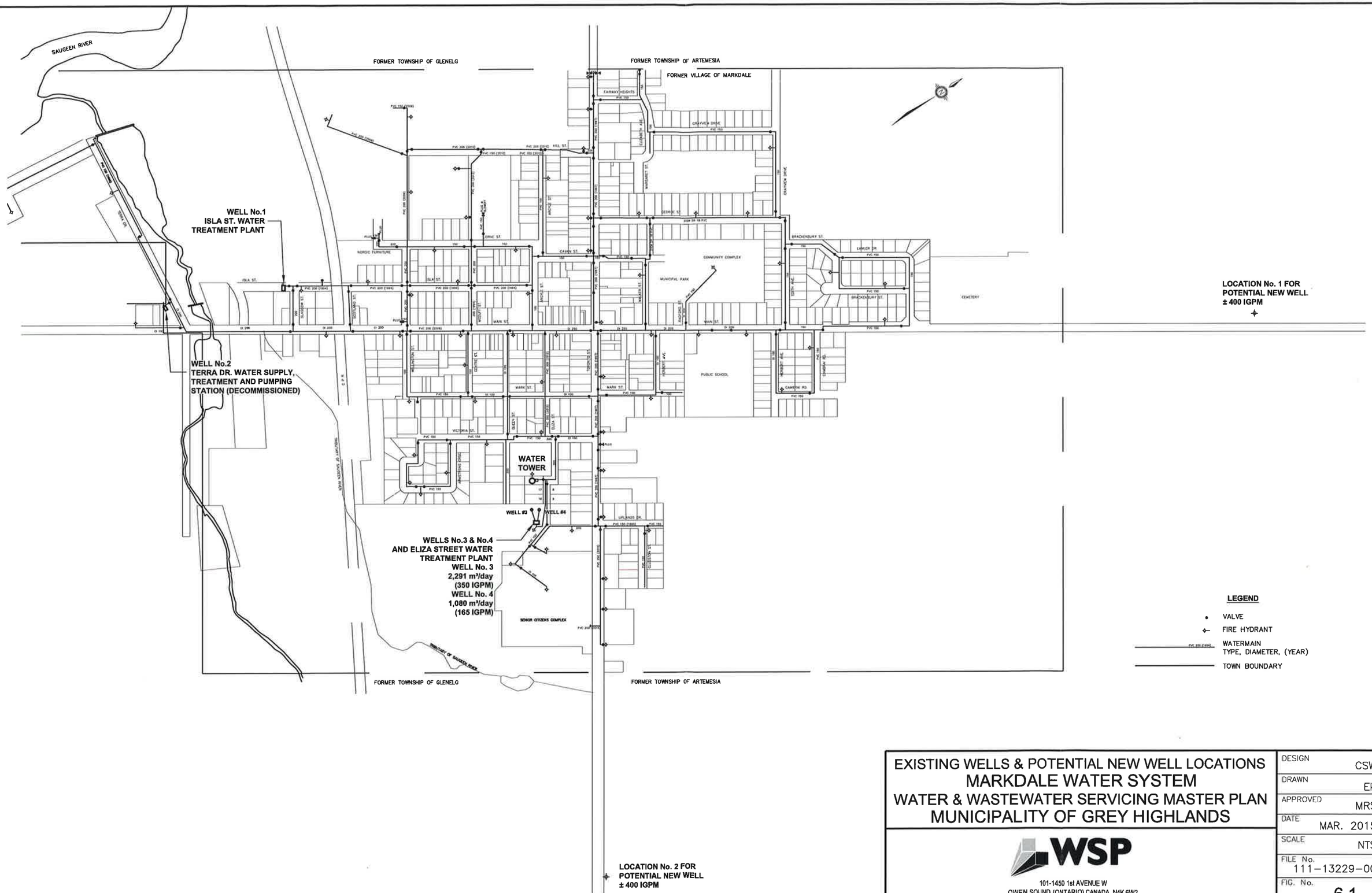
Figure 3.25

MARKDALE WHPA

Municipality of Grey Highlands

2005-2006 Groundwater Technical Study
Saugeen Valley-Grey Sauble-Northern Bruce Source Protection Region

044533 (REP001)GIS-WA0101 WHPA Mapbook July 23, 2007



EXISTING WELLS & POTENTIAL NEW WELL LOCATIONS
MARKDALE WATER SYSTEM
WATER & WASTEWATER SERVICING MASTER PLAN
MUNICIPALITY OF GREY HIGHLANDS

WSP
101-1450 1st AVENUE W
OWEN SOUND (ONTARIO) CANADA N4K 6W2
TEL.: 519-376-7612 | FAX: 519-376-8008 | WWW.WSPGROUP.COM

DESIGN	CSW
DRAWN	EK
APPROVED	MRS
DATE	MAR. 2015
SCALE	NTS
FILE No.	111-13229-00
FIG. No.	6.1

COPYRIGHT © WSP INC.

PLOTTED: Wednesday, May 11, 2016 2:22:23 PM
G:\2011\05\117 - 13229-00 - Grey Highlands\Reports\Water & Wastewater Servicing Master Plan - Jan 2016\Master Plan\Figur\FIGURE-6.1 (... May 11, 2016 - 2:22pm

Appendix F

PROPOSED WATER STORAGE FACILITY OPTIONS

TABLE 6.2B
WATER STORAGE FACILITIES - ALTERNATIVE 1

WATER AND WASTEWATER SERVICING MASTER PLAN
MARKDALE-FLESHERTON-KIMBERLEY-AMIK-EUGENIA-BEAVER VALLEY
MUNICIPALITY OF GREY HIGHLANDS

111-13229-00

Water Storage Facility	Type of Storage	Design Year	Top Water Elevation (m)	Top of Emergency Storage and Fire Storage Elevation (m)	Bottom of Fire Storage Elevation (m)	Base Elevation (m)	Total Usable Storage (m^3)	Fire Storage (m^3)
Markdale (PI-1, PI-3, PI-4, PII-1, PII-2, PII-3, PII-4, PIII-1, PIII-2, PIII-3 and PIII-4)	New Elevated Glass-Fused -To-Steel Tank	50	488.00	478.12	464.06	436.65	6275	2376
	New Elevated Glass-Fused -To-Steel Tank	20	488.00	478.12	464.06	436.65	5027	2041
Kimberley, Amik, Talisman (PI-2 and PI-5)	Existing Storage Facility	50	332.15	330.70	327.40	327.40	886	461
	Existing Storage Facility	20	332.15	331.10	328.97	327.40	581	274

TABLE 6.2C
WATER STORAGE FACILITIES - ALTERNATIVE 2

WATER AND WASTEWATER SERVICING MASTER PLAN
MARKDALE-FLESHERTON-KIMBERLEY-AMIK-EUGENIA-BEAVER VALLEY
MUNICIPALITY OF GREY HIGHLANDS

111-13229-00

Water Storage Facility	Type of Storage	Design Year	Top Water Elevation (m)	Top of Emergency Storage and Fire Storage Elevation (m)	Bottom of Fire Storage Elevation (m)	Base Elevation (m)	Total Usable Storage (m^3)	Fire Storage (m^3)
Markdale (PI-1, PI-3, PI-4 and PII-3)	New Elevated Glass-Fused -To-Steel Tank	50	488.00	478.12	464.06	436.65	4750	2041
	New Elevated Glass-Fused -To-Steel Tank	20	488.00	478.12	464.06	436.65	3782	1717
Kimberley, Amik, Talisman (PI-2 and PI-5)	Existing Storage Facility	50	332.15	330.60	327.40	327.40	886	461
	Existing Storage Facility	20	332.15	331.10	328.97	327.40	581	274
Flesherton (PII-1, PII-2, and PII-4)	New On-Ground Glass-Fused -To-Steel Tank	50	488.00	482.9	478.00	478.00	1162	569
	New On-Ground Glass-Fused -To-Steel Tank	20	488.00	483.31	478.00	478.00	1070	569
Eugenia (PIII-1, PIII-2, PIII-3 and PIII-4)	New Elevated Glass-Fused -To-Steel Tank	50	488.00	478.12	464.06	450.00	1911	792
	New Elevated Glass-Fused -To-Steel Tank	20	488.00	478.12	464.06	450.00	1623	684

TABLE 6.2D
WATER STORAGE FACILITIES - ALTERNATIVE 3

WATER AND WASTEWATER SERVICING MASTER PLAN
MARKDALE-FLESHERTON-KIMBERLEY-AMIK-EUGENIA-BEAVER VALLEY
MUNICIPALITY OF GREY HIGHLANDS

111-13229-00

Water Storage Facility	Type of Storage	Design Year	Top Water Elevation (m)	Top of Emergency Storage and Fire Storage Elevation (m)	Bottom of Fire Storage Elevation (m)	Base Elevation (m)	Total Usable Storage (m^3)	Fire Storage (m^3)
Markdale (PI-1, PI-3, PI-4 PII-1, PII-2, PII-3 and PII-4)	New Glass-Fused - To-Steel Elevated Storage	50	488.00	478.12	464.06	436.65	5110	2041
	New Glass-Fused - To-Steel Elevated Storage	20	488.00	478.12	464.06	436.65	4069	1717
Kimberley, Amik, Talisman (PI-2 and PI-5)	Existing Storage Facility	50	332.15	330.60	327.40	327.40	886	461
	Existing Storage Facility	20	332.15	331.10	328.97	327.40	581	274
Eugenia (PIII-1, PIII-2, PIII-3 and PIII-4)	New Elevated Glass-Fused -To-Steel Tank	50	488.00	478.12	464.06	450.00	1911	792
	New Elevated Glass-Fused -To-Steel Tank	20	488.00	478.12	464.06	450.00	1623	684

TABLE 6.2E
WATER STORAGE FACILITIES - ALTERNATIVE 4

WATER AND WASTEWATER SERVICING MASTER PLAN
MARKDALE-FLESHERTON-KIMBERLEY-AMIK-EUGENIA-BEAVER VALLEY
MUNICIPALITY OF GREY HIGHLANDS

111-13229-00

Water Storage Facility	Type of Storage	Design Year	Top Water Elevation (m)	Top of Emergency Storage and Fire Storage Elevation (m)	Bottom of Fire Storage Elevation (m)	Base Elevation (m)	Total Usable Storage (m^3)	Fire Storage (m^3)
Markdale (PI-1, PI-3, PI-4 and PII-3)	New Glass-Fused - To-Steel Elevated Storage	50	488.00	478.12	464.06	436.65	4750	2041
	New Glass-Fused - To-Steel Elevated Storage	20	488.00	478.12	464.06	436.65	3782	1717
Kimberley, Amik, Talisman (PI-2 and PI-5)	Existing Storage Facility	50	332.15	330.60	327.40	327.40	886	461
	Existing Storage Facility	20	332.15	331.10	328.97	327.40	581	274
Flesherton (PII-1, PII-2, PII-4, PIII-1, PIII-2, PIII-3 and PIII-4)	New On-Ground Glass-Fused -To-Steel Tank	50	488.00	482.02	478.00	478.00	2577	1037
	New On-Ground Glass-Fused -To-Steel Tank	20	488.00	482.29	478.00	478.00	2095	900

TABLE 6.2F
WATER STORAGE FACILITIES - ALTERNATIVE 5

WATER AND WASTEWATER SERVICING MASTER PLAN
MARKDALE-FLESHERTON-KIMBERLEY-AMIK-EUGENIA-BEAVER VALLEY
MUNICIPALITY OF GREY HIGHLANDS

111-13229-00

Water Storage Facility	Type of Storage	Design Year	Top Water Elevation (m)	Top of Emergency Storage and Fire Storage Elevation (m)	Bottom of Fire Storage Elevation (m)	Base Elevation (m)	Total Usable Storage (m^3)	Fire Storage (m^3)
Markdale (PI-1, PI-2, PI-3, PI-4, PI-5, PII-1, PII-2, PII-3 and PII-4)	New Elevated Glass-Fused -To-Steel Tank	50	488.00	478.12	464.06	436.65	5218	2041
	New Elevated Glass-Fused -To-Steel Tank	20	488.00	478.12	464.06	436.65	4648	2041
Eugenia (PIII-1, PIII-2, PIII-3 and PIII-4)	New Elevated Glass-Fused -To-Steel Tank	50	488.00	478.12	464.06	450.00	1911	792
	New Elevated Glass-Fused -To-Steel Tank	20	488.00	478.12	464.06	450.00	1623	684

TABLE 6.2G
WATER STORAGE FACILITIES - ALTERNATIVE 6

WATER AND WASTEWATER SERVICING MASTER PLAN
MARKDALE-FLESHERTON-KIMBERLEY-AMIK-EUGENIA-BEAVER VALLEY
MUNICIPALITY OF GREY HIGHLANDS

111-13229-00

Water Storage Facility	Type of Storage	Design Year	Top Water Elevation (m)	Top of Emergency Storage and Fire Storage Elevation (m)	Bottom of Fire Storage Elevation (m)	Base Elevation (m)	Total Usable Storage (m^3)	Fire Storage (m^3)
Markdale (PI-1, PI-2, PI-3, PI-4, PI-5 and PII-3)	New Elevated Glass-Fused -To-Steel Tank	50	488.00	478.12	464.06	436.65	4998	2041
	New Elevated Glass-Fused -To-Steel Tank	20	488.00	478.12	464.06	436.65	3956	1717
Flesherton (PII-1, PII-2, PII-4, PIII-1, PIII-2, PIII-3 and PIII-4)	New On-Ground Glass-Fused -To-Steel Tank	50	488.00	482.02	478.00	478.00	2577	1037
	New On-Ground Glass-Fused -To-Steel Tank	20	488.00	482.29	478.00	478.00	2095	900

TABLE 6.2H
WATER STORAGE FACILITIES - ALTERNATIVE 7 AND 7A

WATER AND WASTEWATER SERVICING MASTER PLAN
MARKDALE-FLESHERTON-KIMBERLEY-AMIK-EUGENIA-BEAVER VALLEY
MUNICIPALITY OF GREY HIGHLANDS

111-13229-00

Water Storage Facility	Type of Storage	Design Year	Top Water Elevation (m)	Top of Emergency Storage and Fire Storage Elevation (m)	Bottom of Fire Storage Elevation (m)	Base Elevation (m)	Total Usable Storage (m^3)	Fire Storage (m^3)
Markdale (PI-1, PI-2, PI-3, PI-4, PI-5, PII-1, PII-2, PII-3, PII-4, PIII-1, PIII-2, PIII-3 and PIII-4)	New Glass-Fused - To-Steel Elevated Storage	50	488.00	478.12	464.06	436.65	6511	2376
	New Glass-Fused - To-Steel Elevated Storage	20	488.00	478.12	464.06	436.65	5192	2041

Appendix G

WATER STORAGE FACILITY SIZING CALCULATIONS

Water Storage Alternatives

ALTERNATIVE #1

Markdale	New Elevated GFS Tank (PI-1, P1-3, PI-4, PII-1, PII-2, PII-3, PII-4, PIII-1, PIII-2, PIII-3 and PIII-4)	Average Day	5567 m^3/day		A	2376 m^3	Fire Storage
		Max Day	10577 m^3/day	**50 Year**	B	2644 m^3	Equalization Storage (25% of maximum day demand)
		Population	13274		C	1255 m^3	Emergency Storage (25% of A +B)
					Total	**6275 m^3**	
		Average Day	4169 m^3/day		A	2041 m^3	Fire Storage
		Max Day	7921 m^3/day	**20 year**	B	1980 m^3	Equalization Storage (25% of maximum day demand)
		Population	10168		C	1005 m^3	Emergency Storage (25% of A +B)
					Total	**5027 m^3**	
Kimberley	Existing Storage **(870 m^3)** (PI-2 and PI-5)	Average Day	397 m^3/day		A	461 m^3	Fire Storage
		Max Day	993 m^3/day	**50 Year**	B	248 m^3	Equalization Storage (25% of maximum day demand)
		Population	1025		C	177 m^3	Emergency Storage (25% of A +B)
					Total	**886 m^3**	
		Average Day	278 m^3/day		A	274 m^3	Fire Storage
		Max Day	765 m^3/day	**20 year**	B	191 m^3	Equalization Storage (25% of maximum day demand)
		Population	761		C	116 m^3	Emergency Storage (25% of A +B)
					Total	**581 m^3**	

ALTERNATIVE #2

Markdale	New Elevated GFS Tank (PI-1, P1-3, PI-4, and PII-3	Average Day	3517 m^3/day		A	2041 m^3	Fire Storage
		Max Day	7034 m^3/day	**50 Year**	B	1759 m^3	Equalization Storage (25% of maximum day demand)
		Population	8289		C	950 m^3	Emergency Storage (25% of A +B)
					Total	**4750 m^3**	
		Average Day	2617 m^3/day		A	1717 m^3	Fire Storage
		Max Day	5234 m^3/day	**20 year**	B	1309 m^3	Equalization Storage (25% of maximum day demand)
		Population	6291		C	756 m^3	Emergency Storage (25% of A +B)
					Total	**3782 m^3**	
Kimberley	Existing Storage **(870 m^3)** (PI-2 and PI-5)	Average Day	397 m^3/day		A	461 m^3	Fire Storage
		Max Day	993 m^3/day	**50 Year**	B	248 m^3	Equalization Storage (25% of maximum day demand)
		Population	1025		C	177 m^3	Emergency Storage (25% of A +B)
					Total	**886 m^3**	
		Average Day	278 m^3/day		A	274 m^3	Fire Storage
		Max Day	765 m^3/day	**20 year**	B	191 m^3	Equalization Storage (25% of maximum day demand)
		Population	761		C	116 m^3	Emergency Storage (25% of A +B)
					Total	**581 m^3**	

Flesherton	New On-Ground Storage Tank (PII-1, PII-2 and PII-4)	Average Day	577 m^3/day		A	569 m^3	Fire Storage
		Max Day	1443 m^3/day	**50 Year**	B	361 m^3	Equalization Storage (25% of maximum day demand)
		Population	1710		C	232 m^3	Emergency Storage (25% of A +B)
					Total	**1162 m^3**	
		Average Day	459 m^3/day		A	569 m^3	Fire Storage
		Max Day	1148 m^3/day	**20 year**	B	287 m^3	Equalization Storage (25% of maximum day demand)
		Population	1448		C	214 m^3	Emergency Storage (25% of A +B)
					Total	**1070 m^3**	
Eugenia	New Elevated GFS Tank (PIII-1, PIII-2, PIII-3 and PIII-4)	Average Day	1473 m^3/day		A	792 m^3	Fire Storage
		Max Day	2946 m^3/day	**50 Year**	B	737 m^3	Equalization Storage (25% of maximum day demand)
		Population	3277		C	382 m^3	Emergency Storage (25% of A +B)
					Total	**1911 m^3**	
		Average Day	1093 m^3/day		A	684 m^3	Fire Storage
		Max Day	2459 m^3/day	**20 year**	B	615 m^3	Equalization Storage (25% of maximum day demand)
		Population	2429		C	325 m^3	Emergency Storage (25% of A +B)
					Total	**1623 m^3**	
ALTERNATIVE #3							
Markdale	New Elevated GFS Tank (PI-1, P1-3, P-4, PII-1, PII-2, PII-3 and PII-4)	Average Day	4094 m^3/day		A	2041 m^3	Fire Storage
		Max Day	8188 m^3/day	**50 Year**	B	2047 m^3	Equalization Storage (25% of maximum day demand)
		Population	9998		C	1022 m^3	Emergency Storage (25% of A +B)
					Total	**5110 m^3**	
		Average Day	3076 m^3/day		A	1717 m^3	Fire Storage
		Max Day	6152 m^3/day	**20 year**	B	1538 m^3	Equalization Storage (25% of maximum day demand)
		Population	7739		C	814 m^3	Emergency Storage (25% of A +B)
					Total	**4069 m^3**	
Kimberley	Existing Storage **(870 m^3)** (PI-2 and PI-5)	Average Day	397 m^3/day		A	461 m^3	Fire Storage
		Max Day	993 m^3/day	**50 Year**	B	248 m^3	Equalization Storage (25% of maximum day demand)
		Population	1025		C	177 m^3	Emergency Storage (25% of A +B)
					Total	**886 m^3**	
		Average Day	278 m^3/day		A	274 m^3	Fire Storage
		Max Day	765 m^3/day	**20 year**	B	191 m^3	Equalization Storage (25% of maximum day demand)
		Population	761		C	116 m^3	Emergency Storage (25% of A +B)
					Total	**581 m^3**	
Eugenia	New Elevated GFS Tank (PIII-1, PIII-2, PIII-3 and PIII-4)	Average Day	1473 m^3/day		A	792 m^3	Fire Storage
		Max Day	2946 m^3/day	**50 Year**	B	737 m^3	Equalization Storage (25% of maximum day demand)

		Population	3277		C	382 m^3	Emergency Storage (25% of A +B)
					Total	**1911 m^3**	
		Average Day	1093 m^3/day		A	684 m^3	Fire Storage
		Max Day	2459 m^3/day	**20 year**	B	615 m^3	Equalization Storage (25% of maximum day demand)
		Population	2429		C	325 m^3	Emergency Storage (25% of A +B)
					Total	**1623 m^3**	
ALTERNATIVE #4							
Markdale	New Elevated GFS Tank (PI-1, P1-3, PI-4, and PII-3	Average Day	3517 m^3/day		A	2041 m^3	Fire Storage
		Max Day	7034 m^3/day	**50 Year**	B	1759 m^3	Equalization Storage (25% of maximum day demand)
		Population	8289		C	950 m^3	Emergency Storage (25% of A +B)
					Total	**4750 m^3**	
		Average Day	2617 m^3/day		A	1717 m^3	Fire Storage
		Max Day	5234 m^3/day	**20 year**	B	1309 m^3	Equalization Storage (25% of maximum day demand)
		Population	6291		C	756 m^3	Emergency Storage (25% of A +B)
					Total	**3782 m^3**	
Kimberley	Existing Storage **(870 m^3)** (PI-2 and PI-5)	Average Day	397 m^3/day		A	461 m^3	Fire Storage
		Max Day	993 m^3/day	**50 Year**	B	248 m^3	Equalization Storage (25% of maximum day demand)
		Population	1025		C	177 m^3	Emergency Storage (25% of A +B)
					Total	**886 m^3**	
		Average Day	278 m^3/day		A	274 m^3	Fire Storage
		Max Day	765 m^3/day	**20 year**	B	191 m^3	Equalization Storage (25% of maximum day demand)
		Population	761		C	116 m^3	Emergency Storage (25% of A +B)
					Total	**581 m^3**	
Flesherton	New On-Ground Storage Tank (PII-1, PII-2, PII-4, PIII-1, PIII-2, PIII-3 and PIII-4)	Average Day	2050 m^3/day		A	1037 m^3	Fire Storage
		Max Day	4100 m^3/day	**50 Year**	B	1025 m^3	Equalization Storage (25% of maximum day demand)
		Population	4986		C	515 m^3	Emergency Storage (25% of A +B)
					Total	**2577 m^3**	
		Average Day	1552 m^3/day		A	900 m^3	Fire Storage
		Max Day	3104 m^3/day	**20 year**	B	776 m^3	Equalization Storage (25% of maximum day demand)
		Population	3877		C	419 m^3	Emergency Storage (25% of A +B)
					Total	**2095 m^3**	
ALTERNATIVE #5							
Markdale	New Elevated GFS Tank (PI-1, PI-2, P1-3, PI-4, PI-5, PII-1, PII-2, PII-3 and PII-4)	Average Day	4491 m^3/day		A	2041 m^3	Fire Storage
		Max Day	8533 m^3/day	**50 Year**	B	2133 m^3	Equalization Storage (25% of maximum day demand)

		Population	11024		C	1044 m^3	Emergency Storage (25% of A +B)
					Total	**5218 m^3**	
		Average Day	3354 m^3/day		A	2041 m^3	Fire Storage
		Max Day	6708 m^3/day	**20 year**	B	1677 m^3	Equalization Storage (25% of maximum day demand)
		Population	8501		C	930 m^3	Emergency Storage (25% of A +B)
					Total	**4648 m^3**	
Eugenia	New Elevated GFS Tank (PIII-1, PIII-2, PIII-3 and PIII-4)	Average Day	1473 m^3/day		A	792 m^3	Fire Storage
		Max Day	2946 m^3/day	**50 Year**	B	737 m^3	Equalization Storage (25% of maximum day demand)
		Population	3273		C	382 m^3	Emergency Storage (25% of A +B)
					Total	**1911 m^3**	
		Average Day	1093 m^3/day		A	684 m^3	Fire Storage
		Max Day	2459 m^3/day	**20 year**	B	615 m^3	Equalization Storage (25% of maximum day demand)
		Population	2429		C	325 m^3	Emergency Storage (25% of A +B)
					Total	**1623 m^3**	
ALTERNATIVE #6							
Markdale	New Elevated GFS Tank (PI-1, PI-2, P1-3, PI-4, PI-5 and PII-3)	Average Day	3914 m^3/day		A	2041 m^3	Fire Storage
		Max Day	7828 m^3/day	**50 Year**	B	1957 m^3	Equalization Storage (25% of maximum day demand)
		Population	9315		C	1000 m^3	Emergency Storage (25% of A +B)
					Total	**4998 m^3**	
		Average Day	2895 m^3/day		A	1717 m^3	Fire Storage
		Max Day	5790 m^3/day	**20 year**	B	1448 m^3	Equalization Storage (25% of maximum day demand)
		Population	7053		C	791 m^3	Emergency Storage (25% of A +B)
					Total	**3956 m^3**	
Flesherton	New On-Ground Storage Tank (PII-1, PII-2, PII-4, PIII-1, PIII-2, PIII-3 and PIII-4)	Average Day	2050 m^3/day		A	1037 m^3	Fire Storage
		Max Day	4100 m^3/day	**50 Year**	B	1025 m^3	Equalization Storage (25% of maximum day demand)
		Population	4986		C	515 m^3	Emergency Storage (25% of A +B)
					Total	**2577 m^3**	
		Average Day	1552 m^3/day		A	900 m^3	Fire Storage
		Max Day	3104 m^3/day	**20 year**	B	776 m^3	Equalization Storage (25% of maximum day demand)
		Population	3877		C	419 m^3	Emergency Storage (25% of A +B)
					Total	**2095 m^3**	

ALTERNATIVE #7

Markdale	New Elevated GFS Tank (PI-1, PI-2, P1-3, PI-4, PI-5, PII-1, PII-2, PII-3, PII-4, PIII-1, PIII-2, PIII-3 and PIII-4)	Average Day	5964 m^3/day		A	2376 m^3	Fire Storage
		Max Day	11332 m^3/day	**50 Year**	B	2833 m^3	Equalization Storage (25% of maximum day demand)
		Population	14300		C	1302 m^3	Emergency Storage (25% of A +B)
					Total	**6511 m^3**	
		Average Day	4447 m^3/day		A	2041 m^3	Fire Storage
		Max Day	8449 m^3/day	**20 year**	B	2112 m^3	Equalization Storage (25% of maximum day demand)
		Population	10930		C	1038 m^3	Emergency Storage (25% of A +B)
					Total	**5192 m^3**	

Markdale Only - 2017 Calculations

Markdale	New Elevated GFS Tank (PI-1)	Average Day	2697 m^3/day		A	1717 m^3	Fire Storage
		Max Day	5394 m^3/day	**50 Year**	B	1349 m^3	Equalization Storage (25% of maximum day demand)
		Population	6470		C	766 m^3	Emergency Storage (25% of A +B)
					Total	**3832 m^3**	

Appendix H

PRELIMNARY FIRE FLOW WATER DISTRIBUTION NETWORK MODELLING OUTPUT MAPPING

TABLE 6.3A
FIRE FLOWS FROM WATER DISTRIBUTION NETWORK MODEL
Water and Wastewater Servicing Master Plan
Markdale-Flesherton-Kimberley-Amik-Eugenia-Beaver Valley
Municipality of Grey Highlands

Alternative 2 - Water Storage Facilities - Markdale, Flesherton, Eugenia and Kimberley-Amik-Talisman (300 mm dia. trunk watermain)

111-13229-00

Fire Flow Node	Location	Description	Fire Flow	
		Street/Road	Litres/Min.	IGPM
J-38	Markdale	Toronto St. & Main St.	10,400	2,288
J-59	Markdale	Main St. & Lawler Dr.	6,100	1,342
J-29	Markdale	Wellington St. & Hill St.	10,000	2,200
J-5	Markdale	Toronto St. South End	11,500	2,530
J-62	Flesherton	Collingwood St. & Beachell St.	3,800	836
J-74	Flesherton	Collingwood St. & Victoria St.	3,500	770
J-100	Flesherton	Campbell St. west of Alice	2,200	616
J-187	Beaver Valley Ski Club Area	West end of subdivision at Beaver Valley	1,800	396
J-177	Beaver Valley Ski Club Area	At Ski Club	2,500	550
J-211	Kimberley	Downtown	1,600	352
J-221	Amik	West end of Amik Cres.	2,700	594
J-260	Talisman	Talisman Mountain Resort	1,600	352
J-156	Eugenia	Downtown	2,000	462

TABLE 6.3B
FIRE FLOWS FROM WATER DISTRIBUTION NETWORK MODEL
Water and Wastewater Servicing Master Plan
Markdale-Flesherton-Kimberley-Amik-Eugenia-Beaver Valley
Municipality of Grey Highlands

Alternative 6 - Water Storage Facilities - Markdale, Flesherton and Kimberley-Amik-Talisman

(300 mm dia. Trunk Watermain)

111-13229-00

Fire Flow Node	Location	Description	Fire Flow	
		Street/Road	Litres/Min.	IGPM
J-38	Markdale	Toronto St. & Main St.	10,500	2,310
J-59	Markdale	Main St. & Lawler Dr.	6,100	1,342
J-29	Markdale	Wellington St. & Hill St.	10,000	2,200
J-5	Markdale	Toronto St. South End	11,400	2,530
J-62	Flesherton	Collingwood St. & Beachell St.	750	165
J-74	Flesherton	Collingwood St. & Victoria St.	700	154
J-100	Flesherton	Campbell St. west of Alice	750	165
J-187	Beaver Valley Ski Club Area	West end of subdivision at Beaver Valley	2,000	440
J-177	Beaver Valley Ski Club Area	At Ski Club	1,000	220
J-211	Kimberley	Downtown	350	77
J-221	Amik	West end of Amik Cres.	2,700	594
J-260	Talisman	Talisman Mountain Resort	350	77
J-156	Eugenia	Downtown	250	55

TABLE 6.3C
FIRE FLOWS FROM WATER DISTRIBUTION NETWORK MODEL
Water and Wastewater Servicing Master Plan
Markdale-Flesherton-Kimberley-Amik-Eugenia-Beaver Valley
Municipality of Grey Highlands

Alternative 6A - Water Storage Facilities - Markdale, Flesherton and Kimberley-Amik-Talisman

No service to Eugenia at this time (300 mm dia. trunk watermain)

111-13229-00

Fire Flow Node	Location	Description	Fire Flow	
		Street/Road	Litres/Min.	IGPM
J-38	Markdale	Toronto St. & Main St.	14,500	3,190
J-59	Markdale	Main St. & Lawler Dr.	8,500	1,670
J-29	Markdale	Wellington St. & Hill St.	10,000	2,200
J-5	Markdale	Toronto St. South End	12,600	2,772
J-62	Flesherton	Collingwood St. & Beachell St.	5,500	1,210
J-74	Flesherton	Collingwood St. & Victoria St.	5,500	1,210
J-100	Flesherton	Campbell St. west of Alice	2,500	550
J-187	Beaver Valley Ski Club Area	West end of subdivision at Beaver Valley	1,965	432
J-177	Beaver Valley Ski Club Area	At Ski Club	2,700	593
J-211	Kimberley	Downtown	2,700	593
J-221	Amik	West end of Amik Cres.	2,354	518
J-260	Talisman	Talisman Mountain Resort	3,300	726

SCENARIO 6A

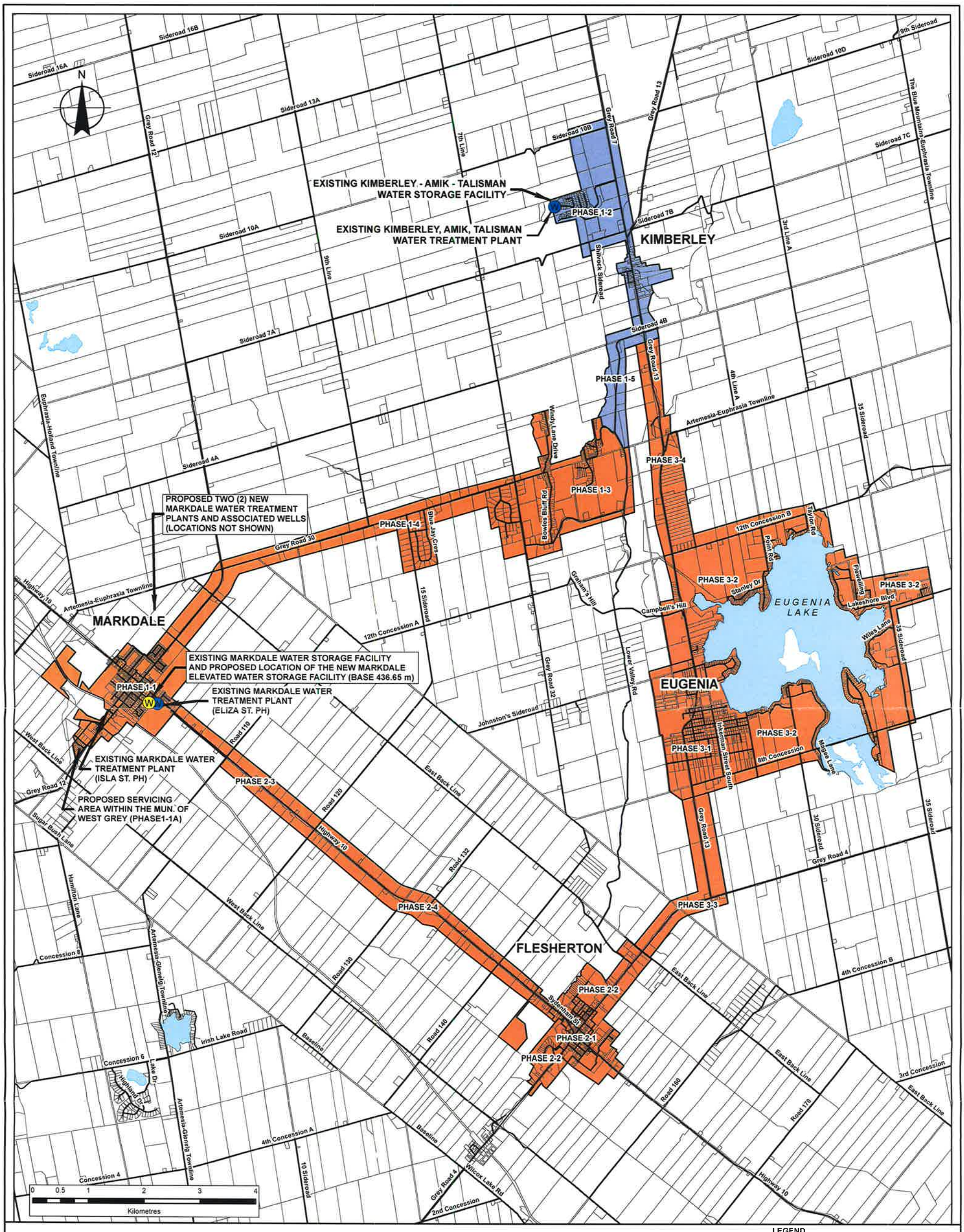
AVAILABLE FIRE FLOWS

- 0-500 IGPM
- 500-1,000 IGPM
- 1,000-2,000 IGPM
- 2,000-3,000 IGPM
- >3,000 IGPM

J-221
J-260
J-211
J-177
J-187
J-59
J-29
J-5
J-74
J-100

Appendix I

PROPOSED WATER TREATMENT PLANT SERVICE AREAS FOR ALTERNATIVES



Design Water Demands - Water Treatment Plant - Alternative 1

WATER AND WASTEWATER SERVICING MASTER PLAN
MARKDALE-FLESHERTON-KIMBERLEY-AMIK-EUGENIA-BEAVER VALLEY
MUNICIPALITY OF GREY HIGHLANDS

111-13229-00

Water Treatment Plant	Existing		20 Year		50 Year	
	Average Day Water Demand (m^3/day)	Maximum Day Water Demand (m^3/day)	Average Day Water Demand (m^3/day)	Maximum Day Water Demand (m^3/day)	Average Day Water Demand (m^3/day)	Maximum Day Water Demand (m^3/day)
Markdale WTP (P1-1, P1-3, P1-4, P2-1, P2-2, P2-3, P2-4, P3-1, P3-2, P3-3 and P3-4)	1,227	2,454	4,169	7,921	5,567	10,577
Kimberley, Amik, Talisman WTP (P1-2 and P1-5)	160	440	278	765	397	993

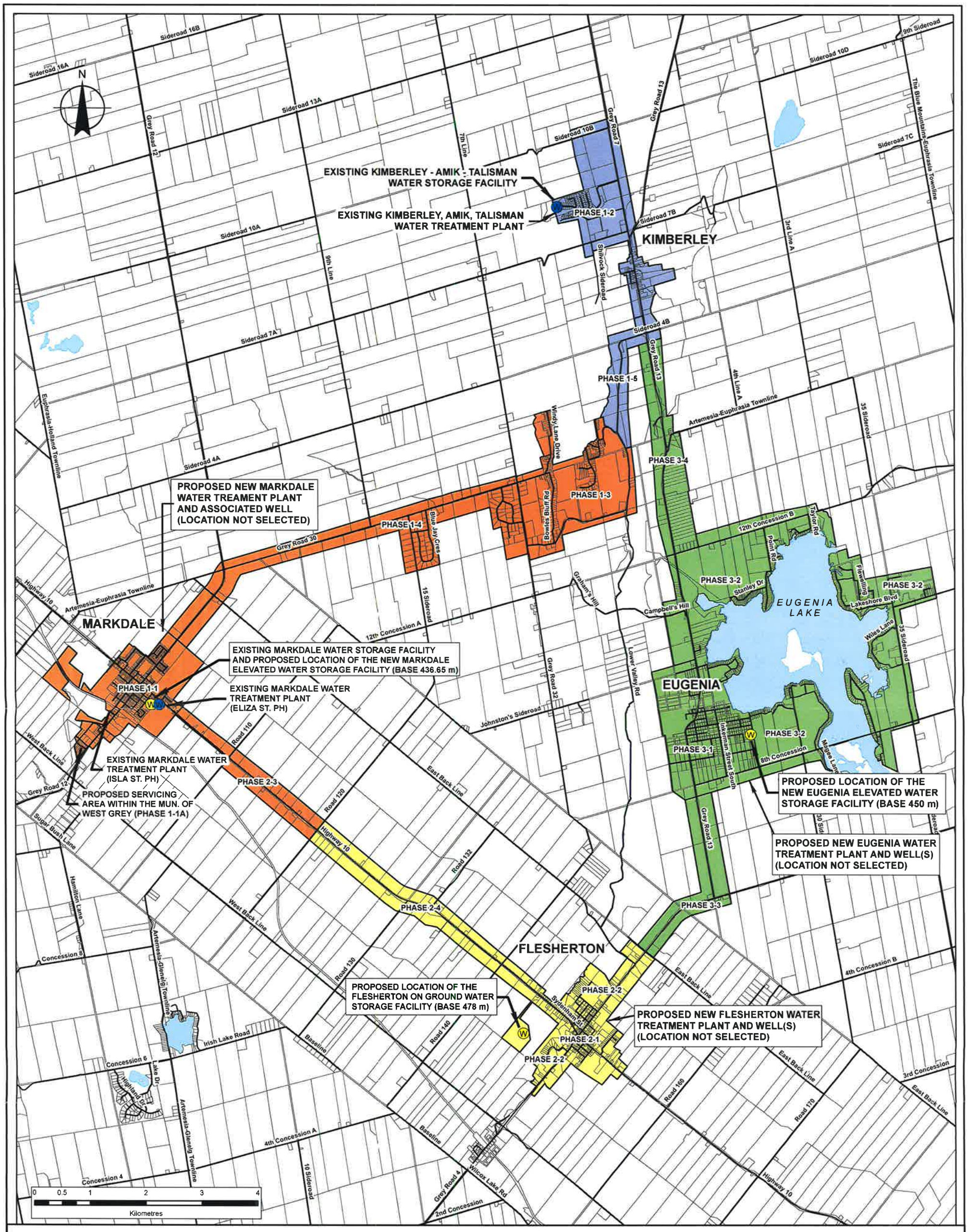
LEGEND

- PROPERTY PARCEL
- MARKDALE WTP PROPOSED SERVICE AREA
- KIMBERLEY, AMIK, TALISMAN WTP PROPOSED SERVICE AREA
- EXISTING WATER STORAGE FACILITY
- PROPOSED WATER STORAGE FACILITY

PROPOSED WATER TREATMENT PLANT SERVICE AREAS
ALTERNATIVE 1
MUNICIPALITY OF GREY HIGHLANDS
WATER AND WASTEWATER MASTER PLAN

WSP
1450 1st AVENUE WEST, SUITE 101
OWEN SOUND, ONTARIO CANADA N4K 6W2
PHONE: 519 376-7612 - FAX: 519 376-8008 - WWW.WSPGROUP.COM

DESIGN	CW
DRAWN	JET
APPROVED	CW
DATE	MAY 2016
SCALE	SEE SCALE BAR
FILE No	111-13229-00
FIG No	6.4A



Design Water Demands - Water Treatment Plant - Alternative 2

WATER AND WASTEWATER SERVICING MASTER PLAN
MARKDALE-FLESHERTON-KIMBERLEY-AMIK-EUGENIA-BEAVER VALLEY
MUNICIPALITY OF GREY HIGHLANDS

111-13229-00

Water Treatment Plant	Existing		20 Year		50 Year	
	Average Day Water Demand (m^3/day)	Maximum Day Water Demand (m^3/day)	Average Day Water Demand (m^3/day)	Maximum Day Water Demand (m^3/day)	Average Day Water Demand (m^3/day)	Maximum Day Water Demand (m^3/day)
Markdale WTP (P1-1, P1-3, P1-4 and P2-3)	1,227	2,454	2,617	5,234	3,517	7,034
Kimberley, Amik, Talisman WTP (P1-2 and P1-5)	160	440	278	765	397	993
Flesherton WTP (P2-1, P2-2 and P2-4)	0	0	459	1,148	577	1,443
Eugenia WTP (P3-1, P3-2, P3-3 and P3-4)	0	0	1,093	2,459	1,473	2,946

LEGEND

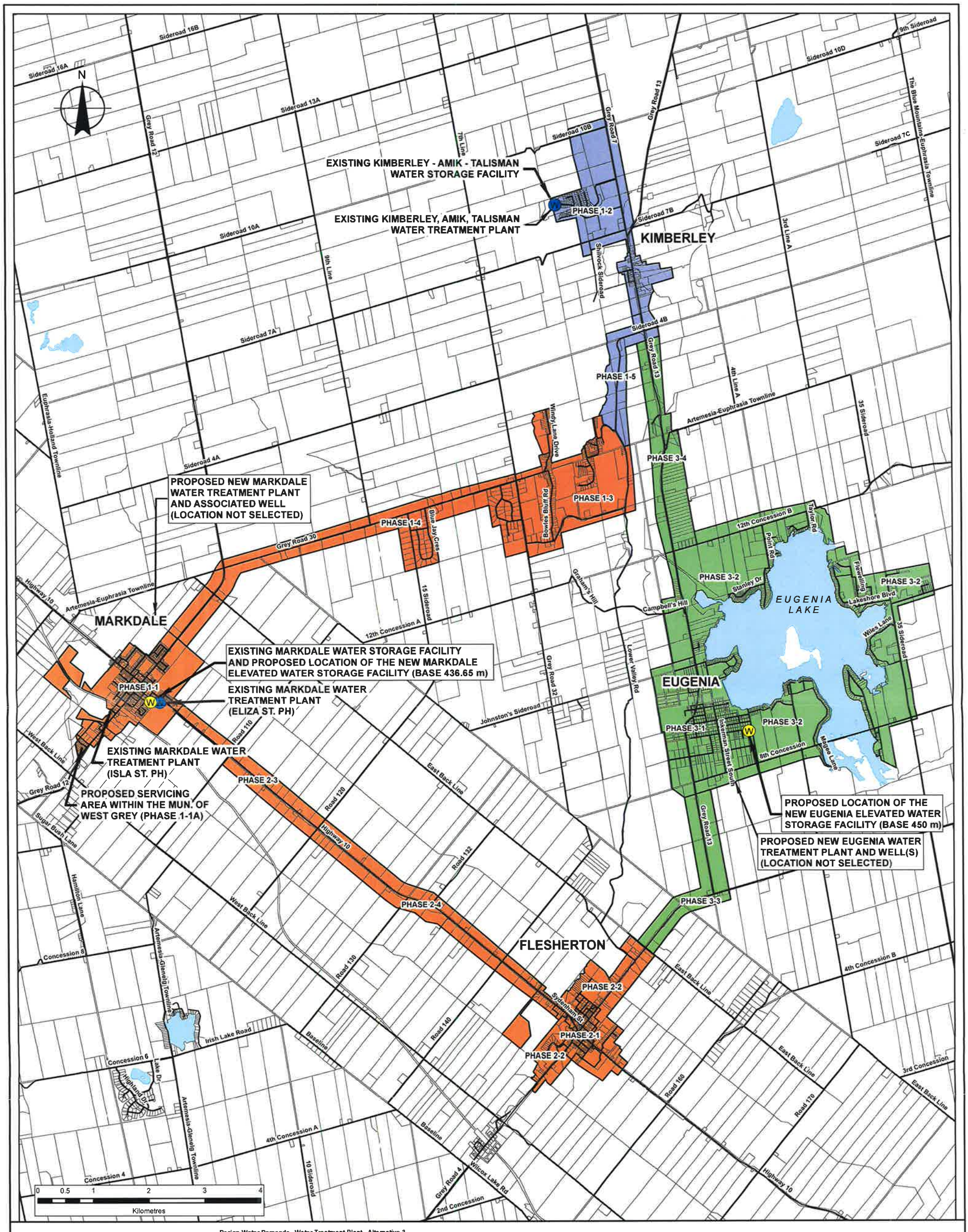
- MARKDALE WTP PROPOSED SERVICE AREA
- KIMBERLEY, AMIK, TALISMAN WTP PROPOSED SERVICE AREA
- FLESHERTON WTP PROPOSED SERVICE AREA *
- EUGENIA WTP PROPOSED SERVICE AREA *
- PROPERTY PARCEL
- EXISTING WATER STORAGE FACILITY
- PROPOSED WATER STORAGE FACILITY

* NOTE: THE LOCATION OF THE PROPOSED FLESHERTON & EUGENIA WATER TREATMENT PLANTS IS TBD

PROPOSED WATER TREATMENT PLANT SERVICE AREAS
ALTERNATIVE 2
MUNICIPALITY OF GREY HIGHLANDS
WATER AND WASTEWATER MASTER PLAN

WSP
1450 1st AVENUE WEST, SUITE 101
OWEN SOUND, ONTARIO CANADA N4K 6W2
PHONE: 519 376-7612 - FAX: 519 376-8008 - WWW.WSPGROUP.COM

DESIGN	CW
DRAWN	JET
APPROVED	CW
DATE	MAY 2016
SCALE	SEE SCALE BAR
FILE No	111-13229-00
FIG No	6.4B



Design Water Demands - Water Treatment Plant - Alternative 3

WATER AND WASTEWATER SERVICING MASTER PLAN
MARKDALE-FLESHERTON-KIMBERLEY-AMIK-EUGENIA-BEAVER VALLEY
MUNICIPALITY OF GREY HIGHLANDS

111-13229-00

Water Treatment Plant	Existing		20 Year		50 Year	
	Average Day Water Demand (m^3/day)	Maximum Day Water Demand (m^3/day)	Average Day Water Demand (m^3/day)	Maximum Day Water Demand (m^3/day)	Average Day Water Demand (m^3/day)	Maximum Day Water Demand (m^3/day)
Markdale WTP (P1-1, P1-3, P1-4, P2-1, P2-2, P2-3 and P2-4)	1,227	2,454	3,076	6,152	4,094	8,188
Kimberley, Amik, Talisman WTP (P1-2 and P1-5)	160	440	278	765	397	993
Eugenia WTP (P3-1, P3-2, P3-3 and P3-4)	0	0	1,093	2,459	1,473	2,946

LEGEND

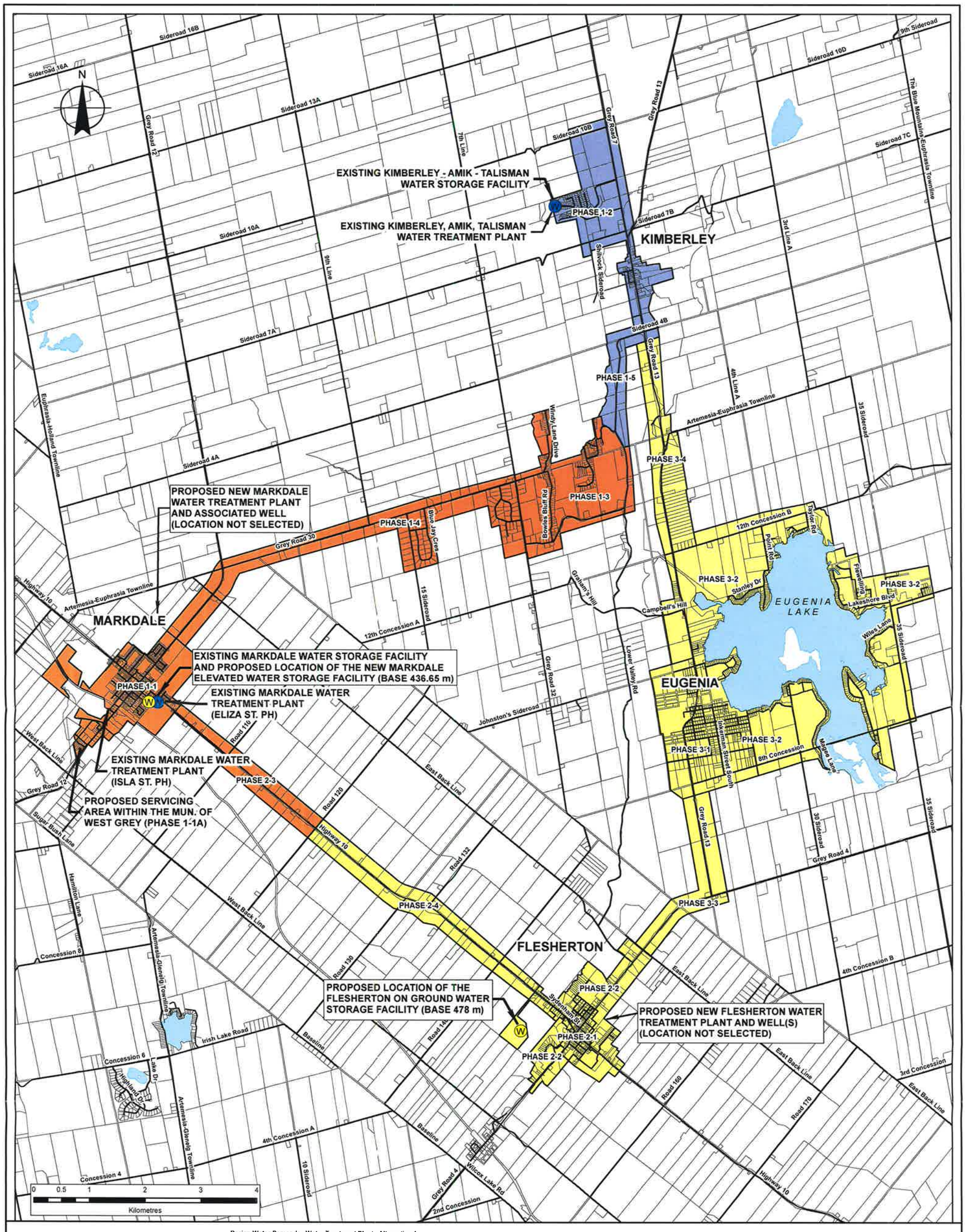
- MARKDALE WTP PROPOSED SERVICE AREA
- KIMBERLEY, AMIK, TALISMAN WTP PROPOSED SERVICE AREA
- EUGENIA WTP PROPOSED SERVICE AREA *
- PROPERTY PARCEL
- EXISTING WATER STORAGE FACILITY
- (W) PROPOSED WATER STORAGE FACILITY

* NOTE: THE LOCATION OF THE PROPOSED EUGENIA WATER TREATMENT PLANTS IS TBD.

PROPOSED WATER TREATMENT PLANT SERVICE AREAS
ALTERNATIVE 3
MUNICIPALITY OF GREY HIGHLANDS
WATER AND WASTEWATER MASTER PLAN

WSP
1450 1st AVENUE WEST, SUITE 101
OWEN SOUND, ONTARIO CANADA N4K 6W2
PHONE: 519 376-7612 - FAX: 519 376-8008 - WWW.WSPGROUP.COM

DESIGN	CW
DRAWN	JET
APPROVED	CW
DATE	MAY 2016
SCALE	SEE SCALE BAR
FILE No.	111-13229-00
FIG. No.	6.4C



Design Water Demands - Water Treatment Plant - Alternative 4

WATER AND WASTEWATER SERVICING MASTER PLAN
MARKDALE-FLESHERTON-KIMBERLEY-AMIK-EUGENIA-BEAVER VALLEY
MUNICIPALITY OF GREY HIGHLANDS

111-13229-00

Water Treatment Plant	Existing		20 Year		50 Year	
	Average Day Water Demand (m^3/day)	Maximum Day Water Demand (m^3/day)	Average Day Water Demand (m^3/day)	Maximum Day Water Demand (m^3/day)	Average Day Water Demand (m^3/day)	Maximum Day Water Demand (m^3/day)
Markdale WTP (P1-1, P1-3, P1-4, and P2-3)	1,227	2,454	2,617	5,234	3,517	7,034
Kimberley, Amik, Talisman WTP (P1-2 and P1-5)	160	440	278	765	397	993
Flesterton WTP (P2-1, P2-2, P2-4, P3-1, P3-2, P3-3 and P3-4)	0	0	1,552	3,104	2,050	4,100

LEGEND

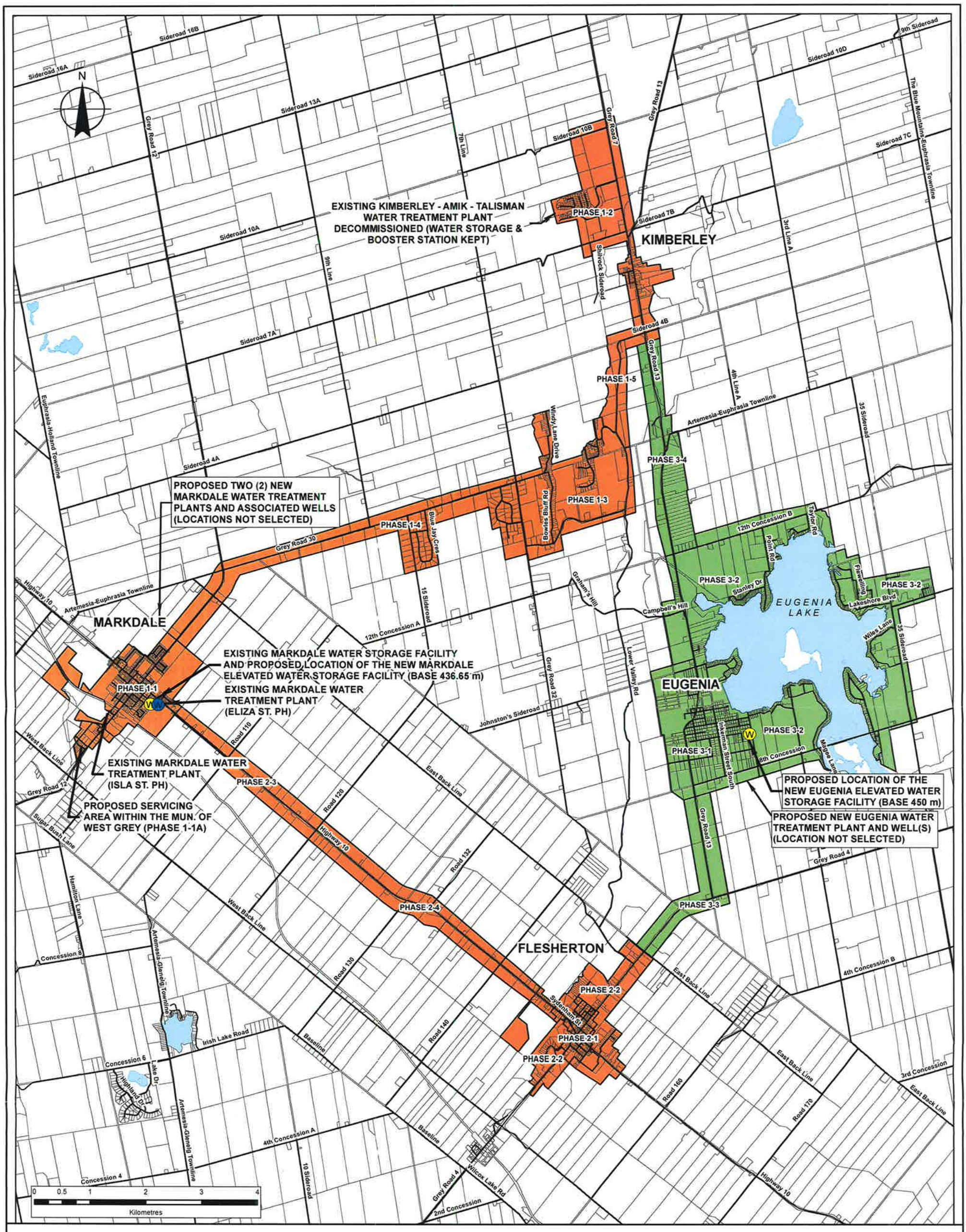
- KIMBERLEY, AMIK, TALISMAN WTP PROPOSED SERVICE AREA
- FLESHERTON WTP PROPOSED SERVICE AREA *
- PROPERTY PARCEL
- EXISTING WATER STORAGE FACILITY
- PROPOSED WATER STORAGE FACILITY

* NOTE: THE LOCATION OF THE PROPOSED FLESHERTON WATER TREATMENT PLANT IS TBD.

PROPOSED WATER TREATMENT PLANT SERVICE AREAS
ALTERNATIVE 4
MUNICIPALITY OF GREY HIGHLANDS
WATER AND WASTEWATER MASTER PLAN

WSP
1450 1st AVENUE WEST, SUITE 101
OWEN SOUND, ONTARIO CANADA N4K 6W2
PHONE: 519 376-7612 - FAX: 519 376-8008 - WWW.WSPGROUP.COM

DESIGN	CW
DRAWN	JET
APPROVED	CW
DATE	MAY 2016
SCALE	SEE SCALE BAR
FILE No	111-13229-00
FIG. No	6.4D



Design Water Demands - Water Treatment Plant - Alternative 5

WATER AND WASTEWATER SERVICING MASTER PLAN
MARKDALE-FLESHERTON-KIMBERLEY-AMIK-EUGENIA-BEAVER VALLEY
MUNICIPALITY OF GREY HIGHLANDS

111-13229-00

Water Treatment Plant	Existing		20 Year		50 Year	
	Average Day Water Demand (m^3/day)	Maximum Day Water Demand (m^3/day)	Average Day Water Demand (m^3/day)	Maximum Day Water Demand (m^3/day)	Average Day Water Demand (m^3/day)	Maximum Day Water Demand (m^3/day)
Markdale WTP (P1-1, P1-2, P1-3, P1-4, P1-5, P2-1, P2-2, P2-3 and P2-4)	1,387	2,774	3,354	6,708	4,491	8,533
Eugenia WTP (P3-1, P3-2, P3-3 and P3-4)	0	0	1,093	2,459	1,473	2,946

LEGEND

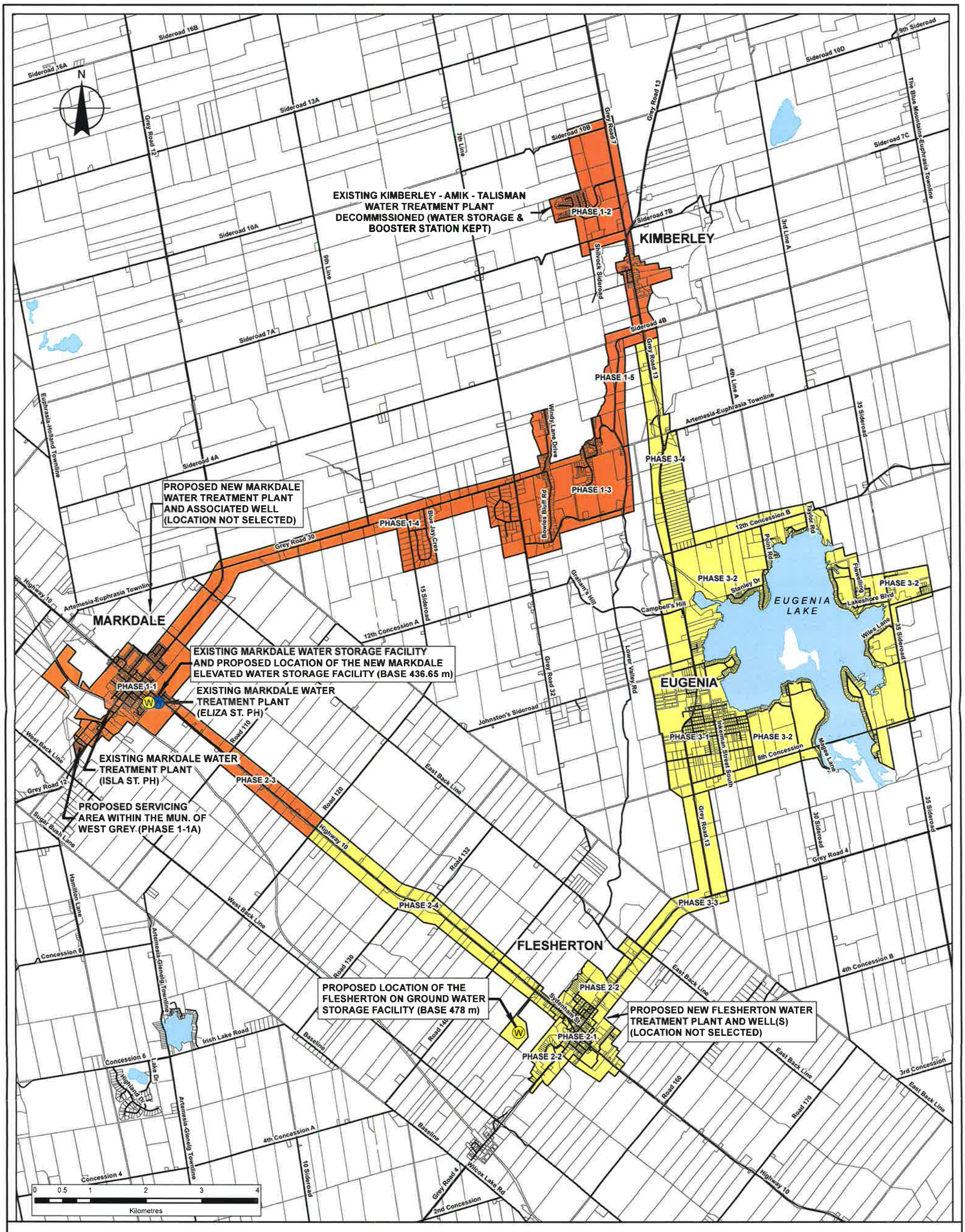
- MARKDALE WTP PROPOSED SERVICE AREA
- EUGENIA WTP PROPOSED SERVICE AREA *
- PROPERTY PARCEL
- EXISTING WATER STORAGE FACILITY
- PROPOSED WATER STORAGE FACILITY

* NOTE: THE LOCATION OF THE PROPOSED EUGENIA WATER TREATMENT PLANTS IS TBD.

PROPOSED WATER TREATMENT PLANT SERVICE AREAS
ALTERNATIVE 5
MUNICIPALITY OF GREY HIGHLANDS
WATER AND WASTEWATER MASTER PLAN

WSP
1450 1st AVENUE WEST, SUITE 101
OWEN SOUND, ONTARIO CANADA N4K 6W2
PHONE: 519 376-7612 - FAX: 519 376-8008 - WWW.WSPGROUP.COM

DESIGN	CW
DRAWN	JET
APPROVED	CW
DATE	MAY 2016
SCALE	SEE SCALE BAR
FILE No	111-13229-00
FIG No	6.4E



Design Water Demands - Water Treatment Plant - Alternative 6

WATER AND WASTEWATER SERVICING MASTER PLAN
MARKDALE-FLESHERTON-KIMBERLEY-AMIK-EUGENIA-BEAVER VALLEY
MUNICIPALITY OF GREY HIGHLANDS

111-13229-00

Water Treatment Plant	Existing		20 Year		50 Year	
	Average Day Water Demand (m^3/day)	Maximum Day Water Demand (m^3/day)	Average Day Water Demand (m^3/day)	Maximum Day Water Demand (m^3/day)	Average Day Water Demand (m^3/day)	Maximum Day Water Demand (m^3/day)
Markdale WTP (P1-1, P1-2, P1-3, P1-4, P1-5 and P2-3)	1,387	2,774	2,895	5,790	3,914	7,828
Flesherton WTP (P2-1, P2-2 and P2-4, P3-1, P3-2, P3-3 and P3-4)	0	0	1,552	3,104	2,050	4,100

LEGEND

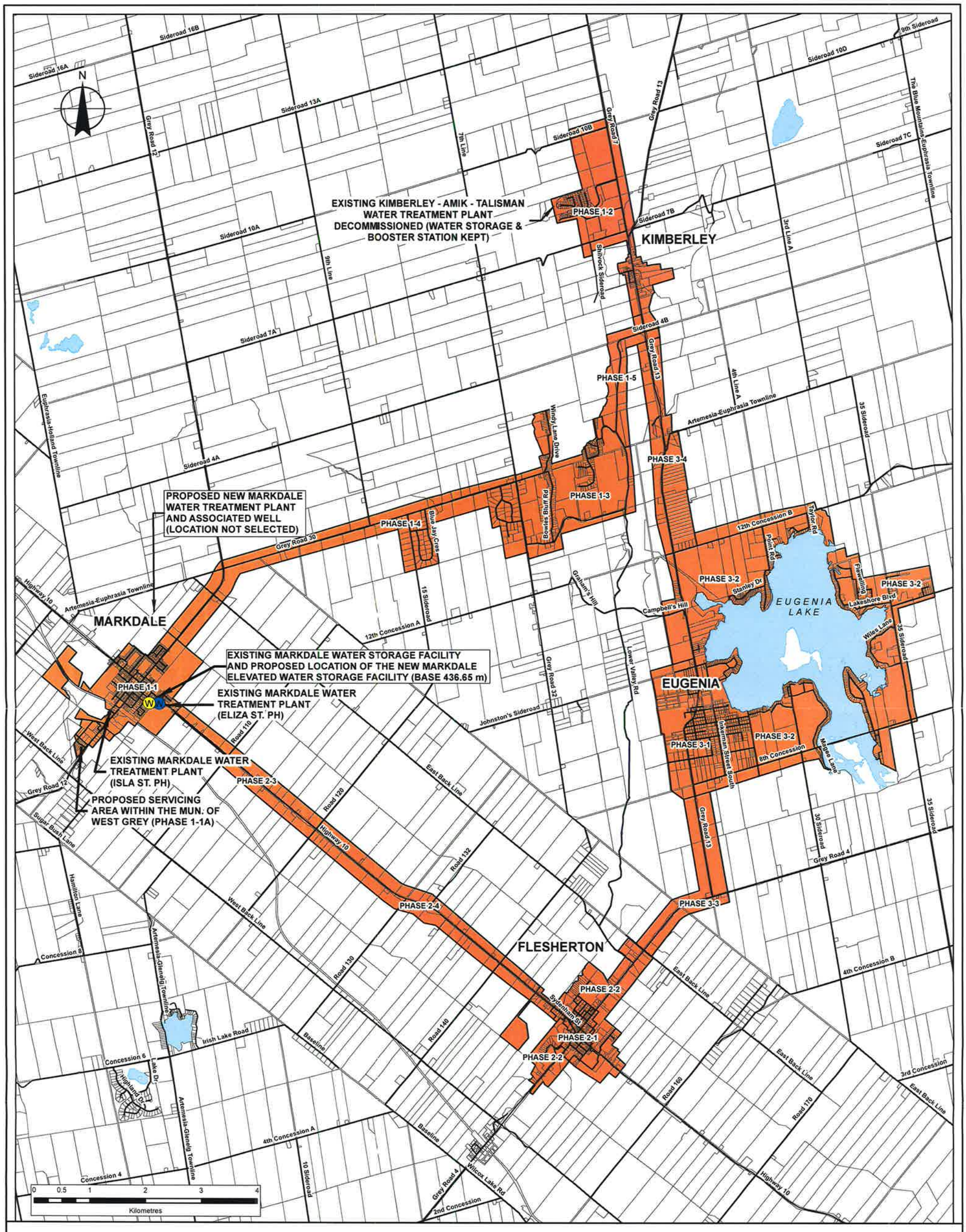
- MARKDALE WTP PROPOSED SERVICE AREA
- FLESHERTON WTP PROPOSED SERVICE AREA *
- PROPERTY PARCEL
- EXISTING WATER STORAGE FACILITY
- PROPOSED WATER STORAGE FACILITY

* NOTE: THE LOCATION OF THE PROPOSED FLESTHERTON WATER TREATMENT PLANT IS TBD.

PROPOSED WATER TREATMENT PLANT SERVICE AREAS
ALTERNATIVE 6
MUNICIPALITY OF GREY HIGHLANDS
WATER AND WASTEWATER MASTER PLAN

WSP
1450 1st AVENUE WEST, SUITE 101
OWEN SOUND, ONTARIO CANADA N4K 6W2
PHONE: 519 376-7612 - FAX: 519 376-8008 - WWW.WSPGROUP.COM

DESIGN	CW
DRAWN	JET
APPROVED	CW
DATE	MAY 2016
SCALE	SEE SCALE BAR
FILE No.	111-13229-00
FIG. No.	6.4F



Design Water Demands - Water Treatment Plant - Alternative 7

WATER AND WASTEWATER SERVICING MASTER PLAN
MARKDALE-FLESHERTON-KIMBERLEY-AMIK-EUGENIA-BEAVER VALLEY
MUNICIPALITY OF GREY HIGHLANDS

111-13229-00

Water Treatment Plant	Existing		20 Year		50 Year	
	Average Day Water Demand (m^3/day)	Maximum Day Water Demand (m^3/day)	Average Day Water Demand (m^3/day)	Maximum Day Water Demand (m^3/day)	Average Day Water Demand (m^3/day)	Maximum Day Water Demand (m^3/day)
Markdale WTP (P1-1, P1-2, P1-3, P1-4, P1-5, P2-1, P2-2, P2-3, P2-4, P3-1, P3-2, P3-3 and P3-4)	1,387	2,774	4,447	8,449	5,964	11,332

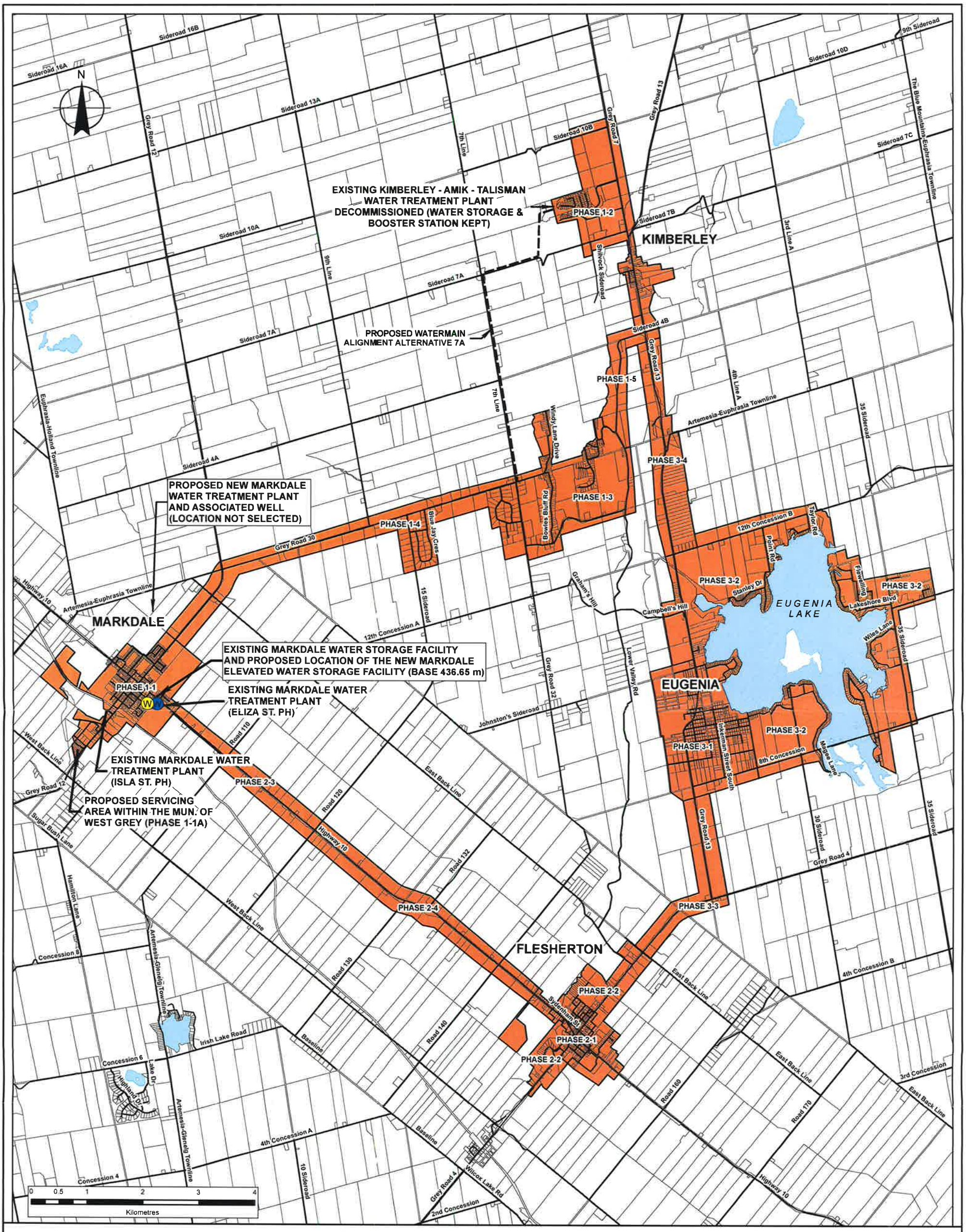
LEGEND

- MARKDALE WTP PROPOSED SERVICE AREA
- PROPERTY PARCEL
- EXISTING WATER STORAGE FACILITY
- PROPOSED WATER STORAGE FACILITY

PROPOSED WATER TREATMENT PLANT SERVICE AREAS
ALTERNATIVE 7
MUNICIPALITY OF GREY HIGHLANDS
WATER AND WASTEWATER MASTER PLAN

WSP
1450 1st AVENUE WEST, SUITE 101
OWEN SOUND, ONTARIO CANADA N4K 6W2
PHONE: 519 376-7612 - FAX: 519 376-8008 - WWW.WSPGROUP.COM

DESIGN	CW
DRAWN	JET
APPROVED	CW
DATE	MAY 2016
SCALE	SEE SCALE BAR
FILE No	111-13229-00
FIG No	6.4G



Design Water Demands - Water Treatment Plant - Alternative 7A

WATER AND WASTEWATER SERVICING MASTER PLAN
MARKDALE-FLESHERTON-KIMBERLEY-AMIK-EUGENIA-BEAVER VALLEY
MUNICIPALITY OF GREY HIGHLANDS

111-13229-00

Water Treatment Plant	Existing		20 Year		50 Year	
	Average Day Water Demand (m^3/day)	Maximum Day Water Demand (m^3/day)	Average Day Water Demand (m^3/day)	Maximum Day Water Demand (m^3/day)	Average Day Water Demand (m^3/day)	Maximum Day Water Demand (m^3/day)
Markdale WTP (P1-1, P1-2, P1-3, P1-4, P1-5, P2-1, P2-2, P2-3, P2-4, P3-1, P3-2, P3-3 and P3-4)	1,387	2,774	4,447	8,449	5,964	11,332

LEGEND

- MARKDALE WTP PROPOSED SERVICE AREA
- PROPERTY PARCEL
- PROPOSED WATERMAIN ALIGNMENT ALTERNATIVE 7A
- EXISTING WATER STORAGE FACILITY
- PROPOSED WATER STORAGE FACILITY

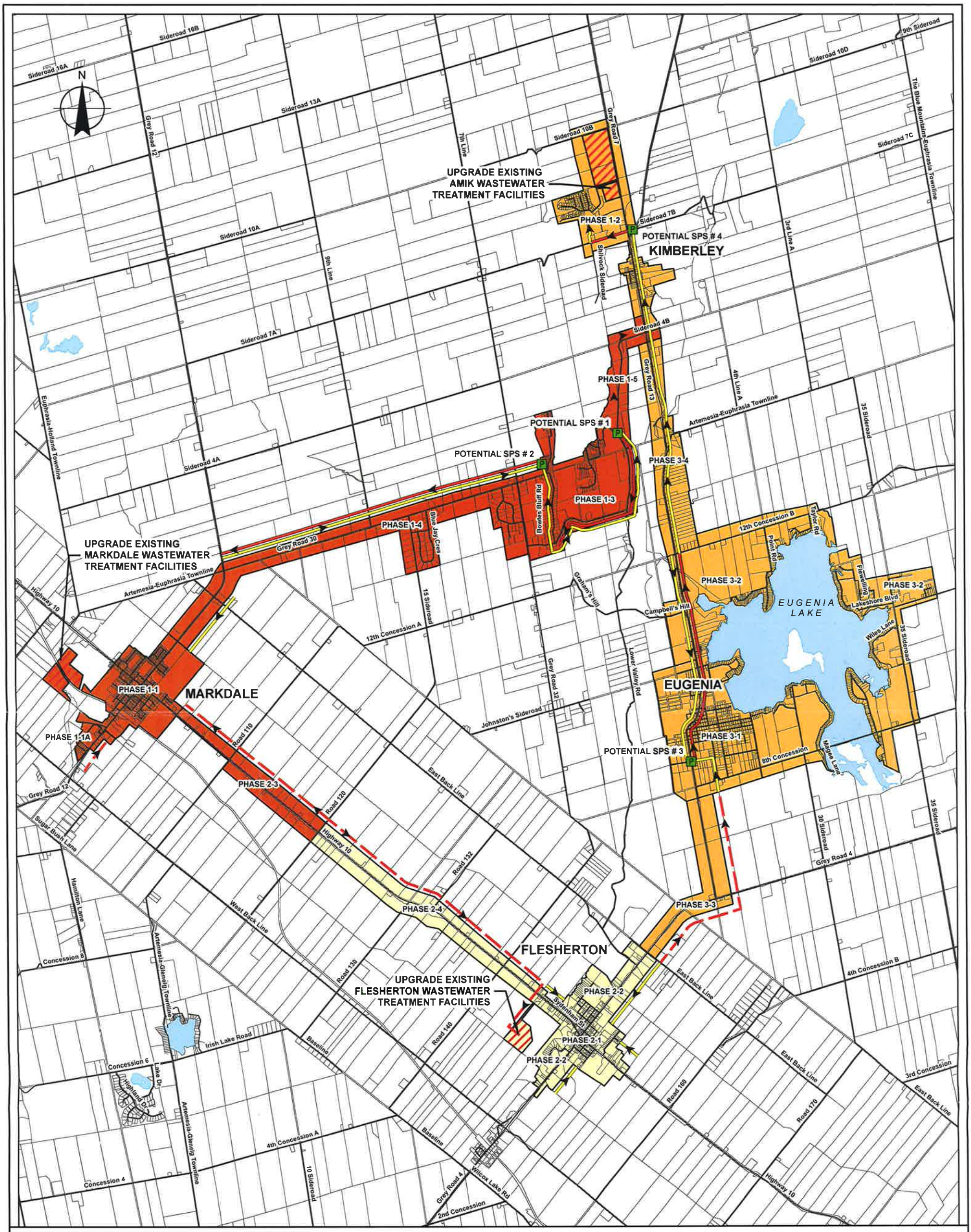
PROPOSED WATER TREATMENT PLANT SERVICE AREAS ALTERNATIVE 7A
MUNICIPALITY OF GREY HIGHLANDS
WATER AND WASTEWATER MASTER PLAN

WSP
1450 1st AVENUE WEST, SUITE 101
OWEN SOUND, ONTARIO CANADA N4K 6W2
PHONE: 519 376-7612 - FAX: 519 376-8008 - WWW.WSPGROUP.COM

DESIGN	CW
DRAWN	JET
APPROVED	CW
DATE	MAY 2016
SCALE	SEE SCALE BAR
FILE No	111-13229-00
FIG No	6.4H

Appendix J

PROPOSED WASTEWATER TREATMENT SERVICE AREAS FOR ALTERNATIVES



Design Sewage Flows - Alternative 1

WATER AND WASTEWATER SERVICING MASTER PLAN
MARKDALE-FLESHERTON-KIMBERLEY-AMIK-EUGENIA-BEAVER VALLEY
MUNICIPALITY OF GREY HIGHLANDS

111-13229-00

Wastewater Treatment Plants	Existing Sewage Flow (m^3/day)	20 Year Flow (m^3/day)	50 Year Flow (m^3/day)
Markdale WWTP (Includes P1-1, P1-3, P1-4 and P2-3)	988	2,398	3,207
Amik WWTP (Includes P1-2, P1-5, P3-1, P3-2, P3-3 and P3-4)	217	1,530	2,039
Flesherton WWTP (Includes P2-1, P2-2 and P2-4)	174	459	577

LEGEND

- EXISTING MUNICIPAL WASTEWATER FACILITY
- MARKDALE WWTP PROPOSED SERVICE AREA
- AMIK WWTP PROPOSED SERVICE AREA
- FLESHERTON WWTP PROPOSED SERVICE AREA
- PROPERTY PARCEL

PROPOSED WASTEWATER MAINS

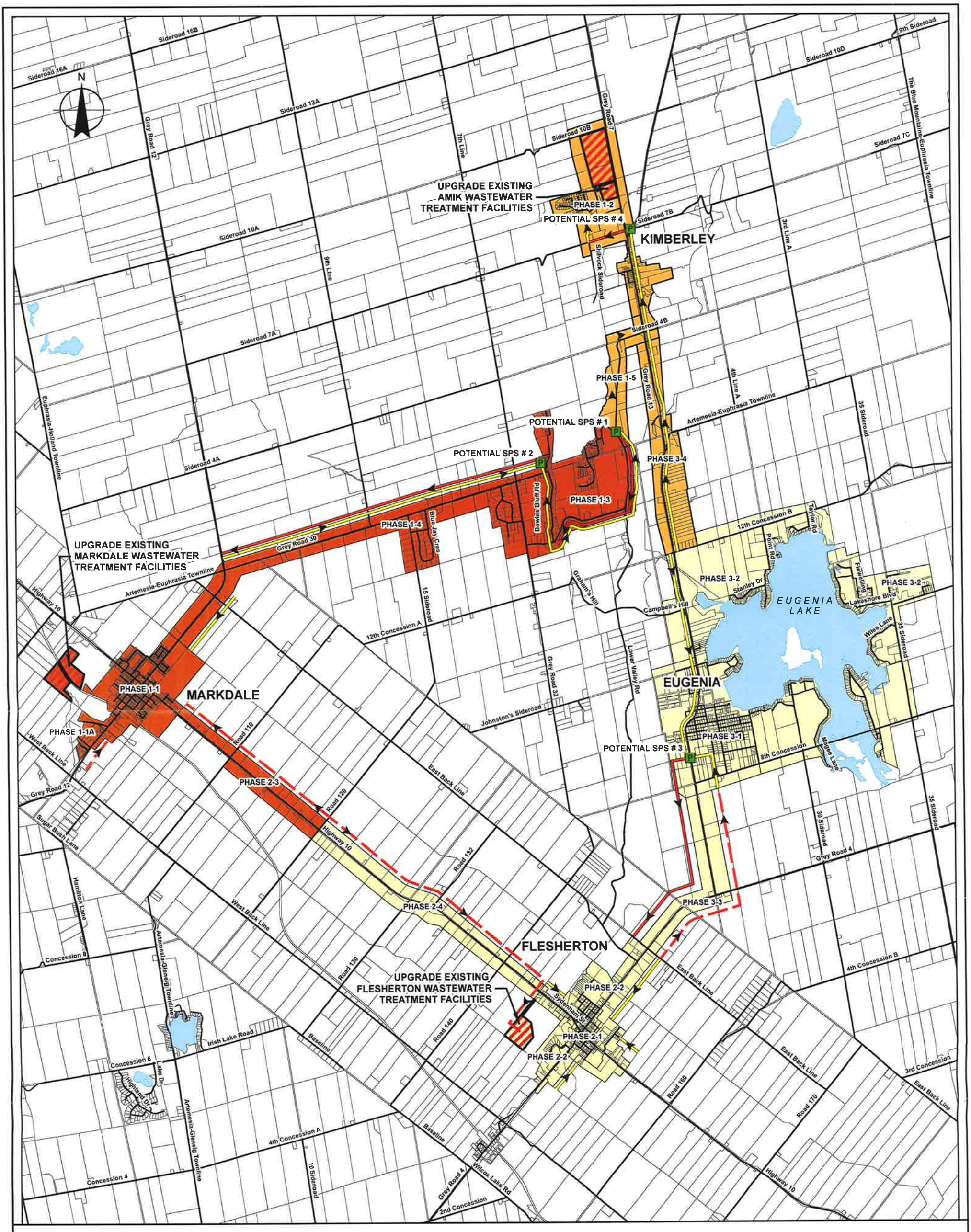
- FORCEMAIN (SPS)
- FORCEMAIN (WITH GRINDER PUMPS)
- GRAVITY MAIN
- POTENTIAL LOCATION FOR SEWAGE PUMP STATION (APPROX.)
- DIRECTION OF FLOW

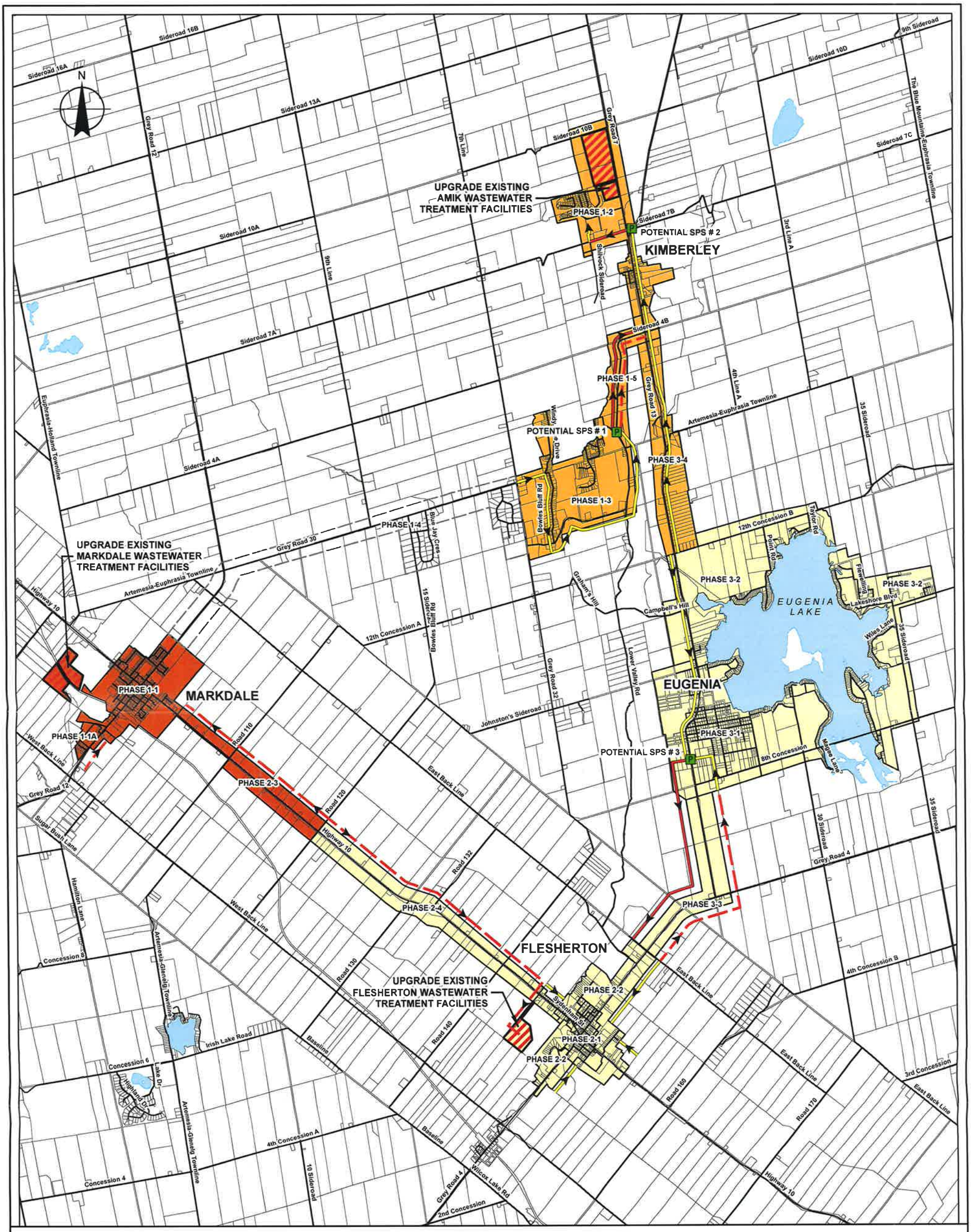
0 0.5 1 2 3 4
Kilometres

PROPOSED WASTEWATER SERVICE AREAS
ALTERNATIVE 1
MUNICIPALITY OF GREY HIGHLANDS
WATER AND WASTEWATER MASTER PLAN

WSP
1450 1st AVENUE WEST, SUITE 101
OWEN SOUND, ONTARIO CANADA N4K 6W2
PHONE: 519 376-7612 - FAX: 519 376-8008 - WWW.WSPGROUP.COM

DESIGN	CW
DRAWN	JET
APPROVED	CW
DATE	MAY 2016
SCALE	SEE SCALE BAR
FILE No	111-13229-00
FIG No	6.6A


N
Sideroad 16A
Sideroad 16B
Grey Road 12
Sideroad 13A
7th Line
Grey Road 7
Sideroad 10B
UPGRADE EXISTING
AMIK WASTEWATER
TREATMENT FACILITIES
PHASE 1-2
POTENTIAL SPS # 4
Sideroad 7B
KIMBERLEY
Sideroad 10A
9th Line
Shilvock Sideroad
Sideroad 4B
PHASE 1-5
Grey Road 13
Sideroad 7A
POTENTIAL SPS # 1
POTENTIAL SPS # 2
PHASE 3-4
PHASE 1-3
Bowles Bluff Rd
Blue Jay Cres
PHASE 1-4
Grey Road 30
Euphrasia-Holland Townline
Sideroad 4A
UPGRADE EXISTING
MARKDALE WASTEWATER
TREATMENT FACILITIES
Artemesia-Euphrasia Townline
Highway 10
12th Concession A
15 Sideroad
Grey Road 32
Grahams Hill
Campbell's Hill
Lower Valley Rd
PHASE 3-2
Stanley Dr
EUGENIA
LAKE
Lakeshore Blvd
Wiles Lane
35 Sideroad
PHASE 1-1
MARKDALE
Johnston's Sideroad
EUGENIA
PHASE 3-1
POTENTIAL SPS # 3
8th Concession
Magee Lane
PHASE 1-1A
West Back Line
Road 110
PHASE 2-3
East Back Line
Grey Road 12
Road 120
Sugar Bush Lane
Hamilton Lane
Road 132
PHASE 3-3
Grey Road 4
PHASE 2-4
FLESHERTON
Concession 8
Road 130
UPGRADE EXISTING
FLESHERTON WASTEWATER
TREATMENT FACILITIES
PHASE 2-2
Sydenham St
PHASE 2-1
Irish Lake Road
Concession 6
Lake Dr
Highland Dr
Road 140
Road 160
Road 170
Concession 4
4th Concession A
10 Sideroad
Grey Road 4
Wilcox Lake Rd
2nd Concession
Highway 10
Design Sewage Flows - Alternative 2
WATER AND WASTEWATER SERVICING MASTER PLAN
MARKDALE-FLESHERTON-KIMBERLEY-AMIK-EUGENIA-BEAVER VALLEY
MUNICIPALITY OF GREY HIGHLANDS
111-13229-00
Wastewater Treatment Plants
Existing Sewage Flow (m3/day)
20 Year Flow (m3/day)
50 Year Flow (m3/day)
Markdale WWTP (Includes P1-1, P1-3, P1-4 and P2-3)
988
2,398
3,207
Amik WWTP (Includes P1-2, P1-5 and P3-4)
217
501
652
Flesherton WWTP (Includes P2-1, P2-2, P2-4, P3-1, P3-2 and P3-3)
174
1,488
1,964
LEGEND
MUNICIPAL WASTEWATER FACILITY
MARKDALE WWTP PROPOSED SERVICE AREA
AMIK WWTP PROPOSED SERVICE AREA
FLESHERTON WWTP PROPOSED SERVICE AREA
PROPERTY PARCEL
PROPOSED WASTEWATER MAINS
FORCEMAIN (SPS)
FORCEMAIN (WITH GRINDER PUMPS)
GRAVITY MAIN
POTENTIAL LOCATION FOR SEWAGE PUMP STATION (APPROX.)
DIRECTION OF FLOW
0 0.5 1 2 3 4
Kilometres
PROPOSED WASTEWATER SERVICE AREAS
ALTERNATIVE 2
MUNICIPALITY OF GREY HIGHLANDS
WATER AND WASTEWATER MASTER PLAN
WSP
1450 1st AVENUE WEST, SUITE 101
OWEN SOUND, ONTARIO CANADA N4K 6W2
PHONE: 519 376-7612 - FAX: 519 376-8008 - WWW.WSPGROUP.COM
DESIGN CW
DRAWN JET
APPROVED CW
DATE MAY 2016
SCALE SEE SCALE BAR
FILE No 111-13229-00
FIG No 6.6B



Design Sewage Flows - Alternative 3 (Phase 1-4 not Serviced)

WATER AND WASTEWATER SERVICING MASTER PLAN
MARKDALE-FLESHERTON-KIMBERLEY-AMIK-EUGENIA-BEAVER VALLEY
MUNICIPALITY OF GREY HIGHLANDS

111-13229-00

Wastewater Treatment Plants	Existing Sewage Flow (m^3/day)	20 Year Flow (m^3/day)	50 Year Flow (m^3/day)
Markdale WWTP (Includes P1-1 and P2-3)	988	1,971	2,631
Amik WWTP (Includes P1-2, P1-3, P1-5 and P3-4)	217	799	1,054
Flesherton WWTP (Includes P2-1, P2-2, P2-4, P3-1, P3-2 and P3-3)	174	1,488	1,964

LEGEND

- MUNICIPAL WASTEWATER FACILITY
- MARKDALE WWTP PROPOSED SERVICE AREA
- AMIK WWTP PROPOSED SERVICE AREA
- FLESHERTON WWTP PROPOSED SERVICE AREA
- PHASE 1-4 (NOT SERVICED UNDER ALTERNATIVE 3)
- PROPERTY PARCEL

PROPOSED WASTEWATER MAINS

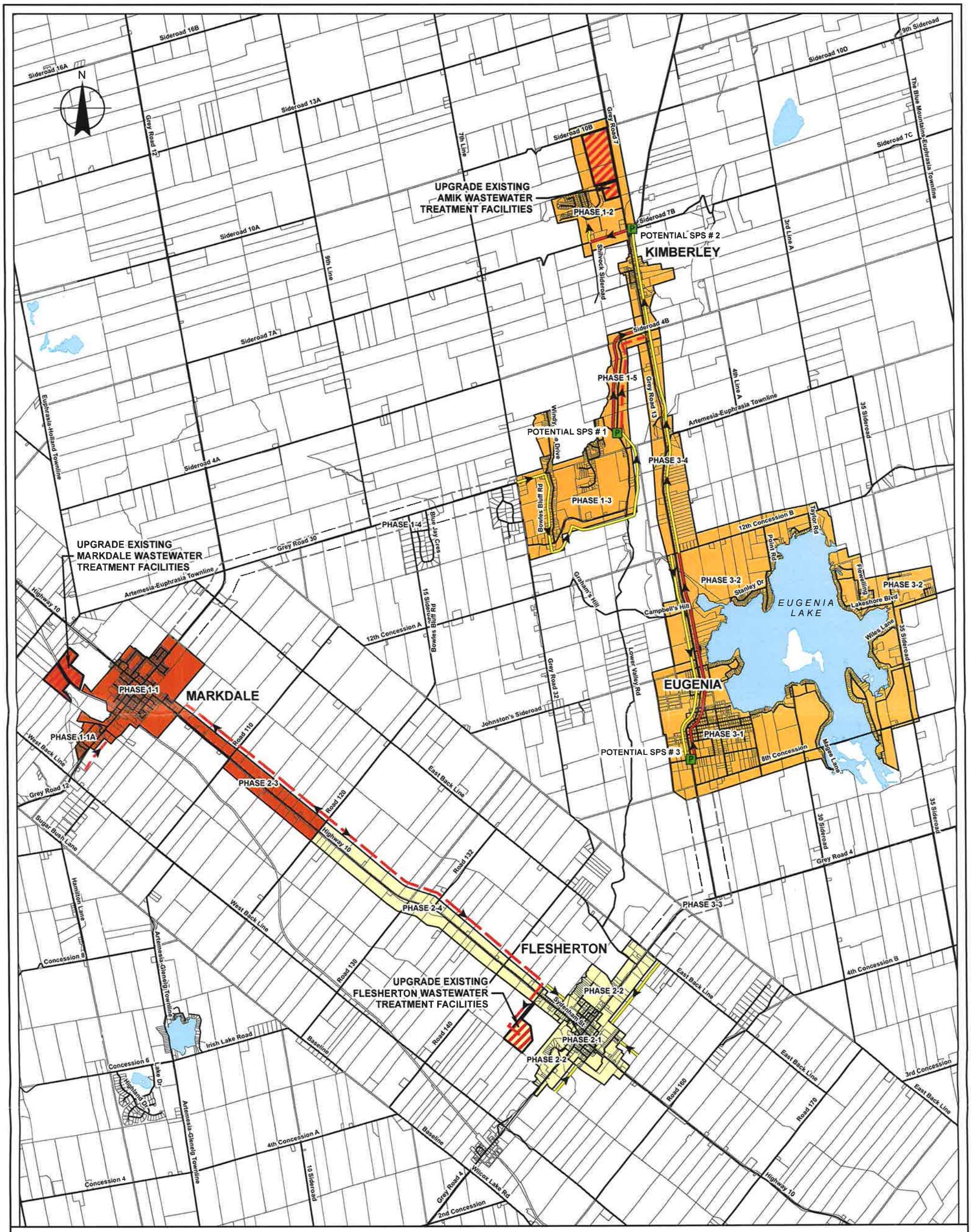
- FORCEMAIN (SPS)
- FORCEMAIN (WITH GRINDER PUMPS)
- GRAVITY MAIN
- POTENTIAL LOCATION FOR SEWAGE PUMP STATION (APPROX.)
- DIRECTION OF FLOW

0 0.5 1 2 3 4
Kilometres

PROPOSED WASTEWATER SERVICE AREAS
ALTERNATIVE 3
MUNICIPALITY OF GREY HIGHLANDS
WATER AND WASTEWATER MASTER PLAN

WSP
1450 1st AVENUE WEST, SUITE 101
OWEN SOUND, ONTARIO CANADA N4K 6W2
PHONE: 519 376-7612 - FAX: 519 376-8008 - WWW.WSPGROUP.COM

DESIGN	CW
DRAWN	JET
APPROVED	CW
DATE	MAY 2016
SCALE	SEE SCALE BAR
FILE No	111-13229-00
FIG No	6.6C



Design Sewage Flows- Alternative 4 (Phase 1-4 and 3-3 not Serviced)

WATER AND WASTEWATER SERVICING MASTER PLAN
MARKDALE-FLESHERTON-KIMBERLEY-AMIK-EUGENIA-BEAVER VALLEY
MUNICIPALITY OF GREY HIGHLANDS

111-13229-00

Wastewater Treatment Plants	Existing Sewage Flow (m^3/day)	20 Year Flow (m^3/day)	50 Year Flow (m^3/day)
Markdale WWTP (Includes P1-1 and P2-3)	988	1,971	2,631
Amik WWTP (Includes P1-2, P1-3, P1-5, P3-1, P3-2 AND P3-4)	217	1,811	2,418
Flesherton WWTP (Includes P2-1, P2-2 AND P2-4)	174	459	577

LEGEND

- MUNICIPAL WASTEWATER FACILITY
- MARKDALE WWTP PROPOSED SERVICE AREA
- AMIK WWTP PROPOSED SERVICE AREA
- FLESHERTON WWTP PROPOSED SERVICE AREA
- PHASE 1-4 AND 3-3 (NOT SERVICED UNDER ALTERNATIVE 4)
- PROPERTY PARCEL

PROPOSED WASTEWATER MAINS

- FORCEMAIN (SPS)
- FORCEMAIN (WITH GRINDER PUMPS)
- GRAVITY MAIN
- POTENTIAL LOCATION FOR SEWAGE PUMP STATION (APPROX.)
- DIRECTION OF FLOW

0 0.5 1 2 3 4
Kilometres

PROPOSED WASTEWATER SERVICE AREAS
ALTERNATIVE 4
MUNICIPALITY OF GREY HIGHLANDS
WATER AND WASTEWATER MASTER PLAN

WSP
1450 1st AVENUE WEST, SUITE 101
OWEN SOUND, ONTARIO CANADA N4K 6W2
PHONE: 519 376-7612 - FAX: 519 376-8008 - WWW.WSPGROUP.COM

DESIGN	CW
DRAWN	JET
APPROVED	CW
DATE	MAY 2016
SCALE	SEE SCALE BAR
FILE No	111-13229-00
FIG No	6.6D

Appendix K

SUMMARY TABLES – NATURAL, SOCIAL AND ECONOMIC IMPACTS OF THE PROPSOED WATER AND SEWAGE ALTERNATIVES

TABLE 7.1A
SUMMARY OF ECONOMIC, SOCIAL AND NATURAL ENVIRONMENT IMPACTS - WATER ALTERNATIVE SOLUTIONS

WATER AND WASTEWATER SERVICING MASTER PLAN
MARKDALE-FLESHERTON-KIMBERLEY-AMIK-EUGENIA-BEAVER VALLEY
MUNICIPALITY OF GREY HIGHLANDS

Alternative	Location	Description	Economic Impacts		Social Impacts		Natural Environmental Impacts	
			Advantage	Disadvantage	Advantage	Disadvantage	Advantage	Disadvantage
W.1	**Markdale** (PI-1, PI-3, PI-4, PII-1, PII-2, PII-3, PII-4, PIII-1, PIII-2, PIII-3 and PIII-4)	Approx. 39,179 m of 300 mm dia. trunk watermain Approx. 1,808 m of 200 mm dia. other watermain Two (2) new supply wells (+/- 400 IGPM each) Two (2) new water treatment pumphouses (one (1) for each new well) Upgrade existing well pumps to pump to future water storage facility Decommission existing Markdale water standpipe Construction of new 6,275 m^3 Markdale elevated glass-fused to steel elevated water storage facility (50 year design storage)	Third least expensive capital cost of all alternatives Less locations to be operated (i.e. less O&M costs)	Second most expensive alternative for a new water storage facility in Markdale Requires two (2) new wells and associated water treatment plant pumphouses in Markdale (i.e. increased O&M costs) Second largest distribution system for Markdale O&M of Kimberley WTP required	Complete municipal water system as compared to some areas on individual wells. Improves reliability of water supply	Some noise related activity during construction Some residual increase in air emissions and dust particles during construction Construction activities may potentially affect and inconvenience property owners including agricultural land access	Construction activities are temporary and would be completed in phases. Insignificant disturbance to the environment with no permanent effects expected	
	Kimberley, Amik, Talisman (PI-2 and PI-5)	Approx. 6,470 m of 300 mm dia. trunk watermain Utilize existing Kimberley water treatment plant Utilize existing Kimberley water storage and booster pumping New booster station						
W.2	**Markdale** (PI-1, PI-3, PI-4 and PII-3)	Approx. 17,100 m of 300 mm dia. trunk watermain Approx. 1,808 m of 200 mm dia. other watermain One (1) new supply well (+/- 400 IGPM) One (1) new water treatment pumphouse Upgrade existing well pumps to pump to future water storage facility Decommission existing Markdale water standpipe Construction of new 4,750 m^3 Markdale elevated glass-fused to steel elevated water storage facility (50 year design storage)	Least expensive alternative for a new water storage facility in Markdale (similar to W.4) Requires only one (1) new well and associated water treatment plant pumphouse Smallest distribution system for Markdale (similar to W.4)	Second most expensive capital cost of all alternatives O&M of Kimberley WTP required Requires one (1) or two (2) new wells and one (1) water treatment plant pumphouse in Flesherton (i.e. additional capital) Requires new water storage facility in Flesherton (i.e. additional capital) Requires one (1) or two (2) new wells and one (1) water treatment plant pumphouse in Eugenia (i.e. additional capital) Requires new water storage facility in Eugenia (i.e. additional capital) Most locations to be operated (i.e. increased O&M costs)	Complete municipal water system as compared to some areas on individual wells. Improves reliability of water supply	Some noise related activity during construction Some residual increase in air emissions and dust particles during construction Construction activities may potentially affect and inconvenience property owners including agricultural land access	Construction activities are temporary and would be completed in phases. Insignificant disturbance to the environment with no permanent effects expected	
	Kimberley, Amik, Talisman (PI-2 and PI-5)	Approx. 6,470 m of 300 mm dia. trunk watermain Utilize existing Kimberley water treatment plant Utilize existing Kimberley water storage and booster pumping New booster station						
	Flesherton (PII-1, PII-2 and PII-4)	Approx. 8,815 m of 300 mm dia. trunk watermain One (1) or two (2) new supply wells (+/- 175 IGPM total) One (1) new water treatment pumphouse Construction of new 1,175 m^3 Flesherton on-ground glass-fused to steel elevated water storage facility (50 year design storage)							
	Eugenia (PIII-1, PIII-2, PIII-3 and PIII-4)	Approx. 13,265 m of 300 mm dia. trunk waterm One (1) or two (2) new supply wells (+/- 375 IGPM total) One (1) new water treatment pumphouse Construction of new 1,900 m^3 Eugenia elevated glass-fused to steel elevated water storage facility (50 year design storage)							
W.3	**Markdale** (PI-1, PI-3, PI-4, PII-1, PII-2, PII-3 and PII-4)	Approx. 25,914 m of 300 mm dia. trunk watermain Approx. 1,808 m of 200 mm dia. trunk watermain One (1) new supply well (+/- 400 IGPM) One (1) new water treatment pumphouse Upgrade existing well pumps to pump to future water storage facility Decommission existing Markdale water standpipe Construction of new 5,100 m^3 Markdale elevated glass-fused to steel elevated water storage facility (50 year design storage)	Requires only one (1) new well and associated water treatment plant pumphouse in Markdale (i.e. less capital) Third least expensive alternative for a new water storage facility in Markdale Third smallest distribution system for Markdale	Fourth most expensive capital cost of all alternatives Third most expensive alternative for a new water storage facility in Markdale O&M of Kimberley WTP required. More locations to be operated overall (i.e. increased O & M costs) Requires one (1) or two (2) new wells and one (1) water treatment plant pumphouse in Eugenia (i.e. additional capital) Requires new water storage facility in Eugenia (i.e. additional capital)	Complete municipal water system as compared to some areas on individual wells. Improves reliability of water supply	Some noise related activity during construction Some residual increase in air emissions and dust particles during construction Construction activities may potentially affect and inconvenience property owners including agricultural land access	Construction activities are temporary and would be completed in phases. Insignificant disturbance to the environment with no permanent effects expected	
	Kimberley, Amik, Talisman (PI-2 and PI-5)	Approx. 6,470 m of 300 mm dia. trunk watermain Utilize existing Kimberley water treatment plant Utilize existing Kimberley water storage and booster pumping New booster station						
	Eugenia (PIII-1, PIII-2, PIII-3 and PIII-4)	Approx. 13,265 m of 300 mm dia. trunk watermain One (1) or two (2) new supply wells (+/- 375 IGPM total) One (1) new water treatment pumphouse Construction of new 1,900 m^3 Eugenia elevated glass-fused to steel elevated water storage facility (50 year design storage)							

W.4	**Markdale** (PI-1, PI-3, PI-4, and PII-3)	Approx. 17,100 m of 300 mm dia. trunk watermain Approx. 1,808 m of 200 mm dia. other watermain One (1) new supply well (+/- 400 IGPM) One (1) new water treatment pumphouse Upgrade existing well pumps to pump to future water storage facility Decommission existing Markdale water standpipe Construction of new 4,750 m^3 Markdale elevated glass-fused to steel elevated water storage facility (50 year design storage)	Least expensive capital cost of all alternatives Least expensive alternative for a new water storage facility in Markdale (similar to W.2) Requires only one (1) new well and associated water treatment plant pumphouse in Markdale (i.e. less capital) Smallest distribution system (serviced from only Markdale) (similar to W.2)	O&M of Kimberley WTP required Requires one (1) or two (2) new wells and one (1) water treatment plant pumphouse in Flesherton (i.e. additional capital) Requires new water storage facility in Flesherton (i.e. additional capital) More locations to be operated overall (i.e. increased O&M costs)	Complete municipal water system as compared to some areas on individual wells. Improves reliability of water supply	Some noise related activity during construction Some residual increase in air emissions and dust particles during construction Construction activities may potentially affect and inconvenience property owners including agricultural land access	Construction activities are temporary and would be completed in phases. Insignificant disturbance to the environment with no permanent effects expected	
	Kimberley, Amik, Talisman (PI-2 and PI-5)	Approx. 6,470 m of 300 mm dia. trunk watermain Utilize existing Kimberley water treatment plant Utilize existing Kimberley water storage and booster pumping New booster station						
	Flesherton (PII-1, PII-2, PII-4, PIII-1, PIII-2, PIII-3 and PIII-4)	Approx. 22,080 m of 300 mm dia. trunk watermain One (1) or two (2) new supply wells (+/- 475 IGPM total) One (1) new water treatment pumphouse Construction of new 2,575 m^3 Flesherton on-ground glass-fused to steel elevated water storage facility (50 year design storage)						
W.5	**Markdale** (PI-1, PI-2, PI-3, PI-4, PI-5, PII-1, PII-2, PII-3 and PII-4)	Approx. 32,383 m of 300 mm dia. trunk watermain Approx. 1,808 m of 200 mm dia. other watermain Two (2) new supply wells (+/- 400 IGPM each) Two (2) new water treatment pumphouses (one (1) for each new well) Upgrade existing well pumps to pump to future water storage facility Decommission existing Markdale water standpipe Construction of new 5,225 m^3 Markdale elevated glass-fused to steel elevated water storage facility (50 year design storage) Utilize existing Kimberley water storage and booster pumping (WTP decommissioned) New booster station in Kimberley	O&M of Kimberley WTP not required	Third most expensive capital of all alternatives for water Third most expensive alternative for a new water storage facility in Markdale More locations to be operated overall (i.e. increased O&M costs) Requires two (2) new wells and associated water treatment plant pumphouses in Markdale (i.e. increased O&M costs) Requires one (1) or two (2) new wells and one (1) water treatment plant pumphouse in Eugenia (i.e. additional capital) Requires new water storage facility in Eugenia (i.e. additional capital) Third largest distribution system for Markdale	Complete municipal water system as compared to some areas on individual wells. Improves reliability of water supply	Some noise related activity during construction Some residual increase in air emissions and dust particles during construction Construction activities may potentially affect and inconvenience property owners including agricultural land access	Construction activities are temporary and would be completed in phases. Insignificant disturbance to the environment with no permanent effects expected	
	Eugenia (PIII-1, PIII-2, PIII-3 and PIII-4)	Approx. 13,265 m of 300 mm dia. trunk watermain One (1) or two (2) new supply wells (+/- 375 IGPM total) One (1) new water treatment pumphouse Construction of new 1,900 m^3 Eugenia elevated glass-fused to steel elevated water storage facility (50 year design storage)						
W.6	**Markdale** (PI-1, PI-2, PI-3, PI-4, PI-5 and PII-3)	Approx. 23,568 m of 300 mm dia. trunk watermain Approx. 1,808 m of 200 mm dia. other watermain One (1) new supply well (+/- 400 IGPM) One (1) new water treatment pumphouse Upgrade existing well pumps to pump to future water storage facility Decommission existing Markdale water standpipe Construction of new 5,000 m^3 Markdale elevated glass-fused to steel elevated Utilize existing Kimberley water storage and booster pumping (WTP decommissioned)	Second least expensive capital cost of all alternatives Second least expensive alternative for a new water storage facility in Markdale Second smallest distribution system for Markdale O&M of Kimberley WTP not required Second least locations to be operated overall (i.e. less O&M costs) Requires only one (1) new well and associated water treatment plant pumphouse in Markdale (i.e. less capital)	Requires one (1) or two (2) new wells and one (1) water treatment plant pumphouse in Flesherton (i.e. additional capital) Requires new water storage facility in Flesherton (i.e. additional capital)	Complete municipal water system as compared to some areas on individual wells. Improves reliability of water supply	Some noise related activity during construction Some residual increase in air emissions and dust particles during construction Construction activities may potentially affect and inconvenience property owners including agricultural land access	Construction activities are temporary and would be completed in phases. Insignificant disturbance to the environment with no permanent effects expected	
	Flesherton (PII-1, PII-2, PII-4, PIII-1, PIII-2, PIII-3 and PIII-4)	Approx. 22,080 m of 300 mm dia. One (1) or two (2) new supply wells (+/- 475 IGPM total) One (1) new water treatment pumphouse Construction of new 2,575 m^3 Flesherton on-ground glass-fused to steel elevated water storage facility (50 year design storage)						

W.7	**Markdale** (PI-1, PI-2, P1-3, PI-4, PI-5, PII-1, PII-2, PII-3, PII-4, PIII-1, PIII-2, PIII-3 and PIII-4)	Approx. 45,648 m of 300 mm dia. trunk watermain Approx. 1,808 m of 200 mm dia. other watermain Two (2) new supply wells (+/- 400 IGPM each) Two (2) new water treatment pumphouses (one (1) for each new well) Upgrade well pumps to pump to future water storage facility Decommission existing Markdale water standpipe Construction of new 6,500 m^3 Markdale elevated glass-fused to steel elevated water storage facility (50 year design storage) Utilize existing Kimberley water storage and booster pumping (WTP decommissioned)	Fourth least expensive capital cost of all alternatives Least number of locations to be operated overall (i.e. less O&M costs) O&M of Kimberley WTP not required	Most expensive alternative for a new water storage facility in Markdale (similar to W.7A) Requires two (2) new wells and associated water treatment plant pumphouses in Markdale (i.e. additional capital) Largest distribution system for Markdale	Complete municipal water system as compared to some areas on individual wells. Improves reliability of water supply	Some noise related activity during construction Some residual increase in air emissions and dust particles during construction Construction activities may potentially affect and inconvenience property owners including agricultural land access	Construction activities are temporary and would be completed in phases. Insignificant disturbance to the environment with no permanent effects expected	
W.7A	**Markdale** (PI-1, PI-2, P1-3, PI-4, PI-5, PII-1, PII-2, PII-3, PII-4, PIII-1, PIII-2, PIII-3 and PIII-4)	Approx. 45,648 m of 300 mm dia. trunk watermain Approx. 5,873 m of 300 mm dia. trunk watemain (second connection to Kimberley WTP) Approx. 1,808 m of 200 mm dia. other watermain Two (2) new supply wells (+/- 400 IGPM each) Two (2) new water treatment pumphouses (one (1) for each new well) Upgrade existing well pumps to pump to future water storage facility Decommission existing Markdale water standpipe Construction of new 6,500 m^3 Markdale elevated glass-fused to steel elevated water storage facility (50 year design storage) Utilize existing Kimberley water storage and booster pumping (WTP decommissioned) New booster station in Kimberley	Least number of locations to be operated overall (i.e. less O&M costs) O&M of Kimberley WTP not required	Most expensive capital cost of all alternatives Most expensive alternative for a new water storage facility in Markdale (similar to W.7) Requires two (2) new wells and associated water treatment plant pumphouses in Markdale (i.e. additional capital) Largest distribution system for Markdale	Complete municipal water system as compared to some areas on individual wells. Improves reliability of water supply	Some noise related activity during construction Some residual increase in air emissions and dust particles during construction Construction activities may potentially affect and inconvenience property owners including agricultural land access	Construction activities are temporary and would be completed in phases. Insignificant disturbance to the environment with no permanent effects expected	

TABLE 7.1B
SUMMARY OF ECONOMIC, SOCIAL AND NATURAL ENVIRONMENT IMPACTS - SEWAGE ALTERNATIVE SOLUTIONS

WATER AND WASTEWATER SERVICING MASTER PLAN
MARKDALE-FLESHERTON-KIMBERLEY-AMIK-EUGENIA-BEAVER VALLEY
MUNICIPALITY OF GREY HIGHLANDS

Alternative	Location	Description	Economic Impacts		Social Impacts		Natural Environmental Impacts	
			Advantage	Disadvantage	Advantage	Disadvantage	Advantage	Disadvantage
S.1	**Markdale** (PI-1, PI-3, PI-4, and PII-3)	Approx. 12,250 m of 200 mm dia. gravity main Approx. 12,550 m of 100 mm dia. forcemain Approximately 30 lots (50 year) serviced by grinder pump systems Two (2) new sewage pump stations (SPS#1 and SPS #2) Increase in wastewater treatment plant capacity of 1,122 m^3/day (existing) to 2,398 m^3/day (highest 20 year flow required)	Low pressure grinder pumps maintenance is minimal Least expensive wastewater treatment plant upgrade component cost of total capital cost (similar to S.4)	Second most expensive capital cost of all alternatives Low pressure grinder pumps maintenance. responsibility of individual consumer after initial contract maintenance period More sewage pumping station locations to be operated (i.e. seven (7) total) (i.e. more O&M costs) More gravity main and forcemain (i.e. more capital and O&M)	Municipal sanitary sewer system compared to individual septic systems	Some noise related activity during construction Some residual increase in air emissions and dust particles during construction Construction activities may potentially affect and inconvenience property owners including agricultural land access	Construction activities are temporary and would be completed in phases Insignificant disturbance to the environment with no permanent effects expected Municipal sanitary sewer system compared to individual septic systems (protection of ground water quality)	
	Amik (PI-2, PI-5, PIII-1, PIII-2, PIII-3, and PIII-4)	Approx. 10,200 m of 200 mm dia. gravity main Approx. 11,125 m of 100 mm dia. forcemain Approximately 42 lots (50 year) serviced by grinder pump systems Two (2) new sewage pump stations (SPS#3 and SPS #4) Increase in wastewater treatment plant capacity of 249 m^3/day (existing) to 1,811 m^3/day (highest 20 year flow required under Alternative 4). 20 year flow required for this alternative is 1,530 m^3/day						
	Flesherton (PII-1, PII-2, and PII-4)	Approx. 3,200 m of 200 mm dia. gravity main Approx. 5,825 m of 100 mm dia. forcemain Approximately 74 lots (50 year) serviced by grinder pump systems Optimization of existing wastewater treatment plant capacity of 419 m^3/day to allow for 20 year flow of 459 m^3/day						
S.2	**Markdale** (PI-1, PI-3, PI-4, and PII-3)	Approx. 12,250 m of 200 mm dia. gravity main Approx. 12,550 m of 100 mm dia. forcemain Approximately 30 lots (50 year) serviced by grinder pump systems Two (2) new sewage pump stations (SPS#1 and SPS #2) Increase in wastewater treatment plant capacity of 1,122 m^3/day (existing) to 2,398 m^3/day (highest 20 year flow required)	Low pressure grinder pumps maintenance is minimal	Most expensive capital cost of all alternatives Low pressure grinder pumps maintenance. responsibility of individual consumer after initial contract maintenance period More sewage pumping station locations to be operated (i.e. seven (7) total) (i.e. more O&M costs) More gravity main and forcemain (i.e. more capital and O&M) Second most expensive wastewater treatment plant upgrade component cost of total capital cost	Municipal sanitary sewer system compared to individual septic systems	Some noise related activity during construction Some residual increase in air emissions and dust particles during construction Construction activities may potentially affect and inconvenience property owners including agricultural land access	Construction activities are temporary and would be completed in phases Insignificant disturbance to the environment with no permanent effects expected Municipal sanitary sewer system compared to individual septic systems (protection of ground water quality)	
	Amik (PI-2, PI-5, and PIII-4)	Approx. 5,700 m of 200 mm dia. gravity main Approx. 3,175 m of 100 mm dia. forcemain Approximately 19 lots (50 year) serviced by grinder pump systems One (1) new sewage pump station (SPS #4) Increase in wastewater treatment plant capacity of 249 m^3/day (existing) to 431 m^3/day as previous approved by Certificate of Approval. Optimization of existing future wastewater treatment plant capacity of 431 m^3/day to allow for 20 year flow of 501 m^3/day						

	Flesherton (PII-1, PII-2, PII-4, PIII-1, PIII-2, and PIII-3)	Approx. 7,675 m of 200 mm dia. gravity main Approx. 12,750 m of 100 mm dia. forcemain Approximately 97 lots (50 year) serviced by grinder pump systems One (1) new sewage pump station (SPS #3) Increase in wastewater treatment plant capacity of 419 m^3/day (existing) to 1,488 m^3/day (highest 20 year flow required)						
S.3	**Markdale** (PI-1 and PII-3)	Approx. 3,272 m of 100 mm dia. forcemain Approximately 30 lots (50 year) serviced by grinder pump systems increase in wastewater treatment plant capacity of 1,122 m^3/day (existing) to 2,398 m^3/day (highest 20 year flow required under Alternative 1 and 2). 20 year flow required for this alternative is 1,971 m^3/day	Second least expensive capital cost of all alternatives Low pressure grinder pumps maintenance is minimal Less sewage pumping station locations to be operated (i.e. six (6) total) (i.e. less O&M costs) Second least gravity main and forcemain (i.e. less capital and O&M)	Low pressure grinder pumps maintenance, responsibility of individual consumer after initial contract maintenance period Most expensive wastewater treatment plant upgrade component cost of total capital cost	Municipal sanitary sewer system compared to individual septic systems	Some noise related activity during construction Some residual increase in air emissions and dust particles during construction Construction activities may potentially affect and inconvenience property owners including agricultural land access	Construction activities are temporary and would be completed in phases Insignificant disturbance to the environment with no permanent effects expected Municipal sanitary sewer system compared to individual septic systems (protection of ground water quality)	
	Amik (PI-2, PI-3, PI-5, and PIII-4)	Approx. 10,625 m of 200 mm dia. gravity main Approx. 5,325 m of 100 mm dia. forcemain Approximately 19 lots (50 year) serviced by grinder pump systems Two (2) new sewage pump stations (SPS#1 and SPS #2) Increase in wastewater treatment plant capacity of 249 m^3/day (existing) to 1,811 m^3/day (highest 20 year flow required under Alternative 4). 20 year flow required for this alternative is 799 m^3/day						
	Flesherton (PII-1, PII-2, PII-4, PIII-1, PIII-2, and PIII-3)	Approx. 7,675 m of 200 mm dia. gravity main Approx. 12,750 m of 100 mm dia. forcemain Approximately 97 lots (50 year) serviced by grinder pump systems One (1) new sewage pump station (SPS #3) Increase in wastewater treatment plant capacity of 419 m^3/day (existing) to 1,488 m^3/day (highest 20 year flow required)						
S.4	**Markdale** (PI-1 and PII-3)	Approx. 3,272 m of 100 mm dia. forcemain Approximately 30 lots (50 year) serviced by grinder pump systems increase in wastewater treatment plant capacity of 1,122 m^3/day (existing) to 2,398 m^3/day (highest 20 year flow required under Alternative 1 and 2). 20 year flow required for this alternative is 1,971 m^3/day	Least expensive capital cost of all alternatives Low pressure grinder pumps maintenance is minimal Less sewage pumping station locations to be operated (i.e. six (6) total) (i.e. less O&M costs) Least gravity main and forcemain (i.e. less capital and O&M) Least expensive wastewater treatment plant upgrade component cost of total capital cost (similar to S.4)	Low pressure grinder pumps maintenance, responsibility of individual consumer after initial contract maintenance period	Municipal sanitary sewer system compared to individual septic systems	Some noise related activity during construction Some residual increase in air emissions and dust particles during construction Construction activities may potentially affect and inconvenience property owners including agricultural land access	Construction activities are temporary and would be completed in phases Insignificant disturbance to the environment with no permanent effects expected Municipal sanitary sewer system compared to individual septic systems (protection of ground water quality)	
	Amik (PI-2, PI-3, PI-5, PIII-1, PIII-2 and PIII-4)	Approx. 15,110 m of 200 mm dia. gravity main Approx. 9,810 m of 100 mm dia. forcemain Approximately 19 lots (50 year) serviced by grinder pump systems Three (3) new sewage pump stations (SPS#1, SPS #2, and SPS #3) Increase in wastewater treatment plant capacity of 249 m^3/day (existing) to 1,811 m^3/day (highest 20 year flow required under Alternative 4). 20 year flow required for this alternative is 799 m^3/day						
	Flesherton (PII-1, PII-2, and PII-3)	Approx. 3,200 m of 200 mm dia. gravity main Approx. 5,825 m of 100 mm dia. forcemain Approximately 74 lots (50 year) serviced by grinder pump systems Optimization of existing wastewater treatment plant capacity of 419 m^3/day to allow for 20 year flow of 459 m^3/day						

Appendix L

CAPITAL COST TABLES FOR ALTERNATIVE SOLUTIONS

Table W.1: Cost Estimate for Alternative W.1 - Water

WATER AND WASTEWATER SERVICING MASTER PLAN
MARKDALE-FLESHERTON-KIMBERLEY-AMIK-EUGENIA-BEAVER VALLEY
MUNICIPALITY OF GREY HIGHLANDS

Capital Cost Estimate (Class C)					
2012 Constant Dollars					**January 2012**
Item #	**Item Description**	**Unit**	**Qty**	**Unit Cost**	**Total**
Markdale (PI-1, PI-3, PI-4, PII-1, PII-2, PII-3, PII-4, PIII-1, PIII-2, PIII-3 and PIII-4)					
	Construction				
1.0	**Mobilization/Demobilization**	L.S.	100%	$450,000.00	$450,000.00
2.0	**Site Work**				
2.1	Clearing and grubbing of watermain route	L.S.	100%	$200,000.00	$200,000.00
2.2	Clearing and grubbing at new water storage facility	L.S.	100%	$5,000.00	$5,000.00
2.3	Clearing and grubbing at new water treatment plant and pumphouses	L.S.	100%	$40,000.00	$40,000.00
2.4	Site development work at new water storage facility (access, fill, parking, yard piping)	L.S.	100%	$50,000.00	$50,000.00
2.5	Site development work at new water treatment plant and pumphouses (access, fill, parking, yard piping)	L.S.	100%	$200,000.00	$200,000.00
2.6	Topsoiling, hydro seeding, restoration along watermain route and at the new water storage facility and new water treatment plant and pumphouses	L.S.	100%	$115,000.00	$115,000.00
2.7	3 Phase hydro and Bell service connection at new water storage facility	L.S.	100%	$20,000.00	$20,000.00
2.8	3 Phase hydro and Bell service connection at new water treatment plant and pumphouses	L.S.	100%	$40,000.00	$40,000.00
2.9	Decommission existing Markdale Standpipe	L.S.	100%	$30,000.00	$30,000.00
3.0	**New Supply Wells Construction (P1-1)**				
3.1	Install new supply well #1	L.S.	100%	$50,000.00	$50,000.00
3.2	Install new supply well #2	L.S.	100%	$50,000.00	$50,000.00
4.0	**Watermain Construction**				
4.1	Construct 300 mm ⌀ watermain	m	39,179	$350.00	$13,712,650.00
4.2	Construct 200 mm ⌀ watermain (across easement at Beaver Valley to Grey Road 30)	m	1,808	$300.00	$542,400.00
4.3	Pressure reducing valve chambers	L.S.	100%	$100,000.00	$100,000.00
4.4	Hydrants	ea.	218	$4,500.00	$981,000.00
4.5	Rock removal by blasting	m^3	7000	$165.00	$1,155,000.00
5.0	**New Water Treatment Plant and Pumphouses (P1-1)**				

Table W.1: Cost Estimate for Alternative W.1 - Water

WATER AND WASTEWATER SERVICING MASTER PLAN
MARKDALE-FLESHERTON-KIMBERLEY-AMIK-EUGENIA-BEAVER VALLEY
MUNICIPALITY OF GREY HIGHLANDS

Capital Cost Estimate (Class C)					
2012 Constant Dollars					**January 2012**
Item #	**Item Description**	**Unit**	**Qty**	**Unit Cost**	**Total**
5.1	Construct new water treatment plant and pumphouse #1	L.S.	100%	$900,000.00	$900,000.00
5.2	Construct new water treatment plant and pumphouse #2	L.S.	100%	$900,000.00	$900,000.00
6.0	**New Water Storage Facility (P1-1)**				
6.1	Construction of new glass-fused to steel elevated water storage facility	L.S.	100%	$5,500,000.00	$5,500,000.00
7.0	**Environmental Works**				
7.1	Erosion control	L.S.	100%	$115,000.00	$115,000.00
8.0	**Bonding & Insurance**	L.S.	100%	$550,000.00	$550,000.00
9 .0	**Allowances**				
9.1	Soils investigation prior to Construction	L.S.	100%	$60,000.00	$60,000.00
9.2	Rock Blast Survey	L.S.	100%	$30,000.00	$30,000.00
9.3	Startup of new Water Storage Facility, New Water Treatment Plant and Pumphouses and watermain including commissioning, reports and manuals	L.S.	100%	$60,000.00	$60,000.00
	Subtotal Construction Cost				$25,856,050.00
	Construction Contingency	%	10%		$2,585,605.00
	Total Construction Cost				$28,441,655.00
	Non-Construction				
10.0	**Engineering Design**	%	7%		$1,990,915.85
11.0	**Contract Administration**	%	8%		$2,275,332.40
12.0	**Engineering Disbursement**	%	1.2%		$341,299.86
13.0	**Approvals (CofA, Zoning, etc.)**	L.S.	100%	$75,000.00	$75,000.00
14.0	**EA for New Wells**	L.S.	100%	$30,000.00	$30,000.00
15.0	**Test Pump of New Wells**	L.S.	100%	$30,000.00	$30,000.00
16.0	**Aquifer Evaluation Report for New Wells**	L.S.	100%	$30,000.00	$30,000.00
17.0	**Materials Testing Allowance and Soils Inspection during construction**	L.S.	100%	$90,000.00	$90,000.00
	Total Non-Construction Cost				$4,862,548.11
	Total Cost for Construction				$33,304,203.11
	Kimberley-Amik-Talisman (PI-2 and PI-5)				

Table W.1: Cost Estimate for Alternative W.1 - Water

WATER AND WASTEWATER SERVICING MASTER PLAN
MARKDALE-FLESHERTON-KIMBERLEY-AMIK-EUGENIA-BEAVER VALLEY
MUNICIPALITY OF GREY HIGHLANDS

Capital Cost Estimate (Class C)					
2012 Constant Dollars					**January 2012**
Item #	**Item Description**	**Unit**	**Qty**	**Unit Cost**	**Total**
	Construction				
1.0	**Mobilization/Demobilization**	L.S.	100%	$50,000.00	$50,000.00
2.0	**Site Work**				
2.1	Clearing and grubbing of watermain route	L.S.	100%	$25,000.00	$25,000.00
2.2	Topsoiling, hydro seeding, restoration along watermain route	L.S.	100%	$10,000.00	$10,000.00
3.0	**Watermain Construction**				
3.1	Construct 300 mm ⌀ watermain	m	6,470	$350.00	$2,264,500.00
3.2	Pressure reducing valve chambers	L.S.	100%	$25,000.00	$25,000.00
3.3	Hydrants	ea.	36	$4,500.00	$162,000.00
3.4	Rock removal by blasting	m^3	1200	$165.00	$198,000.00
4.0	**New Booster Pumping Station (PI-2)**				
4.1	Construction of new booster pumping station	L.S.	100%	$500,000.00	$500,000.00
5.0	**Environmental Works**				
5.1	Erosion control	L.S.	100%	$15,000.00	$15,000.00
6.0	**Bonding & Insurance**	L.S.	100%	$60,000.00	$60,000.00
7.0	**Allowances**				
7.1	Soils investigation prior to construction	L.S.	100%	$10,000.00	$10,000.00
7.2	Rock Blast Survey	L.S.	100%	$5,000.00	$5,000.00
7.3	Startup and commissioning of new watermain	L.S.	100%	$10,000.00	$10,000.00
	Subtotal Construction Cost				$3,334,500.00
	Construction Contingency	%	10%		$333,450.00
	Total Construction Cost				$3,667,950.00
	Non-Construction				
8.0	**Engineering Design**	%	7%		$256,756.50
9.0	**Contract Administration**	%	8%		$293,436.00
10.0	**Engineering Disbursement**	%	1.2%		$44,015.40
11.0	**Approvals (CofA, Zoning, etc.)**	L.S.	100%	$15,000.00	$15,000.00
12.0	**Materials Testing Allowance and Soils Inspection during construction**	L.S.	100%	$15,000.00	$15,000.00

Table W.1: Cost Estimate for Alternative W.1 - Water

WATER AND WASTEWATER SERVICING MASTER PLAN
MARKDALE-FLESHERTON-KIMBERLEY-AMIK-EUGENIA-BEAVER VALLEY
MUNICIPALITY OF GREY HIGHLANDS

Capital Cost Estimate (Class C)					
2012 Constant Dollars					January 2012
Item #	Item Description	Unit	Qty	Unit Cost	Total
	Total Non-Construction Cost				$624,207.90
	Total Cost for Construction				$4,292,157.90
	Total Project Cost for Alternative W.1				$37,596,361.01

Table W.2: Cost Estimate for Alternative W.2 - Water

WATER AND WASTEWATER SERVICING MASTER PLAN
MARKDALE-FLESHERTON-KIMBERLEY-AMIK-EUGENIA-BEAVER VALLEY
MUNICIPALITY OF GREY HIGHLANDS

Capital Cost Estimate (Class C)					
2012 Constant Dollars					**January 2012**
Item #	**Item Description**	**Unit**	**Qty**	**Unit Cost**	**Total**
	Markdale (PI-1, PI-3, PI-4 and PII-3)				
	Construction				
1.0	**Mobilization/Demobilization**	L.S.	100%	$200,000.00	$200,000.00
2.0	**Site Work**				
2.1	Clearing and grubbing of watermain route	L.S.	100%	$75,000.00	$75,000.00
2.2	Clearing and grubbing at new water storage facility	L.S.	100%	$5,000.00	$5,000.00
2.3	Clearing and grubbing at new water treatment plant and pumphouse	L.S.	100%	$20,000.00	$20,000.00
2.4	Site development work at new water storage facility (access, fill, parking, yard piping)	L.S.	100%	$50,000.00	$50,000.00
2.5	Site development work at new water treatment plant and pumphouse (access, fill, parking, yard piping)	L.S.	100%	$100,000.00	$100,000.00
2.6	Topsoiling, hydro seeding, restoration along watermain route and at the new water storage facility and new water treatment plant and pumphouse	L.S.	100%	$50,000.00	$50,000.00
2.7	3 Phase hydro and Bell service connection at new water storage facility	L.S.	100%	$20,000.00	$20,000.00
2.8	3 Phase hydro and Bell service connection at new water treatment plant and pumphouse	L.S.	100%	$20,000.00	$20,000.00
2.9	Decommission existing Markdale Standpipe	L.S.	100%	$30,000.00	$30,000.00
3.0	**New Supply Well Construction (PI-1)**				
3.1	Install new supply well	L.S.	100%	$50,000.00	$50,000.00
4.0	**Watermain Construction**				
4.1	Construct 300 mm ⌀ watermain	m	17,100	$350.00	$5,985,000.00
4.2	Construct 200 mm ⌀ watermain (across easement at Beaver Valley to Grey Road 30)	m	1,808	$300.00	$542,400.00
4.3	Pressure reducing valve chambers	L.S.	100%	$50,000.00	$50,000.00
4.4	Hydrants	ea.	95	$4,500.00	$427,500.00
4.5	Rock removal by blasting	m^3	3100	$165.00	$511,500.00
5.0	**New Water Treatment Plant and Pumphouse (PI-1)**				
5.1	Construct new water treatment plant and pumphouse	L.S.	100%	$900,000.00	$900,000.00

Table W.2: Cost Estimate for Alternative W.2 - Water

WATER AND WASTEWATER SERVICING MASTER PLAN
MARKDALE-FLESHERTON-KIMBERLEY-AMIK-EUGENIA-BEAVER VALLEY
MUNICIPALITY OF GREY HIGHLANDS

Capital Cost Estimate (Class C)					
2012 Constant Dollars					**January 2012**
Item #	**Item Description**	**Unit**	**Qty**	**Unit Cost**	**Total**
6.0	**New Water Storage Facility (PI-1)**				
6.1	Construction of new glass-fused to steel elevated water storage facility	L.S.	100%	$4,200,000.00	$4,200,000.00
7.0	**Environmental Works**				
7.1	Erosion control	L.S.	100%	$50,000.00	$50,000.00
8.0	**Bonding & Insurance**	L.S.	100%	$290,000.00	$290,000.00
9.0	**Allowances**				
9.1	Soils investigation prior to Construction	L.S.	100%	$25,000.00	$25,000.00
9.2	Rock Blast Survey	L.S.	100%	$10,000.00	$10,000.00
9.3	Startup of new Water Storage Facility, New Water Treatment Plant and Pumphouse and watermain including commissioning, reports and manuals	L.S.	100%	$20,000.00	$20,000.00
	Subtotal Construction Cost				$13,631,400.00
	Construction Contingency	%	10%		$1,363,140.00
	Total Construction Cost				$14,994,540.00
	Non-Construction				
10.0	**Engineering Design**	%	7%		$1,049,617.80
11.0	**Contract Administration**	%	8%		$1,199,563.20
12.0	**Engineering Disbursement**	%	1.2%		$179,934.48
13.0	**Approvals (CofA, Zoning, etc.)**	L.S.	100%	$25,000.00	$25,000.00
14.0	**EA for New Well**	L.S.	100%	$20,000.00	$20,000.00
15.0	**Test Pump of New Well**	L.S.	100%	$20,000.00	$20,000.00
16.0	**Aquifer Evaluation Report for New Well**	L.S.	100%	$20,000.00	$20,000.00
17.0	**Materials Testing Allowance and Soils Inspection during construction**	L.S.	100%	$40,000.00	$40,000.00
	Total Non-Construction Cost				$2,554,115.48
	Total Cost for Construction				$17,548,655.48
	Kimberley-Amik-Talisman (PI-2 and PI-5)				
	Construction				
1.0	**Mobilization/Demobilization**	L.S.	100%	$50,000.00	$50,000.00

Table W.2: Cost Estimate for Alternative W.2 - Water

WATER AND WASTEWATER SERVICING MASTER PLAN
MARKDALE-FLESHERTON-KIMBERLEY-AMIK-EUGENIA-BEAVER VALLEY
MUNICIPALITY OF GREY HIGHLANDS

Capital Cost Estimate (Class C)					
2012 Constant Dollars					**January 2012**
Item #	**Item Description**	**Unit**	**Qty**	**Unit Cost**	**Total**
2.0	**Site Work**				
2.1	Clearing and grubbing of watermain route	L.S.	100%	$25,000.00	$25,000.00
2.2	Topsoiling, hydro seeding, restoration along watermain route	L.S.	100%	$10,000.00	$10,000.00
3.0	**Watermain Construction**				
3.1	Construct 300 mm ⌀ watermain	m	6,470	$350.00	$2,264,500.00
3.2	Pressure reducing valve chambers	L.S.	100%	$25,000.00	$25,000.00
3.3	Hydrants	ea.	36	$4,500.00	$162,000.00
3.4	Rock removal by blasting	m^3	1200	$165.00	$198,000.00
4.0	**New Booster Pumping Station (PI-2)**				
4.1	Construction of new booster pumping station	L.S.	100%	$500,000.00	$500,000.00
5.0	**Environmental Works**				
5.1	Erosion control	L.S.	100%	$15,000.00	$15,000.00
6.0	**Bonding & Insurance**	L.S.	100%	$60,000.00	$60,000.00
7.0	**Allowances**				
7.1	Soils investigation prior to construction	L.S.	100%	$10,000.00	$10,000.00
7.2	Rock Blast Survey	L.S.	100%	$5,000.00	$5,000.00
7.3	Startup and commissioning of new watermain	L.S.	100%	$10,000.00	$10,000.00
	Subtotal Construction Cost				$3,334,500.00
	Construction Contingency	%	10%		$333,450.00
	Total Construction Cost				$3,667,950.00
	Non-Construction				
8.0	**Engineering Design**	%	7%		$256,756.50
9.0	**Contract Administration**	%	8%		$293,436.00
10.0	**Engineering Disbursement**	%	1.2%		$44,015.40
11.0	**Approvals (CofA, Zoning, etc.)**	L.S.	100%	$15,000.00	$15,000.00
12.0	**Materials Testing Allowance and Soils Inspection during construction**	L.S.	100%	$15,000.00	$15,000.00
	Total Non-Construction Cost				$624,207.90
	Total Cost for Construction				$4,292,157.90

Table W.2: Cost Estimate for Alternative W.2 - Water

WATER AND WASTEWATER SERVICING MASTER PLAN
MARKDALE-FLESHERTON-KIMBERLEY-AMIK-EUGENIA-BEAVER VALLEY
MUNICIPALITY OF GREY HIGHLANDS

Capital Cost Estimate (Class C)					
2012 Constant Dollars					**January 2012**
Item #	**Item Description**	**Unit**	**Qty**	**Unit Cost**	**Total**
	Flesherton (PII-1, PII-2, and PII-4)				
	Construction				
1.0	**Mobilization/Demobilization**	L.S.	100%	$100,000.00	$100,000.00
2.0	**Site Work**				
2.1	Clearing and grubbing of watermain route	L.S.	100%	$50,000.00	$50,000.00
2.2	Clearing and grubbing at new water storage facility	L.S.	100%	$15,000.00	$15,000.00
2.3	Clearing and grubbing at new water treatment plant and pumphouse	L.S.	100%	$20,000.00	$20,000.00
2.4	Site development work at new water storage facility (access, fill, parking, yard piping)	L.S.	100%	$50,000.00	$50,000.00
2.5	Site development work at new water treatment plant and pumphouse (access, fill, parking, yard piping)	L.S.	100%	$100,000.00	$100,000.00
2.6	Topsoiling, hydro seeding, restoration along watermain route and at the new water storage facility and new water treatment plant and pumphouse	L.S.	100%	$25,000.00	$25,000.00
2.7	3 Phase hydro and Bell service connection at new water storage facility	L.S.	100%	$20,000.00	$20,000.00
2.8	3 Phase hydro and Bell service connection at new water treatment plant and pumphouse	L.S.	100%	$20,000.00	$20,000.00
3.0	**New Supply Well Construction (PII-1 or PII-2)**				
3.1	Install new supply well(s)	L.S.	100%	$75,000.00	$75,000.00
4.0	**Watermain Construction**				
4.1	Construct 300 mm ⌀ watermain	m	8,815	$350.00	$3,085,250.00
4.2	Hydrants	ea.	49	$4,500.00	$220,500.00
4.3	Rock removal by blasting	m^3	1600	$165.00	$264,000.00
5.0	**New Water Treatment Plant and Pumphouse (PII-1 or PII-2)**				
5.1	Construct new water treatment plant and pumphouse	L.S.	100%	$900,000.00	$900,000.00
6.0	**New Water Storage Facility (PII-2)**				
6.1	Construction of new glass-fused to steel on-ground water storage facility	L.S.	100%	$400,000.00	$400,000.00
7.0	**Environmental Works**				

Table W.2: Cost Estimate for Alternative W.2 - Water

WATER AND WASTEWATER SERVICING MASTER PLAN
MARKDALE-FLESHERTON-KIMBERLEY-AMIK-EUGENIA-BEAVER VALLEY
MUNICIPALITY OF GREY HIGHLANDS

7.1	Erosion control	L.S.	100%	$25,000.00	$25,000.00
8.0	**Bonding & Insurance**	L.S.	100%	$120,000.00	$120,000.00
9.0	**Allowances**				
9.1	Soils investigation prior to Construction	L.S.	100%	$15,000.00	$15,000.00
9.2	Rock Blast Survey	L.S.	100%	$10,000.00	$10,000.00
9.3	Startup of new Water Storage Facility, New Water Treatment Plant and Pumphouse and watermain including commissioning, reports and manuals	L.S.	100%	$20,000.00	$20,000.00
	Subtotal Construction Cost				$5,534,750.00
	Construction Contingency	%	10%		$553,475.00
	Total Construction Cost				**$6,088,225.00**
	Non-Construction				
10.0	**Engineering Design**	%	7%		$426,175.75
11.0	**Contract Administration**	%	8%		$487,058.00
12.0	**Engineering Disbursement**	%	1.2%		$73,058.70
13.0	**Approvals (CofA, Zoning, etc.)**	L.S.	100%	$25,000.00	$25,000.00
14.0	**EA for New Well(s)**	L.S.	100%	$20,000.00	$20,000.00
15.0	**Test Pump of New Well(s)**	L.S.	100%	$30,000.00	$20,000.00
16.0	**Aquifer Evaluation Report for New Well(s)**	L.S.	100%	$20,000.00	$20,000.00
17.0	**Materials Testing Allowance and Soils Inspection during construction**	L.S.	100%	$20,000.00	$20,000.00
	Total Non-Construction Cost				**$1,091,292.45**
	Total Cost for Construction				**$7,179,517.45**
	Eugenia (PIII-1, PIII-2, PIII-3 and PIII-4)				
	Construction				
1.0	**Mobilization/Demobilization**	L.S.	100%	$150,000.00	$150,000.00
2.0	**Site Work**				
2.1	Clearing and grubbing of watermain route	L.S.	100%	$75,000.00	$75,000.00
2.2	Clearing and grubbing at new water storage facility	L.S.	100%	$15,000.00	$15,000.00
2.3	Clearing and grubbing at new water treatment plant and pumphouse	L.S.	100%	$20,000.00	$20,000.00
2.4	Site development work at new water storage facility (access, fill, parking, yard piping)	L.S.	100%	$50,000.00	$50,000.00

C:\Documents and Settings\117 - Linear\111-13229-00 - Grey Highlands\Reports\Water & Wastewater Servicing Master Plan - Jan 2016\Master Plan\Appendices\Appendix L\Table A- W.2 - Cost Estimate for Alternative W.2 - Water.wpd

Table W.2: Cost Estimate for Alternative W.2 - Water

WATER AND WASTEWATER SERVICING MASTER PLAN
MARKDALE-FLESHERTON-KIMBERLEY-AMIK-EUGENIA-BEAVER VALLEY
MUNICIPALITY OF GREY HIGHLANDS

2.5	Site development work at new water treatment plant and pumphouse (access, fill, parking, yard piping)	L.S.	100%	$100,000.00	$100,000.00
2.6	Topsoiling, hydro seeding, restoration along watermain route and at the new water storage facility and new water treatment plant and pumphouse	L.S.	100%	$40,000.00	$40,000.00
2.7	3 Phase hydro and Bell service connection at new water storage facility	L.S.	100%	$20,000.00	$20,000.00
2.8	3 Phase hydro and Bell service connection at new water treatment plant and pumphouse	L.S.	100%	$20,000.00	$20,000.00
3.0	**New Supply Well Construction (PIII-1)**				
3.1	Install new supply well(s)	L.S.	100%	$75,000.00	$75,000.00
4.0	**Watermain Construction**				
4.1	Construct 300 mm ⌀ watermain	m	13,265	$350.00	$4,642,750.00
4.2	Pressure reducing valve chambers	L.S.	100%	$50,000.00	$50,000.00
4.3	Hydrants	ea.	74	$4,500.00	$333,000.00
4.4	Rock removal by blasting	m^3	2400	$165.00	$396,000.00
5.0	**New Water Treatment Plant and Pumphouse (PIII-1)**				
5.1	Construct new water treatment plant and pumphouse	L.S.	100%	$900,000.00	$900,000.00
6.0	**New Water Storage Facility (PIII-1)**				
6.1	Construction of new glass-fused to steel elevated water storage facility	L.S.	100%	$2,700,000.00	$2,700,000.00
7.0	**Environmental Works**				
7.1	Erosion control	L.S.	100%	$40,000.00	$40,000.00
8.0	**Bonding & Insurance**	L.S.	100%	$215,000.00	$215,000.00
9.0	**Allowances**				
9.1	Soils investigation prior to Construction	L.S.	100%	$20,000.00	$20,000.00
9.2	Rock Blast Survey	L.S.	100%	$10,000.00	$10,000.00
9.3	Startup of new Water Storage Facility, New Water Treatment Plant and Pumphouse and watermain including commissioning, reports and manuals	L.S.	100%	$20,000.00	$20,000.00
	Subtotal Construction Cost				$9,891,750.00
	Construction Contingency	%	10%		$989,175.00
	Total Construction Cost				$10,880,925.00
	Non-Construction				
10.0	**Engineering Design**	%	7%		$761,664.75
11.0	**Contract Administration**	%	8%		$870,474.00

Table W.2: Cost Estimate for Alternative W.2 - Water

WATER AND WASTEWATER SERVICING MASTER PLAN
MARKDALE-FLESHERTON-KIMBERLEY-AMIK-EUGENIA-BEAVER VALLEY
MUNICIPALITY OF GREY HIGHLANDS

12.0	**Engineering Disbursement**	%	1.2%		$130,571.10
13.0	**Approvals (CofA, Zoning, etc.)**	L.S.	100%	$25,000.00	$25,000.00
14.0	**EA for New Well(s)**	L.S.	100%	$20,000.00	$20,000.00
15.0	**Test Pump of New Well(s)**	L.S.	100%	$30,000.00	$20,000.00
16.0	**Aquifer Evaluation Report for New Well(s)**	L.S.	100%	$20,000.00	$20,000.00
17.0	**Materials Testing Allowance and Soils Inspection during construction**	L.S.	100%	$30,000.00	$30,000.00
	Total Non-Construction Cost				$1,877,709.85
	Total Cost for Construction				**$12,758,634.85**
	Total Project Cost for Alternative W.2				**$41,778,965.68**

Table W.3: Cost Estimate for Alternative W.3 - Water

WATER AND WASTEWATER SERVICING MASTER PLAN
MARKDALE-FLESHERTON-KIMBERLEY-AMIK-EUGENIA-BEAVER VALLEY
MUNICIPALITY OF GREY HIGHLANDS

Capital Cost Estimate (Class C)					
2012 Constant Dollars					**January 2012**
Item #	**Item Description**	**Unit**	**Qty**	**Unit Cost**	**Total**
Markdale (PI-1, PI-3, PI-4, PII-1, PII-2, PII-3 and PII-4)					
	Construction				
1.0	**Mobilization/Demobilization**	L.S.	100%	$300,000.00	$300,000.00
2.0	**Site Work**				
2.1	Clearing and grubbing of watermain route	L.S.	100%	$125,000.00	$125,000.00
2.2	Clearing and grubbing at new water storage facility	L.S.	100%	$5,000.00	$5,000.00
2.3	Clearing and grubbing at new water treatment plant and pumphouse	L.S.	100%	$20,000.00	$20,000.00
2.4	Site development work at new water storage facility (access, fill, parking, yard piping)	L.S.	100%	$50,000.00	$50,000.00
2.5	Site development work at new water treatment plant and pumphouse (access, fill, parking, yard piping)	L.S.	100%	$100,000.00	$100,000.00
2.6	Topsoiling, hydro seeding, restoration along watermain route and at the new water storage facility and new water treatment plant and pumphouse	L.S.	100%	$75,000.00	$75,000.00
2.7	3 Phase hydro and Bell service connection at new water storage facility	L.S.	100%	$20,000.00	$20,000.00
2.8	3 Phase hydro and Bell service connection at new water treatment plant and pumphouse	L.S.	100%	$20,000.00	$20,000.00
2.9	Decommission existing Markdale Standpipe	L.S.	100%	$30,000.00	$30,000.00
3.0	**New Supply Well Construction (PI-1)**				
3.1	Install new supply well	L.S.	100%	$50,000.00	$50,000.00
4.0	**Watermain Construction**				
4.1	Construct 300 mm ⌀ watermain	m	25,914	$350.00	$9,069,900.00
4.2	Construct 200 mm ⌀ watermain (across easement at Beaver Valley to Grey Road 30)	m	1,808	$300.00	$542,400.00
4.3	Pressure reducing valve chambers	L.S.	100%	$50,000.00	$50,000.00
4.4	Hydrants	ea.	144	$4,500.00	$648,000.00
4.5	Rock removal by blasting	m^3	4650	$165.00	$767,250.00
5.0	**New Water Treatment Plant and Pumphouse (PI-1)**				
5.1	Construct new water treatment plant and pumphouse	L.S.	100%	$900,000.00	$900,000.00

Table W.3: Cost Estimate for Alternative W.3 - Water

WATER AND WASTEWATER SERVICING MASTER PLAN
MARKDALE-FLESHERTON-KIMBERLEY-AMIK-EUGENIA-BEAVER VALLEY
MUNICIPALITY OF GREY HIGHLANDS

Capital Cost Estimate (Class C)					
2012 Constant Dollars					**January 2012**
Item #	**Item Description**	**Unit**	**Qty**	**Unit Cost**	**Total**
6.0	**New Water Storage Facility (PI-1)**				
6.1	Construction of new glass-fused to steel elevated water storage facility	L.S.	100%	$4,500,000.00	$4,500,000.00
7.0	**Environmental Works**				
7.1	Erosion control	L.S.	100%	$75,000.00	$75,000.00
8.0	**Bonding & Insurance**	L.S.	100%	$380,000.00	$380,000.00
9.0	**Allowances**				
9.1	Soils investigation prior to Construction	L.S.	100%	$40,000.00	$40,000.00
9.2	Rock Blast Survey	L.S.	100%	$20,000.00	$20,000.00
9.3	Startup of new Water Storage Facility, New Water Treatment Plant and Pumphouse and watermain including commissioning, reports and manuals	L.S.	100%	$40,000.00	$40,000.00
	Subtotal Construction Cost				$17,827,550.00
	Construction Contingency	%	10%		$1,782,755.00
	Total Construction Cost				$19,610,305.00
	Non-Construction				
10.0	**Engineering Design**	%	7%		$1,372,721.35
11.0	**Contract Administration**	%	8%		$1,568,824.40
12.0	**Engineering Disbursement**	%	1.2%		$235,323.66
13.0	**Approvals (CofA, Zoning, etc.)**	L.S.	100%	$50,000.00	$50,000.00
14.0	**EA for New Well**	L.S.	100%	$20,000.00	$20,000.00
15.0	**Test Pump of New Well**	L.S.	100%	$20,000.00	$20,000.00
16.0	**Aquifer Evaluation Report for New Well**	L.S.	100%	$20,000.00	$20,000.00
17.0	**Materials Testing Allowance and Soils Inspection during construction**	L.S.	100%	$60,000.00	$60,000.00
	Total Non-Construction Cost				$3,346,869.41
	Total Cost for Construction				$22,957,174.41
	Kimberley-Amik-Talisman (PI-2 and PI-5)				
	Construction				
1.0	**Mobilization/Demobilization**	L.S.	100%	$50,000.00	$50,000.00

Table W.3: Cost Estimate for Alternative W.3 - Water

WATER AND WASTEWATER SERVICING MASTER PLAN
MARKDALE-FLESHERTON-KIMBERLEY-AMIK-EUGENIA-BEAVER VALLEY
MUNICIPALITY OF GREY HIGHLANDS

Capital Cost Estimate (Class C)					
2012 Constant Dollars					**January 2012**
Item #	**Item Description**	**Unit**	**Qty**	**Unit Cost**	**Total**
2.0	**Site Work**				
2.1	Clearing and grubbing of watermain route	L.S.	100%	$25,000.00	$25,000.00
2.2	Topsoiling, hydro seeding, restoration along watermain route	L.S.	100%	$10,000.00	$10,000.00
3.0	**Watermain Construction**				
3.1	Construct 300 mm ⌀ watermain	m	6,470	$350.00	$2,264,500.00
3.2	Pressure reducing valve chambers	L.S.	100%	$25,000.00	$25,000.00
3.3	Hydrants	ea.	36	$4,500.00	$162,000.00
3.4	Rock removal by blasting	m^3	1200	$165.00	$198,000.00
4.0	**New Booster Pumping Station (PI-2)**				
4.1	Construction of new booster pumping station	L.S.	100%	$500,000.00	$500,000.00
5.0	**Environmental Works**				
5.1	Erosion control	L.S.	100%	$15,000.00	$15,000.00
6.0	**Bonding & Insurance**	L.S.	100%	$60,000.00	$60,000.00
7.0	**Allowances**				
7.1	Soils investigation prior to construction	L.S.	100%	$10,000.00	$10,000.00
7.2	Rock Blast Survey	L.S.	100%	$5,000.00	$5,000.00
7.3	Startup and commissioning of new watermain	L.S.	100%	$10,000.00	$10,000.00
	Subtotal Construction Cost				$3,334,500.00
	Construction Contingency	%	10%		$333,450.00
	Total Construction Cost				$3,667,950.00
	Non-Construction				
8.0	**Engineering Design**	%	7%		$256,756.50
9.0	**Contract Administration**	%	8%		$293,436.00
10.0	**Engineering Disbursement**	%	1.2%		$44,015.40
11.0	**Approvals (CofA, Zoning, etc.)**	L.S.	100%	$15,000.00	$15,000.00
12.0	**Materials Testing Allowance and Soils Inspection during construction**	L.S.	100%	$15,000.00	$15,000.00
	Total Non-Construction Cost				$624,207.90
	Total Cost for Construction				$4,292,157.90

Table W.3: Cost Estimate for Alternative W.3 - Water

WATER AND WASTEWATER SERVICING MASTER PLAN
MARKDALE-FLESHERTON-KIMBERLEY-AMIK-EUGENIA-BEAVER VALLEY
MUNICIPALITY OF GREY HIGHLANDS

Capital Cost Estimate (Class C)					
2012 Constant Dollars					**January 2012**
Item #	**Item Description**	**Unit**	**Qty**	**Unit Cost**	**Total**
	Eugenia (PIII-1, PIII-2, PIII-3 and PIII-4)				
	Construction				
1.0	**Mobilization/Demobilization**	L.S.	100%	$150,000.00	$150,000.00
2.0	**Site Work**				
2.1	Clearing and grubbing of watermain route	L.S.	100%	$75,000.00	$75,000.00
2.2	Clearing and grubbing at new water storage facility	L.S.	100%	$15,000.00	$15,000.00
2.3	Clearing and grubbing at new water treatment plant and pumphouse	L.S.	100%	$20,000.00	$20,000.00
2.4	Site development work at new water storage facility (access, fill, parking, yard piping)	L.S.	100%	$50,000.00	$50,000.00
2.5	Site development work at new water treatment plant and pumphouse (access, fill, parking, yard piping)	L.S.	100%	$100,000.00	$100,000.00
2.6	Topsoiling, hydro seeding, restoration along watermain route and at the new water storage facility and new water treatment plant and pumphouse	L.S.	100%	$40,000.00	$40,000.00
2.7	3 Phase hydro and Bell service connection at new water storage facility	L.S.	100%	$20,000.00	$20,000.00
2.8	3 Phase hydro and Bell service connection at new water treatment plant and pumphouse	L.S.	100%	$20,000.00	$20,000.00
3.0	**New Supply Well Construction (PIII-1)**				
3.1	Install new supply well(s)	L.S.	100%	$75,000.00	$75,000.00
4.0	**Watermain Construction**				
4.1	Construct 300 mm ⌀ watermain	m	13,265	$350.00	$4,642,750.00
4.2	Pressure reducing valve chambers	L.S.	100%	$50,000.00	$50,000.00
4.3	Hydrants	ea.	74	$4,500.00	$333,000.00
4.4	Rock removal by blasting	m^3	2400	$165.00	$396,000.00
5.0	**New Water Treatment Plant and Pumphouse (PIII-1)**				
5.1	Construct new water treatment plant and pumphouse	L.S.	100%	$900,000.00	$900,000.00
6.0	**New Water Storage Facility (PIII-1)**				

Table W.3: Cost Estimate for Alternative W.3 - Water

WATER AND WASTEWATER SERVICING MASTER PLAN
MARKDALE-FLESHERTON-KIMBERLEY-AMIK-EUGENIA-BEAVER VALLEY
MUNICIPALITY OF GREY HIGHLANDS

6.1	Construction of new glass-fused to steel elevated water storage facility	L.S.	100%	$2,700,000.00	$2,700,000.00
7.0	**Environmental Works**				
7.1	Erosion control	L.S.	100%	$40,000.00	$40,000.00
8.0	**Bonding & Insurance**	L.S.	100%	$215,000.00	$215,000.00
9.0	**Allowances**				
9.1	Soils investigation prior to Construction	L.S.	100%	$20,000.00	$20,000.00
9.2	Rock Blast Survey	L.S.	100%	$10,000.00	$10,000.00
9.3	Startup of new Water Storage Facility, New Water Treatment Plant and Pumphouse and watermain including commissioning, reports and manuals	L.S.	100%	$20,000.00	$20,000.00
	Subtotal Construction Cost				$9,891,750.00
	Construction Contingency	%	10%		$989,175.00
	Total Construction Cost				$10,880,925.00
	Non-Construction				
10.0	**Engineering Design**	%	7%		$761,664.75
11.0	**Contract Administration**	%	8%		$870,474.00
12.0	**Engineering Disbursement**	%	1.2%		$130,571.10
13.0	**Approvals (CofA, Zoning, etc.)**	L.S.	100%	$25,000.00	$25,000.00
14.0	**EA for New Well(s)**	L.S.	100%	$20,000.00	$20,000.00
15.0	**Test Pump of New Well(s)**	L.S.	100%	$30,000.00	$20,000.00
16.0	**Aquifer Evaluation Report for New Well(s)**	L.S.	100%	$20,000.00	$20,000.00
17.0	**Materials Testing Allowance and Soils Inspection during construction**	L.S.	100%	$30,000.00	$30,000.00
	Total Non-Construction Cost				$1,877,709.85
	Total Cost for Construction				$12,758,634.85
	Total Project Cost for Alternative W.3				$40,007,967.16

Table W.4: Cost Estimate for Alternative W.4 - Water

WATER AND WASTEWATER SERVICING MASTER PLAN
MARKDALE-FLESHERTON-KIMBERLEY-AMIK-EUGENIA-BEAVER VALLEY
MUNICIPALITY OF GREY HIGHLANDS

Capital Cost Estimate (Class C)					
2012 Constant Dollars					**January 2012**
Item #	**Item Description**	**Unit**	**Qty**	**Unit Cost**	**Total**
	Markdale (PI-1, PI-3, PI-4 and PII-3)				
	Construction				
1.0	**Mobilization/Demobilization**	L.S.	100%	$200,000.00	$200,000.00
2.0	**Site Work**				
2.1	Clearing and grubbing of watermain route	L.S.	100%	$75,000.00	$75,000.00
2.2	Clearing and grubbing at new water storage facility	L.S.	100%	$5,000.00	$5,000.00
2.3	Clearing and grubbing at new water treatment plant and pumphouse	L.S.	100%	$20,000.00	$20,000.00
2.4	Site development work at new water storage facility (access, fill, parking, yard piping)	L.S.	100%	$50,000.00	$50,000.00
2.5	Site development work at new water treatment plant and pumphouse (access, fill, parking, yard piping)	L.S.	100%	$100,000.00	$100,000.00
2.6	Topsoiling, hydro seeding, restoration along watermain route and at the new water storage facility and new water treatment plant and pumphouse	L.S.	100%	$50,000.00	$50,000.00
2.7	3 Phase hydro and Bell service connection at new water storage facility	L.S.	100%	$20,000.00	$20,000.00
2.8	3 Phase hydro and Bell service connection at new water treatment plant and pumphouse	L.S.	100%	$20,000.00	$20,000.00
2.9	Decommission existing Markdale Standpipe	L.S.	100%	$30,000.00	$30,000.00
3.0	**New Supply Well Construction (PI-1)**				
3.1	Install new supply well	L.S.	100%	$50,000.00	$50,000.00
4.0	**Watermain Construction**				
4.1	Construct 300 mm ⌀ watermain	m	17,100	$350.00	$5,985,000.00
4.2	Construct 200 mm ⌀ watermain (across easement at Beaver Valley to Grey Road 30)	m	1,808	$300.00	$542,400.00
4.3	Pressure reducing valve chambers	L.S.	100%	$50,000.00	$50,000.00
4.4	Hydrants	ea.	95	$4,500.00	$427,500.00
4.5	Rock removal by blasting	m^3	3100	$165.00	$511,500.00
5.0	**New Water Treatment Plant and Pumphouse (PI-1)**				
5.1	Construct new water treatment plant and pumphouse	L.S.	100%	$900,000.00	$900,000.00

Table W.4: Cost Estimate for Alternative W.4 - Water

WATER AND WASTEWATER SERVICING MASTER PLAN
MARKDALE-FLESHERTON-KIMBERLEY-AMIK-EUGENIA-BEAVER VALLEY
MUNICIPALITY OF GREY HIGHLANDS

Capital Cost Estimate (Class C)					
2012 Constant Dollars					**January 2012**
Item #	**Item Description**	**Unit**	**Qty**	**Unit Cost**	**Total**
6.0	**New Water Storage Facility (PI-1)**				
6.1	Construction of new glass-fused to steel elevated water storage facility	L.S.	100%	$4,200,000.00	$4,200,000.00
7.0	**Environmental Works**				
7.1	Erosion control	L.S.	100%	$50,000.00	$50,000.00
8.0	**Bonding & Insurance**	L.S.	100%	$290,000.00	$290,000.00
9.0	**Allowances**				
9.1	Soils investigation prior to Construction	L.S.	100%	$25,000.00	$25,000.00
9.2	Rock Blast Survey	L.S.	100%	$10,000.00	$10,000.00
9.3	Startup of new Water Storage Facility, New Water Treatment Plant and Pumphouse and watermain including commissioning, reports and manuals	L.S.	100%	$20,000.00	$20,000.00
	Subtotal Construction Cost				$13,631,400.00
	Construction Contingency	%	10%		$1,363,140.00
	Total Construction Cost				$14,994,540.00
	Non-Construction				
10.0	**Engineering Design**	%	7%		$1,049,617.80
11.0	**Contract Administration**	%	8%		$1,199,563.20
12.0	**Engineering Disbursement**	%	1.2%		$179,934.48
13.0	**Approvals (CofA, Zoning, etc.)**	L.S.	100%	$25,000.00	$25,000.00
14.0	**EA for New Well**	L.S.	100%	$20,000.00	$20,000.00
15.0	**Test Pump of New Well**	L.S.	100%	$20,000.00	$20,000.00
16.0	**Aquifer Evaluation Report for New Well**	L.S.	100%	$20,000.00	$20,000.00
17.0	**Materials Testing Allowance and Soils Inspection during construction**	L.S.	100%	$40,000.00	$40,000.00
	Total Non-Construction Cost				$2,554,115.48
	Total Cost for Construction				$17,548,655.48
	Kimberley-Amik-Talisman (PI-2 and PI-5)				
	Construction				
1.0	**Mobilization/Demobilization**	L.S.	100%	$50,000.00	$50,000.00

Table W.4: Cost Estimate for Alternative W.4 - Water

WATER AND WASTEWATER SERVICING MASTER PLAN
MARKDALE-FLESHERTON-KIMBERLEY-AMIK-EUGENIA-BEAVER VALLEY
MUNICIPALITY OF GREY HIGHLANDS

Capital Cost Estimate (Class C)					
2012 Constant Dollars					**January 2012**
Item #	**Item Description**	**Unit**	**Qty**	**Unit Cost**	**Total**
2.0	**Site Work**				
2.1	Clearing and grubbing of watermain route	L.S.	100%	$25,000.00	$25,000.00
2.2	Topsoiling, hydro seeding, restoration along watermain route	L.S.	100%	$10,000.00	$10,000.00
3.0	**Watermain Construction**				
3.1	Construct 300 mm ⌀ watermain	m	6,470	$350.00	$2,264,500.00
3.2	Pressure reducing valve chambers	L.S.	100%	$25,000.00	$25,000.00
3.3	Hydrants	ea.	36	$4,500.00	$162,000.00
3.4	Rock removal by blasting	m^3	1200	$165.00	$198,000.00
4.0	**New Booster Pumping Station (PI-2)**				
4.1	Construction of new booster pumping station	L.S.	100%	$500,000.00	$500,000.00
5.0	**Environmental Works**				
5.1	Erosion control	L.S.	100%	$15,000.00	$15,000.00
6.0	**Bonding & Insurance**	L.S.	100%	$60,000.00	$60,000.00
7.0	**Allowances**				
7.1	Soils investigation prior to construction	L.S.	100%	$10,000.00	$10,000.00
7.2	Rock Blast Survey	L.S.	100%	$5,000.00	$5,000.00
7.3	Startup and commissioning of new watermain	L.S.	100%	$10,000.00	$10,000.00
	Subtotal Construction Cost				$3,334,500.00
	Construction Contingency	%	10%		$333,450.00
	Total Construction Cost				$3,667,950.00
	Non-Construction				
8.0	**Engineering Design**	%	7%		$256,756.50
9.0	**Contract Administration**	%	8%		$293,436.00
10.0	**Engineering Disbursement**	%	1.2%		$44,015.40
11.0	**Approvals (CofA, Zoning, etc.)**	L.S.	100%	$15,000.00	$15,000.00
12.0	**Materials Testing Allowance and Soils Inspection during construction**	L.S.	100%	$15,000.00	$15,000.00
	Total Non-Construction Cost				$624,207.90
	Total Cost for Construction				$4,292,157.90

Table W.4: Cost Estimate for Alternative W.4 - Water

WATER AND WASTEWATER SERVICING MASTER PLAN
MARKDALE-FLESHERTON-KIMBERLEY-AMIK-EUGENIA-BEAVER VALLEY
MUNICIPALITY OF GREY HIGHLANDS

Flesherton (PII-1, PII-2, PII-4, PIII-1, PIII-2, PIII-3 and PIII-4)					
	Construction				
1.0	**Mobilization/Demobilization**	L.S.	100%	$250,000.00	$250,000.00
2.0	**Site Work**				
2.1	Clearing and grubbing of watermain route	L.S.	100%	$125,000.00	$125,000.00
2.2	Clearing and grubbing at new water storage facility	L.S.	100%	$15,000.00	$15,000.00
2.3	Clearing and grubbing at new water treatment plant and pumphouse	L.S.	100%	$20,000.00	$20,000.00
2.4	Site development work at new water storage facility (access, fill, parking, yard piping)	L.S.	100%	$50,000.00	$50,000.00
2.5	Site development work at new water treatment plant and pumphouse (access, fill, parking, yard piping)	L.S.	100%	$100,000.00	$100,000.00
2.6	Topsoiling, hydro seeding, restoration along watermain route and at the new water storage facility and new water treatment plant and pumphouse	L.S.	100%	$65,000.00	$65,000.00
2.7	3 Phase hydro and Bell service connection at new water storage facility	L.S.	100%	$20,000.00	$20,000.00
2.8	3 Phase hydro and Bell service connection at new water treatment plant and pumphouse	L.S.	100%	$20,000.00	$20,000.00
3.0	**New Supply Well Construction (PII-1 or PII-2)**				
3.1	Install new supply well(s)	L.S.	100%	$75,000.00	$75,000.00
4.0	**Watermain Construction**				
4.1	Construct 300 mm ⌀ watermain	m	22,080	$350.00	$7,728,000.00
4.2	Pressure reducing valve chambers	L.S.	100%	$50,000.00	$50,000.00
4.3	Hydrants	ea.	123	$4,500.00	$553,500.00
4.4	Rock removal by blasting	m^3	4000	$165.00	$660,000.00
5.0	**New Water Treatment Plant and Pumphouse (PII-1 or PII-2)**				
5.1	Construct new water treatment plant and pumphouse	L.S.	100%	$900,000.00	$900,000.00
6.0	**New Water Storage Facility (PII-2)**				
6.1	Construction of new glass-fused to steel on-ground water storage facility	L.S.	100%	$700,000.00	$700,000.00
7.0	**Environmental Works**				
7.1	Erosion control	L.S.	100%	$65,000.00	$65,000.00
8.0	**Bonding & Insurance**	L.S.	100%	$250,000.00	$250,000.00
9.0	**Allowances**				

Table W.4: Cost Estimate for Alternative W.4 - Water

WATER AND WASTEWATER SERVICING MASTER PLAN
MARKDALE-FLESHERTON-KIMBERLEY-AMIK-EUGENIA-BEAVER VALLEY
MUNICIPALITY OF GREY HIGHLANDS

9.1	Soils investigation prior to Construction	L.S.	100%	$35,000.00	$35,000.00
9.2	Rock Blast Survey	L.S.	100%	$20,000.00	$20,000.00
9.3	Startup of new Water Storage Facility, New Water Treatment Plant and Pumphouse and watermain including commissioning, reports and manuals	L.S.	100%	$40,000.00	$40,000.00
	Subtotal Construction Cost				$11,741,500.00
	Construction Contingency	%	10%		$1,174,150.00
	Total Construction Cost				$12,915,650.00
	Non-Construction				
10.0	**Engineering Design**	%	7%		$904,095.50
11.0	**Contract Administration**	%	8%		$1,033,252.00
12.0	**Engineering Disbursement**	%	1.2%		$154,987.80
13.0	**Approvals (CofA, Zoning, etc.)**	L.S.	100%	$50,000.00	$50,000.00
14.0	**EA for New Well(s)**	L.S.	100%	$20,000.00	$20,000.00
15.0	**Test Pump of New Well(s)**	L.S.	100%	$30,000.00	$20,000.00
16.0	**Aquifer Evaluation Report for New Well(s)**	L.S.	100%	$20,000.00	$20,000.00
17.0	**Materials Testing Allowance and Soils Inspection during construction**	L.S.	100%	$50,000.00	$50,000.00
	Total Non-Construction Cost				$2,252,335.30
	Total Cost for Construction				$15,167,985.30
	Total Project Cost for Alternative W.4				$37,008,798.68

Table W.5: Cost Estimate for Alternative W.5 - Water

WATER AND WASTEWATER SERVICING MASTER PLAN
MARKDALE-FLESHERTON-KIMBERLEY-AMIK-EUGENIA-BEAVER VALLEY
MUNICIPALITY OF GREY HIGHLANDS

Capital Cost Estimate (Class C)					
2012 Constant Dollars					**January 2012**
Item #	**Item Description**	**Unit**	**Qty**	**Unit Cost**	**Total**
Markdale (PI-1, PI-2, PI-3, PI-4, PI-5, PII-1, PII-2, PII-3 and PII-4)					
	Construction				
1.0	**Mobilization/Demobilization**	L.S.	100%	$350,000.00	$350,000.00
2.0	**Site Work**				
2.1	Clearing and grubbing of watermain route	L.S.	100%	$150,000.00	$150,000.00
2.2	Clearing and grubbing at new water storage facility	L.S.	100%	$5,000.00	$5,000.00
2.3	Clearing and grubbing at new water treatment plant and pumphouses	L.S.	100%	$40,000.00	$40,000.00
2.4	Site development work at new water storage facility (access, fill, parking, yard piping)	L.S.	100%	$50,000.00	$50,000.00
2.5	Site development work at new water treatment plant and pumphouses (access, fill, parking, yard piping)	L.S.	100%	$200,000.00	$200,000.00
2.6	Topsoiling, hydro seeding, restoration along watermain route and at the new water storage facility and new water treatment plant and pumphouses	L.S.	100%	$85,000.00	$85,000.00
2.7	3 Phase hydro and Bell service connection at new water storage facility	L.S.	100%	$20,000.00	$20,000.00
2.8	3 Phase hydro and Bell service connection at new water treatment plant and pumphouses	L.S.	100%	$40,000.00	$40,000.00
2.9	Decommission existing Markdale Standpipe	L.S.	100%	$30,000.00	$30,000.00
2.10	Decommission Kimberley-Amik-Talisman WTP	L.S.	100%	$20,000.00	$20,000.00
3.0	**New Supply Well Construction (PI-1)**				
3.1	Install new supply well #1	L.S.	100%	$50,000.00	$50,000.00
3.2	Install new supply well #2	L.S.	100%	$50,000.00	$50,000.00
4.0	**Watermain Construction**				
4.1	Construct 300 mm ⌀ watermain	m	32,383	$350.00	$11,334,050.00
4.2	Construct 200 mm ⌀ watermain (across easement at Beaver Valley to Grey Road 30)	m	1,808	$300.00	$542,400.00
4.3	Pressure reducing valve chambers	L.S.	100%	$75,000.00	$75,000.00
4.4	Hydrants	ea.	180	$4,500.00	$810,000.00
4.5	Rock removal by blasting	m^3	5850	$165.00	$965,250.00

Table W.5: Cost Estimate for Alternative W.5 - Water

WATER AND WASTEWATER SERVICING MASTER PLAN
MARKDALE-FLESHERTON-KIMBERLEY-AMIK-EUGENIA-BEAVER VALLEY
MUNICIPALITY OF GREY HIGHLANDS

Capital Cost Estimate (Class C)					
2012 Constant Dollars					**January 2012**
Item #	**Item Description**	**Unit**	**Qty**	**Unit Cost**	**Total**
5.0	**New Water Treatment Plant and Pumphouse (PI-1)**				
5.1	Construct new water treatment plant and pumphouse #1	L.S.	100%	$900,000.00	$900,000.00
5.2	Construct new water treatment plant and pumphouse #2	L.S.	100%	$900,000.00	$900,000.00
6.0	**New Water Storage Facility (PI-1)**				
6.1	Construction of new glass-fused to steel elevated water storage facility	L.S.	100%	$4,600,000.00	$4,600,000.00
7.0	**New Booster Pumping Station (PI-2)**				
7.1	Construction of new booster pumping station	L.S.	100%	$500,000.00	$500,000.00
8.0	**Environmental Works**				
8.1	Erosion control	L.S.	100%	$90,000.00	$90,000.00
9.0	**Bonding & Insurance**	L.S.	100%	$470,000.00	$470,000.00
10.0	**Allowances**				
10.1	Soils investigation prior to Construction	L.S.	100%	$50,000.00	$50,000.00
10.2	Rock Blast Survey	L.S.	100%	$25,000.00	$25,000.00
10.3	Startup of new Water Storage Facility, New Water Treatment Plant and Pumphouse and watermain including commissioning, reports and manuals	L.S.	100%	$50,000.00	$50,000.00
	Subtotal Construction Cost				$22,401,700.00
	Construction Contingency	%	10%		$2,240,170.00
	Total Construction Cost				$24,641,870.00
	Non-Construction				
11.0	**Engineering Design**	%	7%		$1,724,930.90
12.0	**Contract Administration**	%	8%		$1,971,349.60
13.0	**Engineering Disbursement**	%	1.2%		$295,702.44
14.0	**Approvals (CofA, Zoning, etc.)**	L.S.	100%	$65,000.00	$65,000.00
15.0	**EA for New Wells**	L.S.	100%	$30,000.00	$30,000.00
16.0	**Test Pump of New Wells**	L.S.	100%	$30,000.00	$30,000.00
17.0	**Aquifer Evaluation Report for New Wells**	L.S.	100%	$30,000.00	$30,000.00
18.0	**Materials Testing Allowance and Soils Inspection during construction**	L.S.	100%	$75,000.00	$75,000.00
	Total Non-Construction Cost				$4,221,982.94

Table W.5: Cost Estimate for Alternative W.5 - Water

WATER AND WASTEWATER SERVICING MASTER PLAN
MARKDALE-FLESHERTON-KIMBERLEY-AMIK-EUGENIA-BEAVER VALLEY
MUNICIPALITY OF GREY HIGHLANDS

Capital Cost Estimate (Class C)					
2012 Constant Dollars					**January 2012**
Item #	**Item Description**	**Unit**	**Qty**	**Unit Cost**	**Total**
	Total Cost for Construction				$28,863,852.94

	Eugenia (PIII-1, PIII-2, PIII-3 and PIII-4)				
	Construction				
1.0	**Mobilization/Demobilization**	L.S.	100%	$150,000.00	$150,000.00
2.0	**Site Work**				
2.1	Clearing and grubbing of watermain route	L.S.	100%	$75,000.00	$75,000.00
2.2	Clearing and grubbing at new water storage facility	L.S.	100%	$15,000.00	$15,000.00
2.3	Clearing and grubbing at new water treatment plant and pumphouse	L.S.	100%	$20,000.00	$20,000.00
2.4	Site development work at new water storage facility (access, fill, parking, yard piping)	L.S.	100%	$50,000.00	$50,000.00
2.5	Site development work at new water treatment plant and pumphouse (access, fill, parking, yard piping)	L.S.	100%	$100,000.00	$100,000.00
2.6	Topsoiling, hydro seeding, restoration along watermain route and at the new water storage facility and new water treatment plant and pumphouse	L.S.	100%	$40,000.00	$40,000.00
2.7	3 Phase hydro and Bell service connection at new water storage facility	L.S.	100%	$20,000.00	$20,000.00
2.8	3 Phase hydro and Bell service connection at new water treatment plant and pumphouse	L.S.	100%	$20,000.00	$20,000.00
3.0	**New Supply Well Construction (PIII-1)**				
3.1	Install new supply well(s)	L.S.	100%	$75,000.00	$75,000.00
4.0	**Watermain Construction**				
4.1	Construct 300 mm ⌀ watermain	m	13,265	$350.00	$4,642,750.00
4.2	Pressure reducing valve chambers	L.S.	100%	$50,000.00	$50,000.00
4.3	Hydrants	ea.	74	$4,500.00	$333,000.00
4.4	Rock removal by blasting	m^3	2400	$165.00	$396,000.00
5.0	**New Water Treatment Plant and Pumphouse (PIII-1)**				
5.1	Construct new water treatment plant and pumphouse	L.S.	100%	$900,000.00	$900,000.00
6.0	**New Water Storage Facility (PIII-1)**				

Table W.5: Cost Estimate for Alternative W.5 - Water

WATER AND WASTEWATER SERVICING MASTER PLAN
MARKDALE-FLESHERTON-KIMBERLEY-AMIK-EUGENIA-BEAVER VALLEY
MUNICIPALITY OF GREY HIGHLANDS

6.1	Construction of new glass-fused to steel elevated water storage facility	L.S.	100%	$2,700,000.00	$2,700,000.00
7.0	**Environmental Works**				
7.1	Erosion control	L.S.	100%	$40,000.00	$40,000.00
8.0	**Bonding & Insurance**	L.S.	100%	$215,000.00	$215,000.00
9.0	**Allowances**				
9.1	Soils investigation prior to Construction	L.S.	100%	$20,000.00	$20,000.00
9.2	Rock Blast Survey	L.S.	100%	$10,000.00	$10,000.00
9.3	Startup of new Water Storage Facility, New Water Treatment Plant and Pumphouse and watermain including commissioning, reports and manuals	L.S.	100%	$20,000.00	$20,000.00
	Subtotal Construction Cost				$9,891,750.00
	Construction Contingency	%	10%		$989,175.00
	Total Construction Cost				$10,880,925.00
	Non-Construction				
10.0	**Engineering Design**	%	7%		$761,664.75
11.0	**Contract Administration**	%	8%		$870,474.00
12.0	**Engineering Disbursement**	%	1.2%		$130,571.10
13.0	**Approvals (CofA, Zoning, etc.)**	L.S.	100%	$25,000.00	$25,000.00
14.0	**EA for New Well(s)**	L.S.	100%	$20,000.00	$20,000.00
15.0	**Test Pump of New Well(s)**	L.S.	100%	$30,000.00	$20,000.00
16.0	**Aquifer Evaluation Report for New Well(s)**	L.S.	100%	$20,000.00	$20,000.00
17.0	**Materials Testing Allowance and Soils Inspection during construction**	L.S.	100%	$30,000.00	$30,000.00
	Total Non-Construction Cost				$1,877,709.85
	Total Cost for Construction				$12,758,634.85
	Total Project Cost for Alternative W.5				$41,622,487.79

Table W.6: Cost Estimate for Alternative W.6 - Water

WATER AND WASTEWATER SERVICING MASTER PLAN
MARKDALE-FLESHERTON-KIMBERLEY-AMIK-EUGENIA-BEAVER VALLEY
MUNICIPALITY OF GREY HIGHLANDS

Capital Cost Estimate (Class C)					
2012 Constant Dollars					**January 2012**
Item #	**Item Description**	**Unit**	**Qty**	**Unit Cost**	**Total**
	Markdale (PI-1, PI-2, PI-3, PI-4, PI-5 and PII-3)				
	Construction				
1.0	**Mobilization/Demobilization**	L.S.	100%	$250,000.00	$250,000.00
2.0	**Site Work**				
2.1	Clearing and grubbing of watermain route	L.S.	100%	$100,000.00	$100,000.00
2.2	Clearing and grubbing at new water storage facility	L.S.	100%	$5,000.00	$5,000.00
2.3	Clearing and grubbing at new water treatment plant and pumphouse	L.S.	100%	$20,000.00	$20,000.00
2.4	Site development work at new water storage facility (access, fill, parking, yard piping)	L.S.	100%	$50,000.00	$50,000.00
2.5	Site development work at new water treatment plant and pumphouse (access, fill, parking, yard piping)	L.S.	100%	$100,000.00	$100,000.00
2.6	Topsoiling, hydro seeding, restoration along watermain route and at the new water storage facility and new water treatment plant and pumphouse	L.S.	100%	$60,000.00	$60,000.00
2.7	3 Phase hydro and Bell service connection at new water storage facility	L.S.	100%	$20,000.00	$20,000.00
2.8	3 Phase hydro and Bell service connection at new water treatment plant and pumphouse	L.S.	100%	$20,000.00	$20,000.00
2.9	Decommission existing Markdale Standpipe	L.S.	100%	$30,000.00	$30,000.00
2.10	Decommission Kimberley-Amik-Talisman WTP	L.S.	100%	$20,000.00	$20,000.00
3.0	**New Supply Well Construction (PI-1)**				
3.1	Install new supply well	L.S.	100%	$50,000.00	$50,000.00
4.0	**Watermain Construction**				
4.1	Construct 300 mm ⌀ watermain	m	23,568	$350.00	$8,248,800.00
4.2	Construct 200 mm ⌀ watermain (across easement at Beaver Valley to Grey Road 30)	m	1,808	$300.00	$542,400.00
4.3	Pressure reducing valve chambers	L.S.	100%	$75,000.00	$75,000.00
4.4	Hydrants	ea.	131	$4,500.00	$589,500.00
4.5	Rock removal by blasting	m^3	4250	$165.00	$701,250.00
5.0	**New Water Treatment Plant and Pumphouse (PI-1)**				

Table W.6: Cost Estimate for Alternative W.6 - Water

WATER AND WASTEWATER SERVICING MASTER PLAN
MARKDALE-FLESHERTON-KIMBERLEY-AMIK-EUGENIA-BEAVER VALLEY
MUNICIPALITY OF GREY HIGHLANDS

Capital Cost Estimate (Class C)					
2012 Constant Dollars					**January 2012**
Item #	**Item Description**	**Unit**	**Qty**	**Unit Cost**	**Total**
5.1	Construct new water treatment plant and pumphouse	L.S.	100%	$900,000.00	$900,000.00
6.0	**New Water Storage Facility (PI-1)**				
6.1	Construction of new glass-fused to steel elevated water storage facility	L.S.	100%	$4,400,000.00	$4,400,000.00
7.0	**New Booster Pumping Station (PI-2)**				
7.1	Construction of new booster pumping station	L.S.	100%	$500,000.00	$500,000.00
8.0	**Environmental Works**				
8.1	Erosion control	L.S.	100%	$65,000.00	$65,000.00
9.0	**Bonding & Insurance**	L.S.	100%	$355,000.00	$355,000.00
10.0	**Allowances**				
10.1	Soils investigation prior to Construction	L.S.	100%	$35,000.00	$35,000.00
10.2	Rock Blast Survey	L.S.	100%	$15,000.00	$15,000.00
10.3	Startup of new Water Storage Facility, New Water Treatment Plant and Pumphouse and watermain including commissioning, reports and manuals	L.S.	100%	$30,000.00	$30,000.00
	Subtotal Construction Cost				$17,181,950.00
	Construction Contingency	%	10%		$1,718,195.00
	Total Construction Cost				$18,900,145.00
	Non-Construction				
11.0	**Engineering Design**	%	7%		$1,323,010.15
12.0	**Contract Administration**	%	8%		$1,512,011.60
13.0	**Engineering Disbursement**	%	1.2%		$226,801.74
14.0	**Approvals (CofA, Zoning, etc.)**	L.S.	100%	$40,000.00	$40,000.00
15.0	**EA for New Well**	L.S.	100%	$20,000.00	$20,000.00
16.0	**Test Pump of New Well**	L.S.	100%	$20,000.00	$20,000.00
17.0	**Aquifer Evaluation Report for New Well**	L.S.	100%	$20,000.00	$20,000.00
18.0	**Materials Testing Allowance and Soils Inspection during construction**	L.S.	100%	$55,000.00	$55,000.00
	Total Non-Construction Cost				$3,216,823.49
	Total Cost for Construction				$22,116,968.49

Table W.6: Cost Estimate for Alternative W.6 - Water

WATER AND WASTEWATER SERVICING MASTER PLAN
MARKDALE-FLESHERTON-KIMBERLEY-AMIK-EUGENIA-BEAVER VALLEY
MUNICIPALITY OF GREY HIGHLANDS

Flesherton (PII-1, PII-2, PII-4, PIII-1, PIII-2, PIII-3 and PIII-4)					
	Construction				
1.0	**Mobilization/Demobilization**	L.S.	100%	$250,000.00	$250,000.00
2.0	**Site Work**				
2.1	Clearing and grubbing of watermain route	L.S.	100%	$125,000.00	$125,000.00
2.2	Clearing and grubbing at new water storage facility	L.S.	100%	$15,000.00	$15,000.00
2.3	Clearing and grubbing at new water treatment plant and pumphouse	L.S.	100%	$20,000.00	$20,000.00
2.4	Site development work at new water storage facility (access, fill, parking, yard piping)	L.S.	100%	$50,000.00	$50,000.00
2.5	Site development work at new water treatment plant and pumphouse (access, fill, parking, yard piping)	L.S.	100%	$100,000.00	$100,000.00
2.6	Topsoiling, hydro seeding, restoration along watermain route and at the new water storage facility and new water treatment plant and pumphouse	L.S.	100%	$65,000.00	$65,000.00
2.7	3 Phase hydro and Bell service connection at new water storage facility	L.S.	100%	$20,000.00	$20,000.00
2.8	3 Phase hydro and Bell service connection at new water treatment plant and pumphouse	L.S.	100%	$20,000.00	$20,000.00
3.0	**New Supply Well Construction (PII-1 or PII-2)**				
3.1	Install new supply well(s)	L.S.	100%	$75,000.00	$75,000.00
4.0	**Watermain Construction**				
4.1	Construct 300 mm ⌀ watermain	m	22,080	$350.00	$7,728,000.00
4.2	Pressure reducing valve chambers	L.S.	100%	$50,000.00	$50,000.00
4.3	Hydrants	ea.	123	$4,500.00	$553,500.00
4.4	Rock removal by blasting	m^3	4000	$165.00	$660,000.00
5.0	**New Water Treatment Plant and Pumphouse (PII-1 or PII-2)**				
5.1	Construct new water treatment plant and pumphouse	L.S.	100%	$900,000.00	$900,000.00
6.0	**New Water Storage Facility (PII-2)**				
6.1	Construction of new glass-fused to steel on-ground water storage facility	L.S.	100%	$700,000.00	$700,000.00
7.0	**Environmental Works**				

Table W.6: Cost Estimate for Alternative W.6 - Water

WATER AND WASTEWATER SERVICING MASTER PLAN
MARKDALE-FLESHERTON-KIMBERLEY-AMIK-EUGENIA-BEAVER VALLEY
MUNICIPALITY OF GREY HIGHLANDS

7.1	Erosion control	L.S.	100%	$65,000.00	$65,000.00
8.0	**Bonding & Insurance**	L.S.	100%	$250,000.00	$250,000.00
9.0	**Allowances**				
9.1	Soils investigation prior to Construction	L.S.	100%	$35,000.00	$35,000.00
9.2	Rock Blast Survey	L.S.	100%	$20,000.00	$20,000.00
9.3	Startup of new Water Storage Facility, New Water Treatment Plant and Pumphouse and watermain including commissioning, reports and manuals	L.S.	100%	$40,000.00	$40,000.00
	Subtotal Construction Cost				$11,741,500.00
	Construction Contingency	%	10%		$1,174,150.00
	Total Construction Cost				$12,915,650.00
	Non-Construction				
10.0	**Engineering Design**	%	7%		$904,095.50
11.0	**Contract Administration**	%	8%		$1,033,252.00
12.0	**Engineering Disbursement**	%	1.2%		$154,987.80
13.0	**Approvals (CofA, Zoning, etc.)**	L.S.	100%	$50,000.00	$50,000.00
14.0	**EA for New Well(s)**	L.S.	100%	$20,000.00	$20,000.00
15.0	**Test Pump of New Well(s)**	L.S.	100%	$30,000.00	$20,000.00
16.0	**Aquifer Evaluation Report for New Well(s)**	L.S.	100%	$20,000.00	$20,000.00
17.0	**Materials Testing Allowance and Soils Inspection during construction**	L.S.	100%	$50,000.00	$50,000.00
	Total Non-Construction Cost				$2,252,335.30
	Total Cost for Construction				$15,167,985.30
	Total Project Cost for Alternative W.6				$37,284,953.79

Table W.7: Cost Estimate for Alternative W.7 - Water

WATER AND WASTEWATER SERVICING MASTER PLAN
MARKDALE-FLESHERTON-KIMBERLEY-AMIK-EUGENIA-BEAVER VALLEY
MUNICIPALITY OF GREY HIGHLANDS

Capital Cost Estimate (Class C)					
2012 Constant Dollars					**January 2012**
Item #	**Item Description**	**Unit**	**Qty**	**Unit Cost**	**Total**
Markdale (PI-1, PI-2, PI-3, PI-4, PI-5, PII-1, PII-2, PII-3, PII-4, PIII-1, PIII-2, PIII-3 and PIII-4)					
	Construction				
1.0	**Mobilization/Demobilization**	L.S.	100%	$500,000.00	$500,000.00
2.0	**Site Work**				
2.1	Clearing and grubbing of watermain route	L.S.	100%	$225,000.00	$225,000.00
2.2	Clearing and grubbing at new water storage facility	L.S.	100%	$5,000.00	$5,000.00
2.3	Clearing and grubbing at new water treatment plant and pumphouses	L.S.	100%	$40,000.00	$40,000.00
2.4	Site development work at new water storage facility (access, fill, parking, yard piping)	L.S.	100%	$50,000.00	$50,000.00
2.5	Site development work at new water treatment plant and pumphouses (access, fill, parking, yard piping)	L.S.	100%	$200,000.00	$200,000.00
2.6	Topsoiling, hydro seeding, restoration along watermain route and at the new water storage facility and new water treatment plant and pumphouses	L.S.	100%	$125,000.00	$125,000.00
2.7	3 Phase hydro and Bell service connection at new water storage facility	L.S.	100%	$20,000.00	$20,000.00
2.8	3 Phase hydro and Bell service connection at new water treatment plant and pumphouses	L.S.	100%	$40,000.00	$40,000.00
2.9	Decommission existing Markdale Standpipe	L.S.	100%	$30,000.00	$30,000.00
2.10	Decommission Kimberley-Amik-Talisman WTP	L.S.	100%	$20,000.00	$20,000.00
3.0	**New Supply Wells Construction (P1-1)**				
3.1	Install new supply well #1	L.S.	100%	$50,000.00	$50,000.00
3.2	Install new supply well #2	L.S.	100%	$50,000.00	$50,000.00
4.0	**Watermain Construction**				
4.1	Construct 300 mm ⌀ watermain	m	45,648	$350.00	$15,976,800.00
4.2	Construct 200 mm ⌀ watermain (across easement at Beaver Valley to Grey Road 30)	m	1,808	$300.00	$542,400.00
4.3	Pressure reducing valve chambers	L.S.	100%	$75,000.00	$75,000.00
4.4	Hydrants	ea.	254	$4,500.00	$1,143,000.00
4.5	Rock removal by blasting	m^3	8200	$165.00	$1,353,000.00

Table W.7: Cost Estimate for Alternative W.7 - Water

WATER AND WASTEWATER SERVICING MASTER PLAN
MARKDALE-FLESHERTON-KIMBERLEY-AMIK-EUGENIA-BEAVER VALLEY
MUNICIPALITY OF GREY HIGHLANDS

Capital Cost Estimate (Class C)					
2012 Constant Dollars					**January 2012**
Item #	**Item Description**	**Unit**	**Qty**	**Unit Cost**	**Total**
5.0	**New Water Treatment Plant and Pumphouses (P1-1)**				
5.1	Construct new water treatment plant and pumphouse #1	L.S.	100%	$900,000.00	$900,000.00
5.2	Construct new water treatment plant and pumphouse #2	L.S.	100%	$900,000.00	$900,000.00
6.0	**New Water Storage Facility (P1-1)**				
6.1	Construction of new glass-fused to steel elevated water storage facility	L.S.	100%	$5,750,000.00	$5,750,000.00
7.0	**New Booster Pumping Station (PI-2)**				
7.1	Construction of new booster pumping station	L.S.	100%	$500,000.00	$500,000.00
8.0	**Environmental Works**				
8.1	Erosion control	L.S.	100%	$130,000.00	$130,000.00
9.0	**Bonding & Insurance**	L.S.	100%	$620,000.00	$620,000.00
10.0	**Allowances**				
10.1	Soils investigation prior to Construction	L.S.	100%	$70,000.00	$70,000.00
10.2	Rock Blast Survey	L.S.	100%	$45,000.00	$45,000.00
10.3	Startup of new Water Storage Facility, New Water Treatment Plant and Pumphouses and watermain including commissioning, reports and manuals	L.S.	100%	$70,000.00	$70,000.00
	Subtotal Construction Cost				$29,430,200.00
	Construction Contingency	%	10%		$2,943,020.00
	Total Construction Cost				$32,373,220.00
	Non-Construction				
11.0	**Engineering Design**	%	7%		$2,266,125.40
12.0	**Contract Administration**	%	8%		$2,589,857.60
13.0	**Engineering Disbursement**	%	1.2%		$388,478.64
14.0	**Approvals (CofA, Zoning, etc.)**	L.S.	100%	$90,000.00	$90,000.00
15.0	**EA for New Wells**	L.S.	100%	$30,000.00	$30,000.00
16.0	**Test Pump of New Wells**	L.S.	100%	$30,000.00	$30,000.00
17.0	**Aquifer Evaluation Report for New Wells**	L.S.	100%	$30,000.00	$30,000.00
18.0	**Materials Testing Allowance and Soils Inspection during construction**	L.S.	100%	$105,000.00	$105,000.00
	Total Non-Construction Cost				$5,529,461.64

Table W.7: Cost Estimate for Alternative W.7 - Water

WATER AND WASTEWATER SERVICING MASTER PLAN
MARKDALE-FLESHERTON-KIMBERLEY-AMIK-EUGENIA-BEAVER VALLEY
MUNICIPALITY OF GREY HIGHLANDS

Capital Cost Estimate (Class C)					
2012 Constant Dollars					January 2012
Item #	Item Description	Unit	Qty	Unit Cost	Total
Total Project Cost for Alternative W.7					$37,902,681.64

Table W.7A: Cost Estimate for Alternative W.7A - Water

WATER AND WASTEWATER SERVICING MASTER PLAN
MARKDALE-FLESHERTON-KIMBERLEY-AMIK-EUGENIA-BEAVER VALLEY
MUNICIPALITY OF GREY HIGHLANDS

Capital Cost Estimate (Class C)					
2012 Constant Dollars					**January 2012**
Item #	**Item Description**	**Unit**	**Qty**	**Unit Cost**	**Total**
Markdale (PI-1, PI-2, PI-3, PI-4, PI-5, PII-1, PII-2, PII-3, PII-4, PIII-1, PIII-2, PIII-3 and PIII-4)					
	Construction				
1.0	**Mobilization/Demobilization**	L.S.	100%	$500,000.00	$500,000.00
2.0	**Site Work**				
2.1	Clearing and grubbing of watermain route	L.S.	100%	$350,000.00	$350,000.00
2.2	Clearing and grubbing at new water storage facility	L.S.	100%	$5,000.00	$5,000.00
2.3	Clearing and grubbing at new water treatment plant and pumphouses	L.S.	100%	$40,000.00	$40,000.00
2.4	Site development work at new water storage facility (access, fill, parking, yard piping)	L.S.	100%	$50,000.00	$50,000.00
2.5	Site development work at new water treatment plant and pumphouses (access, fill, parking, yard piping)	L.S.	100%	$200,000.00	$200,000.00
2.6	Site development work at existing Kimberley WTP to allow new trunk watermain connection	L.S.	100%	$50,000.00	$50,000.00
2.7	Topsoiling, hydro seeding, restoration along watermain route and at the new water storage facility and new water treatment plant and pumphouses	L.S.	100%	$200,000.00	$200,000.00
2.8	3 Phase hydro and Bell service connection at new water storage facility	L.S.	100%	$20,000.00	$20,000.00
2.9	Decommission existing Markdale Standpipe	L.S.	100%	$30,000.00	$30,000.00
2.10	3 Phase hydro and Bell service connection at new water treatment plant and pumphouses	L.S.	100%	$40,000.00	$40,000.00
2.1	Decommission Kimberley-Amik-Talisman WTP	L.S.	100%	$20,000.00	$20,000.00
3.0	**New Supply Wells Construction (P1-1)**				
3.1	Install new supply well #1	L.S.	100%	$50,000.00	$50,000.00
3.2	Install new supply well #2	L.S.	100%	$50,000.00	$50,000.00
4.0	**Watermain Construction**				
4.1	Construct 300 mm ⌀ watermain (Service Phases)	m	45,648	$350.00	$15,976,800.00
4.2	Construct 300 mm ⌀ watermain (7th Line)	m	3,771	$350.00	$1,319,850.00
4.3	Construct 300 mm ⌀ watermain (Sideroad 7A)	m	1,041	$350.00	$364,350.00
4.4	Construct 300 mm ⌀ watermain (along top edge of Escarpment)	m	761	$450.00	$342,450.00

Table W.7A: Cost Estimate for Alternative W.7A - Water

WATER AND WASTEWATER SERVICING MASTER PLAN
MARKDALE-FLESHERTON-KIMBERLEY-AMIK-EUGENIA-BEAVER VALLEY
MUNICIPALITY OF GREY HIGHLANDS

Capital Cost Estimate (Class C)					
2012 Constant Dollars					**January 2012**
Item #	**Item Description**	**Unit**	**Qty**	**Unit Cost**	**Total**
4.5	Construct 300 mm ⌀ watermain (down Escarpment to Kimberley WTP)	m	300	$750.00	$225,000.00
4.6	Construct 200 mm ⌀ watermain (across easement at Beaver Valley to Grey Road 30)	m	1,808	$300.00	$542,400.00
4.7	Pressure reducing valve chambers	L.S.	100%	$75,000.00	$75,000.00
4.8	Hydrants (Service Phases)	ea.	254	$4,500.00	$1,143,000.00
4.8	Hydrants (Along 7th Line and Side Road 7A)	ea.	27	$4,500.00	$121,500.00
4.9	Rock removal by blasting	m^3	10000	$165.00	$1,650,000.00
5.0	**New Water Treatment Plant and Pumphouses (P1-1)**				
5.1	Construct new water treatment plant and pumphouse #1	L.S.	100%	$900,000.00	$900,000.00
5.2	Construct new water treatment plant and pumphouse #2	L.S.	100%	$900,000.00	$900,000.00
6.0	**New Water Storage Facility (P1-1)**				
6.1	Construction of new glass-fused to steel elevated water storage facility	L.S.	100%	$5,750,000.00	$5,750,000.00
7.0	**New Booster Pumping Station (PI-2)**				
7.1	Construction of new booster pumping station	L.S.	100%	$500,000.00	$500,000.00
8.0	**Environmental Works**				
8.1	Erosion control	L.S.	100%	$200,000.00	$200,000.00
9.0	**Bonding & Insurance**	L.S.	100%	$685,000.00	$685,000.00
10.0	**Allowances**				
10.1	Soils investigation prior to Construction	L.S.	100%	$100,000.00	$100,000.00
10.2	Rock Blast Survey	L.S.	100%	$60,000.00	$60,000.00
10.3	Startup of new Water Storage Facility, New Water Treatment Plant and Pumphouses and watermain including commissioning, reports and manuals	L.S.	100%	$70,000.00	$70,000.00
	Subtotal Construction Cost				$32,530,350.00
	Construction Contingency	%	10%		$3,253,035.00
	Total Construction Cost				$35,783,385.00
	Non-Construction				
11.0	**Engineering Design**	%	7%		$2,504,836.95
12.0	**Contract Administration**	%	8%		$2,862,670.80

Table W.7A: Cost Estimate for Alternative W.7A - Water

WATER AND WASTEWATER SERVICING MASTER PLAN
MARKDALE-FLESHERTON-KIMBERLEY-AMIK-EUGENIA-BEAVER VALLEY
MUNICIPALITY OF GREY HIGHLANDS

Capital Cost Estimate (Class C)					
2012 Constant Dollars					January 2012
Item #	Item Description	Unit	Qty	Unit Cost	Total
13.0	Engineering Disbursement	%	1.2%		$429,400.62
14.0	Approvals (CofA, Zoning, etc.)	L.S.	100%	$150,000.00	$150,000.00
15.0	EA for New Wells	L.S.	100%	$30,000.00	$30,000.00
16.0	Test Pump of New Wells	L.S.	100%	$30,000.00	$30,000.00
17.0	Aquifer Evaluation Report for New Wells	L.S.	100%	$30,000.00	$30,000.00
18.0	Materials Testing Allowance and Soils Inspection during construction	L.S.	100%	$125,000.00	$125,000.00
	Total Non-Construction Cost				$6,161,908.37
	Total Project Cost for Alternative W.7A				$41,945,293.37

Table S.1: Cost Estimate for Alternative S.1 - Sewage

WATER AND WASTEWATER SERVICING MASTER PLAN
MARKDALE-FLESHERTON-KIMBERLEY-AMIK-EUGENIA-BEAVER VALLEY
MUNICIPALITY OF GREY HIGHLANDS

Capital Cost Estimate (Class C)					
2012 Constant Dollars					**January 2012**
Item #	**Item Description**	**Unit**	**Qty**	**Unit Cost**	**Total**
Markdale WWTP (includes PI-1, PI-3, PI-4 and PII-3)					
	Construction				
1.0	**Mobilization/Demobilization**	L.S.	100%	$200,000.00	$200,000.00
2.0	**Site Work**				
2.1	Clearing and grubbing of forcemain route	L.S.	100%	$75,000.00	$75,000.00
2.2	Clearing and grubbing at new sewage pumping station sites	L.S.	100%	$40,000.00	$40,000.00
2.3	Clearing and grubbing at existing WWTP	L.S.	100%	$20,000.00	$20,000.00
2.4	Site development work at new sewage pumping station sites (access, fill, parking, fencing, yard piping)	L.S.	100%	$200,000.00	$200,000.00
2.5	Site development work at existing WWTP (access, fill, parking, fencing, yard piping)	L.S.	100%	$100,000.00	$100,000.00
2.6	Topsoiling, hydro seeding, restoration along forcemain route, new sewage pumping station sites and at existing WWTP	L.S.	100%	$40,000.00	$40,000.00
2.7	3 Phase hydro and Bell service connection at new sewage pumping stations	L.S.	100%	$40,000.00	$40,000.00
2.8	Asphalt removal	L.S.	100%	$150,000.00	$150,000.00
2.9	50 mm HL-4 base asphalt restoration	L.S.	100%	$750,000.00	$750,000.00
2.10	50 mm HL-3 top coat asphalt restoration	L.S.	100%	$850,000.00	$850,000.00
3.0	**Gravity Sewage Main and Forcemain Construction**				
3.1	Construct 200 mm ⌀ gravity main	m	12,250	$400.00	$4,900,000.00
3.2	Construct 100 mm ⌀ forcemain	m	12,550	$225.00	$2,823,750.00
3.3	Low Pressure Grinder Pump Systems (estimated 50 year)	ea.	30	$6,500.00	$195,000.00
3.4	Manholes (1200 mm ⌀)	ea.	102	$6,500.00	$663,000.00
3.5	Rock removal by blasting	m^3	2250	$165.00	$371,250.00
4.0	**New Sewage Pumping Station #1 (PI-3)**				
4.1	Sewage Pump Chamber	L.S.	100%	$80,000.00	$80,000.00
4.2	Valve Chamber	L.S.	100%	$40,000.00	$40,000.00
4.3	Finishes	L.S.	100%	$15,000.00	$15,000.00

Table S.1: Cost Estimate for Alternative S.1 - Sewage

WATER AND WASTEWATER SERVICING MASTER PLAN
MARKDALE-FLESHERTON-KIMBERLEY-AMIK-EUGENIA-BEAVER VALLEY
MUNICIPALITY OF GREY HIGHLANDS

Capital Cost Estimate (Class C)					
2012 Constant Dollars					**January 2012**
Item #	**Item Description**	**Unit**	**Qty**	**Unit Cost**	**Total**
4.4	Mechanical piping, valves, fittings, pressure gauges, and other accessories	L.S.	100%	$60,000.00	$60,000.00
4.5	Miscellaneous metals	L.S.	100%	$30,000.00	$30,000.00
4.6	Two (2) sewage pumps	ea.	2	$25,000.00	$50,000.00
4.7	Two (2) chain hoist	L.S.	100%	$15,000.00	$15,000.00
4.8	One (1) flow meter	L.S.	100%	$5,000.00	$5,000.00
4.9	Standby diesel engine generator set and accessories	L.S.	100%	$50,000.00	$50,000.00
4.10	Electrical works including MCC, control panels, PLC, SCADA, transducers, etc.	L.S.	100%	$50,000.00	$50,000.00
5.0	**New Sewage Pumping Station #2 (PI-3)**				
5.1	Sewage Pump Chamber	L.S.	100%	$80,000.00	$80,000.00
5.2	Valve Chamber	L.S.	100%	$40,000.00	$40,000.00
5.3	Finishes	L.S.	100%	$15,000.00	$15,000.00
5.4	Mechanical piping, valves, fittings, pressure gauges, and other accessories	L.S.	100%	$60,000.00	$60,000.00
5.5	Miscellaneous metals	L.S.	100%	$30,000.00	$30,000.00
5.6	Two (2) sewage pumps	ea.	2	$25,000.00	$50,000.00
5.7	Two (2) chain hoist	L.S.	100%	$15,000.00	$15,000.00
5.8	One (1) flow meter	L.S.	100%	$5,000.00	$5,000.00
5.9	Standby diesel engine generator set and accessories	L.S.	100%	$50,000.00	$50,000.00
5.10	Electrical works including MCC, control panels, PLC, SCADA, transducers, etc.	L.S.	100%	$50,000.00	$50,000.00
6.0	**Upgrades to Existing Wastewater Treatment Plant**				
6.1	Potential upgrades consisting of new aeration cells, aeration equipment, rapid infiltration basins, control building upgrades to increase treatment design capacity to meet estimated 20 year flows	L.S.	100%	$6,000,000.00	$6,000,000.00
6.2	Purchase of adjacent land to accommodate construction of upgrades to the existing WWTP	L.S.	100%	$400,000.00	$400,000.00
7.0	**Environmental Works**				
7.1	Erosion control	L.S.	100%	$30,000.00	$30,000.00
8.0	**Bonding & Insurance**	L.S.	100%	$400,000.00	$400,000.00
9.0	**Allowances**				

Table S.1: Cost Estimate for Alternative S.1 - Sewage

WATER AND WASTEWATER SERVICING MASTER PLAN
MARKDALE-FLESHERTON-KIMBERLEY-AMIK-EUGENIA-BEAVER VALLEY
MUNICIPALITY OF GREY HIGHLANDS

Capital Cost Estimate (Class C)					
2012 Constant Dollars					**January 2012**
Item #	**Item Description**	**Unit**	**Qty**	**Unit Cost**	**Total**
9.1	Soils investigation prior to Construction	L.S.	100%	$30,000.00	$30,000.00
9.2	Rock Blast Survey	L.S.	100%	$10,000.00	$10,000.00
9.3	Startup of new sewage pumping stations, existing upgraded WWTP and gravity main and forcemain including commissioning, reports and manuals	L.S.	100%	$20,000.00	$20,000.00
	Subtotal Construction Cost				$19,098,000.00
	Construction Contingency	%	10%		$1,909,800.00
	Total Construction Cost				$21,007,800.00
Non-Construction					
10.0	**Engineering Design**	%	7.0%		$1,470,546.00
11.0	**Contract Administration**	%	8.0%		$1,680,624.00
12.0	**Engineering Disbursement**	%	1.2%		$252,093.60
13.0	**Approvals (CofA, Zoning, etc.)**	L.S.	100%	$25,000.00	$25,000.00
14.0	**Materials Testing Allowance and Soils Inspection during construction**	L.S.	100%	$30,000.00	$30,000.00
	Total Non-Construction Cost				$3,458,263.60
	Total Cost for Construction				$24,466,063.60
Amik (includes PI-2, PI-5, PIII-1, PIII-2, PIII-3 and PIII-4)					
Construction					
1.0	**Mobilization/Demobilization**	L.S.	100%	$200,000.00	$200,000.00
2.0	**Site Work**				
2.1	Clearing and grubbing of forcemain route	L.S.	100%	$75,000.00	$75,000.00
2.2	Clearing and grubbing at new sewage pumping station sites	L.S.	100%	$40,000.00	$40,000.00
2.3	Clearing and grubbing at existing WWTP	L.S.	100%	$20,000.00	$20,000.00
2.4	Site development work at new sewage pumping station sites (access, fill, parking, fencing, yard piping)	L.S.	100%	$200,000.00	$200,000.00
2.5	Site development work at existing WWTP (access, fill, parking, fencing, yard piping)	L.S.	100%	$100,000.00	$100,000.00
2.6	Topsoiling, hydro seeding, restoration along forcemain route, new sewage pumping station sites and at existing WWTP	L.S.	100%	$40,000.00	$40,000.00

Table S.1: Cost Estimate for Alternative S.1 - Sewage

WATER AND WASTEWATER SERVICING MASTER PLAN
MARKDALE-FLESHERTON-KIMBERLEY-AMIK-EUGENIA-BEAVER VALLEY
MUNICIPALITY OF GREY HIGHLANDS

Capital Cost Estimate (Class C)					
2012 Constant Dollars					**January 2012**
Item #	**Item Description**	**Unit**	**Qty**	**Unit Cost**	**Total**
2.7	3 Phase hydro and Bell service connection at new sewage pumping stations	L.S.	100%	$40,000.00	$40,000.00
2.8	Asphalt removal	L.S.	100%	$150,000.00	$150,000.00
2.9	50 mm HL-4 base asphalt restoration	L.S.	100%	$625,000.00	$625,000.00
2.10	50 mm HL-3 top coat asphalt restoration	L.S.	100%	$700,000.00	$700,000.00
3.0	**Gravity Sewage Main and Forcemain Construction**				
3.1	Construct 200 mm ⌀ gravity main	m	10,200	$400.00	$4,080,000.00
3.2	Construct 100 mm ⌀ forcemain	m	11,125	$225.00	$2,503,125.00
3.3	Low Pressure Grinder Pump Systems (estimated 50 year)	ea.	42	$6,500.00	$273,000.00
3.4	Manholes (1200 mm ⌀)	ea.	85	$6,500.00	$552,500.00
3.5	Rock removal by blasting	m^3	2000	$165.00	$330,000.00
4.0	**New Sewage Pumping Station #3 (PIII-1)**				
4.1	Sewage Pump Chamber	L.S.	100%	$80,000.00	$80,000.00
4.2	Valve Chamber	L.S.	100%	$40,000.00	$40,000.00
4.3	Finishes	L.S.	100%	$15,000.00	$15,000.00
4.4	Mechanical piping, valves, fittings, pressure gauges, and other accessories	L.S.	100%	$60,000.00	$60,000.00
4.5	Miscellaneous metals	L.S.	100%	$30,000.00	$30,000.00
4.6	Two (2) sewage pumps	ea.	2	$25,000.00	$50,000.00
4.7	Two (2) chain hoist	L.S.	100%	$15,000.00	$15,000.00
4.8	One (1) flow meter	L.S.	100%	$5,000.00	$5,000.00
4.9	Standby diesel engine generator set and accessories	L.S.	100%	$50,000.00	$50,000.00
4.10	Electrical works including MCC, control panels, PLC, SCADA, transducers, etc.	L.S.	100%	$50,000.00	$50,000.00
5.0	**New Sewage Pumping Station #4 (PI-2)**				
5.1	Sewage Pump Chamber	L.S.	100%	$80,000.00	$80,000.00
5.2	Valve Chamber	L.S.	100%	$40,000.00	$40,000.00
5.3	Finishes	L.S.	100%	$15,000.00	$15,000.00
5.4	Mechanical piping, valves, fittings, pressure gauges, and other accessories	L.S.	100%	$60,000.00	$60,000.00

Table S.1: Cost Estimate for Alternative S.1 - Sewage

WATER AND WASTEWATER SERVICING MASTER PLAN
MARKDALE-FLESHERTON-KIMBERLEY-AMIK-EUGENIA-BEAVER VALLEY
MUNICIPALITY OF GREY HIGHLANDS

Capital Cost Estimate (Class C)					
2012 Constant Dollars					**January 2012**
Item #	**Item Description**	**Unit**	**Qty**	**Unit Cost**	**Total**
5.5	Miscellaneous metals	L.S.	100%	$30,000.00	$30,000.00
5.6	Two (2) sewage pumps	ea.	2	$25,000.00	$50,000.00
5.7	Two (2) chain hoist	L.S.	100%	$15,000.00	$15,000.00
5.8	One (1) flow meter	L.S.	100%	$5,000.00	$5,000.00
5.9	Standby diesel engine generator set and accessories	L.S.	100%	$50,000.00	$50,000.00
5.10	Electrical works including MCC, control panels, PLC, SCADA, transducers, etc.	L.S.	100%	$50,000.00	$50,000.00
6.0	**Upgrades to Existing Wastewater Treatment Plant**				
6.1	Potential upgrades consisting of new raw sewage pumping station to existing cells, algae control, control building with phosphorous removal, free water surface wetlands and additional subsurface flow wetlands to increase treatment design capacity to meet estimated 20 year flows	L.S.	100%	$4,000,000.00	$4,000,000.00
7.0	**Environmental Works**				
7.1	Erosion control	L.S.	100%	$30,000.00	$30,000.00
8.0	**Bonding & Insurance**	L.S.	100%	$325,000.00	$325,000.00
9.0	**Allowances**				
9.1	Soils investigation prior to Construction	L.S.	100%	$30,000.00	$30,000.00
9.2	Rock Blast Survey	L.S.	100%	$10,000.00	$10,000.00
9.3	Startup of new sewage pumping stations, existing upgraded WWTP and gravity main and forcemain including commissioning, reports and manuals	L.S.	100%	$20,000.00	$20,000.00
	Subtotal Construction Cost				$15,133,625.00
	Construction Contingency	%	10%		$1,513,362.50
	Total Construction Cost				**$16,646,987.50**
Non-Construction					
10.0	**Engineering Design**	%	7.0%		$1,165,289.13
11.0	**Contract Administration**	%	8.0%		$1,331,759.00
12.0	**Engineering Disbursement**	%	1.2%		$199,763.85
13.0	**Approvals (CofA, Zoning, etc.)**	L.S.	100%	$25,000.00	$25,000.00
14.0	**Materials Testing Allowance and Soils Inspection during construction**	L.S.	100%	$30,000.00	$30,000.00

Table S.1: Cost Estimate for Alternative S.1 - Sewage

WATER AND WASTEWATER SERVICING MASTER PLAN
MARKDALE-FLESHERTON-KIMBERLEY-AMIK-EUGENIA-BEAVER VALLEY
MUNICIPALITY OF GREY HIGHLANDS

Capital Cost Estimate (Class C)					
2012 Constant Dollars					**January 2012**
Item #	**Item Description**	**Unit**	**Qty**	**Unit Cost**	**Total**
	Total Non-Construction Cost				$2,751,811.98
	Total Cost for Construction				$19,398,799.48
	Flesherton (includes PII-1, PII-2 and PII-4)				
	Construction				
1.0	**Mobilization/Demobilization**	L.S.	100%	$75,000.00	$75,000.00
2.0	**Site Work**				
2.1	Clearing and grubbing of forcemain route	L.S.	100%	$50,000.00	$50,000.00
2.2	Clearing and grubbing at existing WWTP	L.S.	100%	$20,000.00	$20,000.00
2.3	Site development work at existing WWTP (access, fill, parking, fencing, yard piping)	L.S.	100%	$100,000.00	$100,000.00
2.4	Topsoiling, hydro seeding, restoration along forcemain route and at existing WWTP	L.S.	100%	$25,000.00	$25,000.00
2.5	Asphalt removal	L.S.	100%	$50,000.00	$50,000.00
2.6	50 mm HL-4 base asphalt restoration	L.S.	100%	$200,000.00	$200,000.00
2.7	50 mm HL-3 top coat asphalt restoration	L.S.	100%	$250,000.00	$250,000.00
3.0	**Gravity Sewage Main and Forcemain Construction**				
3.1	Construct 200 mm ⌀ gravity main	m	3,200	$400.00	$1,280,000.00
3.2	Construct 100 mm ⌀ forcemain	m	5,825	$225.00	$1,310,625.00
3.3	Low Pressure Grinder Pump Systems (estimated 50 year)	ea.	74	$6,500.00	$481,000.00
3.4	Manholes (1200 mm ⌀)	ea.	27	$6,500.00	$175,500.00
3.5	Rock removal by blasting	m^3	1050	$165.00	$173,250.00
4.0	**Upgrades to Existing Wastewater Treatment Plant**				
4.1	Optimization of existing WWTP capacity of 419 m^3/day to meet estimated 20 year flow of 459 m^3/day	L.S.	100%	$400,000.00	$400,000.00
5.0	**Environmental Works**				
5.1	Erosion control	L.S.	100%	$15,000.00	$15,000.00
6.0	**Bonding & Insurance**	L.S.	100%	$100,000.00	$100,000.00
7.0	**Allowances**				

Table S.1: Cost Estimate for Alternative S.1 - Sewage

WATER AND WASTEWATER SERVICING MASTER PLAN
MARKDALE-FLESHERTON-KIMBERLEY-AMIK-EUGENIA-BEAVER VALLEY
MUNICIPALITY OF GREY HIGHLANDS

Capital Cost Estimate (Class C)					
2012 Constant Dollars					**January 2012**
Item #	**Item Description**	**Unit**	**Qty**	**Unit Cost**	**Total**
7.1	Soils investigation prior to Construction	L.S.	100%	$20,000.00	$20,000.00
7.2	Rock Blast Survey	L.S.	100%	$10,000.00	$10,000.00
7.3	Startup of existing upgraded WWTP, gravity main, forcemain and grinder pump systems including commissioning, reports and manuals	L.S.	100%	$20,000.00	$20,000.00
	Subtotal Construction Cost				$4,755,375.00
	Construction Contingency	%	10%		$475,537.50
	Total Construction Cost				**$5,230,912.50**
	Non-Construction				
8.0	**Engineering Design**	%	7.0%		$366,163.88
9.0	**Contract Administration**	%	8.0%		$418,473.00
10.0	**Engineering Disbursement**	%	1.2%		$62,770.95
11.0	**Approvals (CofA, Zoning, etc.)**	L.S.	100%	$15,000.00	$15,000.00
12.0	**Materials Testing Allowance and Soils Inspection during construction**	L.S.	100%	$15,000.00	$15,000.00
	Total Non-Construction Cost				$877,407.83
	Total Cost for Construction				$6,108,320.33
	Total Project Cost for Alternative S.1				$49,973,183.40

Table S.2: Cost Estimate for Alternative S.2 - Sewage

WATER AND WASTEWATER SERVICING MASTER PLAN
MARKDALE-FLESHERTON-KIMBERLEY-AMIK-EUGENIA-BEAVER VALLEY
MUNICIPALITY OF GREY HIGHLANDS

Capital Cost Estimate (Class C)					
2012 Constant Dollars					**January 2012**
Item #	**Item Description**	**Unit**	**Qty**	**Unit Cost**	**Total**
Markdale (includes PI-1, PI-3, PI-4 and PII-3)					
	Construction				
1.0	**Mobilization/Demobilization**	L.S.	100%	$200,000.00	$200,000.00
2.0	**Site Work**				
2.1	Clearing and grubbing of forcemain route	L.S.	100%	$75,000.00	$75,000.00
2.2	Clearing and grubbing at new sewage pumping station sites	L.S.	100%	$40,000.00	$40,000.00
2.3	Clearing and grubbing at existing WWTP	L.S.	100%	$20,000.00	$20,000.00
2.4	Site development work at new sewage pumping station sites (access, fill, parking, fencing, yard piping)	L.S.	100%	$200,000.00	$200,000.00
2.5	Site development work at existing WWTP (access, fill, parking, fencing, yard piping)	L.S.	100%	$100,000.00	$100,000.00
2.6	Topsoiling, hydro seeding, restoration along forcemain route, new sewage pumping station sites and at existing WWTP	L.S.	100%	$40,000.00	$40,000.00
2.7	3 Phase hydro and Bell service connection at new sewage pumping stations	L.S.	100%	$40,000.00	$40,000.00
2.8	Asphalt removal	L.S.	100%	$150,000.00	$150,000.00
2.9	50 mm HL-4 base asphalt restoration	L.S.	100%	$750,000.00	$750,000.00
2.10	50 mm HL-3 top coat asphalt restoration	L.S.	100%	$850,000.00	$850,000.00
3.0	**Gravity Sewage Main and Forcemain Construction**				
3.1	Construct 200 mm ⌀ gravity main	m	12,250	$400.00	$4,900,000.00
3.2	Construct 100 mm ⌀ forcemain	m	12,550	$225.00	$2,823,750.00
3.3	Low Pressure Grinder Pump Systems (estimated 50 year)	ea.	30	$6,500.00	$195,000.00
3.4	Manholes (1200 mm ⌀)	ea.	102	$6,500.00	$663,000.00
3.5	Rock removal by blasting	m^3	2250	$165.00	$371,250.00
4.0	**New Sewage Pumping Station #1 (PI-3)**				
4.1	Sewage Pump Chamber	L.S.	100%	$80,000.00	$80,000.00
4.2	Valve Chamber	L.S.	100%	$40,000.00	$40,000.00
4.3	Finishes	L.S.	100%	$15,000.00	$15,000.00

Table S.2: Cost Estimate for Alternative S.2 - Sewage

WATER AND WASTEWATER SERVICING MASTER PLAN
MARKDALE-FLESHERTON-KIMBERLEY-AMIK-EUGENIA-BEAVER VALLEY
MUNICIPALITY OF GREY HIGHLANDS

Capital Cost Estimate (Class C)					
2012 Constant Dollars					**January 2012**
Item #	**Item Description**	**Unit**	**Qty**	**Unit Cost**	**Total**
4.4	Mechanical piping, valves, fittings, pressure gauges, and other accessories	L.S.	100%	$60,000.00	$60,000.00
4.5	Miscellaneous metals	L.S.	100%	$30,000.00	$30,000.00
4.6	Two (2) sewage pumps	ea.	2	$25,000.00	$50,000.00
4.7	Two (2) chain hoist	L.S.	100%	$15,000.00	$15,000.00
4.8	One (1) flow meter	L.S.	100%	$5,000.00	$5,000.00
4.9	Standby diesel engine generator set and accessories	L.S.	100%	$50,000.00	$50,000.00
4.10	Electrical works including MCC, control panels, PLC, SCADA, transducers, etc.	L.S.	100%	$50,000.00	$50,000.00
5.0	**New Sewage Pumping Station #2 (PI-3)**				
5.1	Sewage Pump Chamber	L.S.	100%	$80,000.00	$80,000.00
5.2	Valve Chamber	L.S.	100%	$40,000.00	$40,000.00
5.3	Finishes	L.S.	100%	$15,000.00	$15,000.00
5.4	Mechanical piping, valves, fittings, pressure gauges, and other accessories	L.S.	100%	$60,000.00	$60,000.00
5.5	Miscellaneous metals	L.S.	100%	$30,000.00	$30,000.00
5.6	Two (2) sewage pumps	ea.	2	$25,000.00	$50,000.00
5.7	Two (2) chain hoist	L.S.	100%	$15,000.00	$15,000.00
5.8	One (1) flow meter	L.S.	100%	$5,000.00	$5,000.00
5.9	Standby diesel engine generator set and accessories	L.S.	100%	$50,000.00	$50,000.00
5.10	Electrical works including MCC, control panels, PLC, SCADA, transducers, etc.	L.S.	100%	$50,000.00	$50,000.00
6.0	**Upgrades to Existing Wastewater Treatment Plant**				
6.1	Potential upgrades consisting of new aeration cells, aeration equipment, rapid infiltration basins, control building upgrades to increase treatment design capacity to meet estimated 20 year flows	L.S.	100%	$6,000,000.00	$6,000,000.00
6.2	Purchase of adjacent land to accommodate construction of upgrades to the existing WWTP	L.S.	100%	$400,000.00	$400,000.00
7.0	**Environmental Works**				
7.1	Erosion control	L.S.	100%	$30,000.00	$30,000.00
8.0	**Bonding & Insurance**	L.S.	100%	$400,000.00	$400,000.00
9.0	**Allowances**				

Table S.2: Cost Estimate for Alternative S.2 - Sewage

WATER AND WASTEWATER SERVICING MASTER PLAN
MARKDALE-FLESHERTON-KIMBERLEY-AMIK-EUGENIA-BEAVER VALLEY
MUNICIPALITY OF GREY HIGHLANDS

Capital Cost Estimate (Class C)					
2012 Constant Dollars					**January 2012**
Item #	**Item Description**	**Unit**	**Qty**	**Unit Cost**	**Total**
9.1	Soils investigation prior to Construction	L.S.	100%	$30,000.00	$30,000.00
9.2	Rock Blast Survey	L.S.	100%	$10,000.00	$10,000.00
9.3	Startup of new sewage pumping stations, existing upgraded WWTP and gravity main and forcemain including commissioning, reports and manuals	L.S.	100%	$20,000.00	$20,000.00
	Subtotal Construction Cost				$19,098,000.00
	Construction Contingency	%	10%		$1,909,800.00
	Total Construction Cost				$21,007,800.00
Non-Construction					
10.0	**Engineering Design**	%	7.0%		$1,470,546.00
11.0	**Contract Administration**	%	8.0%		$1,680,624.00
12.0	**Engineering Disbursement**	%	1.2%		$252,093.60
13.0	**Approvals (CofA, Zoning, etc.)**	L.S.	100%	$25,000.00	$25,000.00
14.0	**Materials Testing Allowance and Soils Inspection during construction**	L.S.	100%	$30,000.00	$30,000.00
	Total Non-Construction Cost				$3,458,263.60
	Total Cost for Construction				$24,466,063.60
Amik (Includes PI-2, PI-5, and PIII-4)					
Construction					
1.0	**Mobilization/Demobilization**	L.S.	100%	$100,000.00	$100,000.00
2.0	**Site Work**				
2.1	Clearing and grubbing of forcemain route	L.S.	100%	$30,000.00	$30,000.00
2.2	Clearing and grubbing at new sewage pumping station site	L.S.	100%	$20,000.00	$20,000.00
2.3	Clearing and grubbing at existing WWTP	L.S.	100%	$20,000.00	$20,000.00
2.4	Site development work at new sewage pumping station site (access, fill, parking, fencing, yard piping)	L.S.	100%	$100,000.00	$100,000.00
2.5	Site development work at existing WWTP (access, fill, parking, fencing, yard piping)	L.S.	100%	$100,000.00	$100,000.00
2.6	Topsoiling, hydro seeding, restoration along forcemain route, new sewage pumping station site and at existing WWTP	L.S.	100%	$30,000.00	$30,000.00

Table S.2: Cost Estimate for Alternative S.2 - Sewage

WATER AND WASTEWATER SERVICING MASTER PLAN
MARKDALE-FLESHERTON-KIMBERLEY-AMIK-EUGENIA-BEAVER VALLEY
MUNICIPALITY OF GREY HIGHLANDS

Capital Cost Estimate (Class C)					
2012 Constant Dollars					**January 2012**
Item #	**Item Description**	**Unit**	**Qty**	**Unit Cost**	**Total**
2.7	3 Phase hydro and Bell service connection at new sewage pumping station	L.S.	100%	$20,000.00	$20,000.00
2.8	Asphalt removal	L.S.	100%	$75,000.00	$75,000.00
2.9	50 mm HL-4 base asphalt restoration	L.S.	100%	$350,000.00	$350,000.00
2.10	50 mm HL-3 top coat asphalt restoration	L.S.	100%	$400,000.00	$400,000.00
3.0	**Gravity Sewage Main and Forcemain Construction**				
3.1	Construct 200 mm ⌀ gravity main	m	5,700	$400.00	$2,280,000.00
3.2	Construct 100 mm ⌀ forcemain	m	3,175	$225.00	$714,375.00
3.3	Low Pressure Grinder Pump Systems (estimated 50 year)	ea.	19	$6,500.00	$123,500.00
3.4	Manholes (1200 mm ⌀)	ea.	48	$6,500.00	$312,000.00
3.5	Rock removal by blasting	m^3	600	$165.00	$99,000.00
4.0	**New Sewage Pumping Station #4 (PI-2)**				
4.1	Sewage Pump Chamber	L.S.	100%	$80,000.00	$80,000.00
4.2	Valve Chamber	L.S.	100%	$40,000.00	$40,000.00
4.3	Finishes	L.S.	100%	$15,000.00	$15,000.00
4.4	Mechanical piping, valves, fittings, pressure gauges, and other accessories	L.S.	100%	$60,000.00	$60,000.00
4.5	Miscellaneous metals	L.S.	100%	$30,000.00	$30,000.00
4.6	Two (2) sewage pumps	ea.	2	$25,000.00	$50,000.00
4.7	Two (2) chain hoist	L.S.	100%	$15,000.00	$15,000.00
4.8	One (1) flow meter	L.S.	100%	$5,000.00	$5,000.00
4.9	Standby diesel engine generator set and accessories	L.S.	100%	$50,000.00	$50,000.00
4.10	Electrical works including MCC, control panels, PLC, SCADA, transducers, etc.	L.S.	100%	$50,000.00	$50,000.00
5.0	**Upgrades to Existing Wastewater Treatment Plant**				
5.1	Upgrades to increase treatment capacity of the existing WWTP from 249 m^3/day to meet estimated 20 year flow of 431 m^3/day)already approved by existing CofA)	L.S.	100%	$1,000,000.00	$1,000,000.00
5.2	Optimization of future WWTP capacity of 431 m^3/day to meet estimated 20 year flow of 501 m^3/day	L.S.	100%	$400,000.00	$400,000.00
6.0	**Environmental Works**				

Table S.2: Cost Estimate for Alternative S.2 - Sewage

WATER AND WASTEWATER SERVICING MASTER PLAN
MARKDALE-FLESHERTON-KIMBERLEY-AMIK-EUGENIA-BEAVER VALLEY
MUNICIPALITY OF GREY HIGHLANDS

Capital Cost Estimate (Class C)					
2012 Constant Dollars					**January 2012**
Item #	**Item Description**	**Unit**	**Qty**	**Unit Cost**	**Total**
6.1	Erosion control	L.S.	100%	$15,000.00	$15,000.00
7.0	**Bonding & Insurance**	L.S.	100%	$150,000.00	$150,000.00
8.0	**Allowances**				
8.1	Soils investigation prior to Construction	L.S.	100%	$20,000.00	$20,000.00
8.2	Rock Blast Survey	L.S.	100%	$10,000.00	$10,000.00
8.3	Startup of new sewage pumping station, existing upgraded WWTP and gravity main and forcemain including commissioning, reports and manuals	L.S.	100%	$20,000.00	$20,000.00
	Subtotal Construction Cost				$6,783,875.00
	Construction Contingency	%	10%		$678,387.50
	Total Construction Cost				$7,462,262.50
Non-Construction					
9.0	**Engineering Design**	%	7.0%		$522,358.38
10.0	**Contract Administration**	%	8.0%		$596,981.00
11.0	**Engineering Disbursement**	%	1.2%		$89,547.15
12.0	**Approvals (CofA, Zoning, etc.)**	L.S.	100%	$20,000.00	$20,000.00
13.0	**Materials Testing Allowance and Soils Inspection during construction**	L.S.	100%	$20,000.00	$20,000.00
	Total Non-Construction Cost				$1,248,886.53
	Total Cost for Construction				$8,711,149.03
Flesherton (includes PII-1, PII-2, PII-4, PIII-1, PIII-2 and PIII-3)					
Construction					
1.0	**Mobilization/Demobilization**	L.S.	100%	$200,000.00	$200,000.00
2.0	**Site Work**				
2.1	Clearing and grubbing of forcemain route	L.S.	100%	$100,000.00	$100,000.00
2.2	Clearing and grubbing at new sewage pumping station site	L.S.	100%	$20,000.00	$20,000.00
2.3	Clearing and grubbing at existing WWTP	L.S.	100%	$20,000.00	$20,000.00
2.4	Site development work at new sewage pumping station site (access, fill, parking, fencing, yard piping)	L.S.	100%	$100,000.00	$100,000.00

Table S.2: Cost Estimate for Alternative S.2 - Sewage

WATER AND WASTEWATER SERVICING MASTER PLAN
MARKDALE-FLESHERTON-KIMBERLEY-AMIK-EUGENIA-BEAVER VALLEY
MUNICIPALITY OF GREY HIGHLANDS

Capital Cost Estimate (Class C)					
2012 Constant Dollars					**January 2012**
Item #	**Item Description**	**Unit**	**Qty**	**Unit Cost**	**Total**
2.5	Site development work at existing WWTP (access, fill, parking, fencing, yard piping)	L.S.	100%	$100,000.00	$100,000.00
2.6	Topsoiling, hydro seeding, restoration along forcemain route, new sewage pumping station site and at existing WWTP	L.S.	100%	$40,000.00	$40,000.00
2.7	3 Phase hydro and Bell service connection at new sewage pumping station	L.S.	100%	$20,000.00	$20,000.00
2.8	Asphalt removal	L.S.	100%	$100,000.00	$100,000.00
2.9	50 mm HL-4 base asphalt restoration	L.S.	100%	$475,000.00	$475,000.00
2.10	50 mm HL-3 top coat asphalt restoration	L.S.	100%	$525,000.00	$525,000.00
3.0	**Gravity Sewage Main and Forcemain Construction**				
3.1	Construct 200 mm ⌀ gravity main	m	7,675	$400.00	$3,070,000.00
3.2	Construct 100 mm ⌀ forcemain	m	12,750	$225.00	$2,868,750.00
3.3	Low Pressure Grinder Pump Systems (estimated 50 year)	ea.	97	$6,500.00	$630,500.00
3.4	Manholes (1200 mm ⌀)	ea.	64	$6,500.00	$416,000.00
3.5	Rock removal by blasting	m^3	2300	$165.00	$379,500.00
4.0	**New Sewage Pumping Station #3 (PIII-1)**				
4.1	Sewage Pump Chamber	L.S.	100%	$80,000.00	$80,000.00
4.2	Valve Chamber	L.S.	100%	$40,000.00	$40,000.00
4.3	Finishes	L.S.	100%	$15,000.00	$15,000.00
4.4	Mechanical piping, valves, fittings, pressure gauges, and other accessories	L.S.	100%	$60,000.00	$60,000.00
4.5	Miscellaneous metals	L.S.	100%	$30,000.00	$30,000.00
4.6	Two (2) sewage pumps	ea.	2	$25,000.00	$50,000.00
4.7	Two (2) chain hoist	L.S.	100%	$15,000.00	$15,000.00
4.8	One (1) flow meter	L.S.	100%	$5,000.00	$5,000.00
4.9	Standby diesel engine generator set and accessories	L.S.	100%	$50,000.00	$50,000.00
4.10	Electrical works including MCC, control panels, PLC, SCADA, transducers, etc.	L.S.	100%	$50,000.00	$50,000.00
5.0	**Upgrades to Existing Wastewater Treatment Plant**				

Table S.2: Cost Estimate for Alternative S.2 - Sewage

WATER AND WASTEWATER SERVICING MASTER PLAN
MARKDALE-FLESHERTON-KIMBERLEY-AMIK-EUGENIA-BEAVER VALLEY
MUNICIPALITY OF GREY HIGHLANDS

Capital Cost Estimate (Class C)					
2012 Constant Dollars					**January 2012**
Item #	**Item Description**	**Unit**	**Qty**	**Unit Cost**	**Total**
5.1	Potential upgrades consisting of new grit cannel, membrane filtration building, clarifiers, aeration tanks, upgrades to existing control building, modifications to existing sludge storage areas to increase treatment design capacity to meet estimated 20 year flows	L.S.	100%	$6,000,000.00	$6,000,000.00
6.0	**Environmental Works**				
6.1	Erosion control	L.S.	100%	$30,000.00	$30,000.00
7.0	**Bonding & Insurance**	L.S.	100%	$350,000.00	$350,000.00
8.0	**Allowances**				
8.1	Soils investigation prior to Construction	L.S.	100%	$30,000.00	$30,000.00
8.2	Rock Blast Survey	L.S.	100%	$10,000.00	$10,000.00
8.3	Startup of existing upgraded WWTP, new sewage pumping station gravity main, forcemain and grinder pump systems including commissioning, reports and manuals	L.S.	100%	$30,000.00	$30,000.00
	Subtotal Construction Cost				$15,909,750.00
	Construction Contingency	%	10%		$1,590,975.00
	Total Construction Cost				$17,500,725.00
	Non-Construction				
9.0	**Engineering Design**	%	7.0%		$1,225,050.75
10.0	**Contract Administration**	%	8.0%		$1,400,058.00
11.0	**Engineering Disbursement**	%	1.2%		$210,008.70
12.0	**Approvals (CofA, Zoning, etc.)**	L.S.	100%	$25,000.00	$25,000.00
13.0	**Materials Testing Allowance and Soils Inspection during construction**	L.S.	100%	$30,000.00	$30,000.00
	Total Non-Construction Cost				$2,890,117.45
	Total Cost for Construction				$20,390,842.45
	Total Project Cost for Alternative S.2				$53,568,055.08

Table S.3: Cost Estimate for Alternative S.3 - Sewage

WATER AND WASTEWATER SERVICING MASTER PLAN
MARKDALE-FLESHERTON-KIMBERLEY-AMIK-EUGENIA-BEAVER VALLEY
MUNICIPALITY OF GREY HIGHLANDS

Capital Cost Estimate (Class C)					
2012 Constant Dollars					**January 2012**
Item #	**Item Description**	**Unit**	**Qty**	**Unit Cost**	**Total**
	Markdale (Includes PI-1 and PII-3)				
	Construction				
1.0	**Mobilization/Demobilization**	L.S.	100%	$25,000.00	$25,000.00
2.0	**Site Work**				
2.1	Clearing and grubbing of forcemain route	L.S.	100%	$25,000.00	$25,000.00
2.2	Clearing and grubbing at existing WWTP	L.S.	100%	$20,000.00	$20,000.00
2.3	Site development work at existing WWTP (access, fill, parking, fencing, yard piping)	L.S.	100%	$100,000.00	$100,000.00
2.4	Topsoiling, hydro seeding, restoration along forcemain route and at existing WWTP	L.S.	100%	$10,000.00	$10,000.00
3.0	**Forcemain Construction**				
3.1	Construct 100 mm ⌀ forcemain	m	3,272	$225.00	$736,200.00
3.2	Low Pressure Grinder Pump Systems (estimated 50 year)	ea.	30	$6,500.00	$195,000.00
3.3	Rock removal by blasting	m^3	600	$165.00	$99,000.00
4.0	**Upgrades to Existing Wastewater Treatment Plant**				
4.2	Potential upgrades consisting of new aeration cells, aeration equipment, rapid infiltration basins, control building upgrades to increase treatment design capacity to meet estimated 20 year flows	L.S.	100%	$6,000,000.00	$6,000,000.00
4.2	Purchase of adjacent land to accommodate construction of upgrades to the existing WWTP	L.S.	100%	$400,000.00	$400,000.00
5.0	**Environmental Works**				
5.1	Erosion control	L.S.	100%	$10,000.00	$10,000.00
6.0	**Bonding & Insurance**	L.S.	100%	$175,000.00	$175,000.00
7.0	**Allowances**				
7.1	Soils investigation prior to Construction	L.S.	100%	$10,000.00	$10,000.00
7.2	Rock Blast Survey	L.S.	100%	$5,000.00	$5,000.00
7.3	Startup of existing upgraded WWTP and forcemain including commissioning, reports and manuals	L.S.	100%	$10,000.00	$10,000.00
	Subtotal Construction Cost				$7,820,200.00

Table S.3: Cost Estimate for Alternative S.3 - Sewage

WATER AND WASTEWATER SERVICING MASTER PLAN
MARKDALE-FLESHERTON-KIMBERLEY-AMIK-EUGENIA-BEAVER VALLEY
MUNICIPALITY OF GREY HIGHLANDS

Capital Cost Estimate (Class C)					
2012 Constant Dollars					**January 2012**
Item #	**Item Description**	**Unit**	**Qty**	**Unit Cost**	**Total**
	Construction Contingency	%	10%		$782,020.00
	Total Construction Cost				$8,602,220.00
	Non-Construction				
8.0	**Engineering Design**	%	7.0%		$602,155.40
9.0	**Contract Administration**	%	8.0%		$688,177.60
10.0	**Engineering Disbursement**	%	1.2%		$103,226.64
11.0	**Approvals (CofA, Zoning, etc.)**	L.S.	100%	$10,000.00	$10,000.00
12.0	**Materials Testing Allowance and Soils Inspection during construction**	L.S.	100%	$10,000.00	$10,000.00
	Total Non-Construction Cost				$1,413,559.64
	Total Cost for Construction				$10,015,779.64
	Amik (includes PI-2, PI-3, PI-5, and PIII-4)				
	Construction				
1.0	**Mobilization/Demobilization**	L.S.	100%	$200,000.00	$200,000.00
2.0	**Site Work**				
2.1	Clearing and grubbing of forcemain route	L.S.	100%	$50,000.00	$50,000.00
2.2	Clearing and grubbing at new sewage pumping station sites	L.S.	100%	$40,000.00	$40,000.00
2.3	Clearing and grubbing at existing WWTP	L.S.	100%	$20,000.00	$20,000.00
2.4	Site development work at new sewage pumping station sites (access, fill, parking, fencing, yard piping)	L.S.	100%	$200,000.00	$200,000.00
2.5	Site development work at existing WWTP (access, fill, parking, fencing, yard piping)	L.S.	100%	$100,000.00	$100,000.00
2.6	Topsoiling, hydro seeding, restoration along forcemain route, new sewage pumping station sites and at existing WWTP	L.S.	100%	$30,000.00	$30,000.00
2.7	3 Phase hydro and Bell service connection at new sewage pumping stations	L.S.	100%	$40,000.00	$40,000.00
2.8	Asphalt removal	L.S.	100%	$125,000.00	$125,000.00
2.9	50 mm HL-4 base asphalt restoration	L.S.	100%	$650,000.00	$650,000.00
2.10	50 mm HL-3 top coat asphalt restoration	L.S.	100%	$725,000.00	$725,000.00

Table S.3: Cost Estimate for Alternative S.3 - Sewage

WATER AND WASTEWATER SERVICING MASTER PLAN
MARKDALE-FLESHERTON-KIMBERLEY-AMIK-EUGENIA-BEAVER VALLEY
MUNICIPALITY OF GREY HIGHLANDS

Capital Cost Estimate (Class C)					
2012 Constant Dollars					**January 2012**
Item #	**Item Description**	**Unit**	**Qty**	**Unit Cost**	**Total**
3.0	**Gravity Sewage Main and Forcemain Construction**				
3.1	Construct 200 mm ⌀ gravity main	m	10,625	$400.00	$4,250,000.00
3.2	Construct 100 mm ⌀ forcemain	m	5,325	$225.00	$1,198,125.00
3.3	Low Pressure Grinder Pump Systems (estimated 50 year)	ea.	19	$6,500.00	$123,500.00
3.4	Manholes (1200 mm ⌀)	ea.	89	$6,500.00	$578,500.00
3.5	Rock removal by blasting	m^3	1000	$165.00	$165,000.00
4.0	**New Sewage Pumping Station #1 (PI-5)**				
4.1	Sewage Pump Chamber	L.S.	100%	$80,000.00	$80,000.00
4.2	Valve Chamber	L.S.	100%	$40,000.00	$40,000.00
4.3	Finishes	L.S.	100%	$15,000.00	$15,000.00
4.4	Mechanical piping, valves, fittings, pressure gauges, and other accessories	L.S.	100%	$60,000.00	$60,000.00
4.5	Miscellaneous metals	L.S.	100%	$30,000.00	$30,000.00
4.6	Two (2) sewage pumps	ea.	2	$25,000.00	$50,000.00
4.7	Two (2) chain hoist	L.S.	100%	$15,000.00	$15,000.00
4.8	One (1) flow meter	L.S.	100%	$5,000.00	$5,000.00
4.9	Standby diesel engine generator set and accessories	L.S.	100%	$50,000.00	$50,000.00
4.10	Electrical works including MCC, control panels, PLC, SCADA, transducers, etc.	L.S.	100%	$50,000.00	$50,000.00
5.0	**New Sewage Pumping Station #2 (PI-2)**				
5.1	Sewage Pump Chamber	L.S.	100%	$80,000.00	$80,000.00
5.2	Valve Chamber	L.S.	100%	$40,000.00	$40,000.00
5.3	Finishes	L.S.	100%	$15,000.00	$15,000.00
5.4	Mechanical piping, valves, fittings, pressure gauges, and other accessories	L.S.	100%	$60,000.00	$60,000.00
5.5	Miscellaneous metals	L.S.	100%	$30,000.00	$30,000.00
5.6	Two (2) sewage pumps	ea.	2	$25,000.00	$50,000.00
5.7	Two (2) chain hoist	L.S.	100%	$15,000.00	$15,000.00
5.8	One (1) flow meter	L.S.	100%	$5,000.00	$5,000.00
5.9	Standby diesel engine generator set and accessories	L.S.	100%	$50,000.00	$50,000.00

Table S.3: Cost Estimate for Alternative S.3 - Sewage

WATER AND WASTEWATER SERVICING MASTER PLAN
MARKDALE-FLESHERTON-KIMBERLEY-AMIK-EUGENIA-BEAVER VALLEY
MUNICIPALITY OF GREY HIGHLANDS

Capital Cost Estimate (Class C)					
2012 Constant Dollars					**January 2012**
Item #	**Item Description**	**Unit**	**Qty**	**Unit Cost**	**Total**
5.10	Electrical works including MCC, control panels, PLC, SCADA, transducers, etc.	L.S.	100%	$50,000.00	$50,000.00
6.0	**Upgrades to Existing Wastewater Treatment Plant**				
6.1	Potential upgrades consisting of new raw sewage pumping station to existing cells, algae control, control building with phosphorous removal, free water surface wetlands and additional subsurface flow wetlands to increase treatment design capacity to meet estimated 20 year flows	L.S.	100%	$4,000,000.00	$4,000,000.00
7.0	**Environmental Works**				
7.1	Erosion control	L.S.	100%	$30,000.00	$30,000.00
8.0	**Bonding & Insurance**	L.S.	100%	$300,000.00	$300,000.00
9.0	**Allowances**				
9.1	Soils investigation prior to Construction	L.S.	100%	$30,000.00	$30,000.00
9.2	Rock Blast Survey	L.S.	100%	$10,000.00	$10,000.00
9.3	Startup of new sewage pumping stations, existing upgraded WWTP and gravity main and forcemain including commissioning, reports and manuals	L.S.	100%	$20,000.00	$20,000.00
	Subtotal Construction Cost				$13,675,125.00
	Construction Contingency	%	10%		$1,367,512.50
	Total Construction Cost				$15,042,637.50
	Non-Construction				
10.0	**Engineering Design**	%	7.0%		$1,052,984.63
11.0	**Contract Administration**	%	8.0%		$1,203,411.00
12.0	**Engineering Disbursement**	%	1.2%		$180,511.65
13.0	**Approvals (CofA, Zoning, etc.)**	L.S.	100%	$25,000.00	$25,000.00
14.0	**Materials Testing Allowance and Soils Inspection during construction**	L.S.	100%	$30,000.00	$30,000.00
	Total Non-Construction Cost				$2,491,907.28
	Total Cost for Construction				$17,534,544.78
	Flesherton (includes PII-1, PII-2, PII-4, PIII-1, PIII-2 and PIII-3)				
	Construction				

Table S.3: Cost Estimate for Alternative S.3 - Sewage

WATER AND WASTEWATER SERVICING MASTER PLAN
MARKDALE-FLESHERTON-KIMBERLEY-AMIK-EUGENIA-BEAVER VALLEY
MUNICIPALITY OF GREY HIGHLANDS

Capital Cost Estimate (Class C)					
2012 Constant Dollars					**January 2012**
Item #	**Item Description**	**Unit**	**Qty**	**Unit Cost**	**Total**
1.0	**Mobilization/Demobilization**	L.S.	100%	$200,000.00	$200,000.00
2.0	**Site Work**				
2.1	Clearing and grubbing of forcemain route	L.S.	100%	$100,000.00	$100,000.00
2.2	Clearing and grubbing at new sewage pumping station site	L.S.	100%	$20,000.00	$20,000.00
2.3	Clearing and grubbing at existing WWTP	L.S.	100%	$20,000.00	$20,000.00
2.4	Site development work at new sewage pumping station site (access, fill, parking, fencing, yard piping)	L.S.	100%	$100,000.00	$100,000.00
2.5	Site development work at existing WWTP (access, fill, parking, fencing, yard piping)	L.S.	100%	$100,000.00	$100,000.00
2.6	Topsoiling, hydro seeding, restoration along forcemain route, new sewage pumping station site and at existing WWTP	L.S.	100%	$40,000.00	$40,000.00
2.7	3 Phase hydro and Bell service connection at new sewage pumping station	L.S.	100%	$20,000.00	$20,000.00
2.8	Asphalt removal	L.S.	100%	$100,000.00	$100,000.00
2.9	50 mm HL-4 base asphalt restoration	L.S.	100%	$475,000.00	$475,000.00
2.10	50 mm HL-3 top coat asphalt restoration	L.S.	100%	$525,000.00	$525,000.00
3.0	**Gravity Sewage Main and Forcemain Construction**				
3.1	Construct 200 mm ⌀ gravity main	m	7,675	$400.00	$3,070,000.00
3.2	Construct 100 mm ⌀ forcemain	m	12,750	$225.00	$2,868,750.00
3.3	Low Pressure Grinder Pump Systems (estimated 50 year)	ea.	97	$6,500.00	$630,500.00
3.4	Manholes (1200 mm ⌀)	ea.	64	$6,500.00	$416,000.00
3.5	Rock removal by blasting	m^3	2300	$165.00	$379,500.00
4.0	**New Sewage Pumping Station #3 (PIII-1)**				
4.1	Sewage Pump Chamber	L.S.	100%	$80,000.00	$80,000.00
4.2	Valve Chamber	L.S.	100%	$40,000.00	$40,000.00
4.3	Finishes	L.S.	100%	$15,000.00	$15,000.00
4.4	Mechanical piping, valves, fittings, pressure gauges, and other accessories	L.S.	100%	$60,000.00	$60,000.00
4.5	Miscellaneous metals	L.S.	100%	$30,000.00	$30,000.00
4.6	Two (2) sewage pumps	ea.	2	$25,000.00	$50,000.00

Table S.3: Cost Estimate for Alternative S.3 - Sewage

WATER AND WASTEWATER SERVICING MASTER PLAN
MARKDALE-FLESHERTON-KIMBERLEY-AMIK-EUGENIA-BEAVER VALLEY
MUNICIPALITY OF GREY HIGHLANDS

Capital Cost Estimate (Class C)					
2012 Constant Dollars					**January 2012**
Item #	**Item Description**	**Unit**	**Qty**	**Unit Cost**	**Total**
4.7	Two (2) chain hoist	L.S.	100%	$15,000.00	$15,000.00
4.8	One (1) flow meter	L.S.	100%	$5,000.00	$5,000.00
4.9	Standby diesel engine generator set and accessories	L.S.	100%	$50,000.00	$50,000.00
4.10	Electrical works including MCC, control panels, PLC, SCADA, transducers, etc.	L.S.	100%	$50,000.00	$50,000.00
5.0	**Upgrades to Existing Wastewater Treatment Plant**				
5.1	Potential upgrades consisting of new grit cannel, membrane filtration building, clarifiers, aeration tanks, upgrades to existing control building, modifications to existing sludge storage areas to increase treatment design capacity to meet estimated 20 year flows	L.S.	100%	$6,000,000.00	$6,000,000.00
6.0	**Environmental Works**				
6.1	Erosion control	L.S.	100%	$30,000.00	$30,000.00
7.0	**Bonding & Insurance**	L.S.	100%	$350,000.00	$350,000.00
8.0	**Allowances**				
8.1	Soils investigation prior to Construction	L.S.	100%	$30,000.00	$30,000.00
8.2	Rock Blast Survey	L.S.	100%	$10,000.00	$10,000.00
8.3	Startup of existing upgraded WWTP, gravity main, forcemain and grinder pump systems including commissioning, reports and manuals	L.S.	100%	$30,000.00	$30,000.00
	Subtotal Construction Cost				$15,909,750.00
	Construction Contingency	%	10%		$1,590,975.00
	Total Construction Cost				$17,500,725.00
	Non-Construction				
9.0	**Engineering Design**	%	7.0%		$1,225,050.75
10.0	**Contract Administration**	%	8.0%		$1,400,058.00
11.0	**Engineering Disbursement**	%	1.2%		$210,008.70
12.0	**Approvals (CofA, Zoning, etc.)**	L.S.	100%	$25,000.00	$25,000.00
13.0	**Materials Testing Allowance and Soils Inspection during construction**	L.S.	100%	$30,000.00	$30,000.00
	Total Non-Construction Cost				$2,890,117.45
	Total Cost for Construction				$20,390,842.45

Table S.3: Cost Estimate for Alternative S.3 - Sewage

WATER AND WASTEWATER SERVICING MASTER PLAN
MARKDALE-FLESHERTON-KIMBERLEY-AMIK-EUGENIA-BEAVER VALLEY
MUNICIPALITY OF GREY HIGHLANDS

Capital Cost Estimate (Class C)					
2012 Constant Dollars					January 2012
Item #	Item Description	Unit	Qty	Unit Cost	Total
Total Project Cost for Alternative S.3					$47,941,166.87

Table S.4: Cost Estimate for Alternative S.4 - Sewage

WATER AND WASTEWATER SERVICING MASTER PLAN
MARKDALE-FLESHERTON-KIMBERLEY-AMIK-EUGENIA-BEAVER VALLEY
MUNICIPALITY OF GREY HIGHLANDS

Capital Cost Estimate (Class C)					
2012 Constant Dollars					**January 2012**
Item #	**Item Description**	**Unit**	**Qty**	**Unit Cost**	**Total**
	Markdale (includes PI-1 and PII-3)				
	Construction				
1.0	**Mobilization/Demobilization**	L.S.	100%	$25,000.00	$25,000.00
2.0	**Site Work**				
2.1	Clearing and grubbing of forcemain route	L.S.	100%	$25,000.00	$25,000.00
2.2	Clearing and grubbing at existing WWTP	L.S.	100%	$20,000.00	$20,000.00
2.3	Site development work at existing WWTP (access, fill, parking, fencing, yard piping)	L.S.	100%	$100,000.00	$100,000.00
2.4	Topsoiling, hydro seeding, restoration along forcemain route and at existing WWTP	L.S.	100%	$10,000.00	$10,000.00
3.0	**Forcemain Construction**				
3.1	Construct 100 mm ⌀ forcemain	m	3,272	$225.00	$736,200.00
3.2	Low Pressure Grinder Pump Systems (estimated 50 year)	ea.	30	$6,500.00	$195,000.00
3.3	Rock removal by blasting	m^3	600	$165.00	$99,000.00
4.0	**Upgrades to Existing Wastewater Treatment Plant**				
4.2	Potential upgrades consisting of new aeration cells, aeration equipment, rapid infiltration basins, control building upgrades to increase treatment design capacity to meet estimated 20 year flows	L.S.	100%	$6,000,000.00	$6,000,000.00
4.2	Purchase of adjacent land to accommodate construction of upgrades to the existing WWTP	L.S.	100%	$400,000.00	$400,000.00
5.0	**Environmental Works**				
5.1	Erosion control	L.S.	100%	$10,000.00	$10,000.00
6.0	**Bonding & Insurance**	L.S.	100%	$175,000.00	$175,000.00
7.0	**Allowances**				
7.1	Soils investigation prior to Construction	L.S.	100%	$10,000.00	$10,000.00
7.2	Rock Blast Survey	L.S.	100%	$5,000.00	$5,000.00
7.3	Startup of existing upgraded WWTP and forcemain including commissioning, reports and manuals	L.S.	100%	$10,000.00	$10,000.00
	Subtotal Construction Cost				$7,820,200.00

Table S.4: Cost Estimate for Alternative S.4 - Sewage

WATER AND WASTEWATER SERVICING MASTER PLAN
MARKDALE-FLESHERTON-KIMBERLEY-AMIK-EUGENIA-BEAVER VALLEY
MUNICIPALITY OF GREY HIGHLANDS

Capital Cost Estimate (Class C)					
2012 Constant Dollars					**January 2012**
Item #	**Item Description**	**Unit**	**Qty**	**Unit Cost**	**Total**
	Construction Contingency	%	10%		$782,020.00
	Total Construction Cost				$8,602,220.00
	Non-Construction				
8.0	**Engineering Design**	%	7.0%		$602,155.40
9.0	**Contract Administration**	%	8.0%		$688,177.60
10.0	**Engineering Disbursement**	%	1.2%		$103,226.64
11.0	**Approvals (CofA, Zoning, etc.)**	L.S.	100%	$10,000.00	$10,000.00
12.0	**Materials Testing Allowance and Soils Inspection during construction**	L.S.	100%	$10,000.00	$10,000.00
	Total Non-Construction Cost				$1,413,559.64
	Total Cost for Construction				$10,015,779.64
	Amik (includes PI-2, PI-3, PI-5, PIII-1, PIII-2 and PIII-4)				
	Construction				
1.0	**Mobilization/Demobilization**	L.S.	100%	$200,000.00	$200,000.00
2.0	**Site Work**				
2.1	Clearing and grubbing of forcemain route	L.S.	100%	$50,000.00	$50,000.00
2.2	Clearing and grubbing at new sewage pumping station sites	L.S.	100%	$60,000.00	$60,000.00
2.3	Clearing and grubbing at existing WWTP	L.S.	100%	$20,000.00	$20,000.00
2.4	Site development work at new sewage pumping station sites (access, fill, parking, fencing, yard piping)	L.S.	100%	$300,000.00	$300,000.00
2.5	Site development work at existing WWTP (access, fill, parking, fencing, yard piping)	L.S.	100%	$100,000.00	$100,000.00
2.6	Topsoiling, hydro seeding, restoration along forcemain route, new sewage pumping station sites and at existing WWTP	L.S.	100%	$40,000.00	$40,000.00
2.7	3 Phase hydro and Bell service connection at new sewage pumping stations	L.S.	100%	$60,000.00	$60,000.00
2.8	Asphalt removal	L.S.	100%	$175,000.00	$175,000.00
2.9	50 mm HL-4 base asphalt restoration	L.S.	100%	$925,000.00	$925,000.00
2.10	50 mm HL-3 top coat asphalt restoration	L.S.	100%	$1,025,000.00	$1,025,000.00

Table S.4: Cost Estimate for Alternative S.4 - Sewage

WATER AND WASTEWATER SERVICING MASTER PLAN
MARKDALE-FLESHERTON-KIMBERLEY-AMIK-EUGENIA-BEAVER VALLEY
MUNICIPALITY OF GREY HIGHLANDS

Capital Cost Estimate (Class C)					
2012 Constant Dollars					**January 2012**
Item #	**Item Description**	**Unit**	**Qty**	**Unit Cost**	**Total**
3.0	**Gravity Sewage Main and Forcemain Construction**				
3.1	Construct 200 mm ⌀ gravity main	m	15,110	$400.00	$6,044,000.00
3.2	Construct 100 mm ⌀ forcemain	m	9,810	$225.00	$2,207,250.00
3.3	Low Pressure Grinder Pump Systems (estimated 50 year)	ea.	19	$6,500.00	$123,500.00
3.4	Manholes (1200 mm ⌀)	ea.	126	$6,500.00	$819,000.00
3.5	Rock removal by blasting	m^3	1750	$165.00	$288,750.00
4.0	**New Sewage Pumping Station #1 (PI-5)**				
4.1	Sewage Pump Chamber	L.S.	100%	$80,000.00	$80,000.00
4.2	Valve Chamber	L.S.	100%	$40,000.00	$40,000.00
4.3	Finishes	L.S.	100%	$15,000.00	$15,000.00
4.4	Mechanical piping, valves, fittings, pressure gauges, and other accessories	L.S.	100%	$60,000.00	$60,000.00
4.5	Miscellaneous metals	L.S.	100%	$30,000.00	$30,000.00
4.6	Two (2) sewage pumps	ea.	2	$25,000.00	$50,000.00
4.7	Two (2) chain hoist	L.S.	100%	$15,000.00	$15,000.00
4.8	One (1) flow meter	L.S.	100%	$5,000.00	$5,000.00
4.9	Standby diesel engine generator set and accessories	L.S.	100%	$50,000.00	$50,000.00
4.10	Electrical works including MCC, control panels, PLC, SCADA, transducers, etc.	L.S.	100%	$50,000.00	$50,000.00
5.0	**New Sewage Pumping Station #2 (PI-2)**				
5.1	Sewage Pump Chamber	L.S.	100%	$80,000.00	$80,000.00
5.2	Valve Chamber	L.S.	100%	$40,000.00	$40,000.00
5.3	Finishes	L.S.	100%	$15,000.00	$15,000.00
5.4	Mechanical piping, valves, fittings, pressure gauges, and other accessories	L.S.	100%	$60,000.00	$60,000.00
5.5	Miscellaneous metals	L.S.	100%	$30,000.00	$30,000.00
5.6	Two (2) sewage pumps	ea.	2	$25,000.00	$50,000.00
5.7	Two (2) chain hoist	L.S.	100%	$15,000.00	$15,000.00
5.8	One (1) flow meter	L.S.	100%	$5,000.00	$5,000.00
5.9	Standby diesel engine generator set and accessories	L.S.	100%	$50,000.00	$50,000.00

Table S.4: Cost Estimate for Alternative S.4 - Sewage

WATER AND WASTEWATER SERVICING MASTER PLAN
MARKDALE-FLESHERTON-KIMBERLEY-AMIK-EUGENIA-BEAVER VALLEY
MUNICIPALITY OF GREY HIGHLANDS

Capital Cost Estimate (Class C)					
2012 Constant Dollars					**January 2012**
Item #	**Item Description**	**Unit**	**Qty**	**Unit Cost**	**Total**
5.10	Electrical works including MCC, control panels, PLC, SCADA, transducers, etc.	L.S.	100%	$50,000.00	$50,000.00
6.0	**New Sewage Pumping Station #3 (PIII-1)**				
6.1	Sewage Pump Chamber	L.S.	100%	$80,000.00	$80,000.00
6.2	Valve Chamber	L.S.	100%	$40,000.00	$40,000.00
6.3	Finishes	L.S.	100%	$15,000.00	$15,000.00
6.4	Mechanical piping, valves, fittings, pressure gauges, and other accessories	L.S.	100%	$60,000.00	$60,000.00
6.5	Miscellaneous metals	L.S.	100%	$30,000.00	$30,000.00
6.6	Two (2) sewage pumps	ea.	2	$25,000.00	$50,000.00
6.7	Two (2) chain hoist	L.S.	100%	$15,000.00	$15,000.00
6.8	One (1) flow meter	L.S.	100%	$5,000.00	$5,000.00
6.9	Standby diesel engine generator set and accessories	L.S.	100%	$50,000.00	$50,000.00
6.10	Electrical works including MCC, control panels, PLC, SCADA, transducers, etc.	L.S.	100%	$50,000.00	$50,000.00
7.0	**Upgrades to Existing Wastewater Treatment Plant**				
7.1	Potential upgrades consisting of new raw sewage pumping station to existing cells, algae control, control building with phosphorous removal, free water surface wetlands and additional subsurface flow wetlands to increase treatment design capacity to meet estimated 20 year flows	L.S.	100%	$4,000,000.00	$4,000,000.00
8.0	**Environmental Works**				
8.1	Erosion control	L.S.	100%	$30,000.00	$30,000.00
9.0	**Bonding & Insurance**	L.S.	100%	$375,000.00	$375,000.00
10.0	**Allowances**				
10.1	Soils investigation prior to Construction	L.S.	100%	$30,000.00	$30,000.00
10.2	Rock Blast Survey	L.S.	100%	$10,000.00	$10,000.00
10.3	Startup of new sewage pumping stations, existing upgraded WWTP and gravity main and forcemain including commissioning, reports and manuals	L.S.	100%	$30,000.00	$30,000.00
	Subtotal Construction Cost				$18,097,500.00
	Construction Contingency	%	10%		$1,809,750.00
	Total Construction Cost				$19,907,250.00

Table S.4: Cost Estimate for Alternative S.4 - Sewage

WATER AND WASTEWATER SERVICING MASTER PLAN
MARKDALE-FLESHERTON-KIMBERLEY-AMIK-EUGENIA-BEAVER VALLEY
MUNICIPALITY OF GREY HIGHLANDS

Capital Cost Estimate (Class C)					
2012 Constant Dollars					**January 2012**
Item #	**Item Description**	**Unit**	**Qty**	**Unit Cost**	**Total**
	Non-Construction				
11.0	**Engineering Design**	%	7.0%		$1,393,507.50
12.0	**Contract Administration**	%	8.0%		$1,592,580.00
13.0	**Engineering Disbursement**	%	1.2%		$238,887.00
14.0	**Approvals (CofA, Zoning, etc.)**	L.S.	100%	$25,000.00	$25,000.00
15.0	**Materials Testing Allowance and Soils Inspection during construction**	L.S.	100%	$30,000.00	$30,000.00
	Total Non-Construction Cost				**$3,279,974.50**
	Total Cost for Construction				**$23,187,224.50**
	Flesherton (Includes PII-1, PII-2 and PII-4)				
	Construction				
1.0	**Mobilization/Demobilization**	L.S.	100%	$75,000.00	$75,000.00
2.0	**Site Work**				
2.1	Clearing and grubbing of forcemain route	L.S.	100%	$50,000.00	$50,000.00
2.2	Clearing and grubbing at existing WWTP	L.S.	100%	$20,000.00	$20,000.00
2.3	Site development work at existing WWTP (access, fill, parking, fencing, yard piping)	L.S.	100%	$100,000.00	$100,000.00
2.4	Topsoiling, hydro seeding, restoration along forcemain route and at existing WWTP	L.S.	100%	$25,000.00	$25,000.00
2.5	Asphalt removal	L.S.	100%	$50,000.00	$50,000.00
2.6	50 mm HL-4 base asphalt restoration	L.S.	100%	$200,000.00	$200,000.00
2.7	50 mm HL-3 top coat asphalt restoration	L.S.	100%	$250,000.00	$250,000.00
3.0	**Gravity Sewage Main and Forcemain Construction**				
3.1	Construct 200 mm ⌀ gravity main	m	3,200	$400.00	$1,280,000.00
3.2	Construct 100 mm ⌀ forcemain	m	5,825	$225.00	$1,310,625.00
3.3	Low Pressure Grinder Pump Systems (estimated 50 year)	ea.	74	$6,500.00	$481,000.00
3.4	Manholes (1200 mm ⌀)	ea.	27	$6,500.00	$175,500.00
3.5	Rock removal by blasting	m^3	1050	$165.00	$173,250.00
4.0	**Upgrades to Existing Wastewater Treatment Plant**				

Table S.4: Cost Estimate for Alternative S.4 - Sewage

WATER AND WASTEWATER SERVICING MASTER PLAN
MARKDALE-FLESHERTON-KIMBERLEY-AMIK-EUGENIA-BEAVER VALLEY
MUNICIPALITY OF GREY HIGHLANDS

Capital Cost Estimate (Class C)					
2012 Constant Dollars					**January 2012**
Item #	**Item Description**	**Unit**	**Qty**	**Unit Cost**	**Total**
4.1	Optimization of existing WWTP capacity of 419 m^3/day to meet estimated 20 year flow of 459 m^3/day	L.S.	100%	$400,000.00	$400,000.00
5.0	**Environmental Works**				
5.1	Erosion control	L.S.	100%	$15,000.00	$15,000.00
6.0	**Bonding & Insurance**	L.S.	100%	$100,000.00	$100,000.00
7.0	**Allowances**				
7.1	Soils investigation prior to Construction	L.S.	100%	$20,000.00	$20,000.00
7.2	Rock Blast Survey	L.S.	100%	$10,000.00	$10,000.00
7.3	Startup of existing upgraded WWTP, gravity main, forcemain and grinder pump systems including commissioning, reports and manuals	L.S.	100%	$20,000.00	$20,000.00
	Subtotal Construction Cost				$4,755,375.00
	Construction Contingency	%	10%		$475,537.50
	Total Construction Cost				$5,230,912.50
	Non-Construction				
8.0	**Engineering Design**	%	7.0%		$366,163.88
9.0	**Contract Administration**	%	8.0%		$418,473.00
10.0	**Engineering Disbursement**	%	1.2%		$62,770.95
11.0	**Approvals (CofA, Zoning, etc.)**	L.S.	100%	$15,000.00	$15,000.00
12.0	**Materials Testing Allowance and Soils Inspection during construction**	L.S.	100%	$15,000.00	$15,000.00
	Total Non-Construction Cost				$877,407.83
	Total Cost for Construction				$6,108,320.33
	Total Project Cost for Alternative S.4				$39,311,324.47

Appendix M

PUBLIC AND GOVERNMENT AGENCY CONSULTATION DOCUMENTS

111-13229-00

June 15, 2011

Saugeen First Nation
R.R. #1
Box 640
Southampton, ON
N0H 2L0

Re: Water and Wastewater Servicing Master Plan
Markdale-Flesherton-Kimberley-Amik-Eugenia
Notice of Study Commencement and Public Consultation Meeting
Municipality of Grey Highlands

Dear Mr. Sir/Madam:

Please find enclosed a copy of the Notice of Study Commencement and Public Consultation Meeting for the Water and Wastewater Servicing Master Plan for Markdale-Flesherton-Kimberley-Amik-Eugenia, within the Municipality of Grey Highlands.

This Master Plan Study is being conducted in accordance with the requirements of Phase 1 and Phase 2 of the Municipal Class Environmental Assessment planning process.

The study area of the Master Plan is shown on the attached Key Plan (Figure 1). Also, attached is a problem definition for the Master Plan.

The first public consultation meeting has been arranged to review and receive input from the public about the collection of background information and identification of the problem on Tuesday, June 28, 2011 at 7:00 p.m. at the Centre Grey Complex in Markdale.

We are requesting any comments you may have by July 20, 2011. Please submit your comments to Mr. Chris Wilson, P. Eng., GENIVAR, 1450 – 1st Avenue West, Suite 101, Owen Sound, ON N4K 6W2, Tel: 519-376-7612, ext. 13208 or by e-mail at chris.wilson@genivar.com.

If you should have any questions, please contact me at this office or Mr. Chris Wilson, P. Eng.

Yours truly,

GENIVAR Inc.

M. Ross Slaughter, P. Eng.
Designated Consulting Engineer
Senior Water Resources Engineer
MRS/lem
Encl.
cc: Mr. Shawn Moyer, Water & Wastewater Superintendent, Municipality of Grey Highlands

1450 1st Avenue West, Suite 101, Owen Sound, Ontario N4K 6W2
Telephone: 519.376.7612 • Fax: 519.376.8008 • www.genivar.com

111-13229-00

June 15, 2011

Ministry of Aboriginal Affairs
160 Bloor Street East
4th Floor
Toronto, ON
M4T 1M2

Re: Water and Wastewater Servicing Master Plan
Markdale-Flesherton-Kimberley-Amik-Eugenia
Notice of Study Commencement and Public Consultation Meeting
Municipality of Grey Highlands

Dear Mr. Sir/Madam:

Please find enclosed a copy of the Notice of Study Commencement and Public Consultation Meeting for the Water and Wastewater Servicing Master Plan for Markdale-Flesherton-Kimberley-Amik-Eugenia, within the Municipality of Grey Highlands.

This Master Plan Study is being conducted in accordance with the requirements of Phase 1 and Phase 2 of the Municipal Class Environmental Assessment planning process.

The study area of the Master Plan is shown on the attached Key Plan (Figure 1). Also, attached is a problem definition for the Master Plan.

The first public consultation meeting has been arranged to review and receive input from the public about the collection of background information and identification of the problem on Tuesday, June 28, 2011 at 7:00 p.m. at the Centre Grey Complex in Markdale.

We are requesting any comments you may have by July 20, 2011. Please submit your comments to Mr. Chris Wilson, P. Eng., GENIVAR, 1450 – 1st Avenue West, Suite 101, Owen Sound, ON N4K 6W2, Tel: 519-376-7612, ext. 13208 or by e-mail at chris.wilson@genivar.com.

If you should have any questions, please contact me at this office or Mr. Chris Wilson, P. Eng.

Yours truly,

GENIVAR Inc.

M. Ross Slaughter, P. Eng.
Designated Consulting Engineer
Senior Water Resources Engineer
MRS/lem
Encl.
cc: Mr. Shawn Moyer, Water & Wastewater Superintendent, Municipality of Grey Highlands

1450 1st Avenue West, Suite 101, Owen Sound, Ontario N4K 6W2
Telephone: 519.376.7612 • Fax: 519.376.8008 • www.genivar.com

111-13229-00

June 15, 2011

Chippewas First Nation, Cape Croker
Reserve #27
R.R. #5
Wiarton, ON
N0H 2T0

Re: Water and Wastewater Servicing Master Plan
Markdale-Flesherton-Kimberley-Amik-Eugenia
Notice of Study Commencement and Public Consultation Meeting
Municipality of Grey Highlands

Dear Mr. Sir/Madam:

Please find enclosed a copy of the Notice of Study Commencement and Public Consultation Meeting for the Water and Wastewater Servicing Master Plan for Markdale-Flesherton-Kimberley-Amik-Eugenia, within the Municipality of Grey Highlands.

This Master Plan Study is being conducted in accordance with the requirements of Phase 1 and Phase 2 of the Municipal Class Environmental Assessment planning process.

The study area of the Master Plan is shown on the attached Key Plan (Figure 1). Also, attached is a problem definition for the Master Plan.

The first public consultation meeting has been arranged to review and receive input from the public about the collection of background information and identification of the problem on Tuesday, June 28, 2011 at 7:00 p.m. at the Centre Grey Complex in Markdale.

We are requesting any comments you may have by July 20, 2011. Please submit your comments to Mr. Chris Wilson, P. Eng., GENIVAR, 1450 – 1st Avenue West, Suite 101, Owen Sound, ON N4K 6W2, Tel: 519-376-7612, ext. 13208 or by e-mail at chris.wilson@genivar.com.

If you should have any questions, please contact me at this office or Mr. Chris Wilson, P. Eng.

Yours truly,

GENIVAR Inc.

M. Ross Slaughter, P. Eng.
Designated Consulting Engineer
Senior Water Resources Engineer
MRS/lem
Encl.
cc: Mr. Shawn Moyer, Water & Wastewater Superintendent, Municipality of Grey Highlands

1450 1st Avenue West, Suite 101, Owen Sound, Ontario N4K 6W2
Telephone: 519.376.7612 • Fax: 519.376.8008 • www.genivar.com

111-13229-00

August 24, 2011

Chief Roland Monague
Beausoleil First Nation (Christian Island)
1 O-Gema Street
Christian Island
Cedar Point, ON
L0K 1C0

Re: Water and Wastewater Servicing Master Plan
Markdale-Flesherton-Kimberley-Amik-Eugenia
Municipality of Grey Highlands

Dear Chief Monague:

A Water and Wastewater Servicing Master Plan Study for Markdale-Flesherton-Kimberley-Amik-Eugenia, within the Municipality of Grey Highlands, is being conducted in accordance with the requirements of Phase 1 and Phase 2 of the Municipal Class Environmental Assessment planning process.

The study area of the Master Plan is shown on the attached Key Plan (Figure 1). Also, attached is a problem definition for the Master Plan.

The first public consultation meeting for the Master Plan occurred on Tuesday, June 28, 2011 at 7:00 p.m. at the Centre Grey Complex in Markdale to review and receive input from the public about the collection of background information and identification of the problem. A copy of the Notice of Study Commencement and Public Consultation Meeting is enclosed for the Master Plan.

We are requesting any comments you may have by September 9, 2011. Please submit your comments to Mr. Chris Wilson, P. Eng., GENIVAR, 1450 – 1st Avenue West, Suite 101, Owen Sound, ON N4K 6W2, Tel: 519-376-7612, ext. 13208 or by e-mail at chris.wilson@genivar.com.

If you should have any questions, please contact me at this office or Mr. Chris Wilson, P. Eng.

Yours truly,

GENIVAR Inc.

M. Ross Slaughter, P. Eng.
Designated Consulting Engineer
Senior Water Resources Engineer
MRS/lem
Encl.
cc: Mr. Shawn Moyer, Water & Wastewater Superintendent, Municipality of Grey Highlands

1450 1st Avenue West, Suite 101, Owen Sound, Ontario N4K 6W2
Telephone: 519.376.7612 · Fax: 519.376.8008 · www.genivar.com

111-13229-00

August 24, 2011

Chief Donna Big Canoe
Chippewas of Georgina Island
R.R. #2
P.O. Box 12
Sutton West, ON
L0E 1R0

Re: Water and Wastewater Servicing Master Plan
Markdale-Flesherton-Kimberley-Amik-Eugenia
Municipality of Grey Highlands

Dear Chief Big Canoe:

A Water and Wastewater Servicing Master Plan Study for Markdale-Flesherton-Kimberley-Amik-Eugenia, within the Municipality of Grey Highlands, is being conducted in accordance with the requirements of Phase 1 and Phase 2 of the Municipal Class Environmental Assessment planning process.

The study area of the Master Plan is shown on the attached Key Plan (Figure 1). Also, attached is a problem definition for the Master Plan.

The first public consultation meeting for the Master Plan occurred on Tuesday, June 28, 2011 at 7:00 p.m. at the Centre Grey Complex in Markdale to review and receive input from the public about the collection of background information and identification of the problem. A copy of the Notice of Study Commencement and Public Consultation Meeting is enclosed for the Master Plan.

We are requesting any comments you may have by September 9, 2011. Please submit your comments to Mr. Chris Wilson, P. Eng., GENIVAR, 1450 – 1st Avenue West, Suite 101, Owen Sound, ON N4K 6W2, Tel: 519-376-7612, ext. 13208 or by e-mail at chris.wilson@genivar.com.

If you should have any questions, please contact me at this office or Mr. Chris Wilson, P. Eng.

Yours truly,

GENIVAR Inc.

M. Ross Slaughter, P. Eng.
Designated Consulting Engineer
Senior Water Resources Engineer
MRS/lem
Encl.
cc: Mr. Shawn Moyer, Water & Wastewater Superintendent, Municipality of Grey Highlands

1450 1st Avenue West, Suite 101, Owen Sound, Ontario N4K 6W2
Telephone: 519.376.7612 · Fax: 519.376.8008 · www.genivar.com

111-13229-00

August 24, 2011

Chief Sharon Stinson Henry
Chippewas of Rama
5884 Rama Road
Suite 200
Rama, ON
L0K 1T0

Re: Water and Wastewater Servicing Master Plan
Markdale-Flesherton-Kimberley-Amik-Eugenia
Municipality of Grey Highlands

Dear Chief Stinson Henry:

A Water and Wastewater Servicing Master Plan Study for Markdale-Flesherton-Kimberley-Amik-Eugenia, within the Municipality of Grey Highlands, is being conducted in accordance with the requirements of Phase 1 and Phase 2 of the Municipal Class Environmental Assessment planning process.

The study area of the Master Plan is shown on the attached Key Plan (Figure 1). Also, attached is a problem definition for the Master Plan.

The first public consultation meeting for the Master Plan occurred on Tuesday, June 28, 2011 at 7:00 p.m. at the Centre Grey Complex in Markdale to review and receive input from the public about the collection of background information and identification of the problem. A copy of the Notice of Study Commencement and Public Consultation Meeting is enclosed for the Master Plan.

We are requesting any comments you may have by September 9, 2011. Please submit your comments to Mr. Chris Wilson, P. Eng., GENIVAR, 1450 – 1st Avenue West, Suite 101, Owen Sound, ON N4K 6W2, Tel: 519-376-7612, ext. 13208 or by e-mail at chris.wilson@genivar.com.

If you should have any questions, please contact me at this office or Mr. Chris Wilson, P. Eng.

Yours truly,

GENIVAR Inc.

M. Ross Slaughter, P. Eng.
Designated Consulting Engineer
Senior Water Resources Engineer
MRS/lem
Encl.
cc: Mr. Shawn Moyer, Water & Wastewater Superintendent, Municipality of Grey Highlands

1450 1st Avenue West, Suite 101, Owen Sound, Ontario N4K 6W2
Telephone: 519.376.7612 • Fax: 519.376.8008 • www.genivar.com

111-13229-00

August 24, 2011

Mr. Peter Couture, Interim President
Great Lakes Métis Council
380 9th Street East
Owen Sound, ON
N4K 1P1

Re: Water and Wastewater Servicing Master Plan
Markdale-Flesherton-Kimberley-Amik-Eugenia
Municipality of Grey Highlands

Dear Mr. Couture:

A Water and Wastewater Servicing Master Plan Study for Markdale-Flesherton-Kimberley-Amik-Eugenia, within the Municipality of Grey Highlands, is being conducted in accordance with the requirements of Phase 1 and Phase 2 of the Municipal Class Environmental Assessment planning process.

The study area of the Master Plan is shown on the attached Key Plan (Figure 1). Also, attached is a problem definition for the Master Plan.

The first public consultation meeting for the Master Plan occurred on Tuesday, June 28, 2011 at 7:00 p.m. at the Centre Grey Complex in Markdale to review and receive input from the public about the collection of background information and identification of the problem. A copy of the Notice of Study Commencement and Public Consultation Meeting is enclosed for the Master Plan.

We are requesting any comments you may have by September 9, 2011. Please submit your comments to Mr. Chris Wilson, P. Eng., GENIVAR, 1450 – 1st Avenue West, Suite 101, Owen Sound, ON N4K 6W2, Tel: 519-376-7612, ext. 13208 or by e-mail at chris.wilson@genivar.com.

If you should have any questions, please contact me at this office or Mr. Chris Wilson, P. Eng.

Yours truly,

GENIVAR Inc.

M. Ross Slaughter, P. Eng.
Designated Consulting Engineer
Senior Water Resources Engineer
MRS/lem
Encl.
cc: Mr. Shawn Moyer, Water & Wastewater Superintendent, Municipality of Grey Highlands

111-13229-00

August 24, 2011

Historic Saugeen Métis
204 High Street
Box 1492
Southampton, ON
N0H 2L0

Re: Water and Wastewater Servicing Master Plan
Markdale-Flesherton-Kimberley-Amik-Eugenia
Municipality of Grey Highlands

Dear Sir/Madam:

A Water and Wastewater Servicing Master Plan Study for Markdale-Flesherton-Kimberley-Amik-Eugenia, within the Municipality of Grey Highlands, is being conducted in accordance with the requirements of Phase 1 and Phase 2 of the Municipal Class Environmental Assessment planning process.

The study area of the Master Plan is shown on the attached Key Plan (Figure 1). Also, attached is a problem definition for the Master Plan.

The first public consultation meeting for the Master Plan occurred on Tuesday, June 28, 2011 at 7:00 p.m. at the Centre Grey Complex in Markdale to review and receive input from the public about the collection of background information and identification of the problem. A copy of the Notice of Study Commencement and Public Consultation Meeting is enclosed for the Master Plan.

We are requesting any comments you may have by September 9, 2011. Please submit your comments to Mr. Chris Wilson, P. Eng., GENIVAR, 1450 – 1st Avenue West, Suite 101, Owen Sound, ON N4K 6W2, Tel: 519-376-7612, ext. 13208 or by e-mail at chris.wilson@genivar.com.

If you should have any questions, please contact me at this office or Mr. Chris Wilson, P. Eng.

Yours truly,

GENIVAR Inc.

M. Ross Slaughter, P. Eng.
Designated Consulting Engineer
Senior Water Resources Engineer
MRS/lem
Encl.
cc: Mr. Shawn Moyer, Water & Wastewater Superintendent, Municipality of Grey Highlands

111-13229-00

August 24, 2011

Ms. Janet Townson
Claims Analyst, Ontario Team
Specific Claims Branch
Indian and Northern Affairs Canada
1310-10 Wellington Street
Gatineau, QC
K1A 0H4

Re: Water and Wastewater Servicing Master Plan
Markdale-Flesherton-Kimberley-Amik-Eugenia
Municipality of Grey Highlands

Dear Ms. Townson:

A Water and Wastewater Servicing Master Plan Study for Markdale-Flesherton-Kimberley-Amik-Eugenia, within the Municipality of Grey Highlands, is being conducted in accordance with the requirements of Phase 1 and Phase 2 of the Municipal Class Environmental Assessment planning process.

The study area of the Master Plan is shown on the attached Key Plan (Figure 1). Also, attached is a problem definition for the Master Plan.

The first public consultation meeting for the Master Plan occurred on Tuesday, June 28, 2011 at 7:00 p.m. at the Centre Grey Complex in Markdale to review and receive input from the public about the collection of background information and identification of the problem. A copy of the Notice of Study Commencement and Public Consultation Meeting is enclosed for the Master Plan.

We are requesting any comments you may have by September 9, 2011. Please submit your comments to Mr. Chris Wilson, P. Eng., GENIVAR, 1450 – 1st Avenue West, Suite 101, Owen Sound, ON N4K 6W2, Tel: 519-376-7612, ext. 13208 or by e-mail at chris.wilson@genivar.com.

If you should have any questions, please contact me at this office or Mr. Chris Wilson, P. Eng.

Yours truly,

GENIVAR Inc.

M. Ross Slaughter, P. Eng.
Designated Consulting Engineer
Senior Water Resources Engineer
MRS/lem
Encl.
cc: Mr. Shawn Moyer, Water & Wastewater Superintendent, Municipality of Grey Highlands

1450 1st Avenue West, Suite 101, Owen Sound, Ontario N4K 6W2
Telephone: 519.376.7612 · Fax: 519.376.8008 · www.genivar.com

111-13229-00

August 24, 2011

Métis Consultation Unit
Métis Nation of Ontario Head Office
500 Old St. Patrick Street
Unit D
Ottawa, ON
K1N 9G4

Re: Water and Wastewater Servicing Master Plan
Markdale-Flesherton-Kimberley-Amik-Eugenia
Municipality of Grey Highlands

Dear Sir/Madam:

A Water and Wastewater Servicing Master Plan Study for Markdale-Flesherton-Kimberley-Amik-Eugenia, within the Municipality of Grey Highlands, is being conducted in accordance with the requirements of Phase 1 and Phase 2 of the Municipal Class Environmental Assessment planning process.

The study area of the Master Plan is shown on the attached Key Plan (Figure 1). Also, attached is a problem definition for the Master Plan.

The first public consultation meeting for the Master Plan occurred on Tuesday, June 28, 2011 at 7:00 p.m. at the Centre Grey Complex in Markdale to review and receive input from the public about the collection of background information and identification of the problem. A copy of the Notice of Study Commencement and Public Consultation Meeting is enclosed for the Master Plan.

We are requesting any comments you may have by September 9, 2011. Please submit your comments to Mr. Chris Wilson, P. Eng., GENIVAR, 1450 – 1st Avenue West, Suite 101, Owen Sound, ON N4K 6W2, Tel: 519-376-7612, ext. 13208 or by e-mail at chris.wilson@genivar.com.

If you should have any questions, please contact me at this office or Mr. Chris Wilson, P. Eng.

Yours truly,

GENIVAR Inc.

M. Ross Slaughter, P. Eng.
Designated Consulting Engineer
Senior Water Resources Engineer
MRS/lem
Encl.
cc: Mr. Shawn Moyer, Water & Wastewater Superintendent, Municipality of Grey Highlands

111-13229-00

August 24, 2011

Mr. Sean Darcy, Manager
Assessment and Historical Research
Indian and Northern Affairs Canada
10 Wellington Street
Gatineau, QC
K1A 0H4

Re: Water and Wastewater Servicing Master Plan
Markdale-Flesherton-Kimberley-Amik-Eugenia
Municipality of Grey Highlands

Dear Mr. Darcy:

A Water and Wastewater Servicing Master Plan Study for Markdale-Flesherton-Kimberley-Amik-Eugenia, within the Municipality of Grey Highlands, is being conducted in accordance with the requirements of Phase 1 and Phase 2 of the Municipal Class Environmental Assessment planning process.

The study area of the Master Plan is shown on the attached Key Plan (Figure 1). Also, attached is a problem definition for the Master Plan.

The first public consultation meeting for the Master Plan occurred on Tuesday, June 28, 2011 at 7:00 p.m. at the Centre Grey Complex in Markdale to review and receive input from the public about the collection of background information and identification of the problem. A copy of the Notice of Study Commencement and Public Consultation Meeting is enclosed for the Master Plan.

We are requesting any comments you may have by September 9, 2011. Please submit your comments to Mr. Chris Wilson, P. Eng., GENIVAR, 1450 – 1st Avenue West, Suite 101, Owen Sound, ON N4K 6W2, Tel: 519-376-7612, ext. 13208 or by e-mail at chris.wilson@genivar.com.

If you should have any questions, please contact me at this office or Mr. Chris Wilson, P. Eng.

Yours truly,

GENIVAR Inc.

M. Ross Slaughter, P. Eng.
Designated Consulting Engineer
Senior Water Resources Engineer
MRS/lem
Encl.
cc: Mr. Shawn Moyer, Water & Wastewater Superintendent, Municipality of Grey Highlands

1450 1st Avenue West, Suite 101, Owen Sound, Ontario N4K 6W2
Telephone: 519.376.7612 • Fax: 519.376.8008 • www.genivar.com

111-13229-00 MAILED

Loreen Miller

From: Loreen Miller
Sent: Thursday, April 25, 2013 1:36 PM
To: 'andrew.hinshelwood@ontario.ca'
Subject: Water and Wastewater Servicing Master Plan, Markdale-Flesherton-Kimberley-Amik-Eugenia, Municipality of Grey Highlands
Attachments: Ministry of Tourism, Culture and Sport - Review of Alternative Solutions.PDF

Mr. Hinselwood:

Please find attached a letter from Ross Slaughter, P. Eng., regarding the above-noted subject.

GENIVAR

Loreen Miller
Senior Administrative Assistant

GENIVAR Inc.
1450 1st Avenue West, Suite 101, Owen Sound, ON N4K 6W2 Canada
T 519-376-7612 #13205 F 519-376-8008 | www.genivar.com | loreen.miller@genivar.com

Please consider the environment before printing....

GENIVAR

111-13229-00

April 25, 2013

Mr. Andrew Hinshelwood
Ministry of Tourism, Culture and Sport
435 James Street South
Suite 334
THUNDER BAY, ON
P7E 6S7

Re: Water and Wastewater Servicing Master Plan
Markdale-Flesherton-Kimberley-Amik-Eugenia
Review of Alternative Solutions and Preliminary Identification of Recommended Solution
Municipality of Grey Highlands

Dear Mr. Hinshelwood:

The Municipality of Grey Highlands is carrying out a Master Plan study for a regional water and wastewater system to determine infrastructure requirements for the Municipality to service the study area of Markdale – Flesherton – Kimberley – Amik – Eugenia and the area at the Beaver Valley Ski Club.

This Master Plan Study is being conducted in accordance with the requirements of Phase 1 and Phase 2 of the Municipal Class Environmental Assessment planning process.

A Notice of Study Commencement and Problem Definition for the Water and Wastewater Servicing Master Plan were submitted to Government Agencies on June 15, 2011 for comment. A subsequent public consultation meeting was held on June 28, 2011 at the Centre Grey Complex in Markdale to review and receive input from the public about the collection of background information and identification of the problem.

A draft version of the Water and Wastewater Servicing Master Plan (March 2012), can be found on the Municipality of Grey Highlands' home page at the website as follows: www.greyhighlands.ca.

The Master Plan study area for the Municipality of Grey Highlands is broken down into three (3) main phases (Phase 1, Phase 2 and Phase 3) for the framework for providing sewage and water servicing to existing developed areas and planned future projects and developments. The phases are ordered by the number of priority as per recommendations and per requirements of the Municipality of Grey Highlands. Several sub-phases exist within each of the three (3) main phases proposed, which are discussed in detail in the study report.

Eight (8) alternatives for implementation of phased upgraded and/or new water treatment facilities, water storage and water distribution under the Master Plan were reviewed. As well, four (4) alternatives for implementation of phased upgrades to the three (3) existing wastewater plants (Markdale, Flesherton and Amik-Talisman) under the Master Plan were reviewed. The proposed four (4) alternatives for upgrading the wastewater plants include four (4) alternatives for new sanitary sewer areas and sewage pumping stations.

A draft version of a second report entitled "Outline of Recommended Sewage and Water Servicing for Phase 1 of the Master Plan" (March 2012), can be found on the Municipality of Grey Highlands' home

1450 1st Avenue West, Suite 101, Owen Sound, Ontario N4K 6W2
Telephone: 519.376.7612 · Fax: 519.376.8008 · www.genivar.com

page. This report provides detailed information in relation to Phase 1 (highest priority component) of the recommended preferred alternative solution as outlined in the draft Water and Wastewater Servicing Master Plan.

The second public consultation meeting will be arranged in the near future to review and receive input from the public about the alternative solutions and the preliminary identification of the preferred Master Plan solution.

The Municipality of Grey Highlands and GENIVAR Inc. met with Saugeen Ojibway Nations (SON) representatives on April 24, 2013 to discuss the Draft Water and Wastewater Servicing Master Plan. As per comments from SON, it was requested that the Ministry of Tourism, Culture and Sport be notified of the Master Plan, so that they may provide any comments concerning historical or archaeological resources which may be affected.

Please submit any comments at your earliest convenience to Mr. Chris Wilson, P. Eng., GENIVAR, 1450 – 1st Avenue West, Suite 101, Owen Sound, ON N4K 6W2, Tel: 519-376-7612, ext. 13208 or by e-mail at chris.wilson@genivar.com.

If you should have any questions, please contact me at this office or Mr. Chris Wilson, P. Eng.

Yours truly,

GENIVAR Inc.

M. Ross Slaughter, P. Eng.
Designated Consulting Engineer
Senior Water Resources Engineer
CSW/lem/dlw
Encl.
cc: Mr. Shawn Moyer, Water & Wastewater Superintendent, Municipality of Grey Highlands
Mr. Dorm Ritchie, Environmental Office, SON, Cape Croker

DORAN

Water and Wastewater Servicing Master Plan
Markdale – Flesherton – Kimberley – Amik – Eugenia
Notice of Study Commencement and Public Consultation Meeting
Municipality of Grey Highlands

THE STUDY

The Municipality of Grey Highlands is carrying out a Master Plan study for a regional water and wastewater system to determine infrastructure requirements for the Municipality to service the study area of Markdale – Flesherton – Kimberley – Amik – Eugenia and the area at the Beaver Valley Ski Club. This Master Plan study is being conducted in accordance with the requirements of Phases 1 and 2 of the Municipal Class Environmental Assessment which is an approved process under the Environmental Assessment Act.

WE WANT TO HEAR FROM YOU

Public consultation is a key component of this study. The proposed consultation plan provides for public consultation meetings at two (2) points in the study: June 28, 2011 – to review the problem; and, Fall 2011 – to review alternative solutions. In addition there will be an opportunity to review the final Master Plan report.

The study area is as shown on the attached key plan (Figure 1). The first public consultation meeting has been arranged to review and receive input from the public about the collection of background information and identification of the problem.

Date: Tuesday, June 28, 2011
Time: 7:00 p.m.
Location: Centre Grey Complex, Markdale

STUDY CONTACTS

All those with an interest in the study are urged to attend.

If you have any questions or wish to be added to the study mailing list, please contact:

Mr. Ross Slaughter, P.Eng., Project Manager
GENIVAR Inc.
1450 1st Avenue West, Suite 101
Owen Sound, ON N4K 6W2

Phone: 519-376-7612 X13226
Fax: 519-376-8008
Email: ross.slaughter@genivar.com

Shawn Moyer, Director of Public Utilities
Municipality of Grey Highlands
206 Toronto Street South
Markdale, ON N0C 1H0

Phone: 519-986-2811
Fax: 519-986-3643
Email: moyers@greyhighlands.ca

or visit our website at www.greyhighlands.ca

PROBLEM DEFINITION

Master Plan
for
Water and Wastewater Servicing
Markdale – Flesherton – Kimberley – Amik – Eugenia
Municipality of Grey Highlands

111-13229-00

The Municipality of Grey Highlands wishes to provide adequate communal potable water and wastewater servicing for the existing developed areas at Markdale – Flesherton – Kimberley – Amik – Eugenia and homes/chalets near the Beaver Valley Ski area. Regional water and wastewater servicing would provide for future development in existing communities and in recreational areas in the Beaver Valley and at Eugenia.

The capacity of the Markdale wastewater treatment plant needs to be increased to allow for future development within the community. Also, the Markdale water storage facility and trunk watermains require upgrading to increase fire flows to the downtown area and increase pressures at individual homes and commercial establishments to meet the Ministry of the Environment guidelines.

The built-up area of Flesherton is presently using individual wells for water supply. A communal water system would provide a more protected source of drinking water and fire flows.

Homes and cottages in the Eugenia area are serviced by individual wells and septic systems. A communal water supply would provide a safer water supply and would also provide fire flow. A communal sewage system would provide better protection of water quality of Eugenia Lake and allow for increased development.

Kimberley does not have a communal sewage system and the existing lots are serviced by septic systems. A communal sewage system would provide better water quality protection of the Beaver River and its tributaries in the Kimberley area.

Most of the developed lots (homes/chalets) near the Beaver Valley Ski Club are serviced by individual wells and septic systems. A water quality survey was carried out in January 2001 of homes in the Beaver Valley Ski Club area. Water supplies were taken from 64 homes/chalets and 36 water samples (over 56%) did not meet the Ontario Drinking Water Quality Standards (ODWQS). A communal water system would provide better quality water and safer water than the existing wells. Fire flows would also be provided. A communal wastewater system servicing the Beaver Valley Ski Club area would provide better water quality protection of the Beaver River and its tributaries.

Chris Wilson

From: Sandy Somers [sandy@mccracken-partners.com]
Sent: Tuesday, June 28, 2011 12:01 PM
To: Chris Wilson
Cc: Ross Slaughter
Subject: Water and Wastewater Servicing Master Plan

Importance: High

Dear Chris,

I am writing with respect to the subject Master Plan Study for the Markdale/Flesherton/Kimberley/Amik/Eugenia areas. We own a chalet on Talisman Mountain Drive and utilize the Amik water services. In addition, like all chalet/home owners on Talisman Mountain Drive, we have a septic system for our sewage As you may know, this system carries a significant fixed cost which is amortized over relatively few homes and small businesses in the immediate vicinity, leading to significant water bills for home and business owners. This situation has been exacerbated recently by the financial situation at Talisman Resort which is currently closed indefinitely. Talisman was the largest water user within the Amik system, and their closure forces their fixed cost absorption onto the remaining home and business owners. We feel that the current situation is untenable, as it forces a "cadillac" system on too-few users, with obvious cost impact.

I am unable to attend the public consultation meeting this evening, but would be very supportive of any move to consolidate the various water/wastewater systems in the area. Logically, this would seem to be the best means of ensuring safe, reliable supply and services in a cost-effective manner, and would eliminate the hodgepodge of systems that exists currently. This would also be a practical way of addressing the almost certain population growth in the area over the coming years.

Please feel free to contact me if you have any questions or comments, and thank you for your attention to my enquiry.

Kind regards,

Sandy and Gillian Somers
191 Talisman Mountain Drive
Kimberley, Ontario

Sandy Somers, Partner

Tel: 416.363.8900 Ext 227
Cell: 416.709.5644

Toll Free: 1-866-809-8900

McCracken & Partners Executive Search Inc.
120 Adelaide Street West, Suite 2210
Toronto, Ontario M5H 1T1

www.mccracken-partners.com

This message is intended for the named recipient(s) only and may contain information that is privileged and/or confidential. If you have

(4115 (c)

Ministry of
Municipal Affairs
and Housing

Municipal Services Office -
Western

659 Exeter Road, 2nd Floor
London ON N6E 1L3
Tel. (519) 873-4020
Toll Free 1-800-265-4736
Fax (519) 873-4018

Ministère des
Affaires municipales
et du Logement

Bureau des services aux municipalités -
région de l'Ouest

659, rue Exeter, 2e étage
London ON N6E 1L3
Tél. (519) 873-4020
Sans frais 1 800 265-4736
Téléc (519) 873-4018

Ontario

RECEIVED
JUL 19 2011

July 12, 2011

Mr. Chris Wilson, P. Eng.
GENIVAR
1450-1st Avenue West, Suite 101
Owen Sound, ON N4K 6W2

Dear Mr. Wilson:

Re: **Notice of Study Commencement-EA**
Water and Wastewater Servicing Master Plan
Municipality of Grey Highlands, County of Grey

Thank you for your recent circulation of the above-noted matter. In this regard, we offer the following comments for your consideration.

It is understood this Master Plan Servicing study is being conducted in accordance with the requirements of Phase 1 and 2 of the Municipal Class Environmental Assessment. The purpose of this study is to determine infrastructure for the Municipality of Grey Highlands to service the study area of Markdale-Flesherton-Kimberley-Amik-Eugenia and the Beaver Valley Ski Club area.

This office provides access to provincial services on municipal government, finance and administration, as well as land use planning and development issues covered under the *Planning Act*. Section 2 of the *Planning Act* speaks to matters of provincial interest. This section directs decision-making bodies (whether it is a council of a municipality, a local board, a planning board, a minister of the Crown and a ministry, board, commission or agency of the government, or the Ontario Municipal Board) to be consistent with the policy statements issued under Section 3 of the *Planning Act* in exercising any authority that affects a planning matter.

The current policy on land use planning matters for Ontario is the Provincial Policy Statement 2005 (PPS). The PPS speaks to issues such as the promotion of efficient, cost-effective development and land use patterns, and the proper consideration of the various resources of this province. The PPS also speaks to matters dealing with public health and safety.

The requirements of the *Planning Act* apply to applications for planning approvals; these applications include official plan amendments and zoning bylaw amendments. As such, consideration should be given to applicable policies of the *Planning Act,* including the PPS. The PPS is to be read in its entirety and all relevant policies are to be applied to each situation.

Based on our review of this particular matter, it appears that no planning approvals are being sought at this time. However, this project may have implications with respect to those matters covered by the PPS, as noted above. We recommend that you consider these policies in your review of this undertaking.

Ministry of Aboriginal Affairs

160 Bloor St. East, 9th Floor
Toronto, ON M7A 2E6
Tel: (416) 326-4740
Fax: (416) 325-1066
www.aboriginalaffairs.gov.on.ca

Ministère des Affaires Autochtones

160, rue Bloor Est, 9e étage
Toronto ON M7A 2E6
Tél. : (416) 326-4740
Téléc. : (416) 325-1066
www.aboriginalaffairs.gov.on.ca

Ontario

Municipality of
Grey Highlands

AUG 10 2011

AUG 16 2011

RECEIVED

Reference: 292

Shawn Moyer, Director of Public Utilities
Municipality of Grey Highlands
206 Toronto Street South
Markdale, ON N0C 1H0

Re: Water and Wastewater Servicing Master Plan
Markdale-Flesherton-Kimberley-Amik-Eugenia
Notice of Study Commencement and Public Consultation Meeting
Municipality of Grey Highlands

Dear Mr. Moyer:

Thank you for your inquiry regarding the above-noted project.

As a member of the government review team, the Ministry of Aboriginal Affairs (MAA) identifies First Nation and Métis communities who may have the following interests in the area of your project:

- reserves;
- land claims or claims in litigation against Ontario;
- existing or asserted Aboriginal or treaty rights, such as harvesting rights; or
- an interest in your project's potential environmental impacts.

MAA is not the approval or regulatory authority for your project, and receives very limited information about projects in the early stages of their development. In circumstances where a Crown-approved project may negatively impact a claimed Aboriginal or treaty right, the Crown may have a duty to consult the Aboriginal community advancing the claim. The Crown often delegates procedural aspects of its duty to consult to proponents. Please note that the information in this letter should not be relied on as advice about whether the Crown owes a duty to consult in respect of your project, or what consultation may be appropriate. Should you have any questions about your consultation obligations, please contact the appropriate ministry.

You should be aware that many First Nations and Métis communities either have or assert rights to hunt and fish in their traditional territories. For First Nations, these territories typically include lands and waters outside of their reserves.

In some instances, project work may impact aboriginal archaeological resources. If any Aboriginal archaeological resources could be impacted by your project, you should contact your regulating or approving Ministry to inquire about whether any additional Aboriginal communities should be contacted. Aboriginal communities with an interest in archaeological resources may include communities who are not presently located in the vicinity of the proposed project.

With respect to your project, and based on the brief materials you have provided, we can advise that the project appears to be located in an area where First Nations may have existing or asserted rights or claims in MAA's land claims process or litigation, that could be impacted by your project. Contact information is below:

Chippewas of Georgina Island R.R. #2, P.O. Box 12 SUTTON WEST, Ontario L0E 1R0	Chief Donna Big Canoe (705) 437-1337 (Fax) 437-4597 dbigcanoe@georginaisland.com
Beausoleil First Nation (Christian Island) 1 O-Gema Street Christian Island, CEDAR POINT, Ontario L0K 1C0	Chief Roland Monague (705) 247-2051 (Fax) 247-2239 rolymonague@chimnissing.ca
Chippewas of Rama 5884 Rama Road, Suite 200 RAMA, Ontario L0K 1T0	Chief Sharon Stinson Henry (705) 325-3611 (Fax) 325-0879 chiefofmnjikaningfirstnations@mnjikaning.ca
Chippewas of Saugeen R.R. #1, 6493 Hwy. 21 SOUTHAMPTON, Ontario N0H 2L0	Chief Randall Kahgee Jr. (519) 797-2781 (Fax) 797-2978rkahgee@saugeenfirstnation.ca
Chippewas of Nawash Unceded First Nation (Cape Croker) R.R. #5, 135 Lakeshore Road WIARTON, Ontario N0H 2T0	A/Chief Scott Lee (519) 534-1689 (Fax) 534-2130 Teresa.zach@nawash.ca Reception.admin@nawash.ca

For your information, MAA is aware of Métis communities that have asserted rights near your project. Contact information is below:

Great Lakes Métis Council 380 9th Street East Owen Sound, ON N4K 1P1	Peter Couture, Interim President (519) 370-0435 e-mail: osareametiscouncil@live.ca website: www.greatlakesvoyageurs.com
Historic Saugeen Métis 204 High Street, Box 1492 Southhampton, ON N0H 2L0	(519) 483-4000

Please copy any correspondence to Georgian Bay Métis to the Métis Nation of Ontario. Contact information is below:

Métis Nation of Ontario Head Office 500 Old St. Patrick Street, Unit D Ottawa, Ontario, K1N 9G4	Métis Consultation Unit Fax: (613) 725-4225

The Government of Canada sometimes receives claims that Ontario does not receive, or with which Ontario does not become involved. For information about possible claims in the area, MAA recommends you contact the following federal contacts:

Ms. Janet Townson Claims Analyst, Ontario Team Specific Claims Branch Indian and Northern Affairs Canada 1310-10 Wellington St. Gatineau, QC K1A 0H4 Tel: (819) 953-4667 Fax: (819) 997-9873	Mr. Sean Darcy Manager Assessment and Historical Research Indian and Northern Affairs Canada 10 Wellington St. Gatineau, QC K1A 0H4 Tel: (819) 997-8155 Fax: (819) 997-1366

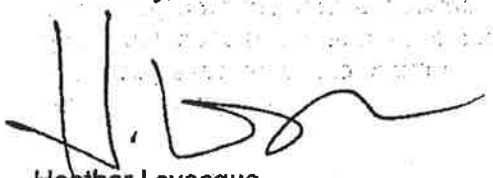
For federal information on litigation contact:

Mr. Marc-André Millaire
Litigation Team Leader for Ontario
Litigation Management and Resolutions Branch
Indian and Northern Affairs Canada
10 Wellington St.
Gatineau, QC K1A 0H4
Tel: (819) 994-1947
Fax: (819) 953-1139

Additional details about your project or changes to it that suggest impacts beyond what you have provided to date may necessitate further consideration of which Aboriginal communities may be affected by or interested in your undertaking. If you think that further consideration may be required, please bring your inquiry to whatever government body oversees the regulatory process for your project.

The information upon which the above comments are based is subject to change. First Nation or Métis communities can make claims at any time, and other developments can occur that could result in additional communities being affected by or interested in your undertaking.

Yours truly,



Heather Levecque
Manager, Consultation Unit
Aboriginal Relations and Ministry Partnerships Division

Chris Wilson

From: Lands and Resources Consultation Coordinator [saugeenmetisadmin@bmts.com]
Sent: Thursday, September 01, 2011 11:11 AM
To: Chris Wilson
Cc: Ross Slaughter; moyers@greyhighlands.ca
Subject: HSM interest in Water and Wastewater Servicing Master Plan

Hi Chris,

The Historic Saugeen Métis (HSM) are very interested in being involved with the Municipality of Grey Highlands Master Plan study for a regional water and wastewater system to determine the infrastructure requirements for servicing the municipality. At this time HSM feels it does not have sufficient information to make any significant comments on the details of the project.

HSM greatly supports the projects intentions/goals to provide safe and reliable drinking water to the citizens of Grey Highlands, enhance the environment through water quality protection and increase safety through fire flow. HSM has a significant interest in any archeological activities that develop through out this process. Unexpected archeological findings during other sewer projects in the territory have not always been handled in the most ideal way therefore, hopefully there will be thorough Archeological assessments completed for this project.

HSM main concerns regarding this project involve the archeological activities related to this project as well as protecting the environmental integrity of the lands and waters of the HSM territory.

We look forward to being involved in the planning process, thank you for the information provided thus far.

Many thanks,

Audrey Erin Holden M.E.S
Lands and Resources Consultation Coordinator

Historic Saugeen Metis
204 High Street
Southampton, Ontario
N0H 2L0

Direct Line (519) 483-4001
Fax (519) 483-4002
Email saugeenmetisadmin@bmts.com

Historic Saugeen Metis, an independent, self-governed aboriginal community in existence along the Lake Huron shoreline since the early 1800s. The rights-bearing Metis community asserts Section 35 Constitution (1982) aboriginal rights and asserts rights is an historic Metis community under the Supreme Court decision R. Vs. Powley (2003).

This email message, including any attachments, is for the intended recipient(s) only, and contains confidential and proprietary information.
Unauthorized distribution, copying or disclosure is strictly prohibited. If you have received this message in error, or are obviously not one
of the intended recipients, please immediately notify the sender by reply email and delete this email message, including any attachments.
Thank you.

111-113229 1052 S.

Chippewas of RAMA First Nation

5884 Rama Road, Suite 200
Rama, Ontario L0K 1T0
T 705.325.3611 F 705.325.0879

A Proud Progressive First Nation Community

RECEIVED
SEP 27 2011

September 16, 2011

GENIVAR
1450 1st Avenue, Suite 101
Owen Sound, ON N4K 6W2

Attention: Ross Slaughter, Designated Consulting Engineer

Re: Water and Wastewater Servicing Master Plan
Markdale-Flesherton-Kimberley-Amik-Eugenia
Municipality of Grey Highlands

Dear Mr. Slaughter:

As a member of the Williams Treaties First Nations, Rama First Nation acknowledges receipt of your letter of August 24, 2011, which was received on August 29, 2011.

A copy of your letter has been forwarded to Karry Sandy-McKenzie, Barrister & Solicitor, Coordinator for Williams Treaties First Nations for further review and response directly to you. Please direct all future correspondence and inquiries, with a copy to Rama First Nation, to Ms. Sandy-McKenzie at 8 Creswick Court, Barrie, ON L4M 2J7 or her e-mail address at k.a.sandy-mckenzie@rogers.com. Her telephone number is (705) 792-5087.

We appreciate your taking the time to share this important information with us.

Sincerely,

Chief Sharon Stinson Henry

c: Council, Rama First Nation
Jeff Hewitt, General Counsel
Karry Sandy-McKenzie, Coordinator Williams Treaties First Nations
Chief Roland Monague Portfolio Chief for Williams Treaties Nations

RECEIVED
JUL 11 2012

July 6, 2012

Mr. Chris Wilson, P. Eng.
GENIVAR
1450 – 1st Avenue West, Suite 101
Owen Sound, On
N4K 6W2

Re: Water and Wastewater Servicing Master Plan for Markdale-Flesherton-Kimberley-Amik-Eugenia; Municipality of Grey Highlands

Dear Mr. Wilson:

Thank you for the opportunity to comment on the draft version of the Water and Wastewater Servicing Master Plan (Match 2012).

The Grey Bruce Health Unit supports the plan, as presented. In particular, several of the objectives of the plan align with of the goals of Public Health including improvements to drinking water supplies, protection of drinking water sources and the protection of surface water including recreational water. In addition, meeting municipal drinking water guidelines and fire water flow needs have obvious benefits to Public Health. While identifying current problems, the plan also anticipates potential future challenges and offers solutions to those problems as well as opportunities that support further improvements and economic development.

The Grey Bruce Health Unit supports municipal water and wastewater systems. The move toward communal, as opposed to on-site servicing, reflects current best practice in sewage management. Evidence shows that properly managed municipal water systems provide a higher level of safety for drinking water than private systems as knowledgeable operators and more robust process checks result in fewer adverse incidents.

While there are obviously challenges to overcome, including financing the proposed system, the municipality's goals for this Master Plan and the vision they show in its development are to be applauded.

Together we build healthy communities,

Dr. Hazel Lynn, M.D., FCFP, MHSc
Medical Officer of Health

HEAD OFFICE: 101 17th Street East, Owen Sound, Ontario N4K 0A5 www.publichealthgreybruce.on.ca

OWEN SOUND
519-376-9420
1-800-263-3456
Fax 519-376-0605

WALKERTON
519-881-1920
1-800-263-3456
Fax 519-881-3920

Niagara Escarpment Commission

99 King Street East
P.O. Box 308
Thornbury, ON N0H 2P0
Tel. No. (519) 599-3340
Fax No. (519) 599-6326
www.escarpment.org

Commission de l'escarpement du Niagara

99, rue King est
p.o.b. 308
Thornbury ON N0H 2P0
No de tel. (519) 599-3340
Télécopieur (519) 599-6326
www.escarpment.org

An agency of the Government of Ontario
Un organisme du gouvernement de l'Ontario

July 10, 2012

Chris Wilson, P. Eng
GENIVAR
1450 - 1st Avenue West, Suite 101
Owen Sound, ON N4K 6E2

Dear Mr. Wilson:

Re: Water and Waste Water Servicing Master Plan
Markdale-Flesherton-Kimberley-Amik-Eugenia
Municipality of Grey Highlands

Thank you for providing information on this Master Plan process as requested. The Niagara Escarpment Commission was not directly notified of this Study, and was not included in the agency consultation list provided in Section 10.0 of the Water & Wastewater Servicing Master Plan.

A significant portion of the Study Area lies within the boundaries of the Niagara Escarpment Plan (NEP) and area of Niagara Escarpment Development Control. I have attached a NEP map for your reference. Additional NEP mapping can also be viewed at www.escarpment.org.

The Master Plan considered servicing options for Markdale, Flesherton, Kimberley, Amik (subdivision), and Eugenia. Full, partial or no services are in place for these areas. The Master Plan has now been completed and a subsequent report entitled "Outline of Recommended Sewage and Water Servicing for Phase 1 of the Master Plan" (March 2012) has been prepared. This Report provided details on Phase 1 (highest priority component) of the recommended preferred alternate solution outlined in the Master Plan. The priority appears to be upgraded services for the Village of Markdale outside of the NEP. However, Phase 1 contains sub-phases for water and sewage servicing which includes alterations to existing, and extension of new water and sewage services to lands within the NEP in the Beaver Valley as shown on Figures 1.1 and 1.2 of the Report.

Within the NEP, "utilities" are a permitted use subject to satisfying the Development Criteria (Part 2) of the NEP. However, within the Escarpment Natural Area designation, only "essential" utility facilities may be permitted.

Essential is defined in the NEP as *"that which is deemed necessary to the public interest after all alternatives have been considered"*. Some of the proposed new servicing infrastructure as outlined in the Report is within the Escarpment Natural Area designation.

The upgrade of existing services and extension of services to the identified areas of existing and potential development associated with the Amik subdivision, Talisman, Kimberley, the Beaver Valley Ski Club and Bowles Bluffs area is commendable in terms of long term environmental protection of these areas. Although we support the provision of services to these areas predominantly designated Escarpment Recreation Area and Minor Urban Centre in the NEP, this does not however, imply that additional development possibilities outside of, or expansions to these designated growth areas will be permitted or be supported by the policies of the NEP. Development, regardless of servicing availability, must occur in accordance with the provisions of the NEP.

A Development Permit is required for any work proposed within the area of Development Control. Development Control is not in effect for substantial portions of the Escarpment Recreation Area designation and is not in effect within the Village of Kimberly.

The Niagara Escarpment Commission requests to be kept informed of the processing of the Master Plan.

Please contact me at 519-599-3740 or at rick.watt@ontario.ca if you wish to discuss these comments.

Yours truly,

Rick Watt
Planner

Enclosure

C: Ken Whitbread, Manager, NEC
Shawn Moyer, Water & Wastewater Superintendent, Municipality of Grey Highlands
Randy Scherzer, Director, Grey County Planning & Development Dept
Bill Armstrong, Regional Environmental Planner, MOE



MAP 1

NIAGARA ESCARPMENT PLAN

MUNICIPALITY OF GREY HIGHLANDS

WATER & WASTE WATER SERVICING MASTER PLAN

NOTE: The Niagara Escarpment Plan Designation boundaries shown on this map are approximate and subject to confirmation through Site Inspection and the application of the 'Interpretation of Boundaries' section of the Niagara Escarpment Plan

Printed on Jul 10, 2012 by browmca3

Ontario

© 2012 Queen's Printer for Ontario

LEGEND

Plan Designations

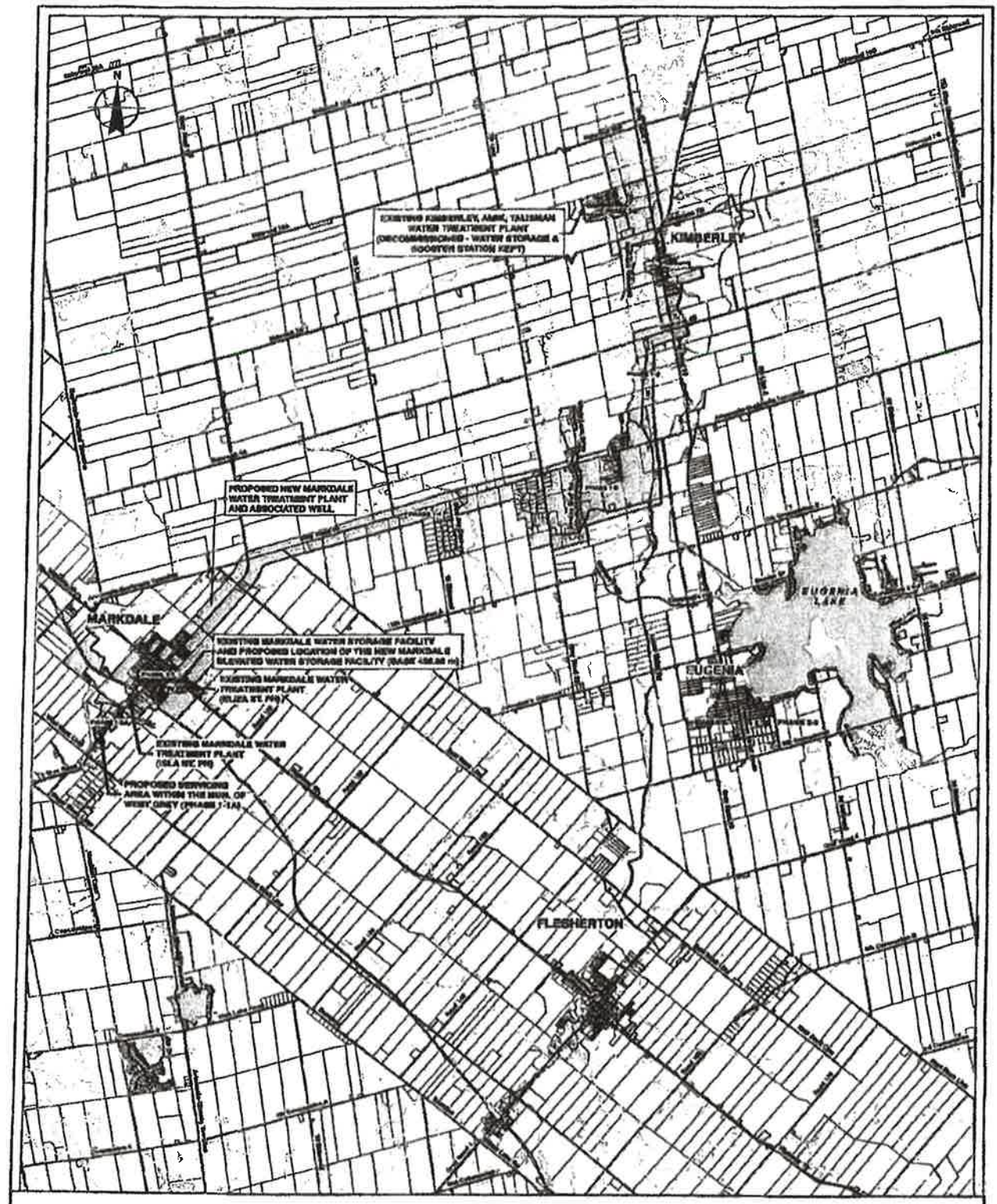
- Escarpment Natural Area
- Escarpment Protection Area
- Escarpment Rural Area
- Mineral Resource Extraction Area
- Escarpment Recreation Area
- Urban Area
- Minor Urban Centre
- Public Land (in Parks and Open Space System)
- Special Policy Areas

Approximate Scale 1:100,000

0 1000 2000 3000 4000 5000

Metres

N



LEGEND

- PROPERTY PARCEL
- WATERBODY
- WETLAND - PERMANENT
- RIVER/STREAM
- MARKDALE WTP PROPOSED SERVICE AREA
- EXISTING WATER STORAGE FACILITY
- PROPOSED WATER STORAGE FACILITY

0 0.5 1 2 3 4
Kilometres

PREFERRED SOLUTION FOR WATER TREATMENT, WATER STORAGE AND WATER DISTRIBUTION
ALTERNATIVE - 1K-8 - PHASE 1
MUNICIPALITY OF GREY HIGHLANDS
WATER AND WASTEWATER MASTER PLAN

GENIVAR

GENIVAR INC
1410 FIRST AVE. WEST, SUITE 1M
OWEN SOUND, ONTARIO N4K 6W6

DESIGN	CHS/MS
DRAWN	JST
APPROVED	CHS/MS
DATE	FEB 2015
SCALE	SEE SCALE BAR
PROJECT No.	111-13555-00
FIG No.	1.1


UPGRADE EXISTING AMIK WASTEWATER TREATMENT FACILITIES
POTENTIAL SPS # 1
KIMBERLEY
POTENTIAL SPS # 2
UPGRADE EXISTING MARKDALE WASTEWATER TREATMENT FACILITIES
EUGENIA LAKE
EUGENIA
MARKDALE
FLESHERTON
LEGEND
MARKDALE WWTP PROPOSED SERVICE AREA
AMIK WWTP PROPOSED SERVICE AREA
MUNICIPAL WASTEWATER FACILITY
PROPERTY PARCEL
POTENTIAL LOCATION FOR SEWAGE PUMP STATION (APPROX.)
PROPOSED SEWER MAINS
NEW - Forcemain from Sewage Pumping Station
NEW - Forcemain with Grinder Pumps
REPLACEMENT - Forcemain with Grinder Pumps
NEW - Gravity Sewer Main
DIRECTION OF FLOW
0 0.5 1 2 3 4
Kilometres
PREFERRED SOLUTION FOR WASTEWATER TREATMENT, SEWAGE PUMPING STATION AND SANITARY SEWER COLLECTION
ALTERNATIVE - 5.4 - PHASE 1
MUSCOKIALITY OF GREY HIGHLANDS
WATER AND WASTEWATER MASTER PLAN
GENIVAR
GENIVAR INC
1458 FIRST AVE. WEST, SUITE 101
OWEN SOUND, ONTARIO N4K 6W2
1.2

Ministry of the Environment
733 Exeter Road
London ON N6E 1L3
Tel': 519 873-5000
Fax: 519 873-5020

Ministère de l'Environnement
733, rue Exeter
London ON N6E 1L3
Tél.: 519 873-5000
Téléc.: 519 873-5020

Ontario

July 16, 2012

Ross Slaughter, P.Eng.
Designated Consulting Engineer
Senior Water Resources Engineer
Genivar
Suite 101
1450 1st Avenue West
Owen Sound, Ontario
N4K 6W2

Dear Mr. Slaughter:

RE: MEA Municipal Class Environmental Assessment - Water & Wastewater Servicing Master Plan – Markdale-Flesherton-Kimberley-Amik-Eugenia-Beaver Valley Municipality of Grey Highlands

---

This acknowledges receipt of the most recent draft (March 2012) of the referenced servicing master plan and the invitation to comments from the ministry's perspectives (scientific-technical and process). While we strongly commend the municipality for its proactive initiation of the plan, we have identified several deficiencies.

Insufficient Environmental Information and Evaluation of Environment Impacts

The report is mostly an engineering and costing assessment of alternatives for water and sewage servicing in support of the municipality's vision for future growth and development. The report lacks information on existing aquatic environment conditions and so baseline conditions (the water resources which need to be protected) are uncharacterized. Without this kind of basic information any comparative assessment of potential environmental impact can not be made.

In this regard, in the absence of assimilative capacity assessment ministry staff cannot "sign-off" on the recommended increased sewage flows.

The study concludes that Alternative S.4 is the preferred solution. In terms of sanitary wastewater treatment upgrades, the Flesherton STP's capacity would be increased from 419 to 459 m^3/day by "optimization" of the existing works; the Markdale STP's capacity would increase from 1,122 to 2,398 m^3/day with the construction of new aeration cells and rapid infiltration basins and other works; and the Amik-Talisman STP would undergo a major expansion (7x) from 249 to 1811 m^3/day with a new continuous discharge. Specifically,

Flesherton – no specific concerns at this point in time with the proposed 10% capacity re-rating subject to an assimilative capacity study of the Boyne River.

Markdale – currently a 2-cell lagoon system discharges to rapid infiltration basins on table lands next to the Rocky Saugeen. Among other upgrades, 8 new infiltration basins would be constructed nearby. As with the current infiltration system, the new basins would need groundwater monitoring observation wells down-gradient to monitor the water quality of the subsurface flow to the river. Should the proposed expansion go forward, the effluent limits shown below should be tightened slightly without triggering noncompliance. This would help ensure that current effluent quality is maintained.

Markdale lagoon - effluent quality and limits

Parameter	Year 1 2007	Year 2 2008	Year 3 2009	Limits
BOD5 (mg/l)	9.5	7	10.1	25
Suspended Solids (mg/l)	12.6	8	13.1	30
Total Phosphorus (mg/l)	0.39	0.28	0.24	1.0

Amik-Talisman – since 2002 the STP has been approved to modify the effluent distribution piping currently used for spray irrigation to allow some overland flow and indirect discharge to an existing natural wetland which is associated with the provincially-significant Beaver Valley Lowlands. A direct discharge to the wetland is not allowed and the wetland is not to be used as a sewage treatment unit. An increase in design capacity up to 431 m^3/day is already approved using treated effluent distributed on a total of 27 hectares comprising a spray irrigation area of 11 hectares, an overland flow area of 8 hectares and the wetland area of 8 hectares. Ministry acceptance of that increase was based on a 2001 water quality assessment showing minimal impact on three tributaries of the Beaver River which traverse the property. However, we now understand that the physical modifications to the sewage works which were approved have not been implemented so the need for a further expansion may be over-stated.

The master plan proposes to replace the spray irrigation system with one which discharges from the lagoons to a "*free water surface wetland*" presumably for the storage and "polishing" of treated sewage before discharge to a tributary of the Beaver River. However the footprint of the new artificial wetland overlaps with an existing natural wetland, a "*mature soft maple riverine swamp*" which is associated with the Beaver Valley Lowlands.

MOE could not support such a proposal for a large-scale expansion because the natural wetland should be conserved rather than converted into a sewage works. MOE's concern for the wetland is the reason why a direct discharge to it was not allowed when the modest expansion was approved in 2002. Any proposal for a surface water discharge would be assessed based on an assimilative capacity study of the receiving water. The Beaver River watershed is a high quality water resource which implies the need for effluent limits significantly more stringent than those currently approved for land application of lagoon sewage (shown below). The 2002 Henderson Paddon "optimization study" in support of the existing approval recommended a monitoring

program of the wetland at the three tributaries of the Beaver River crossing Grey Road 7. For an expansion proposal, such a program would be needed to establish water quality conditions pre and post expansion to show that the assimilative capacity of the receiver has not been exceeded.

Amik lagoon - effluent quality and limits

Parameter	Year 1 2009	Year 2 2010	Year 3 2011	Limits
BOD5 (mg/l)	3.86	4.86	5.71	30
Suspended Solids (mg/l)	7.43	8.43	19.86	60
Total Phosphorus (mg/l)	0.49	0.72	0.52	2

Consultation with Aboriginal Communities

With respect to required consultations with Aboriginal Communities – First Nations and Métis, based on the material provided by the document, the ministry concludes that those efforts are inadequate in that:

- There is no evidence in the draft report that efforts were made to contact relevant aboriginal communities aside from an apparent, inadequate effort on June 15/11 via what was probably a generic letter to the Ministry of Aboriginal Affairs and another one on/about Aug 24/11 to aboriginal communities listed in MMA's reply of August 10(?).

- Responses were received from two communities (Historic Saugeen Métis and Chippewas of Rama FN), both of a type that require follow-up by the proponent. There's no indication of any follow-up.

- The only notice for public meeting was apparently a notice in a local newspaper

- No additional efforts were apparently made to contact "non-responding" aboriginal communities beyond the one letter (either July 15 or Aug 24 iteration) and the newspaper notice. This is inadequate given the scope and potential impacts of the projects contemplated, which would seem to require, as a starting point, meaningful efforts at communication with relevant aboriginal communities.

In general, where there is likely to be an impact upon the natural environment in an area where there are known or asserted rights, the ministry typically expects more than the provision of notice. We expect information to be provided to First Nations' and Métis communities, that those communities have a chance to respond and that any concerns identified are addressed and that these efforts be fully documented in the environmental report.

We think a discussion of Aboriginal consultations along the lines of the following framework is worth consideration.

Community Consulted	Issues/Concerns Identified by Community	Proponent Response	Whether/How Issues/Concerns are Resolved
XYZ First Nation			
ABC Métis Council			

Additional, specific comments

1. We think the discussion of project phases could be more focused by simply saying these are the measures/works necessary to support the municipality's existing and future growth and development priorities as set out by the official plan.

2. In Section 3.0, we believe that official plan designations are really socio-economic conditions rather than Natural Environment conditions and should therefore be relocated to 3.2. In line with our comments about environmental aspects, we expect Section 3.0 to include environmental circumstances such as the Beaver-Boyne, including Lake Eugenia, and Saugeen Rivers including tributaries and recharge/discharge areas, wetlands, forests, karst topography.

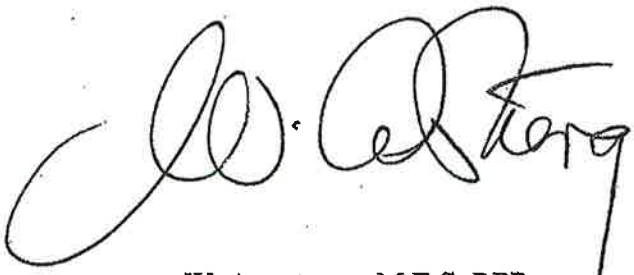
3. We think the discussion in Sections 4.0 and 5.0 really speak to the problem statement or need.

4. We wonder whether any of the alternative water distribution measures in Section 6.4 would result in new development being permitted to occur on partial services – municipal water and individual sewage. The ministry does not normally support Greenfield development on partial services, which is reflected by the Provincial Policy Statement.

5. We are unsure where the "Outline of Recommended Sewage and Water Servicing for Phase 1 of the Master Plan" fits into the master plan. Perhaps a new section inserted after Section 8 (Identification of Preferred Solution)?

If questions arise or if clarification is needed please contact the undersigned at (519) 873-5013 or via email at bill.armstrong@ontario.ca.

Yours truly,



W. Armstrong, M.E.S, RPP
Regional Environmental Planner
Southwestern Region

cc. D. Best
I. Mitchell
S. Abernethy
L. Rising
P. Burns

Chris W

Corporation of the County of Grey

Office of the Director of Planning and Development

595 9th Avenue East, Owen Sound ON N4K 3E3
(519) 376-2205 / 1-800-567-GREY / Fax (519) 376-7970
www.grey.ca

RECEIVED
JUL 20 2012

July 18, 2012

Mr. Chris Wilson, P. Eng.
GENIVAR
1450 – 1st Avenue West, Suite 101
Owen Sound, ON
N4K 6W2

Dear Mr. Wilson:

Thank you for providing the document entitled "Outline of Recommended Sewage and Water Servicing for Phase 1 of the Master Plan" dated March 2012 and circulated to the County on June 8, 2012. County staff has reviewed the document and offer the following comments.

Looking at the proposed service area identified on Figure 1.1, it appears that this does not correlate with areas designated for growth in the County Official Plan, the Municipality of Grey Highlands Official Plan or the Niagara Escarpment Plan. Some areas designated for growth appear to not be included in the proposed servicing area, while other areas identified in the proposed servicing area are not designated for growth in the planning documents. It is recommended that the proposed servicing area be revised to correspond to the areas designated for growth in the planning documents. At a minimum, the proposed 20 year servicing capacity should include the estimated growth for lands designated for growth in the planning documents. For example, the expansion lands approved in County Official Plan Amendment No. 80 (5 year review of the County Official Plan) should be considered in the proposed servicing area/projected capacity totals as the justification provided in the Comprehensive Review prepared by the Municipality contemplated development to occur on these lands within the next 20 years (see attached map showing the lands designated for growth in Markdale). It is also recommended that the Beaver Valley Village subdivision lands, and the future development Block identified in the Beaver Valley Ski Club Subdivision off Windy Lane Drive, should be identified in the proposed servicing area and should be considered in the future servicing capacity projections.

Other lands identified in the proposed servicing area appear to be outside the areas designated for growth in the planning documents (e.g. lands in the north part of Phase 1-2 and lands in the east of Phase 1-3). Although it may be possible to provide services to existing uses within these areas, it should be noted that future development outside of the areas designated for growth will be limited to the policies contained in the planning documents. Any future expansions to settlement areas will need to be justified through a comprehensive review. It should be noted that expansion to growth areas located in the Niagara Escarpment Plan are not permitted based on the 10 year moratorium of settlement area expansions put in place by the Greenbelt Plan.

In terms of estimated growth projections, and determining capacity required for the next 20 years, the Study should consider the growth projections identified in the County's Growth Management Study.

Please note that the projections were made prior to the recession and therefore are higher than the actual growth that has occurred in the past several years. Also, the growth projections focus on permanent population projections; whereas growth within some of the proposed serviced areas (i.e. Beaver Valley, Amik) will likely receive a good portion of seasonal residents. The anticipated seasonal growth should be considered when estimating future servicing capacity requirements.

Based on discussions with the County Transportation Department, staff notes that there is a considerable amount of servicing infrastructure proposed under/adjacent to County roads. The County Transportation Department has noted that approval will be required from the County Transportation Department for any proposed use of the County road allowance for servicing infrastructure. The County Transportation Department has indicated that any proposed servicing on the County roads will need to be placed outside of the ditches and the roadway/shoulders, and that the location of the proposed servicing infrastructure will need to be coordinated with the utility companies.

County staff assumes that a copy of the Master Servicing Plan has been provided to the Ministry of Environment for review and comment. If not, County staff recommends that the document be circulated to the Ministry of Environment for their review. County staff also recommends consultation with First Nations and Métis, as well as any other agencies that may have an interest in the Study (e.g. conservation authorities, etc.).

It is critical that the Master Servicing Plan correlates with the land use planning documents. I recommend that the consultant convene a meeting with staff from the Grey Highlands Planning Department, County of Grey Planning Department, the Ministry of the Environment staff, and the Niagara Escarpment Commission, to discuss the Master Servicing Plan and how it correlates to the land use planning documents and any proposed/draft approved developments within or adjacent to the proposed service area.

Should you have any questions, please do not hesitate to contact the undersigned.

Yours truly,

Randy Scherzer, MCIP RPP
Director of Planning and Development

cc: Municipality of Grey Highlands
Rick Watt, Niagara Escarpment Commission
Mike Kelly, County Transportation Services Department
Bill Armstrong, Ministry of the Environment

Chris Wilson

From: Lands and Resources Consultation Coordinator [saugeenmetisadmin@bmts.com]
Sent: Thursday, July 19, 2012 1:20 PM
To: Chris Wilson
Subject: Water and Wastewater Servicing Master Plan- Grey Highlands
Attachments: Water Serviceing Grey Highlands, responce Letter(1).pdf

Hey Chris,

Sorry this is a day late. HSM doesn't have any direct comments at this time but would like to keep updated on the project and learn more about it as preferred alternatives are chosen and more in depth studies are completed.

The office is very busy leading up to our August event but hopefully GENIVAR can meet with HSM council at some point to discuss the project further (late August/early September?).

Thanks,

Erin

Many thanks,

Audrey Erin Holden M.E.S
Lands and Resources Consultation Coordinator

Historic Saugeen Metis
204 High Street
Southampton, Ontario
N0H 2L0
Direct Line (519) 483-4001
Fax (519) 483-4002
Email saugeenmetisadmin@bmts.com

Historic Saugeen Metis, an independent, self-governed aboriginal community in existence along the Lake Huron shoreline since the early 1800s. The rights-bearing Metis community asserts Section 35 Constitution (1982) aboriginal rights and asserts rights is an historic Metis community under the Supreme Court decision R. Vs. Powley (2003).

HISTORIC
SAUGEEN
MÉTIS

Historic Saugeen Métis
204 High Street
Southampton, Ontario
N0H 2L0
Direct Line (519) 483-4000
Fax (519) 483-4002

July 18, 2012

GENIVAR Inc.
1450 1st Ave. West, Suite 101
Owen Sound, Ontario
N4K 6W2

Re: Water and Wastewater Servicing Master Plan, Markdale-Flesherton-Kinberly-Amik-Eugenia- Review of Alternative Solutions and Preliminary Identification of Recommended Solution, Municipality of Grey Highlands.

Dear Mr. Chris Wilson,

The Historic Saugeen Métis' (HSM) Lands and Resources Department has reviewed the relevant documents regarding the proposed water and wastewater Servicing Master Plan for the Municipality of Grey Highlands.

Although HSM have no direct comments at this time staff and Council would like to keep updated on the status of this project as more in depth studies are completed and eventually the consecutive phases are implemented. HSM have an interest in the degree of preservation of natural features and environmental resources therefore, HSM would request any information regarding natural heritage studies completed for these projects. Additionally, HSM has great interest in all archeological resources in the territory. HSM would request any information regarding archeological assessment for these projects.

The results of the post construction environmental monitoring to ensure the preservation of natural resources and to determine the success of remedial actions would also be of great interest to HSM when that phase of the project is reached.

Once a preferred alternative is chosen, after the second public meeting, HSM would request a meeting to discuss the details of the project and establish a better understanding of the projects affects on their interest in the territory.

Thank you for the information already provided, HSM looks forward to more information on the proposed projects as it becomes available.

Regards,

Audrey Erin Holden M.E.S
Lands and Resources Consultation Coordinator

Historic Saugeen Metis
204 High Street
Southampton, Ontario
N0H 2L0

Direct Line (519) 483-4001
Fax (519) 483-4002
Email saugeenmetisadmin@bmts.com

Chris Wilson

From: Muller, Joseph (MTCS) [Joseph.Muller@ontario.ca]
Sent: Wednesday, May 08, 2013 11:12 AM
To: Chris Wilson
Cc: d.ritchie@saugeenojibwaynation.ca; Slattery, Barbara (ENE); moyers@greyhighlands.ca
Subject: Water and Wastewater Servicing Master Plan,Markdale-Flesherton-Kimberley-Amik-Eugenia-Beaver Valley
Attachments: ArchCheck.pdf; BH-CHL-Check.pdf; Grey Highlands Water-Wastewater Master Plan MTCS comments 2013-05-08.pdf

Dear Chris Wilson:

Please find attached our comments and supporting documents from the Culture Services Unit of the Ministry of Tourism, Culture and Sport regarding the above project, and contact me if you have questions or would like to discuss our comments further. Thank-you for your assistance,

Joe

Joseph Muller, RPP, MCIP

Heritage Planner
Ministry of Tourism, Culture and Sport
Culture Division | Programs and Services Branch | Culture Services Unit

401 Bay Street, Suite 1700
Toronto, Ontario M7A 0A7

Tel. 416.314.7145 | Fax. 416.314.7175

Ministry of Tourism, Culture and Sport

Culture Services Unit
Programs and Services Branch
401 Bay Street, Suite 1700
Toronto ON M7A 0A7

Tel. 416 314-7145
Fax: 416 314 7175

Ministère du Tourisme, de la Culture et du Sport

Unité des services culturels
Direction des programmes et des services
401, rue Bay, Bureau 1700
Toronto ON M7A 0A7
Tél. : 416 314-7145
Téléc. : 416 314 7175

Ontario

May 8, 2013 (EMAIL ONLY)

Mr. Chris Wilson, P.Eng
GENIVAR Inc.
1450 – 1st Avenue West, Suite 101
Owen Sound, ON N4K 6W2
E: Chris.Wilson@genivar.com

RE: Water and Wastewater Servicing Master Plan
Markdale-Flesherton-Kimberley-Amik-Eugenia-Beaver Valley
Municipality of Grey Highlands, Ontario
MTCS file no. 42EA019

Dear Chris Wilson:

Thank you for providing the Ministry of Tourism, Culture and Sport (MTCS) with the report on the above master plan project, as requested by the Saugeen Ojibway Nation at your meeting of April 24, 2013. For this undertaking, it is the mandate of MTCS, under the *Ontario Heritage Act* (*OHA*), to conserve, protect and preserve Ontario's cultural heritage, including:

- Archaeological resources;
- Built heritage resources, including bridges and monuments; and,
- Cultural heritage landscapes.

Under the EA process, a determination of the project's potential impact on these cultural heritage resources is required. Please advise MTCS whether archaeological and/or heritage impact assessments will be completed for your EA project, and forward them to MTCS, before issuing a Notice of Completion.

Archaeological Resources
Screening your EA project with the attached MTCS *Criteria for Evaluating Archaeological Potential* determines whether it may impact archaeological resources. MTCS archaeological sites data are available at archaeologysites@ontario.ca. If your EA project area exhibits archaeological potential, then an archaeological assessment (AA) by an *OHA* licensed archaeologist is recommended and the AA report forwarded to MTCS for review. The Ontario Archaeological Sites Database shows three registered archaeological sites within the project study area.

Built Heritage and Cultural Heritage Landscapes
The MTCS *Screening for Impacts to Built Heritage and Cultural Heritage Landscapes* checklist attached determines whether your EA project may impact these cultural heritage resources: the Clerk for the Municipality of Grey Highlands can provide information on property listed or designated under the *Ontario Heritage Act*. If your EA project may impact known or potential cultural heritage resources, MTCS recommends that a Heritage Impact Assessment (HIA) be prepared by a qualified consultant. The MTCS *Info Sheet #5: Heritage Impact Assessments and Conservation Plans* outlines the scope of HIAs. Please send completed HIAs to MTCS and the local municipality for review, and make it available to local heritage organizations with an interest. A review of the Grey Highlands municipal web site indicates that up to three designated properties and three listed properties may fall within the project study area.

Environmental Assessment Reporting
HIA and AA reports and their recommendations are part of the EA project. Determinations that no cultural heritage resources are impacted and no technical studies are warranted should be documented and summarized as part of the EA process, and included in the final Environmental Study report. MTCS is in no way liable if the information in the completed checklists is found to be inaccurate or incomplete.

Water and Wastewater Servicing Master Plan - MTCS Comments

Section 3.2 Inventory of Social-Economic and Cultural Environment:

This section includes mention of the historical settlement of Markdale, which is not provided for Flesherton and Eugenia. Further details are appropriate, such as inventories of cultural heritage resources, including archaeology, built heritage, and cultural heritage landscapes, within the study area.

Section 10.0 Consultation with Review Agencies and the Public

The Municipal Class Environmental Assessment manual (2011 – Section A.3.6) identifies the Ministry of Tourism and Culture (now MTCS) as a review agency recommended for circulation of Schedule B/C projects. Please include us in the circulation list for future projects.

Thank-you for providing MTCS with the report on the above master plan project. Please provide us with updates through the EA process, and contact me for any questions or clarification.

Sincerely,

Joseph Muller
Heritage Planner
Joseph.Muller@ontario.ca

Copied to: Doran Ritchie, Land Use Planning Coordinator, Saugeen Ojibway Nation
Shawn Moyer, Waste & Wastewater Superintendent, Municipality of Grey Highlands
Barbara Slattery, EA/Planning Coordinator, Ministry of the Environment

Disclaimer: The Ministry of Tourism, Culture and Sport reserves the right to review projects for their potential to impact archaeological, built heritage and cultural heritage landscape resources, and recommend that archaeological and/or heritage impact assessments be undertake.

Please notify MTCS if archaeological resources are impacted by EA project work. All activities impacting archaeological resources must cease immediately, and a licensed archaeologist is required to carry out a determination of their nature and significance.

If human remains are encountered, all activities must cease immediately and the local police be contacted as well as the Cemeteries Regulation Unit of the Ministry of Consumer Services must be contacted. In situations where human remains are associated with archaeological resources, MTCS should also be notified to ensure that the site is not subject to unlicensed alterations which would be a contravention of the *Ontario Heritage Act.*

FILE 111-13229

BEAVER VALLEY SKI CLUB

May 21, 2013

Mr. Dan Best
Municipality of Grey Highlands
P. O. Box 409
Markdale, Ontario
N0C 1H0

Dear Mr. Best:

We are writing to follow up with the municipality regarding the current outline of recommended sewage and water servicing for Phase 1 of the Master Plan version, March 2012. As previously noted in our letter of July 20, 2011 the Beaver Valley Ski Club supports the initiatives outlined in the water & waste water servicing master plan currently under review.

It is our understanding that a similar plan was considered in 2001 with the preparation of a servicing study that was completed by Henderson Padden & Associates, now operating as Genivar Inc. At that time it was recognized that the water quality and quantity in the Beaver Valley area was less than desirable and potentially unsustainable. With now 12 years passing, changes have continued with local water supplies deteriorating.

For the long term, municipal servicing continues to be viewed by the Beaver Valley Ski Club as the most environmental and cost effective approach to provide consistent water and waste water services. The Club continues to support this initiative.

We look forward to hearing more about the next steps. If you require further clarification related to our comments, please do not hesitate to contact me.

Yours truly,

Tim Foster
General Manager

R. R. #4, 100 Pioneer Drive, Markdale, ON N0C 1H0 • t. 519.986.2520 f. 519.986.4168
www.beavervalley.ca

Ross Slaughter

From: Best, Dan [BestD@greyhighlands.ca]
Sent: Wednesday, May 22, 2013 9:02 AM
To: Moyer, Shawn; Ross Slaughter
Cc: Robertson, Debbie
Subject: FW: Water and Waste Water Servicing
Attachments: 0762_001.pdf

HI all. FYI. Debbie, please place on the agenda as correspondence.
Thanks,

Grey Highlands | *The place for all seasons*

Dan Best MPA, BA
Chief Administrative Officer
The Municipality of Grey Highlands
206 Toronto Street South, Unit One P.O.Box 409 Markdale, Ontario N0C 1H0
☎519-986-1216 x231 Toll-Free ☎1-888-342-4059 Fax 519-986-3643
bestd@greyhighlands.ca www.greyhighlands.ca

DISCLAIMER: This electronic transmission, including any accompanying attachments, may contain information that is confidential, privileged and/or exempt from disclosure under applicable law, and is intended only for the recipient(s) named above. Any distribution, review, dissemination or copying of the contents of this communication by anyone other than the intended recipient(s) is strictly prohibited. If you have received this communication in error, please notify the sender immediately by return e-mail and permanently delete the copy you have received.

From: Tim Foster [mailto:tim.foster@beavervalley.ca]
Sent: May-21-13 3:29 PM
To: Best, Dan
Cc: Andrew Martschenko (aachentndc@mac.com)
Subject: Water and Waste Water Servicing

Hello Dan:

Hope you are well today.

I just wanted to let you know that the MOE has provided a 5 year extension allowing the Club to delay its plans for the installation of onsite sewage treatment. This obviously puts us in a good position to continue to support the municipality as it works through its servicing master plan process.

I have attached a revised letter for your files.

Thank you

Tim.....

Water and Wastewater Servicing Master Plan
Markdale - Flesherton - Kimberley - Amik - Eugenia
Notice of Study Commencement and Public Consultation Meeting
Municipality of Grey Highlands

THE STUDY

The Municipality of Grey Highlands is carrying out a Master Plan study for a regional water and wastewater system to determine infrastructure requirements for the Municipality to service the study area of Markdale - Flesherton - Kimberley - Amik - Eugenia and the area at the Beaver Valley Ski Club. This Master Plan study is being conducted in accordance with the requirements of Phases 1 and 2 of the Municipal Class Environmental Assessment which is an approved process under the Environmental Assessment Act.

WE WANT TO HEAR FROM YOU

Public consultation is a key component of this study. The proposed consultation plan provides for public consultation meetings at two (2) points in the study: June 28, 2011 - to review the problem; and, Fall 2011 - to review alternative solutions. In addition there will be an opportunity to review the final Master Plan report.

The study area is as shown on the attached key plan (Figure 1). The first public consultation meeting has been arranged to review and receive input from the public about the collection of background information and identification of the problem.

Date:	Tuesday, June 28, 2011
Time:	7:00 p.m.
Location:	Centre Grey Complex, Markdale

STUDY CONTACTS

All those with an interest in the study are urged to attend.

If you have any questions or wish to be added to the study mailing list, please contact:

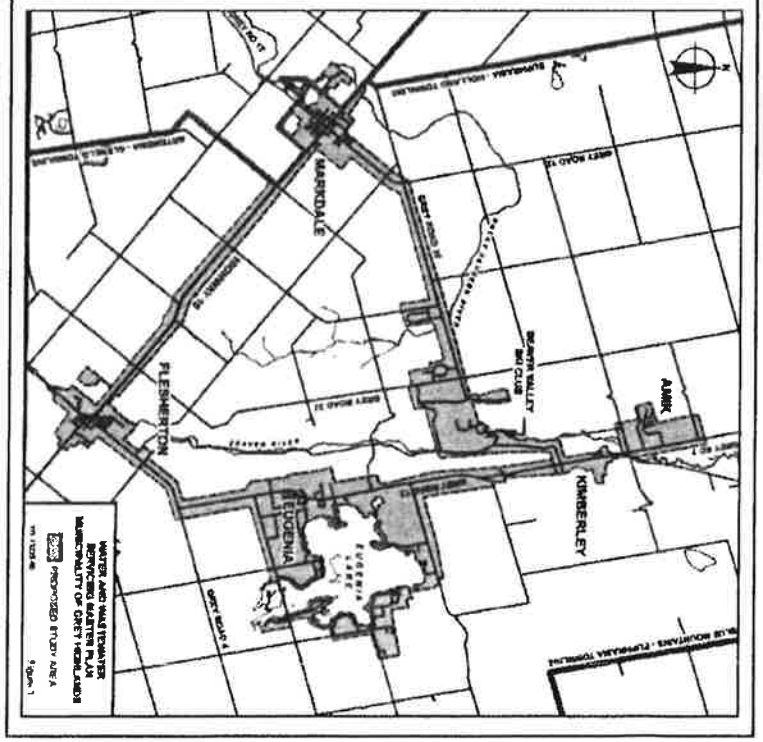
Mr. Ross Slaughter, P.Eng., Project Manager
GENIVAR Inc.
1450 1st Avenue West, Suite 101
Owen Sound, ON N4K 6W2

Phone: 519-376-7612 X13226
Fax: 519-376-8008
Email: ross.slaughter@genivar.com

Shawn Moyer, Director of Public Utilities
Municipality of Grey Highlands
206 Toronto Street South
Markdale, ON N0C 1H0

Phone: 519-986-2811
Fax: 519-986-3643
Email: moyers@greyhighlands.ca

or visit our website at www.genivar.com



GENIVAR

AGENDA

Water and Wastewater Servicing Master Plan
Markdale - Flesherton - Kimberley - Amik - Eugenia - Beaver Valley
111-13229-00
Municipality of Grey Highlands
Public Meeting/Open House, June 28, 2011

7:00 p.m.	Opening Remarks from Mayor Wayne Fitzgerald
7:05 p.m.	Presentation re: Master Plan Ross Slaughter, P. Eng., Senior Water Resources Engineer – GENIVAR
7:20 p.m.	Question Period
7:45 p.m.	Break to Review Display Boards for Master Plan
8:10 p.m.	Continuation of Question Period
9:00 p.m.	Close of Public Meeting/Open House

* Please address all questions to the Chairman of the Meeting from the microphone on the floor.

OWEN SOUND 1450 1st Avenue West, #101, Owen Sound, Ontario N4K 6W2 Tel.: (519) 376-7612 Fax: (519) 376-8008

Public Meeting/Open House

Water & Wastewater Servicing Master Plan

Markdale – Flesherton – Kimberley – Amik – Eugenia – Beaver Valley Municipality of Grey Highlands

June 28, 2011

Markdale Community Centre

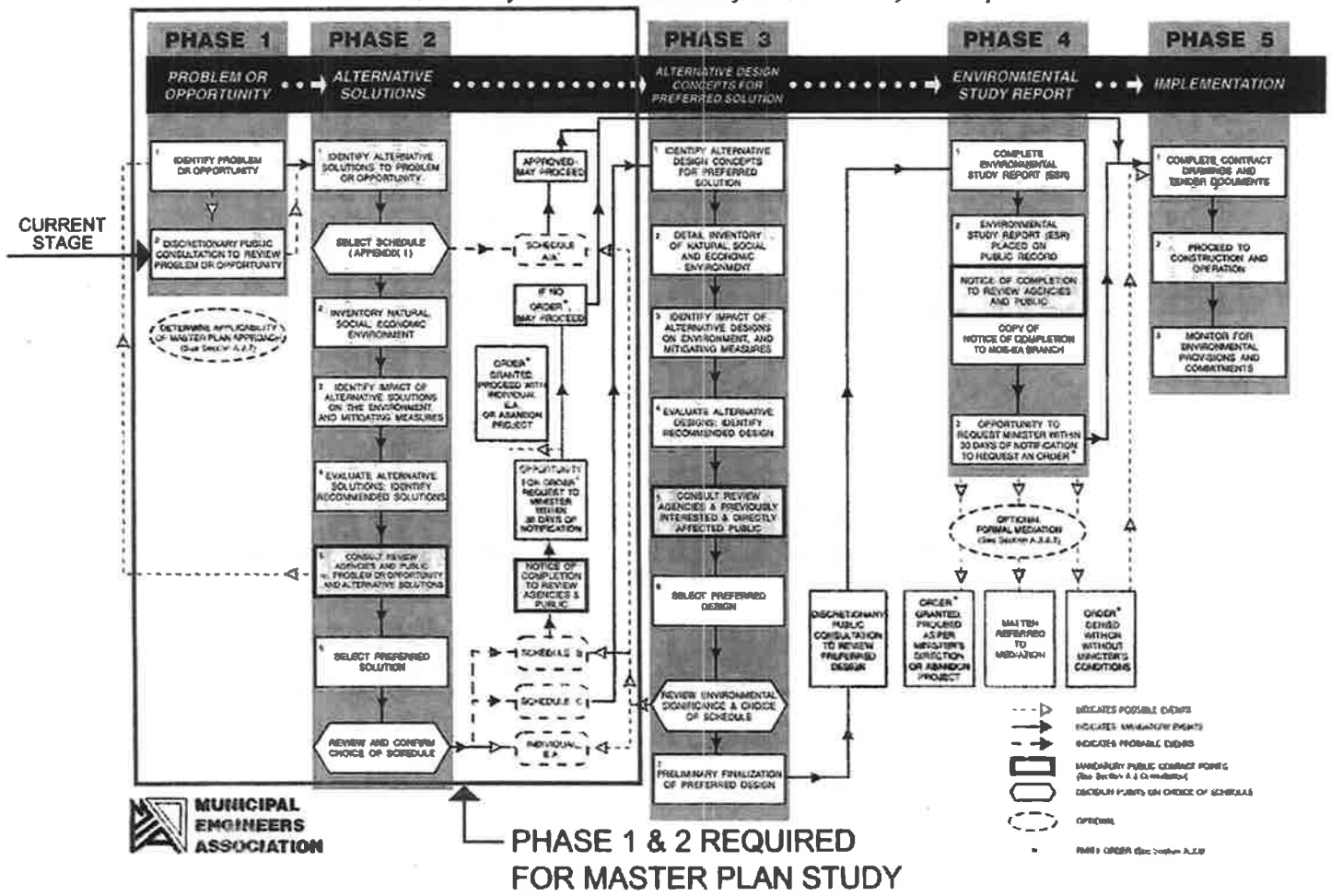
111-13229-00

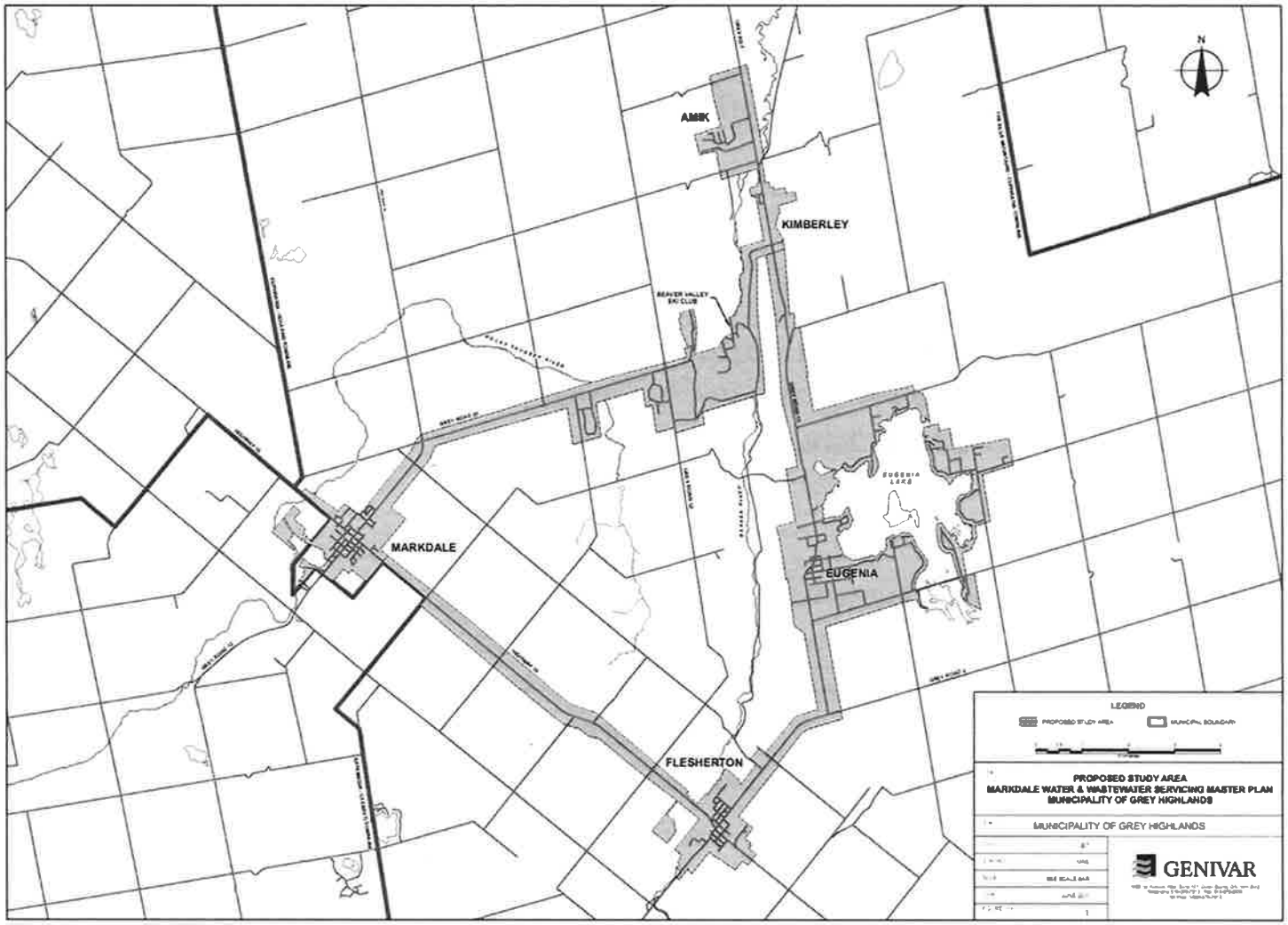
Presented by:

Ross Slaughter, P. Eng.

EXHIBIT A.2 MUNICIPAL CLASS EA PLANNING AND DESIGN PROCESS

NOTE: This flow chart is to be read in conjunction with Part A of the Municipal Class EA



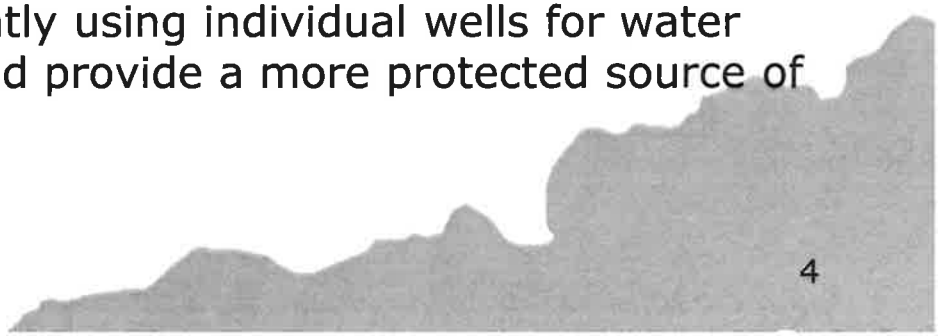

AMIK
KIMBERLEY
MARKDALE
EUGENIA
FLESHERTON
N
LEGEND
PROPOSED STUDY AREA
MUNICIPAL BOUNDARY
PROPOSED STUDY AREA
MARKDALE WATER & WASTEWATER SERVICING MASTER PLAN
MUNICIPALITY OF GREY HIGHLANDS
MUNICIPALITY OF GREY HIGHLANDS
GENIVAR

Problem Definition

The Municipality of Grey Highlands wishes to provide adequate communal potable water and wastewater servicing for the existing developed areas at Markdale – Flesherton – Kimberley – Amik – Eugenia and homes/chalets near the Beaver Valley Ski area. Regional water and wastewater servicing would provide for future development in existing communities and in recreational areas in the Beaver Valley and at Eugenia.

The capacity of the Markdale wastewater treatment plant needs to be increased to allow for future development within the community. Also, the Markdale water storage facility and trunk watermains require upgrading to increase fire flows to the downtown area and increase pressures at individual homes and commercial establishments to meet the Ministry of the Environmental guidelines.

The built-up area of Flesherton is presently using individual wells for water supply. A communal water system would provide a more protected source of drinking water and fire flows.



Problem Definition

Homes and cottages in the Eugenia area are serviced by individual wells and septic systems. A communal water supply would provide a safer water supply and would also provide fire flow. A communal water system would provide better protection of water quality of Eugenia Lake and allow for increased development.

Kimberley does not have a communal sewage system and the existing lots are serviced by septic systems. A communal sewage system would provide better quality protection of the Beaver Valley and its tributaries in the Kimberley area.

Most of the developed lots (homes/chalets) near the Beaver Valley Ski Club are serviced by individual wells and septic systems. A water quality survey was carried out in January 2001 of homes in the Beaver Valley Ski Club area. Water supplies were taken from 64 homes/chalets and 36 water samples (over 56%) did not meet the Ontario Drinking Water Quality Standards (ODWQS). A communal water system would provide better quality water and safer water than the existing wells. Fire flows would also be provided. A communal wastewater system servicing the Beaver Valley Ski Club area would provide better water quality protection of the Beaver Valley and its tributaries.

TABLE 2
EXISTING PROBLEM AREAS – MARKDALE - FLESHERTON - KIMBERLEY - AMIK – EUGENIA – BEAVER VALLEY
MUNICIPALITY OF GREY HIGHLANDS

Location	Category	Existing Problem Areas
Markdale	Water Storage Standpipe	- Height of existing water storage standpipe does not provide for distribution pressures in all areas of Markdale, as required to Ministry of the Environment Guidelines. - Limited available storage capacity for future development in Markdale.
	Water Distribution System	- Distribution pressures in some areas of Markdale do not meet Ministry of Environment Guidelines. - Insufficient fire flow availability in the downtown area of Markdale.
	Wastewater Treatment Plant	- Limited available operating capacity for future development in Markdale.
Flesherton	Individual Well Supply	- No fire flow protection. - Less protection of source of drinking water in comparison to communal water system.
Kimberley	Individual Septic Systems	- Less water quality protection of the Beaver River and its tributaries.
Amik-Talisman	Amik Wastewater Treatment Plant	- Limited available operating capacity for future development in Amik-Talisman area.
Eugenia	Individual Wells and Septic Systems	- No fire flow protection. - Less protection of source of drinking water in comparison to communal water system. - Less water quality protection of Eugenia Lake.
Beaver Valley	Individual Wells and Septic Systems	- No fire flow protection - Water quality survey of individual wells completed in 2001 showed 56% of test results did not meet Ontario Drinking Water Quality Standards (ODWQS). - Less protection of source of drinking water in comparison to communal water system. - Less water quality protection of the Beaver River and its tributaries.

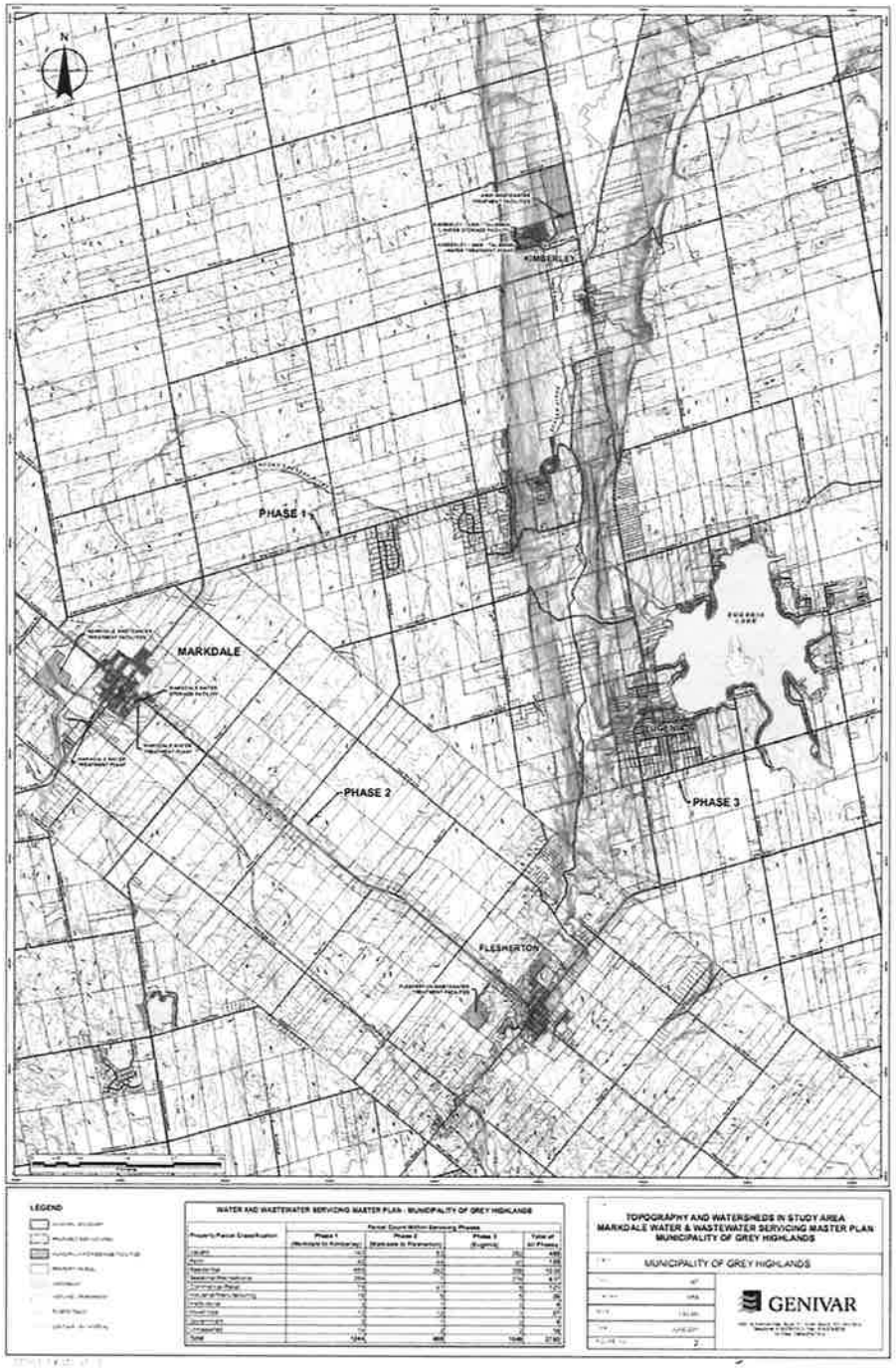
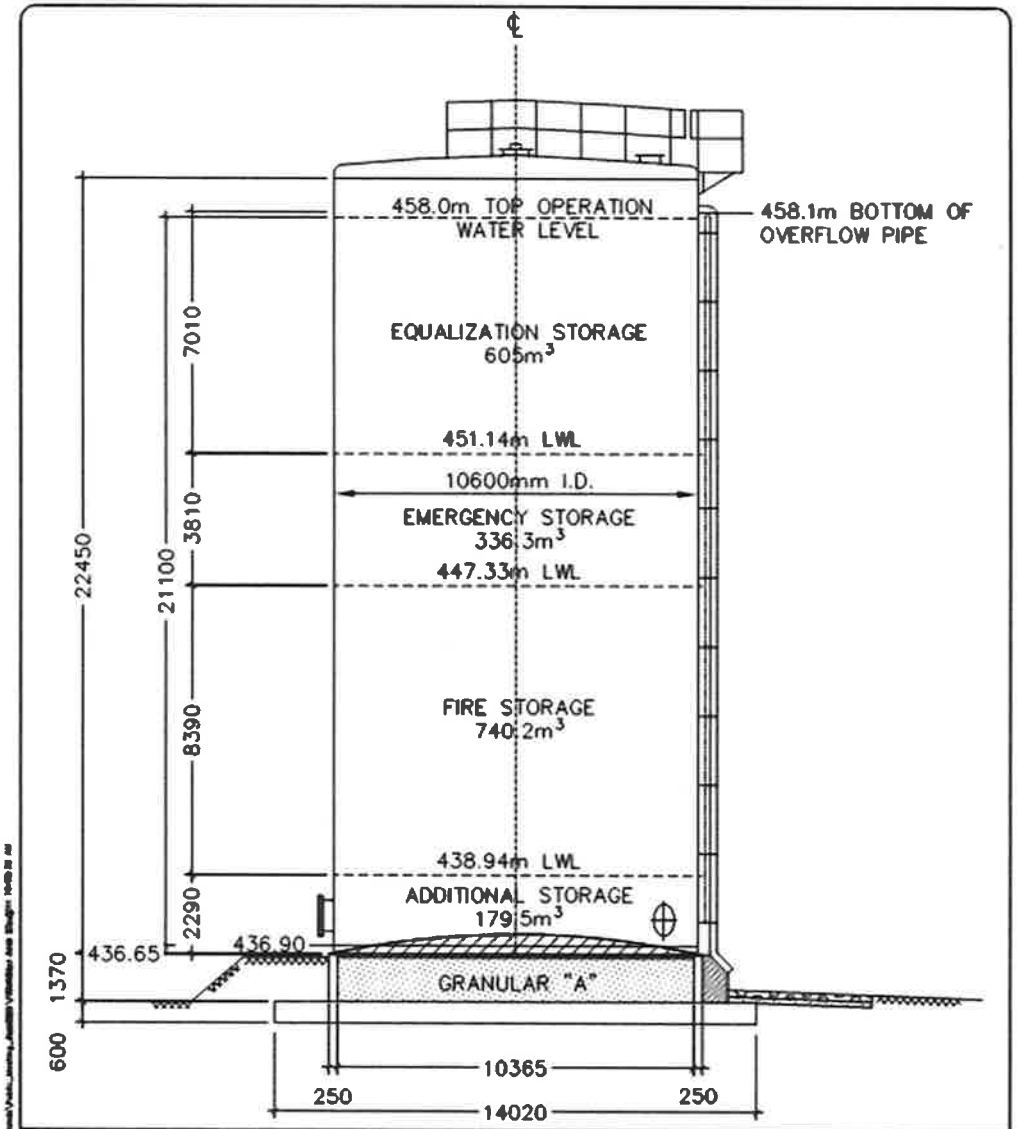

N
KIMBERLEY
PHASE 1
MARKDALE
PHASE 2
PHASE 3
FLESHERTON
LEGEND
WATER AND WASTEWATER SERVICING MASTER PLAN - MUNICIPALITY OF GREY HIGHLANDS
TOPOGRAPHY AND WATERSHEDS IN STUDY AREA
MARKDALE WATER & WASTEWATER SERVICING MASTER PLAN
MUNICIPALITY OF GREY HIGHLANDS
MUNICIPALITY OF GREY HIGHLANDS
GENIVAR

TABLE 1
WATER TREATMENT, WATER STORAGE AND SEWAGE TREATMENT CAPACITY SUMMARY
MARKDALE, FLESHERTON AND KIMBERLEY AMIK-TALISMAN
MUNICIPALITY OF GREY HIGHLANDS

Category	Location	Design Capacity (m^3/day)	Average Day Flow (m^3/day)	Max. Day Flow (m^3/day)
Water Treatment	Markdale		2006 – 1,575 2007 – 1,205 2008 – 1,127 2009 – 996 2010 – 929	2006 – 2,721 2007 – 1,910 2008 – 1,486 2009 – 4,850* 2010 – 1,664
	- Isla Street PS - Well#1 - Eliza Street PS - Well#3 - Well#4	2,619 2,291** 1,080		
	Kimberley Amik-Talisman Water Treatment Plant	1,185	2006 – 2007 – 144 2008 – 100 2009 – 79 2010 – 79	2006 – 2007 – 371 2008 – 392 2009 – 248 2010 – 275
Water Storage	Markdale (Standpipe adjacent to Eliza Street PS)	1,861 (usable storage)	N/A	N/A
	Kimberley Amik-Talisman (Storage Tanks below WTP)	870		
Sewage Treatment	Markdale Wastewater Treatment Plant	1,122	2006 – 2007 – 771 2008 – 864 2009 – 702 2010 – 647	N/A
	Flesherton Wastewater Treatment Plant	419	2006 – 2007 – 127 2008 – 166 2009 – 155 2010 – 142	
	Amik-Talisman Wastewater Treatment Plant	249***	2006 – 2007 – 215 2008 – 241 2009 – 152 2010 – 108	

*Chapmans fire occurred ** Reduced capacity of 2,291 m^3/day until well fully developed to 2,782 m^3/day *** Future upgraded capacity 431 m^3/day

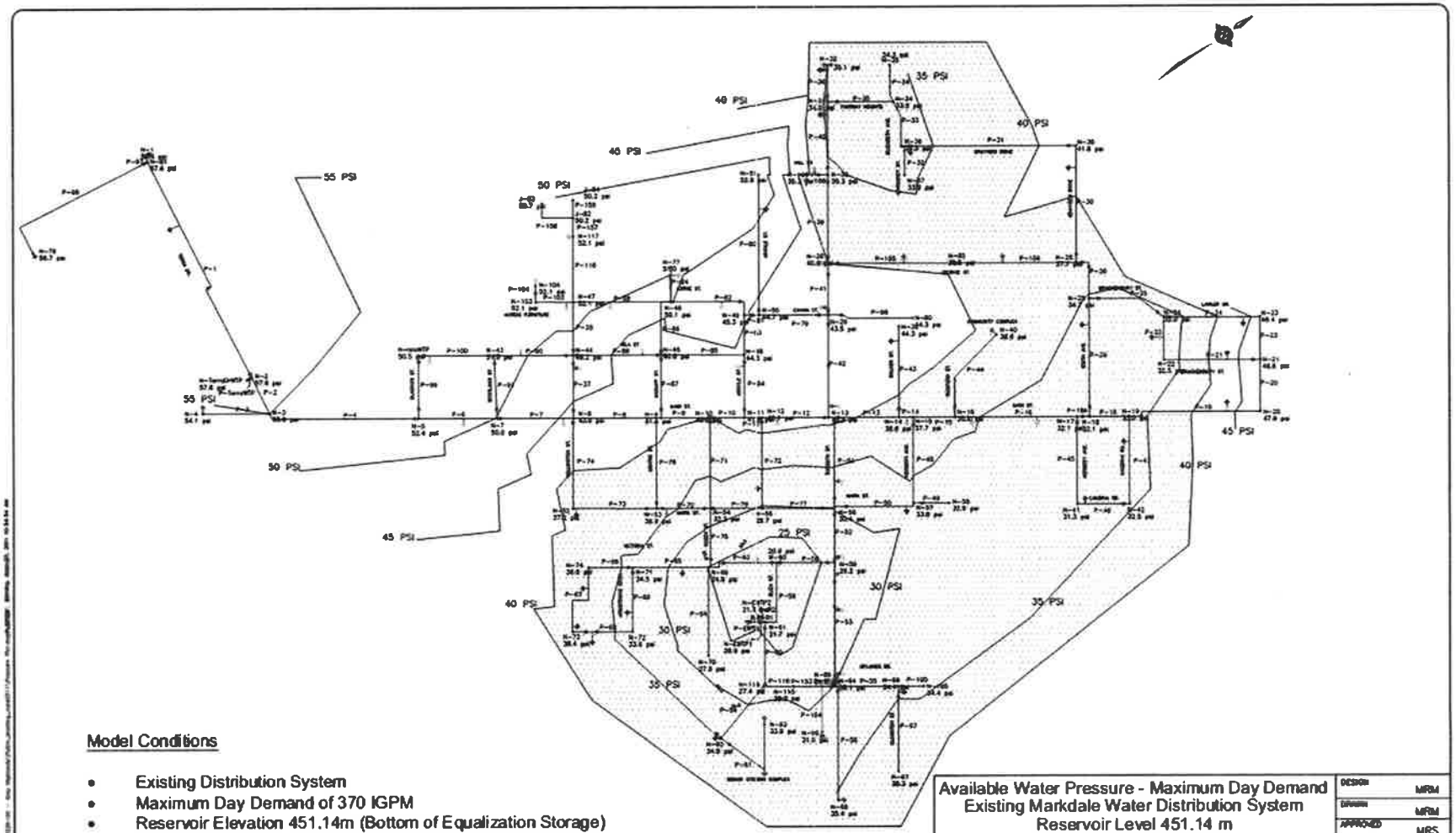


EXISTING 2010 WATER STORAGE ELEVATION AND QUANTITIES-MOE GUIDELINES
MARKDALE STORAGE FACILITY
MUNICIPALITY OF GREY HIGHLANDS

GENIVAR

DESIGN	M R M
DRAWN	J L K
APPROVED	M R S
DATE	APR 2010
SCALE	1:150
FILE No.	10023-12
FIG. No.	2A

COPYRIGHT © GENIVAR CONSULTANTS LP Constructive People



Model Conditions

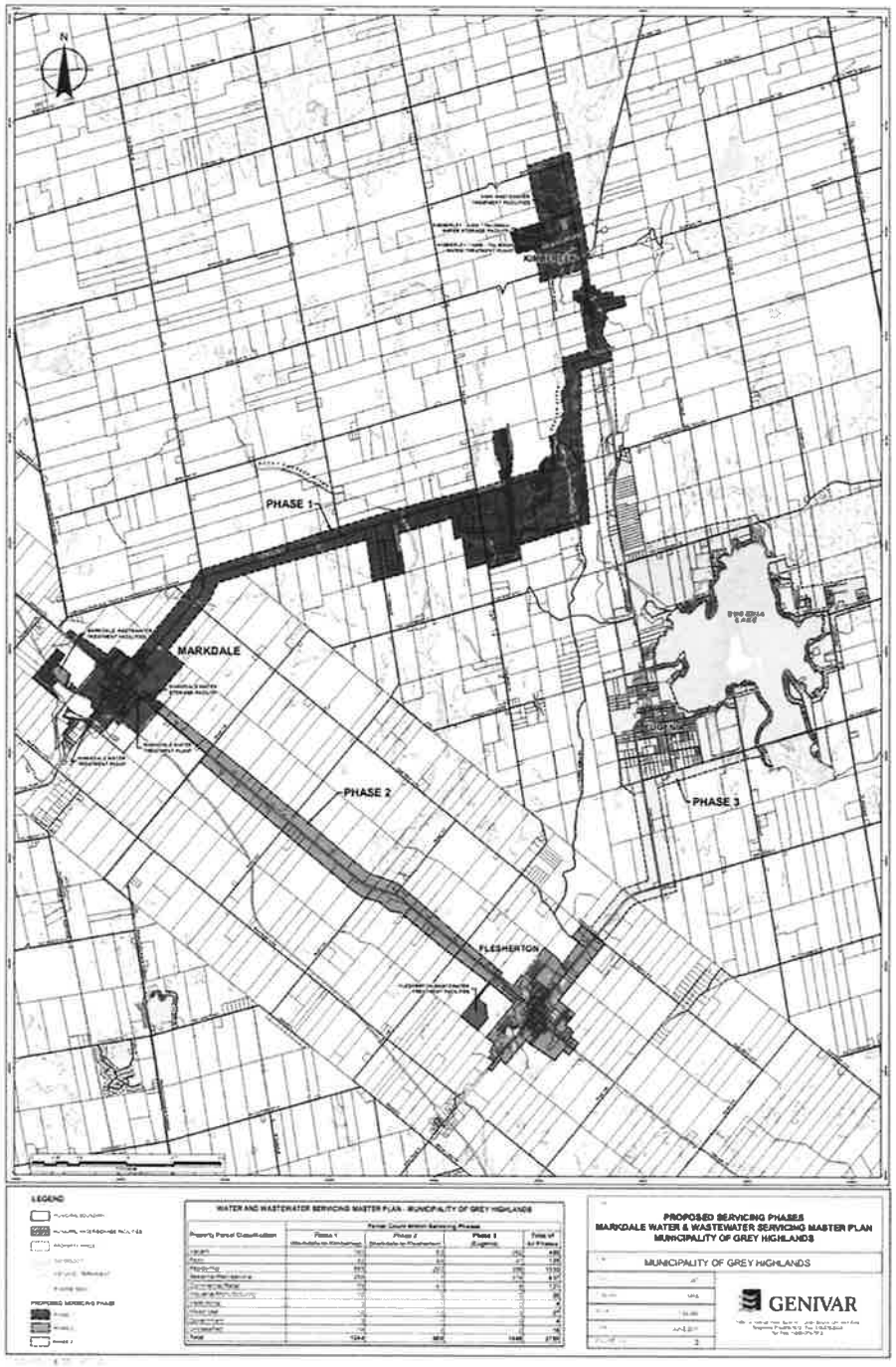
- Existing Distribution System
- Maximum Day Demand of 370 IGPM
- Reservoir Elevation 451.14m (Bottom of Equalization Storage)
- Highlighted Area Indicates Region with Pressure Below 40 psi

Available Water Pressure - Maximum Day Demand
Existing Markdale Water Distribution System
Reservoir Level 451.14 m

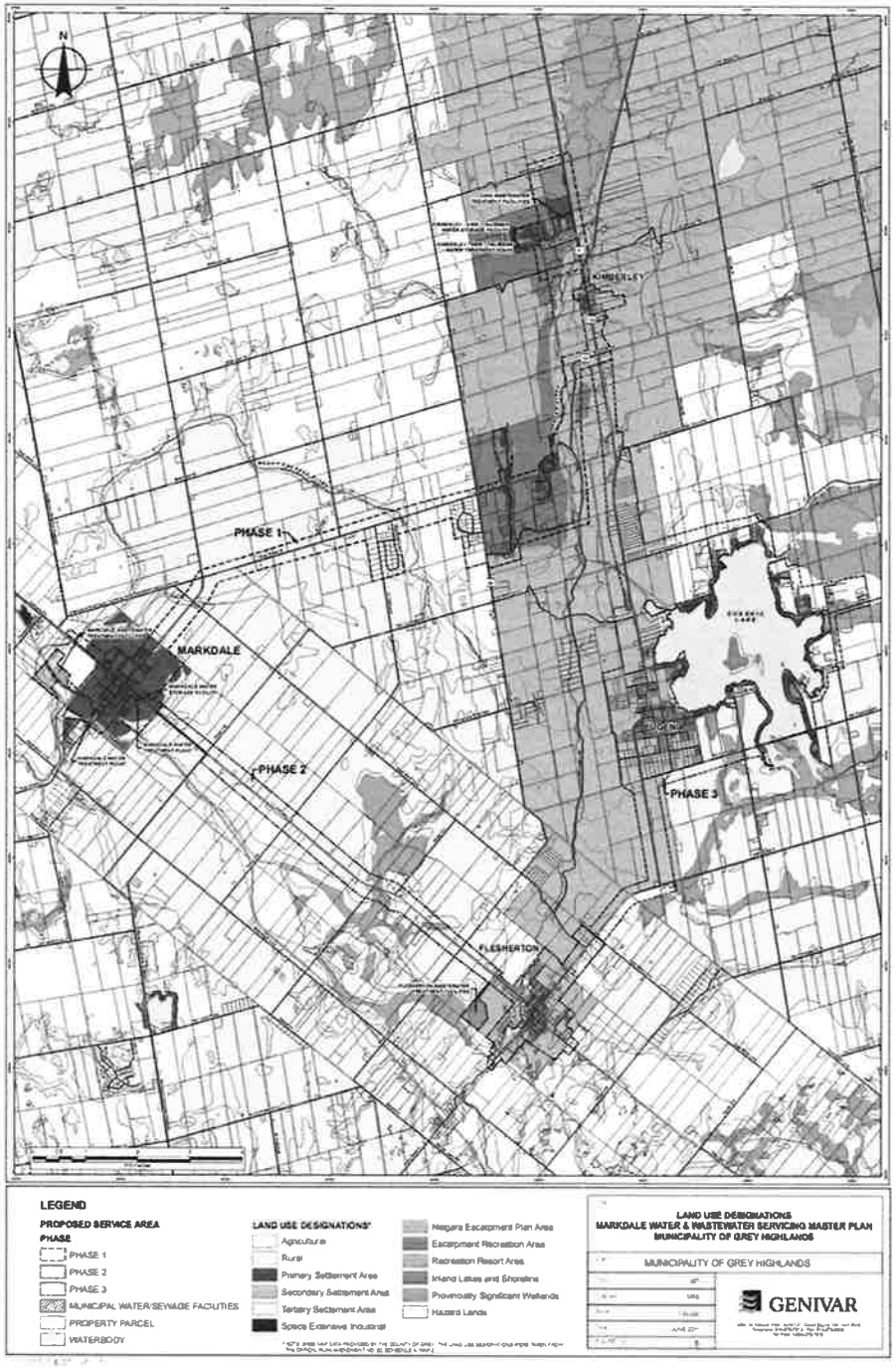
GENIVAR
945 Third Ave E, Suite 212, Owen Sound, ON, N4K 2K8
Telephone (519) 376-7012 / Fax (519) 376-8008
Toll Free: 1-888-376-7012

DESIGN	MRM
DRAWN	MRM
APPROVED	MRS
DATE	APRIL 2010
SCALE	NTS
FILE No.	10-023-12
DWG. No.	3

COPYRIGHT © GENIVAR CONSULTANTS LP Constructive People


N
PHASE 1
MARKDALE
PHASE 2
FLESHERTON
PHASE 3
LEGEND
PROPOSED SERVICING PHASE
WATER AND WASTEWATER SERVICING MASTER PLAN - MUNICIPALITY OF GREY HIGHLANDS
PROPOSED SERVICING PHASES
MARKDALE WATER & WASTEWATER SERVICING MASTER PLAN
MUNICIPALITY OF GREY HIGHLANDS
MUNICIPALITY OF GREY HIGHLANDS
GENIVAR


KIMBERLEY
MARKDALE
TOWNSHIP OF CHATSWORTH
MUNICIPALITY OF GREY HIGHLANDS
MUNICIPALITY OF WEST GREY
EUGENIA LAKE
EUGENIA
LEGEND
MUNICIPAL BOUNDARY
PROPOSED SERVICE AREA - PHASE II
PROPERTY PARCEL
WATERBODY
WETLAND - PERMANENT
RIVER/STREAM
DATA SOURCES: BASE MAP DATA PROVIDED BY THE COUNTY OF GREY
GENIVAR
PROPOSED PHASE II SERVICING
MARKDALE WATER & WASTEWATER SERVICING MASTER PLAN
MUNICIPALITY OF GREY HIGHLANDS
MUNICIPALITY OF GREY HIGHLANDS


N
PHASE 1
PHASE 2
PHASE 3
MARKDALE
KIMBERLEY
FLESHERTON
LEGEND
PROPOSED SERVICE AREA
PHASE
PHASE 1
PHASE 2
PHASE 3
MUNICIPAL WATER/SEWAGE FACILITIES
PROPERTY PARCEL
WATERBODY
LAND USE DESIGNATIONS*
Agriculture
Rural
Primary Settlement Area
Secondary Settlement Area
Tertiary Settlement Area
Specia Extensive Industrial
Niagara Escarpment Plan Area
Escarpment Recreation Area
Recreation Resort Area
Inland Lakes and Shoreline
Provincially Significant Wetlands
Hazard Lands
LAND USE DESIGNATIONS
MARKDALE WATER & WASTEWATER SERVICING MASTER PLAN
MUNICIPALITY OF GREY HIGHLANDS
MUNICIPALITY OF GREY HIGHLANDS
GENIVAR


PHASE 1
MARKDALE
PHASE 2
PHASE 3
LEGEND
PROPOSED SERVICING PHASE
PHASE
PHASE 1
PHASE 2
PHASE 3
MUNICIPAL BOUNDARY
PROPERTY PARCEL
LAND USE PHOTOGRAPH 2006 - ALL PHASES
MARKDALE WATER & WASTEWATER SERVICING MASTER PLAN
MUNICIPALITY OF GREY HIGHLANDS
MUNICIPALITY OF GREY HIGHLANDS
GENIVAR


KIMBERLEY
MARKDALE
EUGENIA
LEGEND
MUNICIPALITY OF GREY HIGHLANDS
GENIVAR

FIGURE 8

MARKDALE WATER & WASTEWATER SERVICING MASTER PLAN

Property Parcel Classification	Parcel Count Within Servicing Phases			
	Phase 1 (Markdale to Kimberley)	Phase 2 (Markdale to Flesherton)	Phase 3 (Eugenia)	Total of All Phases
Vacant	140	83	262	**485**
Farm	40	44	41	**125**
Residential	685	292	356	**1333**
Seasonal/Recreational	256	7	374	**637**
Commercial/Retail	75	41	5	**121**
Industrial/Manufacturing	16	5	5	**26**
Institutional	3	1	0	**4**
Mixed Use	12	12	3	**27**
Government	3	1	0	**4**
Unclassified	14	2	2	**18**
Total	**1244**	**488**	**1048**	**2780**

GENIVAR

Alternatives for Water Treatment Water Storage and Water Distribution

WATER TREATMENT ALTERNATIVES

The following water treatment alternatives are to be considered for the Master Plan Study:

Alternative #1
Install one (1) or two (2) new high capacity wells (+/- 1,364 to 1,818 litres per minute) at Markdale with an additional water treatment and pumping station to pump water into the distribution system and the upgraded water storage facility.

The Kimberley-Amik-Talisman water treatment plant would remain at its capacity of 1,185 m^3/day.

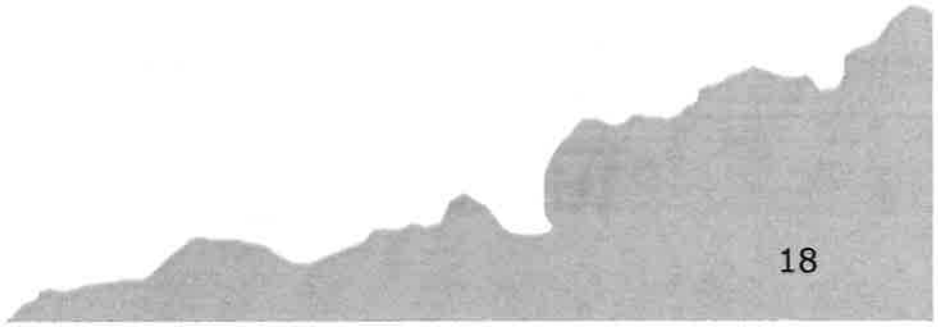
Alternative #2
Provide water treatment to treat water from the Beaver River by upgrading the Kimberley-Amik-Talisman water treatment plant. Maintain the existing Markdale groundwater system.

Alternatives for Water Treatment Water Storage and Water Distribution

WATER TREATMENT ALTERNATIVES

Alternative #3
Provide a new water treatment facility on groundwater at Flesherton which supplies treated water into the water distribution system. The water treatment systems at Isla Street and Eliza Street in Markdale and the Kimberley-Amik-Talisman water treatment plant would remain.

Alternative #4
Construct two (2) new high capacity wells near Eugenia and a water treatment facility to treat groundwater and pump this water into the water distribution system and water storage facilities.



Alternatives for Water Treatment Water Storage and Water Distribution

WATER STORAGE ALTERNATIVES

Alternative #1
Construct a new elevated glass-fused to steel water storage facility at Markdale to provide a storage facility for the entire servicing area including keeping the 870 m^3 of storage at the Kimberley-Amik-Talisman water storage facility.

Alternative #2
Construct a glass-fused to steel standpipe at Markdale to service most of the water service area and keep the Kimberley-Amik-Talisman water storage facility of 870 m^3.

Alternative #3
Construct a new glass-fused to steel elevated storage facility at Markdale, plus a new on-ground storage facility at the existing property for the Flesherton wastewater treatment plant and keep the Kimberley-Amik-Talisman water storage tanks.

Alternative #4
Upgrade the Markdale water storage facility and construct an elevated storage facility or standpipe at Eugenia and keep the Kimberley-Amik-Talisman existing storage.

Alternatives for Water Treatment Water Storage and Water Distribution

WATER DISTRIBUTION ALTERNATIVES

During this Master Plan Study it would appear that Markdale would still be the primary area from which treated water would be distributed. Markdale is an old community with watermains installed originally in approximately 1905. There are existing problems in the Markdale water distribution system, partly to do with the water reservoir and others to do with the size of watermains and distribution of this water during fireflow conditions. A number of watermains need to be upgraded in Markdale to satisfy in-town fireflow demands. For areas outside of Markdale, towards Flesherton and the Beaver Valley Ski Club larger watermains will need to be constructed from the water tower to service these areas. Watermain sizes can be decreased in servicing areas such as Flesherton, Eugenia and the Beaver Valley Ski Club by placing some of the storage at either Flesherton or Eugenia and by utilizing the existing 870 m^3 of storage at the Kimberley-Amik-Talisman water treatment plant. Therefore watermain sizes would be inter-tied with fireflow demands and location and height of water storage facilities. There are three (3) phases for the area to be serviced as shown on Figure 1. The first phase being Markdale and Kimberley through County Road 30 to the Beaver River Valley. Phase #2 would be from Markdale to Flesherton and Phase 3 would be from Flesherton over to Kimberley through Eugenia.

Alternatives for Water Treatment
Water Storage and Water Distribution

PHASE 1 – WATER DISTRIBUTION

Alternative #1 – Phase 1

Provide water service as per Phase #1 from Markdale to Kimberley. This alternative would require trunkmains to be upgraded to at least 300 mm diameter or larger depending on the location for elevation storage.

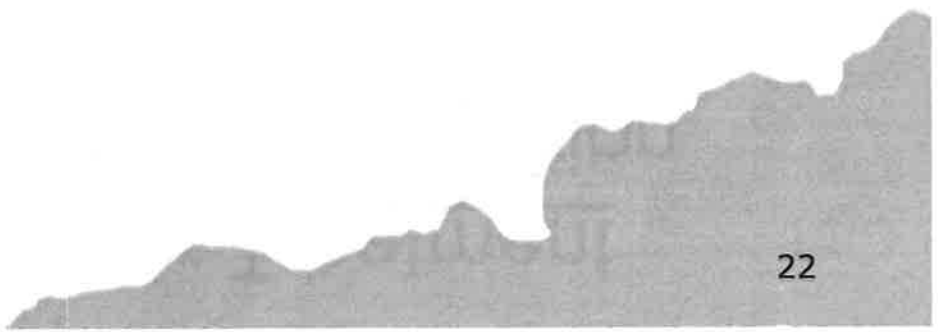
No booster pumping stations are suggested since the water distribution system will float on the Markdale water tower and pressure reducing valves at the escarpment near the Beaver Valley Ski Club will be required. The Kimberley-Amik-Talisman watermain can supply water over to the low lands of the Beaver Valley River at the Beaver Valley Ski Club. In fact in those areas, either system could supply water. However, without a booster pumping station water cannot come from the Kimberley-Amik-Talisman water storage facility up to the top at Windy Lane Drive or the chalets on the top of the escarpment.

Alternatives for Water Treatment
Water Storage and Water Distribution

PHASE 2 – WATER DISTRIBUTION

Alternative #1, Phase #2 will be to supply water to Flesherton from Markdale floating the water system on the Markdale water storage tower. The trunk watermain would be 300 mm diameter mains or larger.

Alternative #2, Phase 2 would be to extend the trunk watermain from the Markdale water tower along Highway 10 to Flesherton and be able to reduce the size of the trunk watermain by installing an on-ground water storage facility at Flesherton at the existing wastewater treatment plant site.



Alternatives for Water Treatment
Water Storage and Water Distribution

PHASE 3 – WATER DISTRIBUTION

Alternative #1, Phase 3
Install the watermain line from Flesherton over to Kimberley servicing Eugenia with water supplied from either the Flesherton water storage facility or the Markdale water storage facility or both.

Alternative #2, Phase 3
Install a smaller water distribution line from Flesherton to Kimberley with an elevated storage facility at Eugenia.

Alternatives for Wastewater Treatment
Sewage Pumping Stations and Sanitary Sewers

WASTEWATER TREATMENT ALTERNATIVES

The following wastewater treatment alternatives are to be considered for the Master Plan Study:

Alternative #1
Expand the Markdale wastewater treatment plant to increase the rated capacity of the plant to +/- 2,000 m^3/day.

Expanding the Flesherton wastewater treatment plant to 650 m^3/day from 419 m^3/day or approximately 50%.

Expand the capacity of the Amik wastewater treatment plant from 249 m^3/day to 431 m^3/day as per the Certificate of Approval.

Alternative #2
Add additional capacity above the capacity outlined above (Alternative #1) at the Markdale and Amik wastewater treatment plants by treating the effluent from the lagoons by making snow and providing tertiary treatment. Snow-making treatment could be located at the effluent end of the Markdale and Amik water treatment plants.

Alternatives for Wastewater Treatment
Sewage Pumping Stations and Sanitary Sewers

SEWAGE PUMPING STATION ALTERNATIVES

The location of a sewage pumping station at Windy Lane Drive and Bowles Bluff Road to pump sewage along County Road 30 from this area via forcemain to the Markdale sanitary sewer system. This should also include servicing for the two existing subdivisions that have been developed along the south side of County Road 30 near the escarpment. A sewage pumping station is to be located along Highway 10 between Flesherton and Markdale to pump sewage via forcemain back to Markdale.

A sewage pumping station in Eugenia to pump sewage collected in that area via forcemain back to the Flesherton wastewater treatment plant.

A sewage pumping station in Kimberley to collect sewage and pump it to the Amik wastewater treatment facility.

A sewage pumping station in the lower Beaver River Valley at the Beaver Valley Ski Club to pump this sewage either to the Amik sewage works or to the pump station at the top of Bowles Bluff Road to the Markdale wastewater treatment plant.

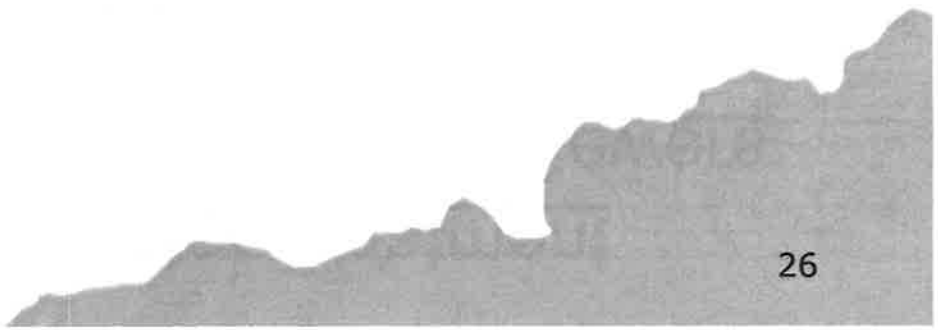
Alternatives for Wastewater Treatment
Sewage Pumping Stations and Sanitary Sewers

SANITARY SEWER COLLECTION SYSTEM

•Alternative #1

The sanitary sewer collection system is to be constructed to service the Kimberley area and sewage would go to the sewage pumping station to be pumped by forcemain to the Amik wastewater treatment facility.

Sanitary sewage would be collected from Windy Lane Drive and Bowles Bluff Road along with the two (2) closest subdivisions on the escarpment at Blue Jay's Crescent back to the escarpment. Sewage would be collected and pumped by forcemain to the Markdale wastewater treatment facilities.



Alternatives for Wastewater Treatment
Sewage Pumping Stations and Sanitary Sewers

SANITARY SEWER COLLECTION SYSTEM

A sewage collection system would be installed in the area servicing the escarpment and built-up area at the Beaver Valley Ski Club and the lower Beaver River. This sewage, when collected, would be pumped by forcemain up the escarpment to the pumping stations at Bowles Bluff Road and Windy Lane Drive to be further pumped to the Markdale wastewater treatment facilities. There would be a sanitary sewer collection system between Markdale and Flesherton along Highway 10, so it would be collected to the sewage pumping station and pumped to the Markdale wastewater treatment facilities. It may be required to have several small stations to service this corridor area. The area immediately northwest of Flesherton would be serviced by extending the sanitary sewer by gravity.

The sanitary sewer system would be installed in Eugenia and around Eugenia Lake. Several small pumping stations would likely be required to pump the sewage to the main sewage pumping station in Eugenia. This sewage would be pumped via forcemain from Eugenia area in Eugenia Lake along Grey Road 12 and Grey Road 4 to the Flesherton wastewater treatment facility.

COMMENT SHEET

Water and Wastewater Servicing Master Plan
Markdale - Flesherton - Kimberley - Amik - Eugenia
Notice of Study Commencement and Public Consultation Meeting
Municipality of Grey Highlands
Public Meeting
tuesday, June 28, 20'l 1
7:00 p.m.
Centre Grey Complex, Markdale

Comments from the **Beaver Valley Ratepayers Association** (BVRA)

We commend the vision of Grey Highlands Council in undertaking this Water and Wastewater Servicing Master Plan Study and support this initiative, especially Phase 1, as it includes the Beaver Valley Recreation Area.

Both the Niagara Escarpment Plan and the County of Grey Official Plan identify the Beaver Valley Area as a growth area; as such the MOE has consistently stressed the need for municipal servicing of the area given existing residential water problems, increasing development pressure and the ignorance of the cumulative impact of more and more wells and septic systems in this fragile karstic environment. Completing feasibility and environmental assessments, leading to some level of municipal servicing in the future makes good planning sense. The BVRA anticipates that this Grey Highlands initiative will go a long way toward addressing the concerns of our members about water quality and quantity.

It also makes good planning sense to us, that by doing the groundwork now, the Municipality will be eligible in the future to take advantage of government infrastructure funding opportunities; this shows great foresight.

The BVRA affirms the need for the development of a secondary growth plan for the area as was mentioned by the planner at the March 28th Council Meeting, coinciding with the Servicing Master Plan and we look forward as an organization to being part of that process.

Of course there are at this stage, many questions that concern BVRA members.

- What is the cost? Who pays?
- Will property owners be required to hook up to municipal servicing if they don't experience water problems?
- One alternative suggests a pumping station or stations in the area of Windy Lane and Bowles Bluff Road. Naturally this has residents there worried about noise, smell, and traffic.
- What effect will this initiative have on current development proposals?
- What effect will this initiative have on future development proposals?

In conclusion, the BVRA congratulates Council on this bold move, applauds the planning vision and looks forward to actively participating in the process.

Cathy Little (President) and Ed O'Neill (Vice-President)

Thomas S. Willoughby
152 Peters Crescent, RR4
Flesherton, ON N0C 1E0

July 15, 2011

Mr. Ross Slaughter
GENIVAR Inc.

and

Shawn Moyer
Director of Public Utilities
Municipality of Grey Highlands

I commend our elected councillors for having the foresight to look at the future needs on the Municipality. After hearing your presentation, I do however think that some of the regional water and wastewater system is more urgent and needs to addressed now.

As I stated during the question period, I feel that the area of Markdale and Flesherton should be addressed first, however starting in Markdale is the right place. My reasons are as follows;

Given the current situation no new development can be serviced at present.

The municipality needs growth in an attempt to attract new industry to ensure current workers and future workers do not have to leave the municipality to find work.

The municipality also has to find ways to increase the tax base. Seasonal residents cannot be the only way.

I also wonder if one of the delays in our hospital proposal is due to the lack of being able to service the sight, at least in the ministry's eyes.

In the area around Eugenia Lake there are many hurdles to overcome. The main hurdle is the numerous "rights of way" rather than municipal roads. Having a municipal roadway will enhance the ability to provide services such as road maintenance, garbage pick up, snow blowing as well as future needs such as water and sewage.

I do not feel that as a taxpayer the municipality should use our tax dollars to convert the rights of way to municipal road standards. The residents along these "rights of way" should have to pay their share to upgrade their road to municipal standards. This should

only be done if the municipality goes ahead with water and sewage plan and these home owners agree to upgrade their "right of ways".

This could easily be accomplished by the municipality raising a debenture for the cost of upgrading the right of way to municipal standards and adding to each affected resident's tax bill over a 10 to 20 year period rather than one payment.

I also have one more concern.

The lack of natural gas in this municipality is a major complaint of many residents. With home heating costs at an all time high and given the numerous home industries throughout the municipality it is time for our elected officials to lobby on our behalf.

Chris Wilson

From: Daryl Minifie [darylminifie@gmail.com]
Sent: Thursday, June 30, 2011 4:21 PM
To: Chris Wilson
Subject: COMMENT SHEET,Water and Wastewater Servicing Master Plan

COMMENT SHEET

Water and Wastewater Servicing Master Plan

Markdale - Flesherton - Kimberley - Amik - Eugenia

Notice of Study Commencement and Public Consultation Meeting

Municipality of Grey Highlands

Public Meeting

Tuesday, June 28, 2011

7:00 p.m.

Centre Grey Complex, Markdale

11 1-r3229-00

The Municipality of Grey Highlands is carrying out a Master Plan study for a regional water and

wastewater system to determine infrastructure requirements for the Municipality to service the study area

of Markdale - Flesherton - Kimberley - Amik - Eugenia and the area at the Beaver Valley Ski Club. This

Master Plan study is being conducted in accordance with the requirements of Phases 1 and 2 of the

Municipal Class Environmental Assessment which is an approved process under the Environmental

Assessment Act.

The first public consultation meeting has been arranged to review and receive input from the public about

the collection of background information and identification of the problem. The second public consultation

meeting will be in the Fall 201 1 to review alternative solutions. In addition,on there will be an opportunity to

eview the final Master Plan report.

Public consultation is a key component of this study. Please review the information presented at the

public meeting and provide comments with regard to this project. Please return this comment sheet lo

Mr. Chris Wilson, P. Eng., GENIVAR Inc., 1450 1't Avenue West, Suite 101, Owen Sound, ON N4K 6W2 (e-mail: chris.wilson@genivar.com, Tel: 519-376-7612, ext. i3208, Fax: 519-376-8009) by

Wednesday, July 20, 2011.

Comments:

do realize that in order for the area to become more economically viable, that eventually the water/waste water issue would be coming up. Having said that, I do firmly believe that the scope of he entire project is absolutely ludicrous. Markdale and Flesherton should and do require a good and safe public water / wastewater system. To extend the wastewater system to the bottom of the Beaver Valley and pump sewage waste upwards towards Markdale at this point really does not seem to make sense. With only 2780 confirmed serviced lots within the entire municipality this does not make any type of sense whatsoever. All rural lots as it stands have existing well/septic systems installed and with proper maintenance, they are a viable means for rural areas. Before any ground is turned on a project such as this ACTUAL costs to the taxpayer HAVE to be disclosed, not just having meetings where the mayor and counsel members say that government grant money is being sought. Exactly how much are we talking? No one seems to be able to disclose any figures. Even in provincial/federal governments pick up half of the tab, that leave the taxpayers of the municipality on the hook for the est of the money. With only 2780 rural properties, that does not spread the tax out to many atepayers. More facts need to be disclosed as this is a very major project affecting a small population with major taxes coming in the future. The federal and provincial govts may contribute to he installation, but they sure will not be contributing to the ongoing maintenance and increase nfrastructure costs due to increase power consumption, more municipal employees to maintain the ystem and for billing, plus increased office space etc in order to house them.

Next time a public meeting is held, please do not insult anyone's intelligence again at the meeting by kipping through the important slides of the presentation,and focusing more on the pretty pictures that ou can make with ArcGIS software.

one must spend their time "defining a problem" then there probably is not that great of a problem to egin with otherwise it would just present itself without the requirement to be defined.

Daryl Minifie

19-924-3222

Chris Wilson

From: D Clarke [dclarke1024@hotmail.com]
Sent: Tuesday, July 05, 2011 8:31 AM
To: Chris Wilson
Subject: Feedback - Grey Highlands Water & Wastewater - Public meeting on June 28

Good morning Chris. I hope you don't mind but rather than write on the form and fax or courier, I find it easier to type and email. Please print and add to your comments. I found the meeting interesting and informative and is now sinking in about how big a project this is. I especially felt that as i drove home after the meeting from Markdale to Flesherton and reflected on the distance. Points

- Commendable that taking a long term view to planning in preparation of $'s being available in the future. It will be interesting to see what tips this project from planning to implementation first: development requests, water or sewage crisis or government money ?
- As mentioned at the meeting, i think there was a limited notice sent out to people and difficult time during the summer. I am sure that the fall meeting will be much better attended.
- I think the best idea of the evening was to talk to the local natural gas provider about tagging along with the planning
- i think the problem statement should include the cost of water at KAT and that any investments made also need to include the investments to reduce the cost of water and maintenance going forward.
- There needs to be careful consideration on opt in/ opt out on water and sewage.
- There needs to be a review of prior completed projects around water and sewage to see what can be done better.

I have sent a note and the link for the slides to approx 15 other home owners in the Kimberley area to read and share with others that I have missed. I hope that they will provide feedback as well.

David Clarke
10 North Riverdale Drive
Inglewood, ON
L7C 1L1

From: Chris.Wilson@genivar.com
To: dclarke1024@hotmail.com
CC: moyers@greyhighlands.ca
Date: Wed, 22 Jun 2011 14:06:03 -0400
Subject: Follow up - Grey Highlands Water & Wastewater - Public meeting on June 28

David,

You have been added to the communication list regarding the Master Plan Study.

Thanks,

GENIVAR
Chris Wilson, B.E.Sc., P.Eng. | Environmental Engineer
GENIVAR | *Constructive People*
450 1st Ave West, Suite 101,
Owen Sound, ON N4K 6W2
519-376-7612 #13208 | www.genivar.com
chris.wilson@genivar.com

(1)

COMMENT SHEET

Water and Wastewater Servicing Master Plan
Markdale – Flesherton – Kimberley – Amik – Eugenia
Notice of Study Commencement and Public Consultation Meeting
Municipality of Grey Highlands

Public Meeting
Tuesday, June 28, 2011
7:00 p.m.
Centre Grey Complex, Markdale

111-13229-00

The Municipality of Grey Highlands is carrying out a Master Plan study for a regional water and wastewater system to determine infrastructure requirements for the Municipality to service the study area of Markdale – Flesherton – Kimberley – Amik – Eugenia and the area at the Beaver Valley Ski Club. This Master Plan study is being conducted in accordance with the requirements of Phases 1 and 2 of the Municipal Class Environmental Assessment which is an approved process under the Environmental Assessment Act.

The first public consultation meeting has been arranged to review and receive input from the public about the collection of background information and identification of the problem. The second public consultation meeting will be in the Fall 2011 to review alternative solutions. In addition there will be an opportunity to review the final Master Plan report.

Public consultation is a key component of this study. Please review the information presented at the public meeting and provide comments with regard to this project. Please return this comment sheet to Mr. Chris Wilson, P. Eng., GENIVAR Inc., 1450 1st Avenue West, Suite 101, Owen Sound, ON N4K 6W2 (e-mail: chris.wilson@genivar.com, Tel: 519-376-7612, ext. 13208, Fax: 519-376-8008) by **Wednesday, July 20, 2011.**

I COMMEND G.H. MAYOR & COUNCIL FOR INITIATING THIS IMPORTANT STUDY. I LIVE NEAR THE B.V.S.C. THE EXISTING HOMES ABOVE THE B.V.S.C AND SURROUNDING THE CLUB HOUSE HAVE QUALITY & QUANTITY PROBLEMS (AS MANY AS 50%). THE AREA ABOVE THE CLUB HAS BEEN DESIGNATED FOR FUTURE DEVELOPMENT. THE A.M.E.C. STUDY STATES THIS IS ONE OF THE MOST SENSITIVE GROUND WATER MANAGEMENT AREAS IN PROVINCE BECAUSE OF KARST.

(Use other side, if necessary)

Name: ED O'NEIL

Address: 486101 GREY RD 30, BOX 1092 MARKDALE

(2)

THERE ARE PRESENTLY PROPOSALS FOR APP. 100 NEW HOMES, WITH THE POTENTIAL FOR AN ADDITIONAL 200 TO FOLLOW. WE DO NOT NEED 300 NEW WELLS & SEPTIC TANKS IN THIS AREA. M.O.E. STATES THAT THERE WOULD BE SUBSTANTIAL RISKS TO EXISTING WELLS.

I WOULD LIKE TO SEE PHASE (1) PROCEED D.S.A.P.

THERE WILL BE QUESTIONS:

- COST & HOW PAID?
- SEWAGE PUMPING STATION AT WINDY LANE & BUCLAS BLUFF RD.
- DO PEOPLE WITH GOOD WELLS HOOK-UP-?

ADVANTAGES

NEW TAX REVENUE. 200 HOMES AT $4000"
WOULD HELP ALL TAXPAYERS!!

- SELLING PRICES OF EXISTING HOMES SHOULD INCREASE.!!

LETS GO FOR IT.

Ed O'Neil

DISTRIBUTED TO THE AREA ON THE WESTSIDE OF THE VALLEY. WATER COULD BE STORED IN THE EXISTING AMIK FACILITIES IF NEEDED AND BY PASS THE CHEMICAL SYSTEM. THE EXISTING SYSTEM COULD BE EXTENDED TO THE BEAVER VALLEY SKI RESORT AND POSSIBLY TO EUGENIA IF NEEDED. THE LAST THING WE NEED IS TO TREAT MORE SURFACE WATER (THE BEAVER RIVER).

ALL EXISTING SEWAGE SYSTEMS SHOULD BE INSPECTED AND RECORDS KEPT CURRANT. THIS MAY TAKE A NUMBER OF YEARS BUT EVENTUARY ALL SEPTIC SYSTEMS WOULD BE GOOD.

PART OF THE STUDY SHOULD INCLUDE LOOKING AT THE EXTENSION OF NATURAL GAS FROM FLESHERTON TO EUGENIA (AND THE LAKE AREA). THEN DOWN TO KIMBERLEY INCLUDING THE BEAVER VALLEY AND TALLISMAN SKI RESORTS AND AMIK VILLAGE.

PLEASE ADD MY NAME TO THE MAILING LIST.

REGARDS,

COMMENT SHEET

Water and Wastewater Servicing Master Plan
Markdale – Flesherton – Kimberley – Amik – Eugenia
Notice of Study Commencement and Public Consultation Meeting
Municipality of Grey Highlands

Public Meeting
Tuesday, June 28, 2011
7:00 p.m.
Centre Grey Complex, Markdale

111-13229-00

The Municipality of Grey Highlands is carrying out a Master Plan study for a regional water and wastewater system to determine infrastructure requirements for the Municipality to service the study area of Markdale – Flesherton – Kimberley – Amik – Eugenia and the area at the Beaver Valley Ski Club. This Master Plan study is being conducted in accordance with the requirements of Phases 1 and 2 of the Municipal Class Environmental Assessment which is an approved process under the Environmental Assessment Act.

The first public consultation meeting has been arranged to review and receive input from the public about the collection of background information and identification of the problem. The second public consultation meeting will be in the Fall 2011 to review alternative solutions. In addition there will be an opportunity to review the final Master Plan report.

Public consultation is a key component of this study. Please review the information presented at the public meeting and provide comments with regard to this project. Please return this comment sheet to Mr. Chris Wilson, P. Eng., GENIVAR Inc., 1450 1st Avenue West, Suite 101, Owen Sound, ON N4K 6W2 (e-mail: chris.wilson@genivar.com, Tel: 519-376-7612, ext. 13208, Fax: 519-376-8008) by **Wednesday, July 20, 2011**.

after 45 years experience dealing with problems and unpleasant conditions resulting from the Markdale sewage lagoons on our farm (far too many to start describing on this page) I hope no further expansion of the present lagoon system would be contemplated! There must be newer & improved methods of technology that could be used. I am tired of working next to the odors which the OWRC said would never occur and which by the way occured long before Chapman's plant was here. The free use of our private laneway has also proved to be unsatisfactory!

(Use other side, if necessary)

Name: John McKeown

Address: P.O. Box 728, Markdale, ON N0C 1H0

519-986-3279

John McKeown

Lots 94 - 97 Hwy 10
Munic. of W. Grey.

COMMENT SHEET

Water and Wastewater Servicing Master Plan
Markdale – Flesherton – Kimberley – Amik – Eugenia
Notice of Study Commencement and Public Consultation Meeting
Municipality of Grey Highlands

Public Meeting
Tuesday, June 28, 2011
7:00 p.m.
Centre Grey Complex, Markdale

111-13229-00

The Municipality of Grey Highlands is carrying out a Master Plan study for a regional water and wastewater system to determine infrastructure requirements for the Municipality to service the study area of Markdale – Flesherton – Kimberley – Amik – Eugenia and the area at the Beaver Valley Ski Club. This Master Plan study is being conducted in accordance with the requirements of Phases 1 and 2 of the Municipal Class Environmental Assessment which is an approved process under the Environmental Assessment Act.

The first public consultation meeting has been arranged to review and receive input from the public about the collection of background information and identification of the problem. The second public consultation meeting will be in the Fall 2011 to review alternative solutions. In addition there will be an opportunity to review the final Master Plan report.

Public consultation is a key component of this study. Please review the information presented at the public meeting and provide comments with regard to this project. Please return this comment sheet to Mr. Chris Wilson, P. Eng., GENIVAR Inc., 1450 1st Avenue West, Suite 101, Owen Sound, ON N4K 6W2 (e-mail: chris.wilson@genivar.com, Tel: 519-376-7612, ext. 13208, Fax: 519-376-8008) by **Wednesday, July 20, 2011.**

The Municipality of West Grey would like the opportunity to discuss a possible partnership in relation to the Grey Highland's Water & Wastewater Servicing Master Plan in order to potentially service West Grey properties on the west, north and south boundaries of Markdale.

Contact:

Ken Gould
Director of Infrastructure and Public Works
The Municipality of West Grey
519-369-2200, ext. 227
kgould@westgrey.com

Christine Robinson
Chief Administrative Officer
The Municipality of West Grey
519-369-2200, ext.222
robinsonc@westgrey.com

(Use other side, if necessary)

Name: THE MUNICIPALITY OF WEST GREY

Address: 402813 GREY ROAD 4, RR 2., DURHAM, ON., N0G 1R0.

SIGN-IN SHEET

Water and Wastewater Servicing Master Plan
Markdale – Flesherton – Kimberley – Amik – Eugenia
Notice of Study Commencement and Public Consultation Meeting
Municipality of Grey Highlands

Public Meeting
Tuesday, June 28, 2011
7:00 p.m.
Centre Grey Complex, Markdale

111-13229-00

111-13229-00

June 8, 2012

Beausoleil First Nation
(Christian Island)
10 Gema Street
Christian Island
Cedar Point, ON
L0K 1C0

Re: Water and Wastewater Servicing Master Plan
Markdale-Flesherton-Kimberley-Amik-Eugenia
Review of Alternative Solutions and Preliminary Identification of Recommended Solution
Municipality of Grey Highlands

Dear Sir/Madam:

The Municipality of Grey Highlands is carrying out a Master Plan study for a regional water and wastewater system to determine infrastructure requirements for the Municipality to service the study area of Markdale – Flesherton – Kimberley – Amik – Eugenia and the area at the Beaver Valley Ski Club.

This Master Plan Study is being conducted in accordance with the requirements of Phase 1 and Phase 2 of the Municipal Class Environmental Assessment planning process.

A Notice of Study Commencement and Problem Definition for the Water and Wastewater Servicing Master Plan were submitted to Government Agencies on June 15, 2011 for comment. A subsequent public consultation meeting was held on June 28, 2011 at the Centre Grey Complex in Markdale to review and receive input from the public about the collection of background information and identification of the problem.

A draft version of the Water and Wastewater Servicing Master Plan (March 2012), can be found on the Municipality of Grey Highlands' home page at the website as follows: www.greyhighlands.ca.

The Master Plan study area for the Municipality of Grey Highlands is broken down into three (3) main phases (Phase 1, Phase 2 and Phase 3) for the framework for providing sewage and water servicing to existing developed areas and planned future projects and developments. The phases are ordered by the number of priority as per recommendations and per requirements of the Municipality of Grey Highlands. Several sub-phases exist within each of the three (3) main phases proposed, which are discussed in detail in the study report.

Eight (8) alternatives for implementation of phased upgraded and/or new water treatment facilities, water storage and water distribution under the Master Plan were reviewed. As well, four (4) alternatives for implementation of phased upgrades to the three (3) existing wastewater plants (Markdale, Flesherton and Amik-Talisman) under the Master Plan were reviewed. The proposed four (4) alternatives for upgrading the wastewater plants include four (4) alternatives for new sanitary sewer areas and sewage pumping stations.

A draft version of a second report entitled "Outline of Recommended Sewage and Water Servicing for Phase 1 of the Master Plan" (March 2012), can be found on the Municipality of Grey Highlands' home

1450 1st Avenue West, Suite 101, Owen Sound, Ontario N4K 6W2
Telephone: 519.376.7612 · Fax: 519.376.8008 · www.genivar.com

page. This report provides detailed information in relation to Phase 1 (highest priority component) of the recommended preferred alternative solution as outlined in the draft Water and Wastewater Servicing Master Plan.

The second public consultation meeting will be arranged in the near future to review and receive input from the public about the alternative solutions and the preliminary identification of the preferred Master Plan solution.

We are requesting any comments you may have by July 18, 2012. Please submit your comments to Mr. Chris Wilson, P. Eng., GENIVAR, 1450 – 1st Avenue West, Suite 101, Owen Sound, ON N4K 6W2, Tel: 519-376-7612, ext. 13208 or by e-mail at chris.wilson@genivar.com.

If you should have any questions, please contact me at this office or Mr. Chris Wilson, P. Eng.

Yours truly,

GENIVAR Inc.

M. Ross Slaughter, P. Eng.
Designated Consulting Engineer
Senior Water Resources Engineer
MRS/lem
Encl.
cc: Mr. Shawn Moyer, Water & Wastewater Superintendent, Municipality of Grey Highlands

111-13229-00

June 8, 2012

Chippewas First Nation
Reserve #27
R.R. #5
Wiarton, ON
N0H 2T0

Re: Water and Wastewater Servicing Master Plan
Markdale-Flesherton-Kimberley-Amik-Eugenia
Review of Alternative Solutions and Preliminary Identification of Recommended Solution
Municipality of Grey Highlands

Dear Sir/Madam:

The Municipality of Grey Highlands is carrying out a Master Plan study for a regional water and wastewater system to determine infrastructure requirements for the Municipality to service the study area of Markdale – Flesherton – Kimberley – Amik – Eugenia and the area at the Beaver Valley Ski Club.

This Master Plan Study is being conducted in accordance with the requirements of Phase 1 and Phase 2 of the Municipal Class Environmental Assessment planning process.

A Notice of Study Commencement and Problem Definition for the Water and Wastewater Servicing Master Plan were submitted to Government Agencies on June 15, 2011 for comment. A subsequent public consultation meeting was held on June 28, 2011 at the Centre Grey Complex in Markdale to review and receive input from the public about the collection of background information and identification of the problem.

A draft version of the Water and Wastewater Servicing Master Plan (March 2012), can be found on the Municipality of Grey Highlands' home page at the website as follows: www.greyhighlands.ca.

The Master Plan study area for the Municipality of Grey Highlands is broken down into three (3) main phases (Phase 1, Phase 2 and Phase 3) for the framework for providing sewage and water servicing to existing developed areas and planned future projects and developments. The phases are ordered by the number of priority as per recommendations and per requirements of the Municipality of Grey Highlands. Several sub-phases exist within each of the three (3) main phases proposed, which are discussed in detail in the study report.

Eight (8) alternatives for implementation of phased upgraded and/or new water treatment facilities, water storage and water distribution under the Master Plan were reviewed. As well, four (4) alternatives for implementation of phased upgrades to the three (3) existing wastewater plants (Markdale, Flesherton and Amik-Talisman) under the Master Plan were reviewed. The proposed four (4) alternatives for upgrading the wastewater plants include four (4) alternatives for new sanitary sewer areas and sewage pumping stations.

A draft version of a second report entitled "Outline of Recommended Sewage and Water Servicing for Phase 1 of the Master Plan" (March 2012), can be found on the Municipality of Grey Highlands' home page. This report provides detailed information in relation to Phase 1 (highest priority component) of the

recommended preferred alternative solution as outlined in the draft Water and Wastewater Servicing Master Plan.

The second public consultation meeting will be arranged in the near future to review and receive input from the public about the alternative solutions and the preliminary identification of the preferred Master Plan solution.

We are requesting any comments you may have by July 18, 2012. Please submit your comments to Mr. Chris Wilson, P. Eng., GENIVAR, 1450 – 1st Avenue West, Suite 101, Owen Sound, ON N4K 6W2, Tel: 519-376-7612, ext. 13208 or by e-mail at chris.wilson@genivar.com.

If you should have any questions, please contact me at this office or Mr. Chris Wilson, P. Eng.

Yours truly,

GENIVAR Inc.

M. Ross Slaughter, P. Eng.
Designated Consulting Engineer
Senior Water Resources Engineer
MRS/lem
Encl.
cc: Mr. Shawn Moyer, Water & Wastewater Superintendent, Municipality of Grey Highlands

111-13229-00

June 8, 2012

Chippewas of Georgina Island
R.R. #2
P.O. Box 12
Sutton West, ON
L0E 1R0

Re: Water and Wastewater Servicing Master Plan
Markdale-Flesherton-Kimberley-Amik-Eugenia
Review of Alternative Solutions and Preliminary Identification of Recommended Solution
Municipality of Grey Highlands

Dear Sir/Madam:

The Municipality of Grey Highlands is carrying out a Master Plan study for a regional water and wastewater system to determine infrastructure requirements for the Municipality to service the study area of Markdale – Flesherton – Kimberley – Amik – Eugenia and the area at the Beaver Valley Ski Club.

This Master Plan Study is being conducted in accordance with the requirements of Phase 1 and Phase 2 of the Municipal Class Environmental Assessment planning process.

A Notice of Study Commencement and Problem Definition for the Water and Wastewater Servicing Master Plan were submitted to Government Agencies on June 15, 2011 for comment. A subsequent public consultation meeting was held on June 28, 2011 at the Centre Grey Complex in Markdale to review and receive input from the public about the collection of background information and identification of the problem.

A draft version of the Water and Wastewater Servicing Master Plan (March 2012), can be found on the Municipality of Grey Highlands' home page at the website as follows: www.greyhighlands.ca.

The Master Plan study area for the Municipality of Grey Highlands is broken down into three (3) main phases (Phase 1, Phase 2 and Phase 3) for the framework for providing sewage and water servicing to existing developed areas and planned future projects and developments. The phases are ordered by the number of priority as per recommendations and per requirements of the Municipality of Grey Highlands. Several sub-phases exist within each of the three (3) main phases proposed, which are discussed in detail in the study report.

Eight (8) alternatives for implementation of phased upgraded and/or new water treatment facilities, water storage and water distribution under the Master Plan were reviewed. As well, four (4) alternatives for implementation of phased upgrades to the three (3) existing wastewater plants (Markdale, Flesherton and Amik-Talisman) under the Master Plan were reviewed. The proposed four (4) alternatives for upgrading the wastewater plants include four (4) alternatives for new sanitary sewer areas and sewage pumping stations.

A draft version of a second report entitled "Outline of Recommended Sewage and Water Servicing for Phase 1 of the Master Plan" (March 2012), can be found on the Municipality of Grey Highlands' home page. This report provides detailed information in relation to Phase 1 (highest priority component) of the

1450 1st Avenue West, Suite 101, Owen Sound, Ontario N4K 6W2
Telephone: 519.376.7612 · Fax: 519.376.8008 · www.genivar.com

recommended preferred alternative solution as outlined in the draft Water and Wastewater Servicing Master Plan.

The second public consultation meeting will be arranged in the near future to review and receive input from the public about the alternative solutions and the preliminary identification of the preferred Master Plan solution.

We are requesting any comments you may have by July 18, 2012. Please submit your comments to Mr. Chris Wilson, P. Eng., GENIVAR, 1450 – 1st Avenue West, Suite 101, Owen Sound, ON N4K 6W2, Tel: 519-376-7612, ext. 13208 or by e-mail at chris.wilson@genivar.com.

If you should have any questions, please contact me at this office or Mr. Chris Wilson, P. Eng.

Yours truly,

GENIVAR Inc.

M. Ross Slaughter, P. Eng.
Designated Consulting Engineer
Senior Water Resources Engineer
MRS/lem
Encl.
cc: Mr. Shawn Moyer, Water & Wastewater Superintendent, Municipality of Grey Highlands

111-13229-00

June 8, 2012

Chippewas of Rama
5884 Rama Road
Suite 200
Rama, ON
L0K 1T0

Re: Water and Wastewater Servicing Master Plan
Markdale-Flesherton-Kimberley-Amik-Eugenia
Review of Alternative Solutions and Preliminary Identification of Recommended Solution
Municipality of Grey Highlands

Dear Sir/Madam:

The Municipality of Grey Highlands is carrying out a Master Plan study for a regional water and wastewater system to determine infrastructure requirements for the Municipality to service the study area of Markdale – Flesherton – Kimberley – Amik – Eugenia and the area at the Beaver Valley Ski Club.

This Master Plan Study is being conducted in accordance with the requirements of Phase 1 and Phase 2 of the Municipal Class Environmental Assessment planning process.

A Notice of Study Commencement and Problem Definition for the Water and Wastewater Servicing Master Plan were submitted to Government Agencies on June 15, 2011 for comment. A subsequent public consultation meeting was held on June 28, 2011 at the Centre Grey Complex in Markdale to review and receive input from the public about the collection of background information and identification of the problem.

A draft version of the Water and Wastewater Servicing Master Plan (March 2012), can be found on the Municipality of Grey Highlands' home page at the website as follows: www.greyhighlands.ca.

The Master Plan study area for the Municipality of Grey Highlands is broken down into three (3) main phases (Phase 1, Phase 2 and Phase 3) for the framework for providing sewage and water servicing to existing developed areas and planned future projects and developments. The phases are ordered by the number of priority as per recommendations and per requirements of the Municipality of Grey Highlands. Several sub-phases exist within each of the three (3) main phases proposed, which are discussed in detail in the study report.

Eight (8) alternatives for implementation of phased upgraded and/or new water treatment facilities, water storage and water distribution under the Master Plan were reviewed. As well, four (4) alternatives for implementation of phased upgrades to the three (3) existing wastewater plants (Markdale, Flesherton and Amik-Talisman) under the Master Plan were reviewed. The proposed four (4) alternatives for upgrading the wastewater plants include four (4) alternatives for new sanitary sewer areas and sewage pumping stations.

A draft version of a second report entitled "Outline of Recommended Sewage and Water Servicing for Phase 1 of the Master Plan" (March 2012), can be found on the Municipality of Grey Highlands' home page. This report provides detailed information in relation to Phase 1 (highest priority component) of the

1450 1st Avenue West, Suite 101, Owen Sound, Ontario N4K 6W2
Telephone: 519.376.7612 • Fax: 519.376.8008 • www.genivar.com

recommended preferred alternative solution as outlined in the draft Water and Wastewater Servicing Master Plan.

The second public consultation meeting will be arranged in the near future to review and receive input from the public about the alternative solutions and the preliminary identification of the preferred Master Plan solution.

We are requesting any comments you may have by July 18, 2012. Please submit your comments to Mr. Chris Wilson, P. Eng., GENIVAR, 1450 – 1st Avenue West, Suite 101, Owen Sound, ON N4K 6W2, Tel: 519-376-7612, ext. 13208 or by e-mail at chris.wilson@genivar.com.

If you should have any questions, please contact me at this office or Mr. Chris Wilson, P. Eng.

Yours truly,

GENIVAR Inc.

M. Ross Slaughter, P. Eng.
Designated Consulting Engineer
Senior Water Resources Engineer
MRS/lem
Encl.
cc: Mr. Shawn Moyer, Water & Wastewater Superintendent, Municipality of Grey Highlands

111-13229-00

June 8, 2012

Great Lakes Metis Council
380 9th Street East
Owen Sound, ON
N4K 1P1

Re: Water and Wastewater Servicing Master Plan
Markdale-Flesherton-Kimberley-Amik-Eugenia
Review of Alternative Solutions and Preliminary Identification of Recommended Solution
Municipality of Grey Highlands

Dear Sir/Madam:

The Municipality of Grey Highlands is carrying out a Master Plan study for a regional water and wastewater system to determine infrastructure requirements for the Municipality to service the study area of Markdale – Flesherton – Kimberley – Amik – Eugenia and the area at the Beaver Valley Ski Club.

This Master Plan Study is being conducted in accordance with the requirements of Phase 1 and Phase 2 of the Municipal Class Environmental Assessment planning process.

A Notice of Study Commencement and Problem Definition for the Water and Wastewater Servicing Master Plan were submitted to Government Agencies on June 15, 2011 for comment. A subsequent public consultation meeting was held on June 28, 2011 at the Centre Grey Complex in Markdale to review and receive input from the public about the collection of background information and identification of the problem.

A draft version of the Water and Wastewater Servicing Master Plan (March 2012), can be found on the Municipality of Grey Highlands' home page at the website as follows: www.greyhighlands.ca.

The Master Plan study area for the Municipality of Grey Highlands is broken down into three (3) main phases (Phase 1, Phase 2 and Phase 3) for the framework for providing sewage and water servicing to existing developed areas and planned future projects and developments. The phases are ordered by the number of priority as per recommendations and per requirements of the Municipality of Grey Highlands. Several sub-phases exist within each of the three (3) main phases proposed, which are discussed in detail in the study report.

Eight (8) alternatives for implementation of phased upgraded and/or new water treatment facilities, water storage and water distribution under the Master Plan were reviewed. As well, four (4) alternatives for implementation of phased upgrades to the three (3) existing wastewater plants (Markdale, Flesherton and Amik-Talisman) under the Master Plan were reviewed. The proposed four (4) alternatives for upgrading the wastewater plants include four (4) alternatives for new sanitary sewer areas and sewage pumping stations.

A draft version of a second report entitled "Outline of Recommended Sewage and Water Servicing for Phase 1 of the Master Plan" (March 2012), can be found on the Municipality of Grey Highlands' home page. This report provides detailed information in relation to Phase 1 (highest priority component) of the

recommended preferred alternative solution as outlined in the draft Water and Wastewater Servicing Master Plan.

The second public consultation meeting will be arranged in the near future to review and receive input from the public about the alternative solutions and the preliminary identification of the preferred Master Plan solution.

We are requesting any comments you may have by July 18, 2012. Please submit your comments to Mr. Chris Wilson, P. Eng., GENIVAR, 1450 – 1st Avenue West, Suite 101, Owen Sound, ON N4K 6W2, Tel: 519-376-7612, ext. 13208 or by e-mail at chris.wilson@genivar.com.

If you should have any questions, please contact me at this office or Mr. Chris Wilson, P. Eng.

Yours truly,

GENIVAR Inc.

M. Ross Slaughter, P. Eng.
Designated Consulting Engineer
Senior Water Resources Engineer
MRS/lem
Encl.
cc: Mr. Shawn Moyer, Water & Wastewater Superintendent, Municipality of Grey Highlands

111-13229-00

June 8, 2012

Historic Saugeen Metis
204 High Street
Box 1492
Southampton, ON
N0H 2L0

Re: Water and Wastewater Servicing Master Plan
Markdale-Flesherton-Kimberley-Amik-Eugenia
Review of Alternative Solutions and Preliminary Identification of Recommended Solution
Municipality of Grey Highlands

Dear Sir/Madam:

The Municipality of Grey Highlands is carrying out a Master Plan study for a regional water and wastewater system to determine infrastructure requirements for the Municipality to service the study area of Markdale – Flesherton – Kimberley – Amik – Eugenia and the area at the Beaver Valley Ski Club.

This Master Plan Study is being conducted in accordance with the requirements of Phase 1 and Phase 2 of the Municipal Class Environmental Assessment planning process.

A Notice of Study Commencement and Problem Definition for the Water and Wastewater Servicing Master Plan were submitted to Government Agencies on June 15, 2011 for comment. A subsequent public consultation meeting was held on June 28, 2011 at the Centre Grey Complex in Markdale to review and receive input from the public about the collection of background information and identification of the problem.

A draft version of the Water and Wastewater Servicing Master Plan (March 2012), can be found on the Municipality of Grey Highlands' home page at the website as follows: www.greyhighlands.ca.

The Master Plan study area for the Municipality of Grey Highlands is broken down into three (3) main phases (Phase 1, Phase 2 and Phase 3) for the framework for providing sewage and water servicing to existing developed areas and planned future projects and developments. The phases are ordered by the number of priority as per recommendations and per requirements of the Municipality of Grey Highlands. Several sub-phases exist within each of the three (3) main phases proposed, which are discussed in detail in the study report.

Eight (8) alternatives for implementation of phased upgraded and/or new water treatment facilities, water storage and water distribution under the Master Plan were reviewed. As well, four (4) alternatives for implementation of phased upgrades to the three (3) existing wastewater plants (Markdale, Flesherton and Amik-Talisman) under the Master Plan were reviewed. The proposed four (4) alternatives for upgrading the wastewater plants include four (4) alternatives for new sanitary sewer areas and sewage pumping stations.

A draft version of a second report entitled "Outline of Recommended Sewage and Water Servicing for Phase 1 of the Master Plan" (March 2012), can be found on the Municipality of Grey Highlands' home page. This report provides detailed information in relation to Phase 1 (highest priority component) of the

1450 1st Avenue West, Suite 101, Owen Sound, Ontario N4K 6W2
Telephone: 519.376.7612 • Fax: 519.376.8008 • www.genivar.com

recommended preferred alternative solution as outlined in the draft Water and Wastewater Servicing Master Plan.

The second public consultation meeting will be arranged in the near future to review and receive input from the public about the alternative solutions and the preliminary identification of the preferred Master Plan solution.

We are requesting any comments you may have by July 18, 2012. Please submit your comments to Mr. Chris Wilson, P. Eng., GENIVAR, 1450 – 1st Avenue West, Suite 101, Owen Sound, ON N4K 6W2, Tel: 519-376-7612, ext. 13208 or by e-mail at chris.wilson@genivar.com.

If you should have any questions, please contact me at this office or Mr. Chris Wilson, P. Eng.

Yours truly,

GENIVAR Inc.

M. Ross Slaughter, P. Eng.
Designated Consulting Engineer
Senior Water Resources Engineer
MRS/lem
Encl.
cc: Mr. Shawn Moyer, Water & Wastewater Superintendent, Municipality of Grey Highlands

111-13229-00

June 8, 2012

Ms. Janet Townson
Claims Analyst
Ontario Specific Claims Branch
INAC
1310-10 Wellington Street
Gatineau, QC
K1A 0H4

Re: Water and Wastewater Servicing Master Plan
Markdale-Flesherton-Kimberley-Amik-Eugenia
Review of Alternative Solutions and Preliminary Identification of Recommended Solution
Municipality of Grey Highlands

Dear Ms. Townson:

The Municipality of Grey Highlands is carrying out a Master Plan study for a regional water and wastewater system to determine infrastructure requirements for the Municipality to service the study area of Markdale – Flesherton – Kimberley – Amik – Eugenia and the area at the Beaver Valley Ski Club.

This Master Plan Study is being conducted in accordance with the requirements of Phase 1 and Phase 2 of the Municipal Class Environmental Assessment planning process.

A Notice of Study Commencement and Problem Definition for the Water and Wastewater Servicing Master Plan were submitted to Government Agencies on June 15, 2011 for comment. A subsequent public consultation meeting was held on June 28, 2011 at the Centre Grey Complex in Markdale to review and receive input from the public about the collection of background information and identification of the problem.

A draft version of the Water and Wastewater Servicing Master Plan (March 2012), can be found on the Municipality of Grey Highlands' home page at the website as follows: www.greyhighlands.ca.

The Master Plan study area for the Municipality of Grey Highlands is broken down into three (3) main phases (Phase 1, Phase 2 and Phase 3) for the framework for providing sewage and water servicing to existing developed areas and planned future projects and developments. The phases are ordered by the number of priority as per recommendations and per requirements of the Municipality of Grey Highlands. Several sub-phases exist within each of the three (3) main phases proposed, which are discussed in detail in the study report.

Eight (8) alternatives for implementation of phased upgraded and/or new water treatment facilities, water storage and water distribution under the Master Plan were reviewed. As well, four (4) alternatives for implementation of phased upgrades to the three (3) existing wastewater plants (Markdale, Flesherton and Amik-Talisman) under the Master Plan were reviewed. The proposed four (4) alternatives for upgrading the wastewater plants include four (4) alternatives for new sanitary sewer areas and sewage pumping stations.

1450 1st Avenue West, Suite 101, Owen Sound, Ontario N4K 6W2
Telephone: 519.376.7612 · Fax: 519.376.8008 · www.genivar.com

A draft version of a second report entitled "Outline of Recommended Sewage and Water Servicing for Phase 1 of the Master Plan" (March 2012), can be found on the Municipality of Grey Highlands' home page. This report provides detailed information in relation to Phase 1 (highest priority component) of the recommended preferred alternative solution as outlined in the draft Water and Wastewater Servicing Master Plan.

The second public consultation meeting will be arranged in the near future to review and receive input from the public about the alternative solutions and the preliminary identification of the preferred Master Plan solution.

We are requesting any comments you may have by July 18, 2012. Please submit your comments to Mr. Chris Wilson, P. Eng., GENIVAR, 1450 – 1st Avenue West, Suite 101, Owen Sound, ON N4K 6W2, Tel: 519-376-7612, ext. 13208 or by e-mail at chris.wilson@genivar.com.

If you should have any questions, please contact me at this office or Mr. Chris Wilson, P. Eng.

Yours truly,

GENIVAR Inc.

M. Ross Slaughter, P. Eng.
Designated Consulting Engineer
Senior Water Resources Engineer
MRS/lem
Encl.
cc: Mr. Shawn Moyer, Water & Wastewater Superintendent, Municipality of Grey Highlands

111-13229-00

June 8, 2012

Indian & Northern Affairs Canada
25 St. Clair Avenue East
8th Floor
Toronto, ON
M4T 1M2

Re: Water and Wastewater Servicing Master Plan
Markdale-Flesherton-Kimberley-Amik-Eugenia
Review of Alternative Solutions and Preliminary Identification of Recommended Solution
Municipality of Grey Highlands

Dear Sir/Madam:

The Municipality of Grey Highlands is carrying out a Master Plan study for a regional water and wastewater system to determine infrastructure requirements for the Municipality to service the study area of Markdale – Flesherton – Kimberley – Amik – Eugenia and the area at the Beaver Valley Ski Club.

This Master Plan Study is being conducted in accordance with the requirements of Phase 1 and Phase 2 of the Municipal Class Environmental Assessment planning process.

A Notice of Study Commencement and Problem Definition for the Water and Wastewater Servicing Master Plan were submitted to Government Agencies on June 15, 2011 for comment. A subsequent public consultation meeting was held on June 28, 2011 at the Centre Grey Complex in Markdale to review and receive input from the public about the collection of background information and identification of the problem.

A draft version of the Water and Wastewater Servicing Master Plan (March 2012), can be found on the Municipality of Grey Highlands' home page at the website as follows: www.greyhighlands.ca.

The Master Plan study area for the Municipality of Grey Highlands is broken down into three (3) main phases (Phase 1, Phase 2 and Phase 3) for the framework for providing sewage and water servicing to existing developed areas and planned future projects and developments. The phases are ordered by the number of priority as per recommendations and per requirements of the Municipality of Grey Highlands. Several sub-phases exist within each of the three (3) main phases proposed, which are discussed in detail in the study report.

Eight (8) alternatives for implementation of phased upgraded and/or new water treatment facilities, water storage and water distribution under the Master Plan were reviewed. As well, four (4) alternatives for implementation of phased upgrades to the three (3) existing wastewater plants (Markdale, Flesherton and Amik-Talisman) under the Master Plan were reviewed. The proposed four (4) alternatives for upgrading the wastewater plants include four (4) alternatives for new sanitary sewer areas and sewage pumping stations.

A draft version of a second report entitled "Outline of Recommended Sewage and Water Servicing for Phase 1 of the Master Plan" (March 2012), can be found on the Municipality of Grey Highlands' home page. This report provides detailed information in relation to Phase 1 (highest priority component) of the

1450 1st Avenue West, Suite 101, Owen Sound, Ontario N4K 6W2
Telephone: 519.376.7612 • Fax: 519.376.8008 • www.genivar.com

recommended preferred alternative solution as outlined in the draft Water and Wastewater Servicing Master Plan.

The second public consultation meeting will be arranged in the near future to review and receive input from the public about the alternative solutions and the preliminary identification of the preferred Master Plan solution.

We are requesting any comments you may have by July 16, 2012. Please submit your comments to Mr. Chris Wilson, P. Eng., GENIVAR, 1450 – 1st Avenue West, Suite 101, Owen Sound, ON N4K 6W2, Tel: 519-376-7612, ext. 13208 or by e-mail at chris.wilson@genivar.com.

If you should have any questions, please contact me at this office or Mr. Chris Wilson, P. Eng.

Yours truly,

GENIVAR Inc.

M. Ross Slaughter, P. Eng.
Designated Consulting Engineer
Senior Water Resources Engineer
MRS/lem
Encl.
cc: Mr. Shawn Moyer, Water & Wastewater Superintendent, Municipality of Grey Highlands

111-13229-00

June 8, 2012

Metis Nation of Ontario
Head Office
500 Old St. Patrick Street
Ottawa, ON
K1N 9G4

Re: Water and Wastewater Servicing Master Plan
Markdale-Flesherton-Kimberley-Amik-Eugenia
Review of Alternative Solutions and Preliminary Identification of Recommended Solution
Municipality of Grey Highlands

Dear Sir/Madam:

The Municipality of Grey Highlands is carrying out a Master Plan study for a regional water and wastewater system to determine infrastructure requirements for the Municipality to service the study area of Markdale – Flesherton – Kimberley – Amik – Eugenia and the area at the Beaver Valley Ski Club.

This Master Plan Study is being conducted in accordance with the requirements of Phase 1 and Phase 2 of the Municipal Class Environmental Assessment planning process.

A Notice of Study Commencement and Problem Definition for the Water and Wastewater Servicing Master Plan were submitted to Government Agencies on June 15, 2011 for comment. A subsequent public consultation meeting was held on June 28, 2011 at the Centre Grey Complex in Markdale to review and receive input from the public about the collection of background information and identification of the problem.

A draft version of the Water and Wastewater Servicing Master Plan (March 2012), can be found on the Municipality of Grey Highlands' home page at the website as follows: www.greyhighlands.ca.

The Master Plan study area for the Municipality of Grey Highlands is broken down into three (3) main phases (Phase 1, Phase 2 and Phase 3) for the framework for providing sewage and water servicing to existing developed areas and planned future projects and developments. The phases are ordered by the number of priority as per recommendations and per requirements of the Municipality of Grey Highlands. Several sub-phases exist within each of the three (3) main phases proposed, which are discussed in detail in the study report.

Eight (8) alternatives for implementation of phased upgraded and/or new water treatment facilities, water storage and water distribution under the Master Plan were reviewed. As well, four (4) alternatives for implementation of phased upgrades to the three (3) existing wastewater plants (Markdale, Flesherton and Amik-Talisman) under the Master Plan were reviewed. The proposed four (4) alternatives for upgrading the wastewater plants include four (4) alternatives for new sanitary sewer areas and sewage pumping stations.

A draft version of a second report entitled "Outline of Recommended Sewage and Water Servicing for Phase 1 of the Master Plan" (March 2012), can be found on the Municipality of Grey Highlands' home page. This report provides detailed information in relation to Phase 1 (highest priority component) of the

1450 1st Avenue West, Suite 101, Owen Sound, Ontario N4K 6W2
Telephone: 519.376.7612 • Fax: 519.376.8008 • www.genivar.com

recommended preferred alternative solution as outlined in the draft Water and Wastewater Servicing Master Plan.

The second public consultation meeting will be arranged in the near future to review and receive input from the public about the alternative solutions and the preliminary identification of the preferred Master Plan solution.

We are requesting any comments you may have by July 18, 2012. Please submit your comments to Mr. Chris Wilson, P. Eng., GENIVAR, 1450 – 1st Avenue West, Suite 101, Owen Sound, ON N4K 6W2, Tel: 519-376-7612, ext. 13208 or by e-mail at chris.wilson@genivar.com.

If you should have any questions, please contact me at this office or Mr. Chris Wilson, P. Eng.

Yours truly,

GENIVAR Inc.

M. Ross Slaughter, P. Eng.
Designated Consulting Engineer
Senior Water Resources Engineer
MRS/lem
Encl.
cc: Mr. Shawn Moyer, Water & Wastewater Superintendent, Municipality of Grey Highlands

111-13229-00

June 8, 2012

Ministry of Aboriginal Affairs
160 Bloor Street East
4th Floor
Toronto, ON
M4T 1M2

Re: Water and Wastewater Servicing Master Plan
Markdale-Flesherton-Kimberley-Amik-Eugenia
Review of Alternative Solutions and Preliminary Identification of Recommended Solution
Municipality of Grey Highlands

Dear Sir/Madam:

The Municipality of Grey Highlands is carrying out a Master Plan study for a regional water and wastewater system to determine infrastructure requirements for the Municipality to service the study area of Markdale – Flesherton – Kimberley – Amik – Eugenia and the area at the Beaver Valley Ski Club.

This Master Plan Study is being conducted in accordance with the requirements of Phase 1 and Phase 2 of the Municipal Class Environmental Assessment planning process.

A Notice of Study Commencement and Problem Definition for the Water and Wastewater Servicing Master Plan were submitted to Government Agencies on June 15, 2011 for comment. A subsequent public consultation meeting was held on June 28, 2011 at the Centre Grey Complex in Markdale to review and receive input from the public about the collection of background information and identification of the problem.

A draft version of the Water and Wastewater Servicing Master Plan (March 2012), can be found on the Municipality of Grey Highlands' home page at the website as follows: www.greyhighlands.ca.

The Master Plan study area for the Municipality of Grey Highlands is broken down into three (3) main phases (Phase 1, Phase 2 and Phase 3) for the framework for providing sewage and water servicing to existing developed areas and planned future projects and developments. The phases are ordered by the number of priority as per recommendations and per requirements of the Municipality of Grey Highlands. Several sub-phases exist within each of the three (3) main phases proposed, which are discussed in detail in the study report.

Eight (8) alternatives for implementation of phased upgraded and/or new water treatment facilities, water storage and water distribution under the Master Plan were reviewed. As well, four (4) alternatives for implementation of phased upgrades to the three (3) existing wastewater plants (Markdale, Flesherton and Amik-Talisman) under the Master Plan were reviewed. The proposed four (4) alternatives for upgrading the wastewater plants include four (4) alternatives for new sanitary sewer areas and sewage pumping stations.

A draft version of a second report entitled "Outline of Recommended Sewage and Water Servicing for Phase 1 of the Master Plan" (March 2012), can be found on the Municipality of Grey Highlands' home page. This report provides detailed information in relation to Phase 1 (highest priority component) of the

1450 1st Avenue West, Suite 101, Owen Sound, Ontario N4K 6W2
Telephone: 519.376.7612 • Fax: 519.376.8008 • www.genivar.com

recommended preferred alternative solution as outlined in the draft Water and Wastewater Servicing Master Plan.

The second public consultation meeting will be arranged in the near future to review and receive input from the public about the alternative solutions and the preliminary identification of the preferred Master Plan solution.

We are requesting any comments you may have by July 18, 2012. Please submit your comments to Mr. Chris Wilson, P. Eng., GENIVAR, 1450 – 1st Avenue West, Suite 101, Owen Sound, ON N4K 6W2, Tel: 519-376-7612, ext. 13208 or by e-mail at chris.wilson@genivar.com.

If you should have any questions, please contact me at this office or Mr. Chris Wilson, P. Eng.

Yours truly,

GENIVAR Inc.

M. Ross Slaughter, P. Eng.
Designated Consulting Engineer
Senior Water Resources Engineer
MRS/lem
Encl.
cc: Mr. Shawn Moyer, Water & Wastewater Superintendent, Municipality of Grey Highlands

111-13229-00

June 8, 2012

Mr. Sean Darcy, Manager
Assessment & Historical Research
INAC
1310-10 Wellington Street
Gatineau, QC
K1A 0H4

Re: Water and Wastewater Servicing Master Plan
Markdale-Flesherton-Kimberley-Amik-Eugenia
Review of Alternative Solutions and Preliminary Identification of Recommended Solution
Municipality of Grey Highlands

Dear Mr. Darcy:

The Municipality of Grey Highlands is carrying out a Master Plan study for a regional water and wastewater system to determine infrastructure requirements for the Municipality to service the study area of Markdale – Flesherton – Kimberley – Amik – Eugenia and the area at the Beaver Valley Ski Club.

This Master Plan Study is being conducted in accordance with the requirements of Phase 1 and Phase 2 of the Municipal Class Environmental Assessment planning process.

A Notice of Study Commencement and Problem Definition for the Water and Wastewater Servicing Master Plan were submitted to Government Agencies on June 15, 2011 for comment. A subsequent public consultation meeting was held on June 28, 2011 at the Centre Grey Complex in Markdale to review and receive input from the public about the collection of background information and identification of the problem.

A draft version of the Water and Wastewater Servicing Master Plan (March 2012), can be found on the Municipality of Grey Highlands' home page at the website as follows: www.greyhighlands.ca.

The Master Plan study area for the Municipality of Grey Highlands is broken down into three (3) main phases (Phase 1, Phase 2 and Phase 3) for the framework for providing sewage and water servicing to existing developed areas and planned future projects and developments. The phases are ordered by the number of priority as per recommendations and per requirements of the Municipality of Grey Highlands. Several sub-phases exist within each of the three (3) main phases proposed, which are discussed in detail in the study report.

Eight (8) alternatives for implementation of phased upgraded and/or new water treatment facilities, water storage and water distribution under the Master Plan were reviewed. As well, four (4) alternatives for implementation of phased upgrades to the three (3) existing wastewater plants (Markdale, Flesherton and Amik-Talisman) under the Master Plan were reviewed. The proposed four (4) alternatives for upgrading the wastewater plants include four (4) alternatives for new sanitary sewer areas and sewage pumping stations.

A draft version of a second report entitled "Outline of Recommended Sewage and Water Servicing for Phase 1 of the Master Plan" (March 2012), can be found on the Municipality of Grey Highlands' home

1450 1st Avenue West, Suite 101, Owen Sound, Ontario N4K 6W2
Telephone: 519.376.7612 • Fax: 519.376.8008 • www.genivar.com

page. This report provides detailed information in relation to Phase 1 (highest priority component) of the recommended preferred alternative solution as outlined in the draft Water and Wastewater Servicing Master Plan.

The second public consultation meeting will be arranged in the near future to review and receive input from the public about the alternative solutions and the preliminary identification of the preferred Master Plan solution.

We are requesting any comments you may have by July 18, 2012. Please submit your comments to Mr. Chris Wilson, P. Eng., GENIVAR, 1450 – 1st Avenue West, Suite 101, Owen Sound, ON N4K 6W2, Tel: 519-376-7612, ext. 13208 or by e-mail at chris.wilson@genivar.com.

If you should have any questions, please contact me at this office or Mr. Chris Wilson, P. Eng.

Yours truly,

GENIVAR Inc.

M. Ross Slaughter, P. Eng.
Designated Consulting Engineer
Senior Water Resources Engineer
MRS/lem
Encl.
cc: Mr. Shawn Moyer, Water & Wastewater Superintendent, Municipality of Grey Highlands

111-13229-00

June 8, 2012

Saugeen First Nation
R.R. #1
Box 640
Southampton, ON
N0H 2L0

Re: Water and Wastewater Servicing Master Plan
Markdale-Flesherton-Kimberley-Amik-Eugenia
Review of Alternative Solutions and Preliminary Identification of Recommended Solution
Municipality of Grey Highlands

Dear Sir/Madam:

The Municipality of Grey Highlands is carrying out a Master Plan study for a regional water and wastewater system to determine infrastructure requirements for the Municipality to service the study area of Markdale – Flesherton – Kimberley – Amik – Eugenia and the area at the Beaver Valley Ski Club.

This Master Plan Study is being conducted in accordance with the requirements of Phase 1 and Phase 2 of the Municipal Class Environmental Assessment planning process.

A Notice of Study Commencement and Problem Definition for the Water and Wastewater Servicing Master Plan were submitted to Government Agencies on June 15, 2011 for comment. A subsequent public consultation meeting was held on June 28, 2011 at the Centre Grey Complex in Markdale to review and receive input from the public about the collection of background information and identification of the problem.

A draft version of the Water and Wastewater Servicing Master Plan (March 2012), can be found on the Municipality of Grey Highlands' home page at the website as follows: www.greyhighlands.ca.

The Master Plan study area for the Municipality of Grey Highlands is broken down into three (3) main phases (Phase 1, Phase 2 and Phase 3) for the framework for providing sewage and water servicing to existing developed areas and planned future projects and developments. The phases are ordered by the number of priority as per recommendations and per requirements of the Municipality of Grey Highlands. Several sub-phases exist within each of the three (3) main phases proposed, which are discussed in detail in the study report.

Eight (8) alternatives for implementation of phased upgraded and/or new water treatment facilities, water storage and water distribution under the Master Plan were reviewed. As well, four (4) alternatives for implementation of phased upgrades to the three (3) existing wastewater plants (Markdale, Flesherton and Amik-Talisman) under the Master Plan were reviewed. The proposed four (4) alternatives for upgrading the wastewater plants include four (4) alternatives for new sanitary sewer areas and sewage pumping stations.

A draft version of a second report entitled "Outline of Recommended Sewage and Water Servicing for Phase 1 of the Master Plan" (March 2012), can be found on the Municipality of Grey Highlands' home page. This report provides detailed information in relation to Phase 1 (highest priority component) of the

1450 1st Avenue West, Suite 101, Owen Sound, Ontario N4K 6W2
Telephone: 519.376.7612 • Fax: 519.376.8008 • www.genivar.com

recommended preferred alternative solution as outlined in the draft Water and Wastewater Servicing Master Plan.

The second public consultation meeting will be arranged in the near future to review and receive input from the public about the alternative solutions and the preliminary identification of the preferred Master Plan solution.

We are requesting any comments you may have by July 18, 2012. Please submit your comments to Mr. Chris Wilson, P. Eng., GENIVAR, 1450 – 1st Avenue West, Suite 101, Owen Sound, ON N4K 6W2, Tel: 519-376-7612, ext. 13208 or by e-mail at chris.wilson@genivar.com.

If you should have any questions, please contact me at this office or Mr. Chris Wilson, P. Eng.

Yours truly,

GENIVAR Inc.

M. Ross Slaughter, P. Eng.
Designated Consulting Engineer
Senior Water Resources Engineer
MRS/lem
Encl.
cc: Mr. Shawn Moyer, Water & Wastewater Superintendent, Municipality of Grey Highlands

From: Lands and Resources Consultation Coordinator [mailto:saugeenmetisadmin@bmts.com]
Sent: Tuesday, November 20, 2012 1:20 PM
To: Ross Slaughter
Subject: Re: Meetig with Historic Saugeen Metis Southampton - TuesdayDecember 11,2012

Hello Ross,

Thank you for the confirmation. We look forward to the December 11th meeting and learning about Grey Highlands' Water and Sewage Master Plan.

Many Thanks,

Audrey

Audrey Erin Holden M.E.S
Lands and Resources Consultation Coordinator

Historic Saugeen Metis
204 High Street
Southampton, Ontario
N0H 2L0
Direct Line (519) 483-4001
Fax (519) 483-4002
Email saugeenmetisadmin@bmts.com

Historic Saugeen Metis, an independent, self-governed aboriginal community in existence along the Lake Huron shoreline since the early 1800s. The rights-bearing Metis community asserts Section 35 Constitution (1982) aboriginal rights and asserts rights is an historic Metis community under the Supreme Court decision R. Vs. Powley (2003).

This email message, including any attachments, is for the intended recipient(s) only, and contains confidential and proprietary information.
Unauthorized distribution, copying or disclosure is strictly prohibited. If you have received this message in error, or are obviously not one
of the intended recipients, please immediately notify the sender by reply email and delete this email message, including any attachments.
Thank you.

On 12-11-19 4:22 PM, "Ross Slaughter" <Ross.Slaughter@genivar.com> wrote:
Audrey Holden and Patsy McArthur
This email confirms our meeting at your office at 204 High Street in Southampton on Tuesday December 11,2012 at 10:30 am to discuss the Water and Sewage Master Plan for the Municipality of Grey Highlands as discussed today.
Ross

GENIVAR

Ross Slaughter, P.Eng. | Senior Environmental Engineer
GENIVAR | *Constructive People*
1450 1st Avenue West, Suite 101, Owen Sound, ON N4K 6W2
Tel: 519-376-7612 #13226 Fax: 519-376-8008 | www.genivar.com <http://www.genivar.com>
<blocked::http://www.genivar.com/> | ross.slaughter@genivar.com <mailto:ross.slaughter@genivar.com>

Please consider the environment before printing...

CONFIDENTIALITY WARNING:
This message is intended only for the use of the individual or entity to which it is addressed, and may contain information which is privileged, confidential, proprietary or exempt from disclosure under applicable law. If you are not the intended recipient or the person responsible for delivering the message to the intended recipient, you are strictly prohibited from disclosing, distributing, copying or in any way using this message. If you have received this communication in error, please notify the sender, and destroy and delete any copies you may have received.

AVERTISSEMENT:
Ce message est destiné uniquement à la personne ou à l'organisation à laquelle il est adressé et il peut contenir des informations privilégiées, confidentielles ou non divulgables en vertu de la loi. Si vous n'êtes pas le destinataire du présent message ni la personne chargée de remettre le présent message à son destinataire, il vous est strictement interdit de le divulguer, de le distribuer, de le copier ou de l'utiliser de quelque façon que ce soit. Si vous avez reçu la présente communication par erreur, veuillez en aviser l'expéditeur et détruire ou effacer tous les exemplaires que vous avez reçus.

GENIVAR

TRANSMITTAL

To: Saugeen Ojibway Nation Office
25 Maadookii Road
RR5
WIARTON, ON
N0H 2T0

Attn: Mr. Jake Linklater, Office Coordinator

Date: December 6, 2012

Re:

Project No.: 111-13229-00

We Are Sending:
- ☒ Attached
- ☐ Shop Drawings
- ☐ Drawings
- ☐ Change Orders
- ☐ Specifications
- ☐ Reports
- ☐ Correspondence
- ☐ Samples
- ☐ Under Separate Cover
- ☐ Other _____

Transmitted:
- ☐ For Approval
- ☐ For Your Information
- ☒ As Requested
- ☐ For Review & Comment
- ☐ Reviewed
- ☐ Reviewed As Noted
- ☐ Return
- ☐ Return After Loan
- ☐ Other _____

Sent Via:
- ☒ Courier
- ☐ Mail
- ☐ Hand Delivered
- ☐ Fax/Original By Mail
- ☐ To be Picked Up

Copies	Description	Purpose
1	"Outline of Recommended Sewage and Water Servicing for Phase 1	
	of Master Plan (Markdale-Beaver Valley-Kimberley-Amik)"	
	dated March 2012	
1	"Water & Wastewater Servicing Master Plan, Markdale-Flesherton-	
	Kimberley-Amik-Eugenia-Beaver Valley" dated March 2012	

Remarks: Jake – As requested in your email, please find enclosed the above noted reports.

GENIVAR Inc.

Copy: Mr. Dan Best, CAO, Municipality of Grey Highlands

~~Per:~~ Debbie Wellwood
for Ross Slaughter, P.Eng.

If material received is not as listed
Please notify us immediately

OWEN SOUND 1450 1st Avenue West, Suite 101, Owen Sound, Ontario N4K 6W2 Tel.: (519) 376-7612 Fax: (519) 376-8008

1030 111-1322

Ross Slaughter

From: Jake Linklater [jakelinklater@saugeenojibwaynation.ca]
Sent: Monday, December 03, 2012 10:52 AM
To: Ross Slaughter
Cc: 'Best, Dan'; 'Moyer, Shawn'; 'Armstrong, Bill (ENE)'; 'Chappell, Rick (ENE)'; Chris Wilson; jakelinklater@saugeenojibwaynation.ca; d.ritchie@saugeenojibwaynation.ca; 'Neil Rooney'; 'Lorraine Land'
Subject: RE: Meeting with Saugeen Ojibway First Nation - Tuesday December 18,2012 - 2:30pm
Attachments: Directions to SON EO.doc

Hi Ross...

Thanks for note. Here are the directions to our office. See you then. I kindly ask that you send us a copy of all paperwork, reports and other related documents prior to our meeting.

Respectfully,

Jake Linklater
Office Coordinator
Saugeen Ojibway Nation Environment Office
25 Maadookii Road
R.R. # 5
Wiarton, ONT
N0H 2T0
519.534.5507 (ph)
519.534.5525 (fx)

The present message is intended only for the named recipient(s) above. Its contents may be confidential. If you have received this message in error, please notify us immediately and delete the original without making a copy, disclosing its contents or taking any action based thereon.

From: Ross Slaughter [mailto:Ross.Slaughter@genivar.com]
Sent: November-28-12 2:52 PM
To: jakelinklater@saugeenojibwaynation.ca
Cc: Best, Dan; Moyer, Shawn; Armstrong, Bill (ENE); Chappell, Rick (ENE); Chris Wilson
Subject: Meeting with Saugeen Ojibway First Nation - Tuesday December 18,2012 - 2:30pm

Jake

This email will confirm our conversation today regarding a meeting with the Saugeen Ojibway First Nation scheduled for Tuesday December 18,2012 at 2:30 pm to discuss the Water and Sanitary Sewer Master Plan for the Municipality of Grey Highlands. The meeting is to be held at your office at Cape Croker . We are asking if Rick Chappel and Bill Armstrong can also attend from the Ontario Ministry of the Environment. Thanks.

Ross

GENIVAR

Ross Slaughter, P.Eng. | Senior Environmental Engineer
GENIVAR | *Constructive People*
1450 1st Avenue West, Suite 101, Owen Sound, ON N4K 6W2

Ross Slaughter

From: Jake Linklater [jakelinklater@saugeenojibwaynation.ca]
Sent: Monday, December 03, 2012 10:52 AM
To: Ross Slaughter
Cc: 'Best, Dan'; 'Moyer, Shawn'; 'Armstrong, Bill (ENE)'; 'Chappell, Rick (ENE)'; Chris Wilson; jakelinklater@saugeenojibwaynation.ca; d.ritchie@saugeenojibwaynation.ca; 'Neil Rooney'; 'Lorraine Land'
Subject: RE: Meeting with Saugeen Ojibway First Nation - Tuesday December 18,2012 - 2:30pm
Attachments: Directions to SON EO.doc

Hi Ross...

Thanks for note. Here are the directions to our office. See you then. I kindly ask that you send us a copy of all paperwork, reports and other related documents prior to our meeting.

Respectfully,

Jake Linklater
Office Coordinator
Saugeen Ojibway Nation Environment Office
25 Maadookii Road
R.R. # 5
Wiarton, ONT
N0H 2T0
519.534.5507 (ph)
519.534.5525 (fx)

The present message is intended only for the named recipient(s) above. Its contents may be confidential. If you have received this message in error, please notify us immediately and delete the original without making a copy, disclosing its contents or taking any action based thereon.

From: Ross Slaughter [mailto:Ross.Slaughter@genivar.com]
Sent: November-28-12 2:52 PM
To: jakelinklater@saugeenojibwaynation.ca
Cc: Best, Dan; Moyer, Shawn; Armstrong, Bill (ENE); Chappell, Rick (ENE); Chris Wilson
Subject: Meeting with Saugeen Ojibway First Nation - Tuesday December 18,2012 - 2:30pm

Jake
This email will confirm our conversation today regarding a meeting with the Saugeen Ojibway First Nation scheduled for Tuesday December 18,2012 at 2:30 pm to discuss the Water and Sanitary Sewer Master Plan for the Municipality of Grey Highlands. The meeting is to be held at your office at Cape Croker . We are asking if Rick Chappel and Bill Armstrong can also attend from the Ontario Ministry of the Environment. Thanks.
Ross

GENIVAR

Ross Slaughter, P.Eng. | Senior Environmental Engineer
GENIVAR | *Constructive People*
1450 1st Avenue West, Suite 101, Owen Sound, ON N4K 6W2

Ross Slaughter

From: Ross Slaughter
Sent: Tuesday, May 07, 2013 12:11 PM
To: 'Doran Ritchie'
Cc: 'Moyer, Shawn'; Best, Dan; 'jakelinklater@saugeenojibwaynation.ca'; 'Chappell, Rick (ENE)'
Subject: RE: Municipality of Grey Highlands Water and Sewer Master Plan - SON Documents

Doran
At the meeting held at your offices on April 24,2013 with the Municipality of Grey Highlands regarding the Water and Sewer Master Plan, it was scheduled to have a response from SON by Friday May 3,2013. Please advise when we can expect a response regarding the Draft Master Plan. Thank you.
Ross

GENIVAR

Ross Slaughter, P.Eng. | Senior Environmental Engineer
GENIVAR | *Constructive People*
1450 1st Avenue West, Suite 101, Owen Sound, ON N4K 6W2
Tel: 519-376-7612 #13226 Fax: 519-376-8008 | www.genivar.com | ross.slaughter@genivar.com

Please consider the environment before printing...

From: Doran Ritchie [mailto:d.ritchie@saugeenojibwaynation.ca]
Sent: Wednesday, April 24, 2013 10:30 AM
To: Ross Slaughter; 'Moyer, Shawn'; 'Best, Dan'
Cc: jakelinklater@saugeenojibwaynation.ca; 'Chappell, Rick (ENE)'
Subject: RE: Municipality of Grey Highlands Water and Sewer Master Plan - SON Documents

FYI,

From: Ross Slaughter [mailto:Ross.Slaughter@genivar.com]
Sent: Monday, April 22, 2013 10:48 AM
To: Doran Ritchie
Cc: jakelinklater@saugeenojibwaynation.ca; Chappell, Rick (ENE); Moyer, Shawn; Best, Dan
Subject: RE: Municipality of Grey Highlands Water and Sewer Master Plan - Meeting - Wednesday April 24,2013 at 9:30am

Doran
Further to our telephone conversation today, this email confirms that Dan Best and Shawn Moyer from the Municipality of Grey Highlands, Rick Chappell from the MOE and myself will attend the meeting at your office in Cape Croker to discuss the Water and Sewer master plan. The meeting is to be held on Wednesday April 24,2013 at 9:30 am.
Ross

GENIVAR

Ross Slaughter, P.Eng. | Senior Environmental Engineer
GENIVAR | *Constructive People*
1450 1st Avenue West, Suite 101, Owen Sound, ON N4K 6W2
Tel: 519-376-7612 #13226 Fax: 519-376-8008 | www.genivar.com | ross.slaughter@genivar.com

Please consider the environment before printing...

the Métis Nation of Ontario

Agenda for meeting with Municipality of Grey Highlands and the Georgian Bay Traditional Territory Consultation Committee Thursday January 24, 2013 6:00 pm Georgian Bay Métis Council Boardroom 355 Cranston Crescent Midland, Ontario

1. Opening Prayer
2. Introductions
3. Presentation of Métis 101
4. Open question and answer period
5. Presentation by Municipality of Grey Highlands S&WMP
6. Open question and answer period
7. Next Steps
8. Closing Prayer

*Holding this meeting does not constitute the conclusion of the consultation process

Métis Nation of Ontario 500 Old St. Patrick St, Unit D, Ottawa, ON K1N 9G4
Tel: 613-798-1488 **Toll free:** 1-800-263-4889 **Fax:** 613-722-4225 **www.metisnation.org**

Ross Slaughter

From: Ross Slaughter
Sent: Thursday, July 11, 2013 2:34 PM
To: Alden Barty (AldenB@metisnation.org)
Cc: Best, Dan (BestD@greyhighlands.ca); Moyer, Shawn (MoyerS@greyhighlands.ca); 'Chappell, Rick (ENE)' (Rick.Chappell@ontario.ca)
Subject: FW: Follow - up From Meeting with the Metis Nation of Ontario on Jan. 24,2013
Attachments: 2013-01-28 - BRIEFING NOTE - Grey Highlands S&W Master Plan.doc

Alden

Thank you for the briefing notes from the Jan. 24,2013 meeting between the Municipality of Grey Highlands and the Metis Nation of Ontario regarding the Water and Sewer Servicing Master Plan . This email is further to our telephone conversation of June 26, 2013 regarding clarification of your strategic considerations for the Municipality of Grey Highlands for the Master Plan. The following are the general details of the requested strategic considerations to be outlined in the Master Plan as discussed:

1. The Draft Water and Sewer Servicing Master Plan will be modified to outline the measures to be put in place to protect the " Species At Risk" and particularly the Hart's Tongue Fern and Butternut Trees.
2. It is intended to carry out more detailed but general archeological assessments to be included in the Master Plan.
3. The Municipality of Grey Highlands received your letter dated February 15,2013 on May 23,2013 regarding access to the water bodies and waterways in the Municipality. This information will be included in the Master Plan Study Report.
4. As requested, we will outline the requirements for employee operator training protocol for municipal employees and construction company personnel contracted for the water and sewer servicing construction work.
5. The Municipality will continue to collect information on wastewater quality and quantity monitoring in Markdale ,Flesherton and Amik (near Kimberly) sewer servicing areas as is being carried out now, with annual reports prepared. This monitoring will be continued after construction.
6. When any archeological reports are prepared for this Master Plan, a copy will be forwarded to the Metis Nation of Ontario.

Please confirm that the information as outlined in this email meets the present requirements of the Metis Nation of Ontario for the Master Plan Study. If you have any questions, please call.

Ross

GENIVAR

Ross Slaughter, P.Eng. | Senior Environmental Engineer
GENIVAR | *Constructive People*
1450 1st Avenue West, Suite 101, Owen Sound, ON N4K 6W2
Tel: 519-376-7612 #13226 Fax: 519-376-8008 | www.genivar.com | ross.slaughter@genivar.com

Please consider the environment before printing...

From: Alden Barty [mailto:AldenB@metisnation.org]
Sent: Wednesday, June 26, 2013 11:21 AM
To: Ross Slaughter
Cc: Danielle Secord; David Dusome; Greg Garratt; LarryDuval (metisman48@hotmail.com); PaulineSaulnier; Peter Coture
Subject: RE: Follow - up From Meeting with the Metis Nation of Ontario onJan. 24,2013

Ross:

Attached is the briefing note for our meeting held on January 24, 2013. The briefing note outlines the concerns and questions the GBTTCC has with the project.
If you have any questions, please contact me.
Best Regards
Alden

From: Ross Slaughter [mailto:Ross.Slaughter@genivar.com]
Sent: June-12-13 4:06 PM
To: Alden Barty
Cc: Best, Dan (BestD@greyhighlands.ca); Moyer, Shawn (MoyerS@greyhighlands.ca); 'Chappell, Rick (ENE)' (Rick.Chappell@ontario.ca)
Subject: Follow - up From Meeting with the Metis Nation of Ontario on Jan. 24,2013

Alden
This email is further to our meeting on Jan. 24, 2013 between the Metis Nation of Ontario and representatives of the Municipality of Grey Highlands and the Ontario Ministry of the Environment. The meeting was held to discuss the Water and Sewer Master Plan being carried out by the Municipality of Grey Highlands. We presented a brief outline of the proposed Master Plan study and left a 7 page hand- out of information and maps.
It was our understanding that you were going to respond after this meeting with any comments you had and/or any additional information that that you would like to request. If you have any questions please call me at this office.
Thanks.
Ross

GENIVAR

Ross Slaughter, P.Eng. | Senior Environmental Engineer
GENIVAR | *Constructive People*
1450 1st Avenue West, Suite 101, Owen Sound, ON N4K 6W2
Tel: 519-376-7612 #13226 Fax: 519-376-8008 | www.genivar.com | ross.slaughter@genivar.com

Please consider the environment before printing...

CONFIDENTIALITY WARNING:
This message is intended only for the use of the individual or entity to which it is addressed, and may contain information which is privileged, confidential, proprietary or exempt from disclosure under applicable law. If you are not the intended recipient or the person responsible for delivering the message to the intended recipient, you are strictly prohibited from disclosing, distributing, copying or in any way using this message. If you have received this communication in error, please notify the sender, and destroy and delete any copies you may have received.

AVERTISSEMENT:
Ce message est destiné uniquement à la personne ou à l'organisation à laquelle il est adressé et il peut contenir des informations privilégiées, confidentielles ou non divulgables en vertu de la loi. Si vous n'êtes pas le destinataire du présent message ni la personne chargée de remettre le présent message à son destinataire, il vous est strictement interdit de le divulguer, de le distribuer, de le copier ou de l'utiliser de quelque façon que ce soit. Si vous avez reçu la présente communication par erreur, veuillez en aviser l'expéditeur et détruire ou effacer tous les exemplaires que vous avez reçus.

MNO Briefing Note

Municipality of Grey Highlands Sewage and Water Servicing Master Plan

Alden Barty for Mark Bowler

January 28, 2013

Summary

- January 24, 2013, The Township of Grey Highland and the consulting firm Genivar Inc. met with the GBTTCC to discuss the design for Municipality of Grey Highlands Sewage and Water Servicing Master Plan
- Genivar Inc. has prepared the twenty (20) year master plan on behalf of the Municipality
- The complete project is scheduled to be completed by three separate phrases
- The modernization of the water lines, waste water and water treatment facilities will provide clean and safe drinking water for local citizens.
- The modernization of the waste water system will remove Septic Tank systems and provide a cleaner environment in the catchment area of the projects.
- The long term cost of the project is estimated to be $64,500,000.00

Background

The Municipality of Grey Highlands sanction the Sewage and Water Servicing Master Plan as many of its facilities no longer met Ontario Government standards for clean drinking water. Genivar Inc. was awarded to contract to conduct the study and development the Master plan.

Strategic considerations

- Within the plan there are references to Species at Risk, Hart's Tongue Fern, Butternut are the two (2) where the Committee has its greatest concern
- Although much of the construction work will be within the highway/street easement there is still an opportunity for archeological presence
- Provide the Municipality of Grey Highlands with a letter similar to the City of Owen Sound requesting access to the shorelines of waterways.

Next steps

- Continue to gather additional information on waste water monitoring before and after construction
- Request a copy on any available archeological report
- Draft letter for the Municipality of Grey Highlands

Attendees:

GBTTCC: Chairperson Pauline Saulnier, GLMC President Peter Coture, MRMC Senator Larry Duval, Liaison Captain of the Hunt Greg Garratt
Municipality of Grey Highlands: Shawn Moyer Director of Public Utilities, CAO Dan Best
Genivar: Ross Slaughter

MEMORANDUM OF UNDERSTANDING

THIS AGREEMENT dated as of July 14 **, 2014**

BETWEEN:

THE SAUGEEN OJIBWAY NATION

(Hereinafter "SON")

AND:

The Municipality of Grey Highlands

(Hereinafter "The Municipality")

(collectively "the Parties")

REGARDING:

Aboriginal Consultation and Accommodation Process for Projects under the Municipality of Grey Highlands Water and Sewer Master Plan

WHEREAS:

1. The Parties wish to build a strong, constructive, cooperative and mutually respectful and beneficial relationship; and

2. The Parties wish to enter into an agreement setting out a framework for the Municipality's consultation and accommodation of SON with respect to projects anticipated by the Municipality of Grey Highlands Water and Sewer Master Plan which take place on SON's traditional territory; and

3. The Parties wish to continue to build a positive relationship by ensuring projects are developed in a way that is respectful of, and accommodates, SON's Rights; and

4. The people of SON reside in and assert a special stewardship relationship with the SON Traditional Territory ("SONTT"), known to SON as Anishnaabekiing, and the identity of the people of SON grows out their relationship with the land and waters in the SONTT; and

5. Under Anishinaabe law, the people of SON have obligations to protect the SONTT, including the duty to protect the land, water, animals, fish, birds, plants, and Anishinaabe burial, ceremonial and cultural sites in the SONTT and the right to harvest for sustenance, cultural and livelihood purposes; and

6. Under Anishinaabe law, those who intend to take actions that may affect the SONTT must respect the SON people and their rights; and

7. Under Canadian law, SON's Aboriginal and treaty rights in respect of the SONTT are recognized and affirmed by s.35 of the *Constitution Act, 1982*; and

8. Under Canadian law, SON asserts Aboriginal and treaty right claims in respect of the SONTT, including the following asserted and court-confirmed rights:

   (a) The legal action SON filed with the Ontario Superior Court of Justice (*Chippewas of Nawash Unceded First Nation and Saugeen First Nation v. Canada et al.* Court File 03-CV-261134CM1) claiming Aboriginal title to part of Lake Huron and Georgian Bay within SONTT; and

   (b) The Ontario Superior Court of Justice decision affirming SON's constitutionally protected commercial fishing rights in *R. v. Jones and Nadjiwon*, [1993] 3 C.N.L.R. 182 (Ont. Prov. Div.); and

   (c) Aboriginal and treaty harvesting rights in the areas of the SONTT covered by Treaties 45½ in 1836 and Treaty 72 in 1854.

9. Under international law, SON has the rights to:

   (a) free and informed consent prior to the approval of any project or any planning decision adversely impacting SONTT; and

   (b) benefit economically from resource development within SONTT; and

10. SON asserts that SON's Aboriginal and treaty rights entitle SON to be sustained as Aboriginal peoples by the lands, waters and resources of the SONTT far into the future; and

11. The full expression of SON's Rights depends on healthy, biologically diverse ecosystems; and

12. While the Municipality acknowledges SON's statements in paragraphs 5, 6, and 9 regarding international law and Anishnaabe law, it takes no position regarding them and is not bound by them except in as far as Canadian law may require; and

13. The Parties share a mutual interest in ensuring that projects in SONTT are planned, reviewed and developed in a manner which ensures healthy communities, ecological protection and sustainable development for present and future generations in the SONTT; and

14. SON must be meaningfully involved in the planning, review and development of activities that affect SON Rights, including archaeology, hydrogeology, engineering, aquatic environments and natural heritage reviews; and

NOW THEREFORE the Parties agree as follows:

15. In this Agreement,

(a) "Burial site" means land where evidence of human remains is discovered;

(b) "Crown" means Her Majesty in Right of Ontario or Canada;

(c) "Cultural site" means lands where evidence of past human activity is discovered;

(d) "Environment" means the entire environment of the Saugeen Ojibway people as it affects them and the exercise of their rights and responsibilities, and includes the spiritual, social, physical, ecological and economic environment;

(e) "Land" includes lands under water;

(f) "Schedule B Project" means projects related to the Water and Sewer Master Plan for which the Municipality has Aboriginal consultation obligations and described in Schedule B.

(g) "SON" means the Saugeen Ojibway Nation, consisting of the Chippewas of Nawash Unceded First Nation and the Chippewas of Saugeen First Nation;

(h) "SON Rights" includes SON's Aboriginal and treaty rights, rights arising out of SON's land claims, rights to the use of the SONTT for harvesting, gathering, cultural or ceremonial purpose and the right to be sustained by and protect the lands, waters and resources in the SONTT;

(i) "SON Traditional Territory" ("SONTT"), known to SON as Anishnaabekiing, means the territory that SON has traditionally used and occupied, including the waters that SON asserts as its traditional waters, as illustrated in the map attached as Schedule "A";

(j) "Specific Project Agreement" means an agreement negotiated between the parties which conforms in all respects to the terms of this MOU and a) describes the specific Schedule B Project to which consultation applies, b) describes a workplan for technical reviews, and c) provides a budget for such reviews. Technical reviews will relate to the Schedule B Project and may be about archaeology, natural heritage, aquatic ecology, hydrogeology, engineering, impacts on SON Rights, and mitigation measures;

(k) "Water and Sewer Master Plan" means the document entitled "Water and Wastewater Servicing Master Plan for the Markdale-Flesherton- Kimberley-Amik-Euginia-Beaver Valley prepared for The Municipality of Grey Highlands (Genivar, March 2102)".

PURPOSES OF AGREEMENT

16. This Agreement will be implemented to promote the following purposes:

    (a) To establish a process for engagement between the Municipality and SON;

    (b) To confirm the commitment of the parties to enter into Specific Project Agreements related to Schedule B Projects; and

    (c) To promote reconciliation by establishing a cooperative and mutually beneficial working relationship between SON and the Municipality.

17. The Municipality currently anticipates moving forward with items 1 and 2 in Schedule B. SON's workplan and the Municipality's budget commitments in relation to items 1 and 2 on Schedule B are fully set out in Schedule C of this MOU. The Parties will negotiate Specific Project Agreements for any future Schedule B Projects.

GENERAL PRINCIPLES OF CONSULTATION AND ACCOMMODATION

18. The Parties agree to work together to identify any impacts of any Schedule B Projects on SON Rights, and to mitigate those impacts. The Municipality retains the discretion to make all decisions about a project including mitigation measures. Where the Municipality declines to incorporate a mitigation measure proposed by SON, it will provide written reasons for its decision.

ARCHEOLOGICAL WORK

19. All archaeological work performed as part of the Municipality's process of consultation and accommodation of SON shall be carried out in accordance with the Ontario Heritage Act and its Regulations. The archaeological work will meet or exceed the Ontario Ministry of Culture "Standards and Guidelines for Consultant Archaeologists" as amended in 2012. The Municipality will provide SON's standards and guidelines for archaeological work, entitled "Conducting Archaeology within the Traditional Territory of the Saugeen Ojibway Nation", June 2011 (attached in Schedule D), and require consulting archaeologists retained by the Municipality to comply with those standards and guidelines. SON acknowledges that consultant archaeologists must also comply with relevant archaeological statutes and regulations, such as the Ontario Heritage Act. Archeological investigations will be agreed upon by the Parties prior to field investigations.

20. Where archaeological work in required in connection with a Schedule B Project, SON and the Municipality will exchange a list of three archaeologists that each agrees is competent to undertake the archaeology work for the Schedule B Project. The Municipality will prequalify archaeologists common to both lists, and the Municipality will invite the prequalified archaeologists to submit a proposal. In all other respects, the normal Municipal procurement processes will apply to the Municipality's selection of the archaeologist.

PROTECTION OF CULTURAL AND BURIAL SITES

21. If a cultural site is identified at any time during construction or archaeological assessment, the Municipality will inform SON and the Parties will work collaboratively to minimize impacts and ensure respectful treatment of any artefacts taking into account the practices and values of the SON as identified by the SON.

22. If at any time during construction, or archaeological assessment, human remains are encountered, the following steps will be taken:

    (a) The person in charge of the work will immediately contact both the Ministry of Culture, and the Cemeteries Regulation Unit of the Ontario Ministry of Consumer and Commercial Relations in Toronto (416-326-8392), SON and SON's archaeologist, the appropriate municipal police, the local coroner, and the Municipality's archaeologist;

    (b) All excavation and other activity that could disturb the site shall immediately cease, and the area shall be secured in a manner which protects the burial location and prevents public access and trespass;

    (c) In addition to any requirements of the *Ontario Heritage Act* and the *Funeral, Burial and Cremation Services Act*, 2002, SON reserves the exclusive right to determine the requirements for treatment of human remains of Aboriginal ancestry found at a site, including the procedures and ceremonies involved in their recovery, handling, protection or reburial. SON may recommend protections for an Aboriginal burial site which exceed the requirements of the *Ontario Heritage Act* and the *Funeral, Burial and Cremation Services Act*, 2002. The Parties agree to fully and respectfully work in cooperation throughout this process.

LAND CLAIMS ISSUES

23. The Parties agree that the construction, operation and maintenance of a Schedule B Project shall occur without prejudice to the claims of SON, and to the position of the Municipality with respect to such claims.

FINANCIAL CONSIDERATIONS

24. The Municipality agrees to pay the costs incurred by SON for the activities and to the amounts set out in a Budget in Schedule C or a Specific Project Agreement. The Budget shall contain a Maximum Contribution Amount. The Parties agree that the Maximum Contribution Amount is intended to cover all of the costs to be incurred by SON to achieve the objectives of this Agreement and will allow SON to have meaningful consultation about the Schedule B Project.

25. The Municipality agrees to reimburse SON for the actual costs incurred by SON in aggregate up to the Maximum Contribution Amount. Subject to paragraph 30, the Municipality will not be required to reimburse SON for any cost other than those specified in the Budget and only up to the amounts specified in the Budget.

26. SON will submit an invoice itemizing and describing the expenses incurred along with relevant documentation within 60 days of the work taking place.

27. The Municipality will pay the amounts requested by SON within 30 days of receiving such invoices subject to paragraphs 26, 27 and 28.

28. Financial arrangements in addition to the Maximum Contribution Amount may be negotiated between the Parties on a case by case basis in relation to the Schedule B Project. These arrangements and undertakings if and when concluded pursuant to an agreement in writing duly executed by each Party, will be attached and become part of the Specific Project Agreement to which they relate. For greater clarity, the Municipality will not be liable for any payment in excess of the Maximum Contribution Amount unless it has entered into such prior written agreement and SON agrees that it shall not incur costs in excess of the Maximum Contribution Amount unless the Parties have entered into such written agreement.

GENERAL PROVISIONS

29. Nothing in this Agreement relieves the Municipality from meeting any of the requirements of the *Environmental Assessment Act*, R.S.O. 1990, c. E.18, *Ontario Heritage Act*, R.S.O. 1990, c. O.18, *Funeral, Burial and Cremation Services Act, 2002*, S.O. 2002, c. 33, or any other obligations Grey Highlands may have at law.

30. Nothing in this Agreement shall be interpreted or implemented so as to derogate from or abrogate any inherent, treaty, aboriginal or other right of SON except as specifically set out in herein.

31. If a dispute arises between the Municipality and SON regarding the interpretation of any provision in this Agreement, the Parties or their duly appointed representatives will meet as soon as is practicable to attempt to resolve the dispute.

32. If the Parties are unable to resolve differences at the appropriate level, the interpretation issue will be raised to more senior levels of the Municipality and SON.

33. If the interpretation dispute cannot be resolved by the Parties directly, they may appoint an independent and mutually agreeable mediator to resolve that dispute within 60 days, or such period as agreed upon, or the Parties may choose other appropriate approaches to assist in reaching resolution of the interpretation issue.

34. Time shall be of the essence regarding the execution and implementation of this Agreement and its Schedules.

35. The Provisions of this Agreement and the Schedules to this Agreement collectively represent the entire agreement between the Parties.

36. This Agreement shall be binding upon and shall enure to the benefit of the Parties hereto and their respective successors and assigns, and in particular any successor or assignee of the Municipality.

37. This Agreement shall, in all respects, be subject to, interpreted, construed and enforced in accordance with and under the laws of Ontario and the laws of Canada applicable therein.

38. Any notice or other communication required or permitted to be given hereunder shall be in writing and shall be delivered by hand or transmitted by facsimile transmission and addressed as follows:

(a) If to SON:

The Saugeen First Nation
Attention: The Chief of the Saugeen First Nation
R.R.#1
Southampton ON N0H 2L0
Fax: (519) 797-2978

and

The Chippewas of Nawash Unceded Nation
Attention: The Chief of the Chippewas of Nawash
RR 5
Wiarton, ON N0H 2T0
Fax: (519) 534-2130

(b) If to Municipality of Grey Highlands
206 Toronto Street South
P.O Box 409
Markdale, ON
N0C 1H0

1-888-342-4059
Fax: 519-986-3643

or such other address or fax number as a party may, from time to time advise the other parties hereto by notice in writing given in accordance with the foregoing. The date of receipt of any such notice shall be deemed to be the date of delivery thereof, if delivered, and on the day of faxing and receipt of a successful transmission confirmation statement, if faxed, provided such day is a business day and if not, on the first business day thereafter.

39. The Parties may agree to amend this Agreement in writing on the basis of mutual agreement.

40. Each Party agrees and acknowledges that it obtained independent legal advice regarding the terms and conditions, nature and effect of this Agreement and acknowledges that it has executed this Agreement voluntarily after receiving such advice. The budget for SON's independent legal advice is set out in Schedule C.

41. This agreement may be executed in counterparts, each of which will be deemed to be an original and all of which taken together will be deemed to constitute one and the same instrument. Counterparts may be executed either in original, electronic or facsimile form and the parties to this agreement adopt any signatures received by electronic or facsimile transmission as original signatures of the parties.

42. SON represents and warrants to the Municipality that the undersigned are the duly authorized representatives of SON and have the necessary power and authority to execute this Agreement on behalf of their members and that this Agreement has been duly authorized and executed and constitutes a valid, binding and enforceable obligation of SON in accordance with its terms.

43. The Municipality represents and warrants to SON that the undersigned is the duly authorized representative of the Municipality and have the necessary power and authority to execute this Agreement and that this Agreement has been duly authorized and executed and constitutes a valid, binding and enforceable obligation of the municipality in accordance with its terms.

44. This MOU terminates immediately upon either Party giving Notice to the other Party of its intention to terminate the MOU.

IN WITNESS WHEREOF the parties have executed this Agreement effective as of the date first written above.

SIGNED, SEALED AND DELIVERED
(in the presence of)

The Municipality of Grey Highlands

Per: Wayne Fitzgerald, Mayor
Date:

Per: Debbie Robertson, Clerk

Date July 25, 2014

I have the authority to bind the Corporation

SIGNED, SEALED AND DELIVERED
(in the presence of)

CHIPPEWAS OF NAWASH UNCEDED FIRST NATION

Per: Arlene Chegahno

Title: Chief of Chippewas of Nawash Unceded First Nation

Date:

I have the authority to bind the First Nation

SAUGEEN OJIBWAY FIRST NATION

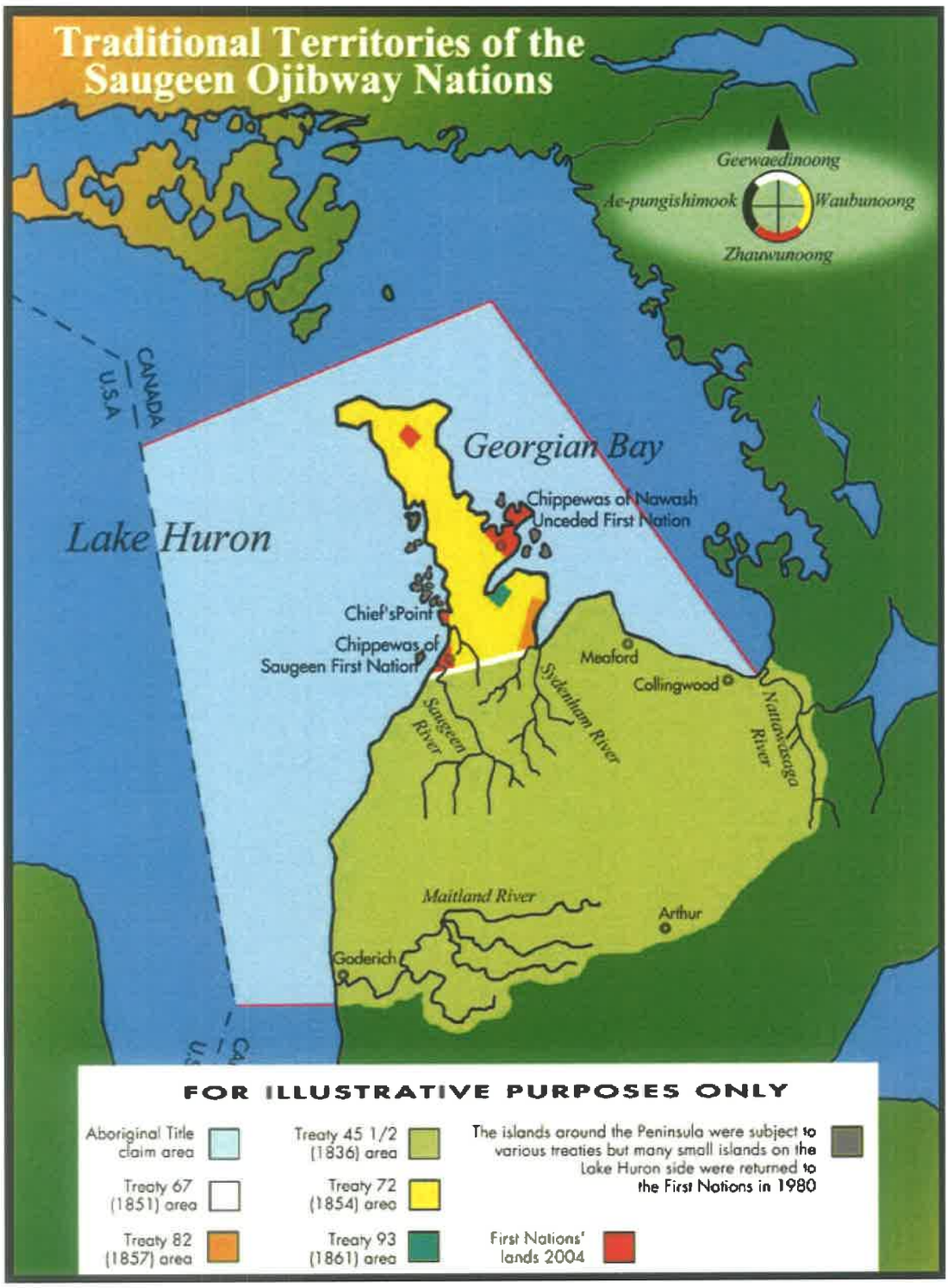
Per: Vernon Roote

Title: Chief for Saugeen Ojibway First Nation #29

Date:

I have the authority to bind the First Nation

Schedule A


Traditional Territories of the Saugeen Ojibway Nations
Geewaedinoong
Ae-pungishimook
Waubunoong
Zhawwunoong
CANADA
U.S.A
Georgian Bay
Lake Huron
Chippewas of Nawash Unceded First Nation
Chief'sPoint
Chippewas of Saugeen First Nation
Meaford
Collingwood
Sydenham River
Saugeen River
Nottawasaga River
Maitland River
Arthur
Goderich
FOR ILLUSTRATIVE PURPOSES ONLY
Aboriginal Title claim area
Treaty 67 (1851) area
Treaty 82 (1857) area
Treaty 45 1/2 (1836) area
Treaty 72 (1854) area
Treaty 93 (1861) area
The islands around the Peninsula were subject to various treaties but many small islands on the Lake Huron side were returned to the First Nations in 1980
First Nations' lands 2004

Schedule B

Grey Highlands Water and Sewer
Master Plan Projects

1. New Markdale elevated water storage facility
2. Optimization of Markdale wastewater treatment plant
3. Any future work described or identified in the Water and Sewer Master Plan which will require an Environmental Assessment under the Ontario Environmental Assessment Act.

Schedule C

Budget for Technical and Professional Costs
for Municipality of Grey Highlands Water and Sewer Master Plan

Area	Tasks	Total Cost
Archaeology	Stage 1 of the Master Plan area (see attached proposal entitled "Proposed MTCS State 1 Archaeological Assessment, Municipality of Grey Highlands Water and Wastewater Servicing Master Plan")	$9,000.00
	Attendance at meeting (see invoice of March 27, 2014)	$ 843.50
Land Claims, Cultural Rights and Fishing Rights Review	Billed Time	$7,200.00
	Billed Disbursements	$1,000.00
Engineering	Billed time, review of projects in schedule B	$2,800.00
Natural Heritage	Billed time, review of projects in schedule B	$2,400.00
Political Representatives	Attendance of Councillor at meeting	$ 250.00
Maximum Contribution Amount		**$23,493.50**
Maximum Contribution Amount less $9,000.00		**$14,493.50**

- Archaeology Stage 1 is proposed only at this time at a cost of $9,000.00
- Municipality has opted to not proceed with Archaeology Stage 1 at this time for the water tower and lagoon optimization projects.
- Any future projects will require consultation with SON regarding Archaeology Stage 1 assessment.

Schedule D

Conducting Archaeology within the Traditional Territory of the Saugeen Ojibway Nation:

Process and Standards for Approval Authorities, Development Proponents and Consultant Archaeologists

Schedule C

Budget for Technical and Professional Costs
for Municipality of Grey Highlands Water and Sewer Master Plan

Area	Tasks	Total Cost
Archaeology	Stage 1 of the Master Plan area (see attached proposal entitled "Proposed MTCS State 1 Archaeological Assessment, Municipality of Grey Highlands Water and Wastewater Servicing Master Plan")	$9,000.00
	Attendance at meeting (see invoice of March 27, 2014)	$ 843.50
Land Claims, Cultural Rights and Fishing Rights Review	Billed Time	$7,200.00
	Billed Disbursements	$1,000.00
Engineering	Billed time, review of projects in schedule B	$2,800.00
Natural Heritage	Billed time, review of projects in schedule B	$2,400.00
Political Representatives	Attendance of Councillor at meeting	$ 250.00
Maximum Contribution Amount		**$23,493.50**
Maximum Contribution Amount less $9,000.00		**$14,493.50**

- Archaeology Stage 1 is proposed only at this time at a cost of $9,000.00
- Municipality has opted to not proceed with Archaeology Stage 1 at this time for the water tower and lagoon optimization projects.
- Any future projects will require consultation with SON regarding Archaeology Stage 1 assessment.

Schedule D

Conducting Archaeology within the Traditional Territory of the Saugeen Ojibway Nation:

Process and Standards for Approval Authorities, Development Proponents and Consultant Archaeologists

206 Toronto Street S, Unit 1, P.O. Box 409, Markdale, ON N0C 1H0
Telephone: 519-986-2811 ~ Fax: 519-986-3643
Toll Free: 1-888-342-4059
Email: info@greyhighlands.ca
Web: www.greyhighlands.ca

NOTICE OF PUBLIC MEETING

Water and Wastewater Servicing Master Plan
Markdale – Flesherton – Kimberley – Amik – Eugenia
Phase 2 Public Information Centre Meeting
Municipality of Grey Highlands

The Municipality of Grey Highlands completed a Draft Master Plan study in 2012 for a regional water and wastewater system to determine infrastructure requirements for the Municipality to service the Study Area of Markdale – Flesherton – Kimberley – Amik – Eugenia and the area at the Beaver Valley Ski Club. As of 2016, the Municipality of Grey Highlands has begun the process to finalize the Master Plan study initiated in 2012, whereby two (2) Schedule B projects with recommended preferred solutions will be presented. The two (2) Schedule B projects within the Master Plan include:

1. Optimization of the existing Markdale Wastewater Treatment Plant
2. Construction of a new Markdale water storage facility and decommissioning of the existing Markdale Water Tower.

Public consultation is a key component of this study. The presentation for the two (2) Schedule B projects within the Master Plan will be completed at the Phase 2 Public Information Centre meeting, which will allow residents, businesses and community organizations to participate in commenting. The presentation will provide an information on the alternatives, preferred alternatives and next steps.

Date: **Monday, April 10, 2017**
Time: **7:00 p.m.**
Location: **Centre Grey Recreation Complex, 75 Walker Rd., Markdale**

If you have any questions or wish to be added to the study mailing list, please contact:

2017
Contact List
Water and Wastewater Servicing
Master Plan

Markdale – Flesherton – Kimberley – Amik – Eugenia

111-13229-00

Contact Name	Address	Phone/Email
1. MOECC, Environmental Assessment & Approvals Branch	2 St Clair Avenue West TORONTO, ON M4V1L5	Fax: 416-314-8452
2. MOECC, Southwestern Region Office Attn: Mr. Craig Newton	733 Exeter Road LONDON ,ON N6E 1L3	craig.newton@ontario.ca
3. MOECC, Owen Sound Office Attn: Shayne Finlay, Water Inspector	Third Floor 101 17th Street East OWEN SOUND, ON N4K 0A5	shayne.finlay@ontario.ca
4. MOECC, Southwest Region Attn: Scott Abernethy, Surface Water Evaluator	733 Exeter Road LONDON ,ON N6E 1L3	scott.abernethy@ontario.ca
5. MOECC, Owen Sound Office Attn: John S. Ritchie, Supervisor	Third Floor 101 17th Street East OWEN SOUND, ON N4K 0A5	john.s.ritchie@ontario.ca
6. Ontario Ministry of the Environment, District Office, Owen Sound Attn: District Manager	Third Floor 101 17th Street East OWEN SOUND, ON N4K 0A5	519-371-2901 rick.chappell@ontario.ca
7. Grey Sauble Conservation Authority Attn: Tim Lanthier, Planner	RR 4 (Fire No. 237897 Inglis Falls Road) OWEN SOUND, ON N4K 5N6	519-376-3076 t.lanthier@greysauble.on.ca
8. Saugeen Valley Conservation Authority	1078 Bruce Road 12, PO Box 150 FORMOSA, ON N0G 1W0	519-367-3040 publicinfo@svca.on.ca
9. Niagara Escarpment Commission Attn: Rick Watt, Senior Planning Coordinator	99 King St. E. Box 308 Thornbury, ON N0H 2P0	519-599-3740 rick.watt@ontario.ca
10. Ministry of Natural Resources & Forestry, Midhurst District Office	2284 Nursery Road Midhurst, ON L0L 1X0	705-725-7546 ken.mott@ontario.ca

Contact Name	Address	Phone/Email
Attn: Ken Mott		
11. Ministry of Tourism, Culture & Sport Attn: Joseph Muller, Heritage Planner	401 Bay Street Suite 1700 Toronto, ON M7A 0A7	416-314-7145 joseph.miller@ontario.ca
12. Grey Bruce Health Unit Attn: Krista Youngblood, Public Health Inspector	101 - 17th Street East OWEN SOUND, ON N4K 0A5	519-376-9420 publichealth@publichealthgreybruce.on.ca
13. Town of The Blue Mountains	Box 310, 26 Bridge Street East THORNBURY, ON N0H 2P0	519-599-3131 info@thebluemountains.ca
14. Municipality of Meaford	21 Trowbridge Street West MEAFORD, ON N4L 1A1	519-538-1060 water@meaford.ca
15. Township of Chatsworth	316837 Highway 6 CHATSWORTH, ON N0H 1G0	519-794-3232 office@chatsworth.ca
16. Municipality of West Grey	402813 Grey Road 4 RR2 DURHAM, ON N0G 1R0	519-369-2200 info@westgrey.com
17. Township of Southgate	RR 1, 185667 Grey Road 9 DUNDALK, ON N0C 1B0	519-923-2110 info@southgate.ca
18. Ministry of Aboriginal Affairs	160 Bloor Street East, 9th Floor TORONTO, ON M5G 2K1	MAA.EA.Review@ontario.ca
19. Indigenous & Northern Affairs Canada	25 St. Clair Ave. E. 8th Floor Toronto, ON M4T 1M2	1-800-567-9604 infopubs@aadnc-aandc.gc.ca
20. Chippewas of Nawash Unceded First Nation, Cape Croker	135 Lakeshore Blvd. Neyaashiinigmiing, ON N0H 2T0	519-534-1689 cnadministrator@nawash.ca

Contact Name	Address	Phone/Email
21. Saugeen First Nation Attn: Allen Deleary, Band Administrator	6493 Hwy. 21 SOUTHAMPTON, ON N0H 2L0	519-797-2781 sfn@saugeenfirstnation.ca
22. Saugeen Ojibway Nation Environment Office Attn: Doran Ritchie, Land Use Planning Coordinator	25 Maadookii Subdivision Neyaashiinigmiing, ON N0H 2T0	519-534-5507 d.ritchie@saugeenojibwaynation.ca
23. Ministry of Transportation, District Office Attn: Cathy Beattie, Contract Services Clerk	1450 - 7th Avenue East Box 520 OWEN SOUND, ON N4K 5R1	519-376-7350 cathy.beattie@ontario.ca
24. Ministry of Agriculture, Food & Rural Affairs – Land Use Planning	6484 Wellington Road 7, Unit 10 Elora, ON N0B 1S0	519-846-3393 carol.neumann@ontario.ca
25. Ministry of Municipal Affairs & Housing Attn: Ian Kerr	659 Exeter Road 2nd Floor London, ON N6E 1L3	519-873-4026 ian.kerr@ontario.ca
26. County of Grey Planning Department	595 9th Avenue East OWEN SOUND, ON N4K 3E3	519-376-5744 randy.scherzer@grey.ca
27. County of Bruce Planning Department	30 Park Street WALKERTON, ON N0G 2V0	519-881-1782 bcplwa@brucecounty.on.ca
28. County of Dufferin	51 Zina Street ORANGEVILLE, ON L9W 1E5	519-941-2816 info@dufferincounty.ca
29. County of Simcoe	Administration Centre 1110 Highway 26 MIDHURST, ON L0L 1X0	705-735-6901 info@simcoe.ca
30. Township of Clearview	Box 200, 217 Gideon Street STAYNER, ON L0M 1S0	705-428-6230 bfalls@clearview.ca
31. Town of Collingwood	Box 157 97 Hurontario Street COLLINGWOOD, ON L9Y 3Z5	salmas@collingwood.ca

Contact Name	Address	Phone/Email
32. Township of Melancthon	157101 Highway 10 R.R. # 6 SHELBURNE, ON L0N 1S9	519-925-5525 info@melancthontownship.ca
33. Chippewas of Georgiana Island	R.R. #2 P.O. Box 12 Sutton West, ON L0E 1R0	705-437-1337 Fax: 705-437-4597
34. Beausoleil First Nation	(Christian Island) 1 0-Gemaa Miikaans Christian Island, ON L9M 0A9	705-247-2051 info@chimnissing.ca
35. Chippewas of Rama Attn: Dan Shilling, First Nation Manager	5884 Rama Road Suite 200 Rama, ON L0K 1T0	705-325-3611 Fax: 705-325-0879
36. Great Lakes Metis Council	380 9th Street East Owen Sound, ON N4K 1P1	519-370-0435 Fax: 519-370-0436
37. Historic Saugeen Metis	204 High Street Box 1492 Southampton, ON N0H 2L0	Tel: 519-483-4000 saugeenmetis@bmts.com
38. Metis Nation of Ontario Head Office	500 Old St. Patrick St. Unit 3 Ottawa, ON K1N 9G4	Metis Consultation Unit Fax: (613) 722-4225
39. Claims Analyst, Ontario Team Specific Claims Branch INAC Attn: Don Boswell, Senior Claims Analyst	1310-10 Wellington St. Gatineau, QC K1A 0H4	819-953-4667 don.boswell@aadnc-aandc.gc.ca
40. Assessment & Historical Research INAC Mr. Sean Darcy, Manager	1310-10 Wellington St. Gatineau, QC K1A 0H4	819-997-8155 sean.darcy@aadnc-aandc.gc.ca

Resident Contacts

.1 Nean Hobbs
PO Box 55
189 Talisman Mtn Dr.
Kimberley, ON, NOC 1G0
n.allman@sympatico.ca

.2 Dave Clarke
dclarke1024@gmail.com

.3 Cheryl & Rob Crowther (e-mail address not working – April 3, 2017)
Box 211
Flesherton, On, N0C 1E0
crcrowther@hotmail.com

.4 Cathy Little (e-mail address not working – April 3, 2017)
Beaver Valley Ratepayers Association
kippawa@cablerocket.com

Miller, Loreen

From: Miller, Loreen
Sent: Monday, April 03, 2017 11:23 AM
To: 'pam.wheaton@ontario.ca'
Subject: Phase 2 Public Information Centre Meeting, Water & Wastewater Servicing Master Plan, Municipality of Grey Highlands, ON
Attachments: Notice of Public Meeting.pdf

Ms. Wheaton:

Please find attached Notice of Public Meeting regarding the above-noted subject for your information.

Loreen Miller
Senior Administrative Assistant

WSP Canada Inc.
1450 – 1st Avenue West, Suite 101
Owen Sound, Ontario N4K 6W2 Canada
T +1 519-376-7612 #13205
F +1 519-376-8008

www.wspgroup.com

Please consider the environment before printing...

Miller, Loreen

From: Wheaton, Pam (MIRR) <Pam.Wheaton@ontario.ca>
Sent: Monday, April 03, 2017 11:23 AM
To: Miller, Loreen
Subject: Automatic reply: Phase 2 Public Information Centre Meeting, Water & Wastewater Servicing Master Plan, Municipality of Grey Highlands, ON

I am retiring as of May 31. Pls direct your inquiry to Joanna Lesurf at Lesurf, Joanna (MAA) or 416-325-1068. Alternatively pls call the ADM EA at 416-325-1067 and they will redirect your call.

Thank you.

Pam Wheaton
(A)Assistant Deputy Minister
Aboriginal Relations and Ministry Partnerships Division Ministry of Aboriginal Affairs
416-325-0304

Miller, Loreen

From: Lesurf, Joanna (MIRR) <Joanna.Lesurf@ontario.ca>
Sent: Monday, April 03, 2017 2:51 PM
To: Miller, Loreen
Cc: MAA.EA.REVIEW (MIRR)
Subject: FW: Phase 2 Public Information Centre Meeting, Water & Wastewater Servicing Master Plan, Municipality of Grey Highlands, ON
Attachments: Notice of Public Meeting.pdf

Hi Loreen,

I have not taken over for Pam Wheaton (I had previously been acting as her Admin Assistant). In terms of any future notices such as the attached, please direct these to MAA.EA.Review@ontario.ca. I've taken the liberty of forwarding along the attached notice to this area (copied on this email).

Best,

Joanna Lesurf
Advisor – Indigenous Relations Unit
Ministry of Indigenous Relations and Reconciliation
160 Bloor Street East, 4th Floor
Toronto, ON M7A 2E6
Tel: (416) 326-1840
Email: joanna.lesurf@ontario.ca

From: Miller, Loreen [mailto:Loreen.Miller@wspgroup.com]
Sent: April-03-17 1:11 PM
To: Lesurf, Joanna (MIRR)
Subject: Phase 2 Public Information Centre Meeting, Water & Wastewater Servicing Master Plan, Municipality of Grey Highlands, ON

Ms. Lesurf:

Please find attached Notice of Public Meeting regarding the above-noted subject for your information. I understand that you will be replacing Pam Wheaton as she replied back after sending her this e-mail that she was retiring and that you were taking her place.

Loreen Miller
Senior Administrative Assistant

WSP Canada Inc.

Miller, Loreen

From: Miller, Loreen
Sent: Monday, April 03, 2017 11:23 AM
To: 'infopubs@aadnc-aandc.gc.ca'
Subject: Phase 2 Public Information Centre Meeting, Water & Wastewater Servicing Master Plan, Municipality of Grey Highlands, ON
Attachments: Notice of Public Meeting.pdf

Please find attached Notice of Public Meeting regarding the above-noted subject for your information.

Loreen Miller
Senior Administrative Assistant

WSP Canada Inc.
1450 – 1st Avenue West, Suite 101
Owen Sound, Ontario N4K 6W2 Canada
T +1 519-376-7612 #13205
F +1 519-376-8008

www.wspgroup.com

Please consider the environment before printing...

Miller, Loreen

From: Miller, Loreen
Sent: Monday, April 03, 2017 11:24 AM
To: cnadministrator@nawash.ca
Subject: Phase 2 Public Information Centre Meeting, Water & Wastewater Servicing Master Plan, Municipality of Grey Highlands, ON
Attachments: Notice of Public Meeting.pdf

Please find attached Notice of Public Meeting regarding the above-noted subject for your information.

Loreen Miller
Senior Administrative Assistant

WSP Canada Inc.
1450 – 1st Avenue West, Suite 101
Owen Sound, Ontario N4K 6W2 Canada
T +1 519-376-7612 #13205
F +1 519-376-8008

www.wspgroup.com

Please consider the environment before printing...

Miller, Loreen

From: Miller, Loreen
Sent: Monday, April 03, 2017 11:24 AM
To: 'sfn@saugeenfirstnation.ca'
Subject: Phase 2 Public Information Centre Meeting, Water & Wastewater Servicing Master Plan, Municipality of Grey Highlands, ON
Attachments: Notice of Public Meeting.pdf

Please find attached Notice of Public Meeting regarding the above-noted subject for your information.

Loreen Miller
Senior Administrative Assistant

WSP Canada Inc.
1450 – 1st Avenue West, Suite 101
Owen Sound, Ontario N4K 6W2 Canada
T +1 519-376-7612 #13205
F +1 519-376-8008

www.wspgroup.com

Please consider the environment before printing...

Miller, Loreen

From: Miller, Loreen
Sent: Monday, April 03, 2017 11:25 AM
To: d.ritchie@saugeenojibwaynation.ca
Subject: Phase 2 Public Information Centre Meeting, Water & Wastewater Servicing Master Plan, Municipality of Grey Highlands, ON
Attachments: Notice of Public Meeting.pdf

Mr. Ritchie:

Please find attached Notice of Public Meeting regarding the above-noted subject for your information.

Loreen Miller
Senior Administrative Assistant

WSP Canada Inc.
1450 – 1st Avenue West, Suite 101
Owen Sound, Ontario N4K 6W2 Canada
T +1 519-376-7612 #13205
F +1 519-376-8008

www.wspgroup.com

Please consider the environment before printing...

Miller, Loreen

From: Miller, Loreen
Sent: Monday, April 03, 2017 11:32 AM
To: 'info@chimnissing.ca'
Subject: Phase 2 Public Information Centre Meeting, Water & Wastewater Servicing Master Plan, Municipality of Grey Highlands, ON
Attachments: Notice of Public Meeting.pdf

Please find attached Notice of Public Meeting regarding the above-noted subject for your information.

Loreen Miller
Senior Administrative Assistant

WSP Canada Inc.
1450 – 1st Avenue West, Suite 101
Owen Sound, Ontario N4K 6W2 Canada
T +1 519-376-7612 #13205
F +1 519-376-8008

www.wspgroup.com

Please consider the environment before printing...

Miller, Loreen

From: Miller, Loreen
Sent: Monday, April 03, 2017 11:34 AM
To: 'saugeenmetis@bmts.com'
Subject: Phase 2 Public Information Centre Meeting, Water & Wastewater Servicing Master Plan, Municipality of Grey Highlands, ON
Attachments: Notice of Public Meeting.pdf

Please find attached Notice of Public Meeting regarding the above-noted subject for your information.



Loreen Miller
Senior Administrative Assistant

WSP Canada Inc.
1450 – 1st Avenue West, Suite 101
Owen Sound, Ontario N4K 6W2 Canada
T +1 519-376-7612 #13205
F +1 519-376-8008

www.wspgroup.com

Please consider the environment before printing...

Miller, Loreen

From: Miller, Loreen
Sent: Monday, April 03, 2017 11:34 AM
To: 'don.boswell@aadnc-aandc.gc.ca'
Subject: Phase 2 Public Information Centre Meeting, Water & Wastewater Servicing Master Plan, Municipality of Grey Highlands, ON
Attachments: Notice of Public Meeting.pdf

Mr. Boswell:

Please find attached Notice of Public Meeting regarding the above-noted subject for your information.

Loreen Miller
Senior Administrative Assistant

WSP Canada Inc.
1450 – 1st Avenue West, Suite 101
Owen Sound, Ontario N4K 6W2 Canada
T +1 519-376-7612 #13205
F +1 519-376-8008

www.wspgroup.com

Please consider the environment before printing...

Miller, Loreen

From: Miller, Loreen
Sent: Monday, April 03, 2017 11:35 AM
To: 'sean.darcy@aadnc-aandc.gc.ca'
Subject: Phase 2 Public Information Centre Meeting, Water & Wastewater Servicing Master Plan, Municipality of Grey Highlands, ON
Attachments: Notice of Public Meeting.pdf

Mr. Darcy:

Please find attached Notice of Public Meeting regarding the above-noted subject for your information.

Loreen Miller
Senior Administrative Assistant

WSP Canada Inc.
1450 – 1st Avenue West, Suite 101
Owen Sound, Ontario N4K 6W2 Canada
T +1 519-376-7612 #13205
F +1 519-376-8008

www.wspgroup.com

Please consider the environment before printing...

WSP

FAX

TO:		**DATE:**	April 3, 2017
COMPANY:	Chippewas of Georgina Island	**TELEPHONE:**	
SUBJECT:	Phase 2 Public Information Centre Meeting, Water & Wastewater Servicing Master Plan, Municipality of Grey	**FAX:**	705-437-4597
PROJECT No.	111-13229-00 ☐ THE ORIGINAL WILL FOLLOW	**NUMBER OF PAGES:** (INCLUDING COVER SHEET)	2

REMARKS

Please find attached Notice of Public Meeting regarding the above-noted subject for your information.

FROM: Chris Wilson, P. Eng.

C.C.:

1450 1st Avenue West, Suite 101, Owen Sound, ON N4K 6W2 Tel.: 519-376-7612 Fax: 519-376-8008

This message, including any document enclosed, is intended only for the addressee and may contain privileged and/or confidential information. Any other person is strictly prohibited from reading, using, disclosing or copying this message. If you have received this message in error, please notify the sender and delete the message. Thank you.

WSP

FAX

TO:	Dan Shilling	**DATE:**	April 3, 2017
COMPANY:	Chippewas of Rama	**TELEPHONE:**	
SUBJECT:	Phase 2 Public Information Centre Meeting, Water & Wastewater Servicing Master Plan, Municipality of Grey	**FAX:**	705-325-0879
PROJECT No.	111-13229-00 ☐ THE ORIGINAL WILL FOLLOW	**NUMBER OF PAGES:** (INCLUDING COVER SHEET)	2

REMARKS

Please find attached Notice of Public Meeting regarding the above-noted subject for your information.

FROM: Chris Wilson, P. Eng.

C.C.:

1450 1st Avenue West, Suite 101, Owen Sound, ON N4K 6W2 Tel.: 519-376-7612 Fax: 519-376-8008

This message, including any document enclosed, is intended only for the addressee and may contain privileged and/or confidential information. Any other person is strictly prohibited from reading, using, disclosing or copying this message. If you have received this message in error, please notify the sender and delete the message. Thank you.

WSP

FAX

TO:		**DATE:**	April 3, 2017
COMPANY:	Great Lakes Metis Council	**TELEPHONE:**	
SUBJECT:	Phase 2 Public Information Centre Meeting, Water & Wastewater Servicing Master Plan, Municipality of Grey	**FAX:**	519-370-0436
PROJECT No.	111-13229-00 ☐ **THE ORIGINAL WILL FOLLOW**	**NUMBER OF PAGES:** (INCLUDING COVER SHEET)	2

REMARKS

Please find attached Notice of Public Meeting regarding the above-noted subject for your information.

FROM: Chris Wilson, P. Eng.

C.C.:

1450 1st Avenue West, Suite 101, Owen Sound, ON N4K 6W2 Tel.: 519-376-7612 Fax: 519-376-8008

This message, including any document enclosed, is intended only for the addressee and may contain privileged and/or confidential information. Any other person is strictly prohibited from reading, using, disclosing or copying this message. If you have received this message in error, please notify the sender and delete the message. Thank you.

WSP

FAX

TO:		**DATE:**	April 3, 2017
COMPANY:	Metis Nation of Ontario (Head Office)	**TELEPHONE:**	
SUBJECT:	Phase 2 Public Information Centre Meeting, Water & Wastewater Servicing Master Plan, Municipality of Grey	**FAX:**	613-722-4225
PROJECT No.	111-13229-00 ☐ THE ORIGINAL WILL FOLLOW	**NUMBER OF PAGES:** (INCLUDING COVER SHEET)	2

REMARKS

Please find attached Notice of Public Meeting regarding the above-noted subject for your information.

FROM: Chris Wilson, P. Eng.

C.C.:

1450 1st Avenue West, Suite 101, Owen Sound, ON N4K 6W2 Tel.: 519-376-7612 Fax: 519-376-8008

This message, including any document enclosed, is intended only for the addressee and may contain privileged and/or confidential information. Any other person is strictly prohibited from reading, using, disclosing or copying this message. If you have received this message in error, please notify the sender and delete the message. Thank you.

Miller, Loreen

From: D Clarke <dclarke1024@hotmail.com>
Sent: Monday, April 03, 2017 3:17 PM
To: Miller, Loreen
Cc: dclarke1024@gmail.com
Subject: RE: Phase 2 Public Information Centre Meeting, Water & Wastewater Servicing Master Plan, Municipality of Grey Highlands, ON

Loreen, thank you very much for your email and invitation. Will plan to attend. I was wondering if you could either update my email to dclarke1024@gmail.com or add it to your email contact list. I do not check my Hotmail account every day and don't want to miss anything.

Thank you very much. Dave

Sent from Mail for Windows 10

From: Miller, Loreen
Sent: Monday, April 3, 2017 11:37 AM
To: dclarke1024@hotmail.com
Subject: Phase 2 Public Information Centre Meeting, Water & Wastewater Servicing Master Plan, Municipality of Grey Highlands, ON

Please find attached Notice of Public Meeting regarding the above-noted subject for your information.

Loreen Miller
Senior Administrative Assistant

WSP Canada Inc.
1450 – 1st Avenue West, Suite 101
Owen Sound, Ontario N4K 6W2 Canada
T +1 519-376-7612 #13205
F +1 519-376-8008

www.wspgroup.com

Please consider the environment before printing...

Miller, Loreen

From: Wilson, Chris
Sent: Monday, April 03, 2017 3:09 PM
To: Krista Youngblood; moyers@greyhighlands.ca
Cc: Miller, Loreen
Subject: RE: Phase 2 Public Information Centre Meeting, Water & Wastewater Servicing Master Plan, Municipality of Grey Highlands, ON

Krista,

Thank you for the email. We will add you to the mailing list. As the notice states, the project was started a few years back to the Draft Master Plan stage. The Municipality is wanted to now finishing the Master Plan with the recommendations for the two (2) projects listed.

Thanks,

WSP

Chris Wilson, B.E.Sc., P.Eng.
Environmental Engineer
Team Lead - Municipal Infrastructure

WSP Canada Inc.
1450 1st Ave West, Suite 101,
Owen Sound, ON N4K 6W2
T 519-376-7612 #13208
C 519-379-2663

www.wspgroup.com

Please consider the environment before printing...

From: Krista Youngblood [mailto:K.Youngblood@publichealthgreybruce.on.ca]
Sent: Monday, April 03, 2017 1:52 PM
To: Wilson, Chris <Chris.Wilson@wspgroup.com>; moyers@greyhighlands.ca
Subject: FW: Phase 2 Public Information Centre Meeting, Water & Wastewater Servicing Master Plan, Municipality of Grey Highlands, ON

Hello Chris and Shawn,

I was unware that this was study was taking place. I am unable to make the meeting but I would very much like to be added to the mailing list.

Thanks,
Krista

Krista Youngblood BSc Hons, BASc Hons, MPH, CPHI(C)
Public Health Inspector

From: Angela Newman
Sent: April 3, 2017 1:46 PM
To: Krista Youngblood <K.Youngblood@publichealthgreybruce.on.ca>
Subject: FW: Phase 2 Public Information Centre Meeting, Water & Wastewater Servicing Master Plan, Municipality of Grey Highlands, ON

FYI

From: Grey Bruce Health Unit
Sent: April 3, 2017 11:27 AM
To: Bob Hart <B.Hart@publichealthgreybruce.on.ca>; Angela Newman <A.Newman@publichealthgreybruce.on.ca>
Subject: FW: Phase 2 Public Information Centre Meeting, Water & Wastewater Servicing Master Plan, Municipality of Grey Highlands, ON

From: Miller, Loreen [mailto:Loreen.Miller@wspgroup.com]
Sent: April 3, 2017 11:15 AM
To: Grey Bruce Health Unit <publichealth@publichealthgreybruce.on.ca>
Subject: Phase 2 Public Information Centre Meeting, Water & Wastewater Servicing Master Plan, Municipality of Grey Highlands, ON

Please find attached Notice of Public Meeting regarding the above-noted subject for your information.

Loreen Miller
Senior Administrative Assistant

WSP Canada Inc.
1450 – 1st Avenue West, Suite 101
Owen Sound, Ontario N4K 6W2 Canada
T +1 519-376-7612 #13205
F +1 519-376-8008

www.wspgroup.com

Please consider the environment before printing...

Please note that the privacy and security of email communication cannot be guaranteed. Please refrain from using email messages to send personal information.

Wilson, Chris

From: Krista Youngblood <K.Youngblood@publichealthgreybruce.on.ca>
Sent: Monday, April 03, 2017 1:52 PM
To: Wilson, Chris; moyers@greyhighlands.ca
Subject: FW: Phase 2 Public Information Centre Meeting, Water & Wastewater Servicing Master Plan, Municipality of Grey Highlands, ON
Attachments: Notice of Public Meeting.pdf

Hello Chris and Shawn,

I was unware that this was study was taking place. I am unable to make the meeting but I would very much like to be added to the mailing list.

Thanks,
Krista

Krista Youngblood BSc Hons, BASc Hons, MPH, CPHI(C)
Public Health Inspector

From: Angela Newman
Sent: April 3, 2017 1:46 PM
To: Krista Youngblood <K.Youngblood@publichealthgreybruce.on.ca>
Subject: FW: Phase 2 Public Information Centre Meeting, Water & Wastewater Servicing Master Plan, Municipality of Grey Highlands, ON

FYI

From: Grey Bruce Health Unit
Sent: April 3, 2017 11:27 AM
To: Bob Hart <B.Hart@publichealthgreybruce.on.ca>; Angela Newman <A.Newman@publichealthgreybruce.on.ca>
Subject: FW: Phase 2 Public Information Centre Meeting, Water & Wastewater Servicing Master Plan, Municipality of Grey Highlands, ON

From: Miller, Loreen [mailto:Loreen.Miller@wspgroup.com]
Sent: April 3, 2017 11:15 AM

Miller, Loreen

From: Lesurf, Joanna (MIRR) <Joanna.Lesurf@ontario.ca>
Sent: Monday, April 03, 2017 2:51 PM
To: Miller, Loreen
Cc: MAA.EA.REVIEW (MIRR)
Subject: FW: Phase 2 Public Information Centre Meeting, Water & Wastewater Servicing Master Plan, Municipality of Grey Highlands, ON
Attachments: Notice of Public Meeting.pdf

Hi Loreen,

I have not taken over for Pam Wheaton (I had previously been acting as her Admin Assistant). In terms of any future notices such as the attached, please direct these to MAA.EA.Review@ontario.ca. I've taken the liberty of forwarding along the attached notice to this area (copied on this email).

Best,

Joanna Lesurf
Advisor – Indigenous Relations Unit
Ministry of Indigenous Relations and Reconciliation
160 Bloor Street East, 4th Floor
Toronto, ON M7A 2E6
Tel: (416) 326-1840
Email: joanna.lesurf@ontario.ca

From: Miller, Loreen [mailto:Loreen.Miller@wspgroup.com]
Sent: April-03-17 1:11 PM
To: Lesurf, Joanna (MIRR)
Subject: Phase 2 Public Information Centre Meeting, Water & Wastewater Servicing Master Plan, Municipality of Grey Highlands, ON

Ms. Lesurf:

Please find attached Notice of Public Meeting regarding the above-noted subject for your information. I understand that you will be replacing Pam Wheaton as she replied back after sending her this e-mail that she was retiring and that you were taking her place.

Loreen Miller
Senior Administrative Assistant

WSP Canada Inc.

1450 – 1st Avenue West, Suite 101
Owen Sound, Ontario N4K 6W2 Canada
T +1 519-376-7612 #13205
F +1 519-376-8008

www.wspgroup.com

Please consider the environment before printing...

Wilson, Chris

From: Tim Lanthier <t.lanthier@greysauble.on.ca>
Sent: Monday, April 03, 2017 4:21 PM
To: Wilson, Chris
Cc: Carl Seider
Subject: RE: Phase 2 Public Information Centre Meeting, Water & Wastewater Servicing Master Plan, Municipality of Grey Highlands

Thanks Chris.

Please note that Markdale is outside of the GSCA watershed jurisdiction, and instead falls within the SVCA watershed jurisdiction.

We recommend that you forward the notice to SVCA.

Regards,

Tim Lanthier
Watershed Planner

From: Wilson, Chris [mailto:Chris.Wilson@wspgroup.com]
Sent: Monday, April 3, 2017 4:19 PM
To: Tim Lanthier <t.lanthier@greysauble.on.ca>; Miller, Loreen <Loreen.Miller@wspgroup.com>
Subject: RE: Phase 2 Public Information Centre Meeting, Water & Wastewater Servicing Master Plan, Municipality of Grey Highlands

Tim,

The two (2) Schedule B projects are in Markdale. The Draft Master Plan from 2012 included many other areas (Flesherton, Eugenia, etc.). The MOECC at that time said that some should be Schedule C, and would not be able to fall under the Master Plan. As a result, the draft Master Plan has been revised to focus on the two (2) listed projects in Markdale (both on existing sites, no expansion). The original information regarding the grand communal water and sewage system is still discussed in the Master Plan, but notes that individual EA's would be required for any of these future endeavors.

Thanks,

WSP
Chris Wilson, B.E.Sc., P.Eng.
Environmental Engineer
Team Lead - Municipal Infrastructure

WSP

PHASE 2 PUBLIC INFORMATION CENTRE AGENDA

Water & Wastewater Servicing Master Plan
111-13229-00 / Phase 2 Public Information Centre
Municipality of Grey Highlands
Centre Grey Recreation Complex, 75 Walker Rd., Markdale, April 10, 2017 at 7:00 p.m.

1. Mayor opens Public Information Centre with remarks.

2. Director Public Utilities Department provides remarks on background information regarding the Water & Wastewater Servicing Master Plan, and the projects reviewed.

3. WSP completes a short presentation regarding the Master Plan details, recommended solutions and costing to the projects reviewed, which include:

    - Optimization of the existing Markdale Wastewater Treatment Plant; and
    - Construction of a new Markdale water storage facility and decommissioning of the existing Markdale Water Tower.

4. Public Information Centre meeting is opened up for a Question and Answer period.

OWEN SOUND 101-1450 1st Avenue West, Owen Sound, Ontario N4K 6W2 Tel.: (519) 376-7612 Fax: (519) 376-8008

WELCOME

Water & Wastewater Servicing Master Plan

Municipality of Grey Highlands

PHASE 2 PUBLIC INFORMATION CENTRE
April 10, 2017

Problem Statement

Introduction

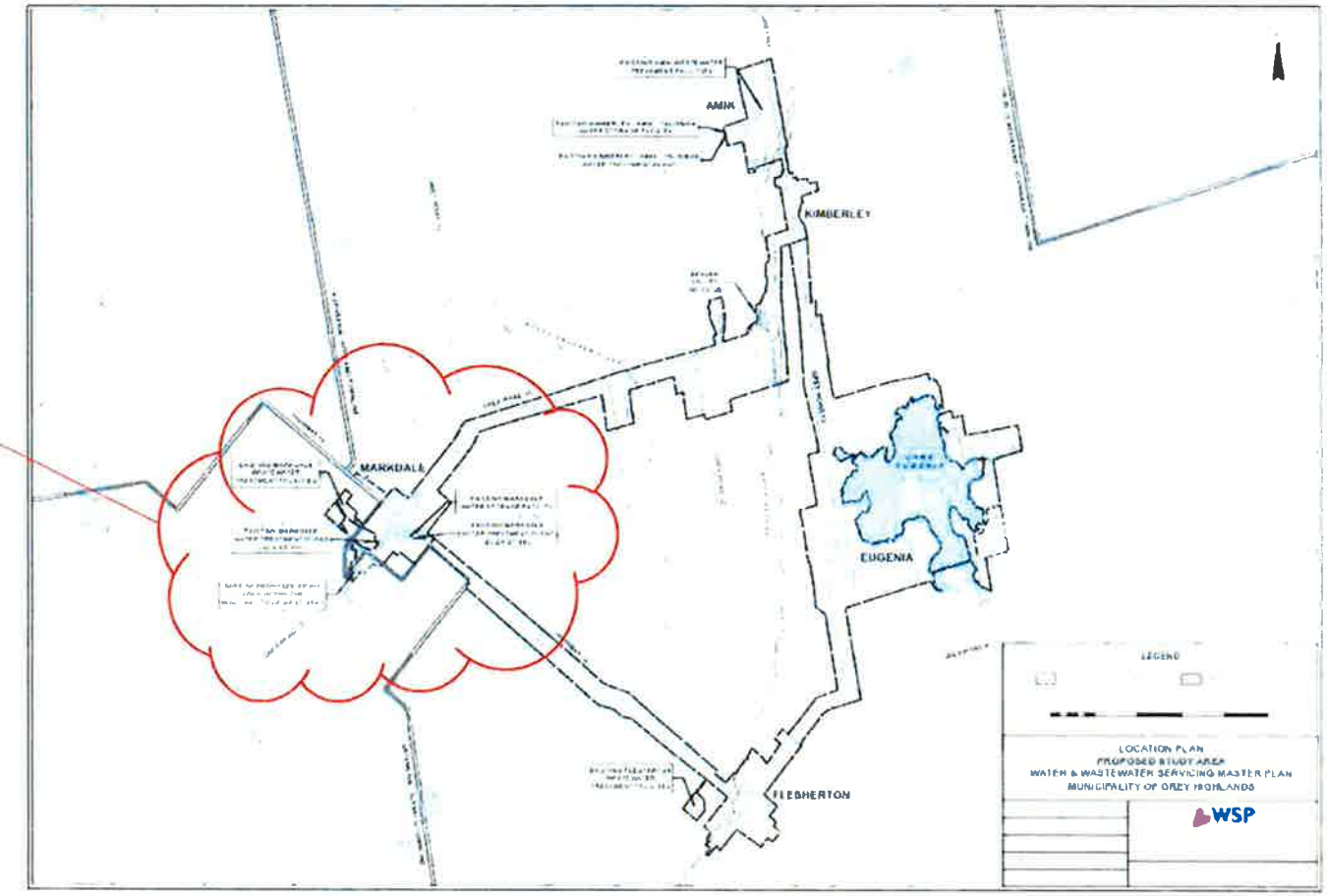
"The Municipality of Grey Highlands wishes to provide adequate communal potable water and wastewater servicing for existing and future developed areas in Markdale – Flesherton – Kimberley – Amik – Eugenia - Beaver Valley.

- The Master Plan reviewed several water and wastewater servicing options for the Markdale-Flesherton-Kimberley-Amik-Eugenia-Beaver Valley areas.
- However, this presentation focuses on the Markdale area only.
- Other existing communities at this point in time, will remain status quo for water and wastewater servicing.
- The existing water treatment facilities in Markdale have sufficient capacity to service a majority of the forecasted 20 year future growth.
- There is insufficient infrastructure in Markdale to provide adequate fire protection currently.
- There is insufficient wastewater treatment capacity in Markdale to service the forecasted 20 year future growth.

Study Area

Markdale

Phase 1-1



Problem Definition

Water Storage - Current Issues

- The existing Markdale water storage facility requires upgrading to provide adequate fire protection to the downtown area, to increase system pressures and to meet MOECC guidelines

Facility	Location	Design Capacity (m^3)	Existing Problem Areas
Markdale Water Storage Standpipe	Adjacent to Eliza St. PS	1,861 (usable storage)	Height of existing standpipe not adequate to maintain the required system pressures per MOECC guidelines in some areas. Limited available storage capacity for future development in Markdale.

Preferred Solution

Water Storage

1. Construct a new 51 m tall, 3,725 m^3 Markdale Elevated Storage Facility
   - Built on existing water storage standpipe site
   - The storage tank would provide sufficient capacity to service growth for the next 50 years.

2. Decommission the existing water storage standpipe after the new water storage facility is constructed.

Problem Definition

Wastewater Treatment - Current Issues

- The capacity of the Markdale Wastewater Treatment Plant (WWTP) needs to be increased to allow for future development within the community.

Facility	Design Capacity (m^3/day)	Average Day Flow (m^3/day)	Existing Problem Areas
Markdale Wastewater Treatment Plant	1,122	781.7 – current flow 1,948 -- projected 20 year flow	Limited available operating capacity for future development in Markdale.

Alternative Solutions

Wastewater Treatment

- Based on 2010 to 2015 average day flow data, the capacity of the plant is at 76% of its capacity.
- However, based on population growth projections the required capacity to service projected growth would be 1,949 m^3/day

- Alternatives considered:

1. Expansion the existing Markdale WWTP from 1,222 m^3/day to the future 20 year average day sewage flow estimated at 1,949 m^3/day.

2. Optimization of the Markdale WWTP to re-rate its capacity to 1,722 m^3/day.

- The Markdale WWTP can be re-rated to a new capacity of 1,722 m^3/day.
- The MOECC was consulted and has agreed in principle to this approach subject to revised effluent treatment criteria.

Effluent Parameter	Effluent Objectives	Effluent Limits	
	Average Concentration (mg/L)	Average Concentration (mg/L)	Average Loadings (kg/d)
CBOD5	20.0	25.0	43.0
TSS	25.0	30.0	51.6
TP	0.50	0.65	1.12
pH	pH of the effluent to be maintained between 6.0 and 9.5, at all times		

Previously 0.8 mg/L

Previously 1.0 mg/L

Estimated Project Costs

- **Water Storage in Markdale -** New 3,725 m^3 Elevated Storage Facility, built on existing water storage standpipe site, and decommissioning of existing standpipe - $5.85 million, including engineering and other project costs (well pump upgrades at existing pump houses), but excluding HST.

- **Wastewater Treatment in Markdale** – No capital costs. Requires further consultation with the MOECC.

Note: The above Capital Cost Estimates are Class "C" and actual project costs could vary +/- 15%.

Next Steps

1. Select preferred alternative solutions - Municipal Council to Approve
2. Finalize Draft Master Plan Report.
3. Send Application to MOECC for amendment to existing ECA for Markdale WWTP.
4. Issue Notice of Completion of Master Plan to Public and Review Agencies and file Master Plan Report for mandatory 30 calendar day public review period.
5. Incorporate any comments and finalize Master Plan Report
6. Complete design concepts for preferred alternative solutions.
7. Proceed to construction of preferred alternative solutions.

Get Involved

Mr. Shawn Moyer
Director of Public Utilities
Municipality of Grey Highlands
206 Toronto Street South
Markdale, ON N0C 1H0
Phone: 519-986-2811
Fax: 519-986-3643
Email: moyers@greyhighlands.ca

Mr. Chris Wilson, P. Eng.,
Consultant
WSP Canada Inc.
1450 – 1st Avenue West, Suite 101
Owen Sound, ON N4K 6W2
Phone: 519-376-7612, ext. 13208
Fax: 519-376-8008
Email: chris.wilson@wspgroup.com

Municipality of Grey Highlands

Water & Wastewater Servicing Master Plan

COMMENT SHEET Phase 2 PIC — *April 10, 2017*

The Municipality of Grey Highlands is interested in hearing the community's comments, questions, concerns and suggestions regarding the process and criteria for the Environmental Assessment for the Water & Wastewater Servicing Master Plan. Please take a few minutes to complete this brief comment sheet. All comments will be carefully considered in the Master Plan.

1. Do you have any comments related to the **existing** infrastructure (Markdale Lagoons and Markdale Water Tower)?

2. Do you have any comments, concerns, questions or suggestions regarding any of the **proposed alternatives** identified?

3. Do you have any comments, concerns, questions or suggestions regarding the **approach and decision-making process** being used to identify and develop the preferred alternative?

4. Additional comments related to the Master Plan.

5. How useful did you find the Public Information Centre? (Please circle one).

Very Useful				Not Very Useful
1	2	3	4	5

6. How would you describe the nature of your interest in this study?

_____ Member of the General Public (including resident)

_____ Member of an Interest Group (Please specify): _____

_____ Consultant

_____ Agency Representative (Please specify): _____

_____ Other (Please specify): _____

7. Please provide any other comments regarding the Public Information centre (i.e., location, help received on understanding study and your concerns, opportunity provided to ask questions/comments/express concern).

(NOTE: Your completed Comment Sheet will be included in the Master Plan Report).

Please return this completed Comment Sheet to staff at the Registration Table or you can fax or mail it by May 1, 2017.

Mr. Shawn Moyer, Director Utilities Department
Municipality of Grey Highlands
206 Toronto Street South
Markdale, ON N0C 1H0
Owen Sound, ON N4K 2H4
Phone: 519-986-3811
Fax: 519-986-3643
E-mail: moyers@greyhighlands.ca

Mr. Chris Wilson, P. Eng.
Consultant Project Manager
WSP Canada Inc.
1450 – 1st Avenue West, Suite 101
Owen Sound, ON N4K 6W2
Telephone: 519-376-7612, ext. 13208
Fax: 519-376-8008
E-mail: chris.wilson@wspgroup.com

Municipality of Grey Highlands

Municipality of Grey Highlands

Water & Wastewater Servicing Master Plan

Phase 2 Public Information Centre ***April 10, 2017***

SIGN-IN SHEET

Please Print Clearly

NAME	ADDRESS	POSTAL CODE	PHONE #	ADD TO MAILING LIST	
				YES ☐	NO ☐
				YES ☐	NO ☐
				YES ☐	NO ☐
				YES ☐	NO ☐
				YES ☐	NO ☐
				YES ☐	NO ☐
				YES ☐	NO ☐
				YES ☐	NO ☐
				YES ☐	NO ☐
				YES ☐	NO ☐

Information gathered is for use in this study only

Thank you for your participation in this study

Wilson, Chris

From: Muller, Joseph (MTCS) <Joseph.Muller@ontario.ca>
Sent: Thursday, April 27, 2017 8:59 AM
To: Wilson, Chris
Cc: moyers@greyhighlands.ca
Subject: Phase 2 Public Information Centre Meeting, Water & Wastewater Servicing Master Plan, Municipality of Grey Highlands, ON
Attachments: 2017-04-27 Grey Highlands Markdalw W-WW HPU MTCS comments.pdf

Hello Chris Wilson:

Pease find attached our comments from the Heritage Program Unit at the Ministry of Tourism, Culture and Sport on the above project, and contact me if you have any questions or would like to discuss the file. Thank-you for your assistance,

Joe

Joseph Muller, RPP, MCIP

Heritage Planner
Ministry of Tourism, Culture and Sport
Culture Division | Programs and Services Branch | Heritage Program Unit

401 Bay Street, Suite 1700
Toronto, Ontario M7A 0A7

Tel. 416.314.7145 | Fax. 416.212.1802

Ministry of Tourism, Culture and Sport

Heritage Program Unit
Programs and Services Branch
401 Bay Street, Suite 1700
Toronto ON M7A 0A7
Tel: 416 314 7145
Fax: 416 212 1802

Ministère du Tourisme, de la Culture et du Sport

Unité des programmes patrimoine
Direction des programmes et des services
401, rue Bay, Bureau 1700
Toronto ON M7A 0A7
Tél: 416 314 7145
Téléc: 416 212 1802

Ontario

April 27, 2017 (EMAIL ONLY)

Chris Wilson, P.Eng.
WSP Canada Inc.
1450 1st Avenue West, Suite 101
Owen Sound, ON N4K 6W2
E: chris.wilson@wspgroup.com

RE: MTCS file #: 0006605
Proponent: Municipality of Grey Highlands
Subject: Notice of Phase 2 Public Information Centre
Water and Wastewater Servicing Master Plan
Location: Municipality of Grey Highlands, Grey County, Ontario

Dear Chris Wilson:

Thank you for providing the Ministry of Tourism, Culture and Sport (MTCS) with the Notice of Commencement for this phase of your project. MTCS's interest in this Environmental Assessment (EA) project relates to its mandate of conserving Ontario's cultural heritage, which includes:

- Archaeological resources, including land-based and marine;
- Built heritage resources, including bridges and monuments; and,
- Cultural heritage landscapes.

Under the EA process, the proponent is required to determine a project's potential impact on cultural heritage resources. Realizing that this project is part of a or arising from a Master Plan, developing or reviewing inventories of known and potential cultural heritage resources within the study area can identify specific resources that may play a significant role in guiding the evaluation of alternatives for subsequent project-driven EAs.

While some cultural heritage resources may have already been formally identified, others may be identified through screening and evaluation. Indigenous communities may have knowledge that can contribute to the identification of cultural heritage resources, and we suggest that any engagement with Indigenous communities includes a discussion about known or potential cultural heritage resources that are of value to these communities. Municipal Heritage Committees, historical societies and other local heritage organizations may also have knowledge that contributes to the identification of cultural heritage resources.

Archaeological Resources
Your EA project may impact archaeological resources and you should screen the project with the MTCS *Criteria for Evaluating Archaeological Potential* to determine if an archaeological assessment is needed. MTCS archaeological sites data are available at *archaeology@ontario.ca*. If your EA project area exhibits archaeological potential, then an archaeological assessment (AA) should be undertaken by an archaeologist licenced under the *OHA*, who is responsible for submitting the report directly to MTCS for review.

Built Heritage and Cultural Heritage Landscapes
The MTCS *Criteria for Evaluating Potential for Built Heritage Resources and Cultural Heritage Landscapes* should be completed to help determine whether your EA project may impact cultural heritage resources. The Clerks for the Municipality of Grey Highlands and Grey County can provide information on property registered or designated under the *Ontario Heritage Act*. Municipal Heritage Planners can also provide information that will assist you in completing the checklist.

If potential or known heritage resources exist, MTCS recommends that a Heritage Impact Assessment (HIA), prepared by a qualified consultant, should be completed to assess potential project impacts. Our Ministry's *Info Sheet #5: Heritage Impact Assessments and Conservation Plans* outlines the scope of HIAs. Please send the HIA to MTCS for review, and make it available to local organizations or individuals who have expressed interest in review.

Environmental Assessment Reporting
All technical heritage studies and their recommendations are to be addressed and incorporated into EA projects. Please advise MTCS whether any technical heritage studies will be completed for your EA project, and provide them to MTCS before issuing a Notice of Completion. If your screening has identified no known or potential cultural heritage resources, or no impacts to these resources, please include the completed checklists and supporting documentation in the EA report or file.

Thank-you for consulting MTCS on this project: please continue to do so through the EA process, and contact me for any questions or clarification.

Sincerely,

Joseph Muller, RPP/MCIP
Heritage Planner
Joseph.Muller@Ontario.ca

Copied to: Shawn Moyer, Director of Public Utilities, Municipality of Grey Highlands

It is the sole responsibility of proponents to ensure that any information and documentation submitted as part of their EA report or file is accurate. MTCS makes no representation or warranty as to the completeness, accuracy or quality of the any checklists, reports or supporting documentation submitted as part of the EA process, and in no way shall MTCS be liable for any harm, damages, costs, expenses, losses, claims or actions that may result if any checklists, reports or supporting documents are discovered to be inaccurate, incomplete, misleading or fraudulent.

Please notify MTCS if archaeological resources are impacted by EA project work. All activities impacting archaeological resources must cease immediately, and a licensed archaeologist is required to carry out an archaeological assessment in accordance with the Ontario Heritage Act and the Standards and Guidelines for Consultant Archaeologists.

If human remains are encountered, all activities must cease immediately and the local police as well as the Cemeteries Regulation Unit of the Ministry of Government and Consumer Services must be contacted. In situations where human remains are associated with archaeological resources, MTCS should also be notified to ensure that the site is not subject to unlicensed alterations which would be a contravention of the Ontario Heritage Act.

Wilson, Chris

From: Lands and Resources Consultation Coordinator <saugeenmetisadmin@bmts.com>
Sent: Tuesday, April 18, 2017 2:09 PM
To: Wilson, Chris
Subject: Request for Comments - Grey County-Grey Highlands (Project) Water and Wastewater Master Servicing Plan - Municipality of Grey Highlands

Your File:
Our File: Grey County-Grey Highlands (Project)

Good Afternoon Mr. Wilson,

The Historic Saugeen Metis (HSM) Lands, Resources, and Consultation Department has reviewed the relevant documents and have no objection or opposition to the proposed development, land re-designation, rezoning, land severance, Official Plan and/or Zoning By-law Amendments.

I trust this may be helpful.

Regards,

George Govier

Co-ordinator Lands, Resources, and Consultation

Historic Saugeen Metis
204 High Street
Southampton, Ontario
N0H 2L0
Direct Line (519) 483-4001
Fax (519) 483-4002
Email saugeenmetisadmin@bmts.com

This message is intended for the addressees only. It may contain confidential or privileged information. No rights to privilege have been

waived. Any copying, retransmittal, taking of action in reliance on, or other use of the information in this communication by persons other than the intended recipient(s) is prohibited. If you have received this message in error, please reply to the sender by e-mail and delete or destroy all copies of this message.

Wilson, Chris

From: Newton, Craig (MOECC) <Craig.Newton@ontario.ca>
Sent: Friday, April 21, 2017 3:54 PM
To: Moyer, Shawn (MoyerS@greyhighlands.ca) (MoyerS@greyhighlands.ca)
Cc: Noordhof, Jake (MOECC); Chappell, Rick (MOECC); Ritchie, John (MOECC); Wilson, Chris; Mitchell, Ian (MOECC)
Subject: Notice of Public Meeting Water & Wastewater Servicing Master Plan Markdale-Flesherton-Kimberly-Amik-Eugenia Phase 2 PIC Meeting Municipality of Grey Highlands
Attachments: MOECC Response To Notice of PIC Phase 2 Water & Wastewater Master Servicing Plan Markdale-Flesherton-Kimberly-Eugenia.pdf

Good Afternoon Mr. Moyer:

Please find attached MOECC's response to the above noted Notice of Public Information Centre. Please note that this serves as the ministry's formal correspondence and will only be delivered via this email.

Yours truly,

Craig Newton
Regional Environmental Planner / EA Coordinator
Ministry of the Environment & Climate Change
Southwestern Region
(519) 873-5014

Ministry of the Environment and Climate Change

733 Exeter Road
London ON N6E 1L3
Tel': 519 873-5000
Fax: 519 873-5020

Ministère de l'Environnement et de l'Action en matière de changement climatique

733, rue Exeter
London ON N6E 1L3
Tél.: 519 873-5000
Fax: 519 873-5020

Ontario

April 21st, 2017

Municipality of Grey Highlands
Public Utilities Department
206 Toronto Street South
Markdale, Ontario
N0C 1H0

Attention: Mr. Shawn Moyer, Director

Re: Notice of Public Meeting Water and Wastewater Master Servicing Plan
Markdale – Flesherton – Kimberly – Eugenia Phase 2 PIC
Municipality of Grey Highlands

Dear Mr. Moyer:

This letter acknowledges receipt of the Notice of Phase 2 Public Information Centre for the above noted project. I looked for, but could not locate a copy of the Notice of Commencement for this project in our Regional office files. As such, please forward to me a copy of said Notice of Commencement at your earliest convenience.

It is understood that the Municipality of Grey Highlands completed a Draft Master Plan study in 2012. As of 2016, the Municipality has reportedly begun the process of finalizing the 2012 Draft Master Plan. Two Schedule B projects with recommended preferred solutions will reportedly be included in the finalized Master Plan:

1. Optimization of the existing Markdale Wastewater Treatment Plant
2. Construction of a new Markdale water storage facility and decommissioning of the existing Markdale Water Tower.

As you know, the Class Environmental Assessment (Class EA) planning process includes consultation with interested stakeholders, evaluation of alternatives, assessment of the effects of the proposed works and identification of measures to mitigate any adverse impacts. In addition to consultation with public agencies and the general public, consultation with Aboriginal communities is required.

Aboriginal Consultation

The Crown has a legal duty to consult Aboriginal communities when it has knowledge, real or constructive, of the existence or potential existence of an Aboriginal or treaty right and contemplates conduct that may adversely impact that right. Before authorizing this project, the Crown must ensure that its duty to consult has been fulfilled, where such a duty is triggered. Although the duty to consult with Aboriginal peoples is a duty of the Crown, the Crown may delegate procedural aspects of this duty to project proponents while retaining oversight of the consultation process.

Your proposed project may have the potential to affect Aboriginal or treaty rights protected under Section 35 of Canada's *Constitution Act* 1982. Where the Crown's duty to consult is triggered in relation to your proposed project, **the MOECC is delegating the procedural aspects of rights-based consultation to you through this letter.** The Crown intends to rely on the delegated consultation process in discharging its duty to consult and maintains the right to participate in the consultation process as it sees fit.

Based on information you have provided to date and the Crown's preliminary assessment you are required to consult with the following communities who have been identified as potentially affected by your proposed project:

- Chippewas of Georgina Island, Chippewas of Mnjikaning and Beausoleil First Nation, with a copy to Williams Treaty Consultation Office
- Saugeen Ojibway Nation Environment Office with a copy to the Chiefs of (Saugeen First Nation and Chippewas of Nawash Unceded First Nation)
- Historic Saugeen Métis
- Great Lakes Métis (Notice to be provided to MNO Consultation Office)
- Georgian Bay Métis council

Steps that you may need to take in relation to Aboriginal consultation for your proposed project are outlined in the "Code of Practice for Consultation in Ontario's Environmental Assessment Process" which can be found at the following link:

https://www.ontario.ca/document/consultation-ontarios-environmental-assessment-process

Additional information related to Ontario's Environmental Assessment Act is available online at:

www.ontario.ca/environmentalassessments.

You must contact the Director of Environmental Approvals Branch under the following circumstances subsequent to initial discussions with the communities identified by MOECC:

- aboriginal or treaty rights impacts are identified to you by the communities;
- you have reason to believe that your proposed project may adversely affect an aboriginal or treaty right;
- consultation has reached an impasse;
- a Part II Order request or elevation request is expected.

The Director of the Environmental Approvals Branch can be notified either by email with the subject line "Potential Duty to Consult" to EAASIBgen@ontario.ca or by mail or fax at the address provided below:

Email:	EAASIBGen@ontario.ca Subject: Potential Duty to Consult
Fax:	416-314-8452
Address:	Environmental Approvals Branch 135 St. Clair Avenue West, 1st Floor Toronto, ON, M4V 1P5

The MOECC will then assess the extent of any Crown duty to consult for the circumstances and will consider whether additional steps should be taken, including what role you will be asked to play in them.

Source Water Protection

As per the recent amendments to the Municipal Engineers Association (MEA) Class Environmental Assessment parent document approved October 2015, proponents undertaking a Municipal Class EA project must identify early in the process whether a project is occurring within a source water protection vulnerable area. This must be clearly documented in a Project File report or ESR. If the project is occurring in a vulnerable area, then there may be policies in the local Source Protection Plan (SPP) that need to be addressed (requirements under the Clean Water Act). The proponent should contact and consult with the appropriate Conservation Authority/Source Protection Authority (CA/SPA) to discuss potential considerations and policies in the SPP that apply to the project.

Please include a section in the report on Source Water Protection. Specifically, it should discuss whether or not the project is located in a vulnerable area or changes or creates new vulnerable areas, and provide applicable details about the area. If located in a vulnerable area, proponents should document whether any project activities are a prescribed drinking water threat and thus pose a risk to drinking water (this should be consulted on with the appropriate CA/SPA). Where an activity poses a risk to drinking water, the proponent must document and discuss in the Project File Report/ESR how the project adheres to or has regard to applicable policies in the local SPP. If creating or changing a vulnerable area, proponents should document whether any existing uses or activities may potentially be affected by the implementation of source protection policies. This section should then be used to inform and should be reflected in other sections of the report, such as the identification of net positive/ negative effects of alternatives, mitigation measures, evaluation of alternatives etc. As a note, even if the project activities in a vulnerable area are deemed not to be a drinking water risk, there may be other policies that apply and so consultation with the local CA/SPA is important.

Conclusion

Thank you for the opportunity to comment on this project. Please keep this office fully informed of the status of this project as it proceeds through the Class EA process.

Please send future correspondence to my attention of Craig Newton, Regional Environmental Planner / Regional EA Coordinator at the address below; email address: craig.newton@ontario.ca; telephone number: 519-873-5014. Thank you in advance.

Yours truly,

Craig Newton
Regional Environmental Planner / Regional EA Coordinator
Ministry of Environment and Climate Change
733 Exeter Road
London ON, N6E 1L3
519 873-5014

Copy: Mr. John Ritchie, Supervisor, Safe Drinking Water Branch, MOECC Owen Sound
Mr. Rick Chappel, District Manager, MOECC Owen Sound
Mr. Jake Noordhof, Sr. Aboriginal Advisor, MOECC Burlington
Mr. Chris Wilson, P.Eng., WSP Canada Inc., Owen Sound

Miller, Loreen

From: Miller, Loreen
Sent: Tuesday, April 11, 2017 11:01 AM
To: 'info@chimnissing.ca'
Subject: Water and Wastewater Master Servicing Plan, Municipality of Grey Highlands
Attachments: Phase 2 PIC Presentation - April 10, 2017.pdf

Please review and provide comment regarding the attached Phase 2 PIC Presentation document to Chris Wilson, P. Eng., (email: chris.wilson@wspgroup.com) by April 28, 2017.

Loreen Miller
Senior Administrative Assistant

WSP Canada Inc.
1450 – 1st Avenue West, Suite 101
Owen Sound, Ontario N4K 6W2 Canada
T +1 519-376-7612 #13205
F +1 519-376-8008

www.wspgroup.com

Please consider the environment before printing...

Miller, Loreen

From: Miller, Loreen
Sent: Tuesday, April 11, 2017 10:59 AM
To: cnadministrator@nawash.ca
Subject: Water and Wastewater Master Servicing Plan, Municipality of Grey Highlands
Attachments: Phase 2 PIC Presentation - April 10, 2017.pdf

Please provide comment regarding the attached Phase 2 PIC Presentation document to Chris Wilson, P. Eng., (email: chris.wilson@wspgroup.com) by April 28, 2017.

Loreen Miller
Senior Administrative Assistant

WSP Canada Inc.
1450 – 1st Avenue West, Suite 101
Owen Sound, Ontario N4K 6W2 Canada
T +1 519-376-7612 #13205
F +1 519-376-8008

www.wspgroup.com

Please consider the environment before printing...

Miller, Loreen

From: Miller, Loreen
Sent: Tuesday, April 11, 2017 11:01 AM
To: d.ritchie@saugeenojibwaynation.ca
Subject: Water and Wastewater Master Servicing Plan, Municipality of Grey Highlands
Attachments: Phase 2 PIC Presentation - April 10, 2017.pdf

Mr. Ritchie:

Please review and provide comment regarding the attached Phase 2 PIC Presentation document to Chris Wilson, P. Eng., (email: chris.wilson@wspgroup.com) by April 28, 2017.

Loreen Miller
Senior Administrative Assistant

WSP Canada Inc.
1450 – 1st Avenue West, Suite 101
Owen Sound, Ontario N4K 6W2 Canada
T +1 519-376-7612 #13205
F +1 519-376-8008

www.wspgroup.com

Please consider the environment before printing...

Miller, Loreen

From: Miller, Loreen
Sent: Tuesday, April 11, 2017 11:01 AM
To: 'saugeenmetis@bmts.com'
Subject: Water and Wastewater Master Servicing Plan, Municipality of Grey Highlands
Attachments: Phase 2 PIC Presentation - April 10, 2017.pdf

Please review and provide comment regarding the attached Phase 2 PIC Presentation document to Chris Wilson, P. Eng., (email: chris.wilson@wspgroup.com) by April 28, 2017.

Loreen Miller
Senior Administrative Assistant

WSP Canada Inc.
1450 – 1st Avenue West, Suite 101
Owen Sound, Ontario N4K 6W2 Canada
T +1 519-376-7612 #13205
F +1 519-376-8008

www.wspgroup.com

Please consider the environment before printing...

Miller, Loreen

From: Miller, Loreen
Sent: Tuesday, April 11, 2017 11:00 AM
To: 'sfn@saugeenfirstnation.ca'
Subject: Water and Wastewater Master Servicing Plan, Municipality of Grey Highlands
Attachments: Phase 2 PIC Presentation - April 10, 2017.pdf

Please provide comment regarding the attached Phase 2 PIC Presentation document to Chris Wilson, P. Eng., (email: chris.wilson@wspgroup.com) by April 28, 2017.

Loreen Miller
Senior Administrative Assistant

WSP Canada Inc.
1450 – 1st Avenue West, Suite 101
Owen Sound, Ontario N4K 6W2 Canada
T +1 519-376-7612 #13205
F +1 519-376-8008

www.wspgroup.com

Please consider the environment before printing...

WSP

FAX

TO:		**DATE:**	April 11, 2017
COMPANY:	Chippewas of Georgina Island	**TELEPHONE:**	
SUBJECT:	Phase 2 Public Information Centre Meeting, Water & Wastewater Servicing Master Plan, Municipality of Grey	**FAX:**	705-437-4597
PROJECT No.	111-13229-00 ☐ THE ORIGINAL WILL FOLLOW	**NUMBER OF PAGES:** (INCLUDING COVER SHEET)	12

REMARKS

Please review and provide comments to Chris Wilson, P. Eng., (email: chris.wilson@wspgroup.com) regarding the attached Phase 2 PIC Presentation held April 10, 2017.

Thank you.

FROM: Chris Wilson, P. Eng.

C.C.:

1450 1st Avenue West, Suite 101, Owen Sound, ON N4K 6W2 Tel.: 519-376-7612 Fax: 519-376-8008

This message, including any document enclosed, is intended only for the addressee and may contain privileged and/or confidential information. Any other person is strictly prohibited from reading, using, disclosing or copying this message. If you have received this message in error, please notify the sender and delete the message. Thank you.

WSP

FAX

TO:		**DATE:**	April 11, 2017
COMPANY:	Chippewas of Rama	**TELEPHONE:**	
SUBJECT:	Phase 2 Public Information Centre Meeting, Water & Wastewater Servicing Master Plan, Municipality of Grey	**FAX:**	705-325-0879
PROJECT No.	111-13229-00 ☐ THE ORIGINAL WILL FOLLOW	**NUMBER OF PAGES:** (INCLUDING COVER SHEET)	12

REMARKS

Please review and provide comments to Chris Wilson, P. Eng., (email: chris.wilson@wspgroup.com) regarding the attached Phase 2 PIC Presentation held April 10, 2017.

Thank you.

FROM: Chris Wilson, P. Eng.

C.C.:

1450 1st Avenue West, Suite 101, Owen Sound, ON N4K 6W2 Tel.: 519-376-7612 Fax: 519-376-8008

This message, including any document enclosed, is intended only for the addressee and may contain privileged and/or confidential information. Any other person is strictly prohibited from reading, using, disclosing or copying this message. If you have received this message in error, please notify the sender and delete the message. Thank you.

WSP

FAX

TO:		**DATE:**	April 11, 2017
COMPANY:	Great Lakes Metis Council	**TELEPHONE:**	
SUBJECT:	Phase 2 Public Information Centre Meeting, Water & Wastewater Servicing Master Plan, Municipality of Grey	**FAX:**	519-370-0436
PROJECT No.	111-13229-00 ☐ THE ORIGINAL WILL FOLLOW	**NUMBER OF PAGES:** (INCLUDING COVER SHEET)	12

REMARKS

Please review and provide comments to Chris Wilson, P. Eng., (email: chris.wilson@wspgroup.com) regarding the attached Phase 2 PIC Presentation held April 10, 2017.

Thank you.

FROM: Chris Wilson, P. Eng.

C.C.:

1450 1st Avenue West, Suite 101, Owen Sound, ON N4K 6W2 Tel.: 519-376-7612 Fax: 519-376-8008

This message, including any document enclosed, is intended only for the addressee and may contain privileged and/or confidential information. Any other person is strictly prohibited from reading, using, disclosing or copying this message. If you have received this message in error, please notify the sender and delete the message. Thank you.

WSP

FAX

TO:		**DATE:**	April 11, 2017
COMPANY:	Metis Nation of Ontario Head Office	**TELEPHONE:**	
SUBJECT:	Phase 2 Public Information Centre Meeting, Water & Wastewater Servicing Master Plan, Municipality of Grey	**FAX:**	613-722-4225
PROJECT No.	111-13229-00 ☐ THE ORIGINAL WILL FOLLOW	**NUMBER OF PAGES:** (INCLUDING COVER SHEET)	12

REMARKS

Please review and provide comments to Chris Wilson, P. Eng., (email: chris.wilson@wspgroup.com) regarding the attached Phase 2 PIC Presentation held April 10, 2017.

Thank you.

FROM: Chris Wilson, P. Eng.

C.C.:

1450 1st Avenue West, Suite 101, Owen Sound, ON N4K 6W2 Tel.: 519-376-7612 Fax: 519-376-8008

This message, including any document enclosed, is intended only for the addressee and may contain privileged and/or confidential information. Any other person is strictly prohibited from reading, using, disclosing or copying this message. If you have received this message in error, please notify the sender and delete the message. Thank you.

111-13229-00

February 27, 2017

Mr. Craig Newton
Ministry of the Environment and Climate Change
733 Exeter Road
London, Ontario
N6E 1L3

Re: Re-Rating of the Markdale Wastewater Treatment Plant
Proposed Effluent Limits

Dear Mr. Newton:

Following up on our conversation from Tuesday, February 14, 2017, I would like to inform you that WSP has been retained by the Municipality of Grey Highlands (Municipality) to complete a Master Water and Wastewater Servicing Plan for their serviced areas. Included in our scope of work is reviewing possible alternative solutions for increasing the capacity of the Markdale Wastewater Treatment Plant (WWTP).

The Municipality completed upgrades to the facility as described in the amended ECA #9378-9M2RLX, which incorporated aeration into the lagoon system as well as winterization of two of the rapid infiltration basins.

As a result of this work, the facility will be seeking a re-rating of the facility from 1,122.3 m^3/d to 1,722 m^3/d. The performance of the lagoons meets the requirements of the 2008 MOECC Design Guidelines for Sewage Works. Therefore, no further upgrades are required in order to re-rate the facility to the proposed average daily flow rate.

Table 1 on the following page provides the existing effluent objectives and effluent limits for the Markdale WWTP.

Table 2 on the following page provides the proposed effluent objectives and effluent limits for the Markdale WWTP.

The only effluent limit we are proposing to change is that of total phosphorus. In order to ensure that the total phosphorus effluent loadings to the receiving stream do not change, we are proposing to lower the total phosphorus effluent limit proportionately to the hydraulic increase to maintain the loadings the same.

WSP Canada Inc.
1450 1st Ave. W.
Suite 101
Owen Sound, ON N4K 6W2

Phone: 519-376-7612
Fax: 519-376-8008
www.wspgroup.com

111-13229-00
February 27, 2017
Mr. Craig Newton, MOECC

Proposed Total Phosphorus Effluent Limit:
TP = (1.12 kg/d) / (1,722 m^3/d) (1000) = 0.65 mg/L

Table 1 – Existing Effluent Objectives and Effluent Limits

Effluent Parameter	Effluent Objectives	Effluent Limits	
	Average Concentration (mg/L)	Average Concentration (mg/L)	Average Loadings (kg/d)
CBOD5	20.0	25.0	28.1
TSS	25.0	30.0	33.7
TP	0.8	1.0	1.12
pH	pH of the effluent to be maintained between 6.0 and 9.5 inclusive, at all times		

Table 2 – Proposed Effluent Objectives and Effluent Limits

Effluent Parameter	Effluent Objectives	Effluent Limits	
	Average Concentration (mg/L)	Average Concentration (mg/L)	Average Loadings (kg/d)
CBOD5	20.0	25.0	43.0
TSS	25.0	30.0	51.6
TP	0.50	0.65	1.12
pH	pH of the effluent to be maintained between 6.0 and 9.5 inclusive, at all times		

Please indicate your concurrence with the proposed limits, in support of the environmental assessment process.

111-13229-00
February 27, 2017
Mr. Craig Newton, MOECC

Should you have any questions or require additional information, please contact the undersigned.

Yours truly,

WSP Canada Inc.

Chris Wilson, P. Eng.
Environmental Engineer
Team Lead - Municipal Infrastructure
CSW/lem

cc Mr. Shawn Moyer, Municipality of Grey Highlands
Mr. Scott Abernethy, Ministry of the Environment and Climate Change
Mr. Shayne Finlay, Ministry of the Environment and Climate Change
Ms. Allison Kershaw, Ministry of the Environment and Climate Change

Encl. ECA #9378-9M2RLX

Ontario

Ministry of the Environment
Ministère de l'Environnement

AMENDED ENVIRONMENTAL COMPLIANCE APPROVAL
NUMBER 9378-9M2RLX
Issue Date: August 13, 2014

The Corporation of the Municipality of Grey Highlands
206 Toronto St S
Post Office Box, No. 409
Markdale, Ontario
N0C 1H0

Site Location: Markdale Sewage Lagoons
Lot 94, 95, 96, Concession 1
Grey Highlands Municipality, County of Grey

You have applied under section 20.2 of Part II.1 of the Environmental Protection Act, R.S.O. 1990, c. E. 19 (Environmental Protection Act) for approval of:

Alterations to the existing municipal sewage treatment plant for the collection, transmission, treatment and disposal of domestic sewage, having a Rated Capacity of 1,122.3 m^3/day and consisting of the following:

Proposed Works

- four (4) 4.25 hp surface aerator/mixers and two (2) 3 hp fine-bubble surface aerator/mixers at the inlet of Cell No. 1 to provide supplementary aeration to the sewage in lagoon system and reduce the quantity of sludge;
- one (1) 3 hp fine-bubble surface aerator/mixer at the inlet of Cell No. 2 to assist algae settling and provide supplementary aeration to the sewage in the lagoon system;
- two (2) 4.25 hp surface aerator/mixers near the outlet of Cell No. 2, as required
- two (2) aerators at the outlet of Cell No. 2 as required, each with a 15 hp sewage effluent pump that pumps the sewage effluent through a 3 hp fine-bubble surface aerator/mixer, which has a specialized impingement aeration process utilized for clarification and equipped with a boom to encourage algae settling;
- one hundred and fifty (150) floating wetland units approximately 1 m x 1 m each, in a line near the outlet of Cell No. 2;
- modification of two (2) rapid infiltration basins to allow year round operation, comprising a clear stone bed on top of existing sand bed, a 300 mm diameter distribution pipe, clear stone and sand backfill, filter cloth and 200 mm top soil and seed;

Previous Works

- an aerated lagoon system with Cell No. 1 approximately 1.4 ha and Cell No. 2 approximately 6.3 ha operating in series;
- two (2) 15 hp blowers and one (1) 5 hp blower;
- One(1) 20,000 L chemical storage tank for phosphorous removal and dosing pump to feed chemical at the interconnecting manhole between Cell No. 1 and Cell No. 2 and/or into the influent structure to lagoon Cell No. 1;
- one (1) effluent pumping station with two (2) 5 hp submersible pumps and flowmeter to measure effluent flow from Cell No. 2 to the rapid infiltration basins;
- eight (8) rapid infiltration basins complete with central influent splitter/control structure and two flow distribution structure to facilitate feeding one, two, four or eight basins simultaneously;
- one (1) overflow structure from Cell No. 2 to provide for emergency discharge to the Rocky Saugeen River;
- observation wells in the centre of the rapid infiltration basins for the purpose of recording the water mound under the basins during operation;
- groundwater monitoring system consisting of a series of observation wells and sampling locations between the rapid infiltration basins and the groundwater discharge area adjacent to the Rocky Saugeen River;

- all other controls, electrical equipment, instrumentation, piping, pumps, valves and appurtenances essential for the proper operation of the aforementioned sewage works;

all in accordance with the submitted supporting documents listed in Schedule A.

For the purpose of this environmental compliance approval, the following definitions apply:

"Annual Average Concentration" means the arithmetic mean of the Monthly Average Concentrations of a contaminant in the effluent calculated for any particular calendar year;

"Annual Average Loading" means the value obtained by multiplying the Annual Average Concentration of a contaminant by the Average Daily Flow over the same calendar year;

"Approval" means this entire document and any schedules attached to it, and the application;

"Average Daily Flow" means the cumulative total sewage flow to the sewage works during a calendar year divided by the number of days during which sewage was flowing to the sewage works that year;

"BOD5" (also known as $TBOD_5$) means five day biochemical oxygen demand measured in an unfiltered sample and includes carbonaceous and nitrogenous oxygen demand;

"By-pass" means diversion of sewage around one or more unit processes within the Sewage Treatment Plant with the diverted sewage flows being returned to the Sewage Treatment Plant treatment train upstream of the Final Effluent sampling location, and discharging to the environment through the

Sewage Treatment Plant outfall;

"CBOD5" means five day carbonaceous (nitrification inhibited) biochemical oxygen demand measured in an unfiltered sample;

"Daily Concentration" means the concentration of a contaminant in the effluent discharged over any single day, as measured by a composite or grab sample, whichever is required;

"Director" means a person appointed by the Minister pursuant to section 5 of the EPA for the purposes of Part II.1 of the EPA;

"Emergency Situation" means a structural, mechanical or electrical failure that causes a temporary reduction in the capacity of the Sewage Treatment Plant or an unforeseen flow condition that may result in:

a) danger to the health or safety of any person; or,
b) injury or damage to any property, or serious risk of injury or damage to any property; or
c) treatment process biomass washout.

"EPA" means the *Environmental Protection Act* , R.S.O. 1990, c.E.19, as amended;

"Equivalent Equipment" means a substituted equipment or like-for-like equipment that meets the required quality and performance standards of a named equipment;

"Event" means an action or occurrence, at a given location within the Sewage Treatment Plant that causes a Plant Bypass or Plant Overflow. An Event ends when there is no recurrence of a Bypass or Overflow in the 12-hour period following the last Bypass or Overflow. Two Events are separated by at least 12 hours during which there has been no recurrence of a Bypass or Overflow;

"Final Effluent" means sewage discharge via the Sewage Treatment Plant outfall after undergoing the full train of unit processes as listed in the Approval;

"Limited Operational Flexibility" (LOF) means any modifications that the Owner is permitted to make to the Works under this Approval;

"Ministry" means the ministry of the government of Ontario responsible for the EPA and OWRA and includes all officials, employees or other persons acting on its behalf;

"Monthly Average Concentration" means the arithmetic mean of all Daily Concentrations of a contaminant in the effluent sampled or measured, or both, during a calendar month;

"Notice of Modifications" means the form entitled "Notice of Modifications to Sewage Works";

"Owner" means The Corporation of the Municipality of Grey Highlands and its successors and assignees;

"OWRA" means the *Ontario Water Resources Act* , R.S.O. 1990, c. O.40, as amended;

"Plant Overflow" means a discharge to the environment from the Sewage Treatment Plant at a location other than the plant outfall or into the plant outfall downstream of the Final Effluent sampling location;

"Previous Works" means those portions of the sewage works previously constructed and approved under an Approval;

"Proposed Works" means the sewage works described in the Owner's application, this Approval, to the extent approved by this Approval;

"Rated Capacity" means the Average Daily Flow for which the Works are approved to handle;

"Regional Water Compliance Manager" means the Regional Water Compliance Manager of the Southwestern Region of the Ministry;

"Sewage Treatment Plant" means the entire sewage treatment and effluent discharge facility;

"Source Protection Plan" means a drinking water source protection plan prepared under the *Clean Water Act, 2006* ;

"Substantial Completion" has the same meaning as "substantial performance" in the *Construction Lien Act* ;

"Water Supervisor" means the Water Supervisor for the Owen Sound office of the Ministry; and

"Works" means the sewage works described in the Owner's application, and this Approval, and includes Proposed Works, Previous Works, and modifications made under Limited Operational Flexibility.

You are hereby notified that this environmental compliance approval is issued to you subject to the terms and conditions outlined below:

TERMS AND CONDITIONS

1. GENERAL PROVISIONS

(1) The Owner shall ensure that any person authorized to carry out work on or operate any aspect of the Works is notified of this Approval and the conditions herein and shall take all reasonable measures to ensure any such person complies with the same.

(2) Except as otherwise provided by these conditions, the Owner shall design, build, install, operate and maintain the Works in accordance with the description given in this Approval, and the application for approval of the Works.

(3) Where there is a conflict between a provision of any document in the schedule referred to in this

Approval and the conditions of this Approval, the Conditions in this Approval shall take precedence, and where there is a conflict between the documents in the schedule, the document bearing the most recent date shall prevail.

(4) Where there is a conflict between the documents listed in the Schedule submitted documents, and the application, the application shall take precedence unless it is clear that the purpose of the document was to amend the application.

(5) The Conditions of this Approval are severable. If any Condition of this Approval, or the application of any requirement of this Approval to any circumstance, is held invalid or unenforceable, the application of such condition to other circumstances and the remainder of this Approval shall not be affected thereby.

2. EXPIRY OF APPROVAL

The approval issued by this Approval will cease to apply to those parts of the Works which have not been constructed within five (5) years of the date of this Approval.

3. CHANGE OF OWNER

(1) The Owner shall notify the Water Supervisor and the Director,in writing, of any of the following changes within thirty (30) days of the change occurring:

(a) change of Owner;

(b) change of address of the Owner;

(c) change of partners where the Owner is or at any time becomes a partnership, and a copy of the most recent declaration filed under the *Business Names Act* , R.S.O. 1990, c.B17 shall be included in the notification to the Water Supervisor;

(d) change of name of the corporation where the Owner is or at any time becomes a corporation, and a copy of the most current information filed under the *Corporations Information Act* , R.S.O. 1990, c. C39 shall be included in the notification to the Water Supervisor;

(2) In the event of any change in ownership of the Works, other than a change to a successor municipality, the Owner shall notify in writing the succeeding owner of the existence of this Approval, and a copy of such notice shall be forwarded to the Water Supervisor and the Director.

4 UPON THE SUBSTANTIAL COMPLETION OF THE WORKS

(1) Upon the Substantial Completion of the Works, the Owner shall prepare a statement, certified by a Professional Engineer, that the works are constructed in accordance with this Approval, and upon

request, shall make the written statement available for inspection by Ministry personnel.

(2) Within one (1) year of the Substantial Completion of the Proposed Works, a set of as-built drawings showing the works "as constructed" shall be prepared. These drawings shall be kept up to date through revisions undertaken from time to time and a copy shall be retained at the Works for the operational life of the Works.

5. BY-PASSES

(1) Any By-pass or Plant Overflow is prohibited, except:

(a) in an Emergency Situation;

(b) where the By-pass / Plant Overflow is a direct and unavoidable result of a planned maintenance procedure, the Owner notified the Water Supervisor 15 days prior to the By-pass and the Water Supervisor has given written consent of the Bypass;and

(c) where the By-pass / Plant Overflow is planned for research or training purposes, the discharger notified the Water Supervisor 15 days prior to the By-pass / Plant Overflow and the Water Supervisor has given written consent of the By-pass / Plant Overflow.

(2) The Owner shall forthwith notify the Spills Action Centre (SAC) and the Medical Officer of Health of all By-pass and Plant Overflow Events. This notice shall include, at a minimum, the following information:

(a) the date, time, and duration of the Event;

(b) the location of the Event;

(c) the measured or estimated volume of the Event (unless the Event is ongoing);

(d) the reason for the Event; and

(e) the level of treatment the By-pass(es) and/or Plant Overflow(s) received and disinfection status of same.

(3) The Owner shall submit By-pass and Plant Overflow Event Reports to the Ministry's local office on a quarterly basis, no later than each of the following dates for each calendar year: February 14, May 15, August 14, and November 15. Event Reports shall be in an electronic format specified by the Ministry. In each Event Report the Owner shall include, at a minimum, the following information on any Events that occurred during the preceding quarter:

(a) the date of the Event(s);

(b) the measured or estimated volume of the Event(s);

(c) the duration of the Event(s);

(d) the location of the Event(s);

(e) the reason for the Event(s); and

(f) the level of treatment the By-pass(es) and/or Plant Overflow(s) received and disinfection status of same.

(4) The Owner shall use best efforts to collect a representative sample consisting of a minimum of two (2) grab samples of the By-pass / Plant Overflow and have it analyzed for parameters outlined in Condition 7, one at the beginning of the Event and the second approximately near the end of the Event, to best reflect the effluent quality of such By-pass or Plant Overflow.

(5) The Owner shall maintain a logbook of all Plant By-passes and Plant Overflows, which shall contain, at a minimum, the types of information set out in subsection 2 (a) to 2(e) in respect of each By-pass and Plant Overflow.

6. EFFLUENT OBJECTIVES

(1) The Owner shall use best efforts to design, construct and operate the Works with the objective that the concentrations of the materials named below as effluent parameters are not exceeded in the effluent from the Works.

Table 1 - Effluent Objectives

Effluent Parameter	Concentration Objective (milligrams per litre unless otherwise indicated)
CBOD5	20.0
Total Suspended Solids	25.0
Total Phosphorus	0.8

(2) The Owner shall use best efforts to:

(a) maintain the pH of the effluent from the Works within the range of 6.5 - 8.5, inclusive, at all times;

(b) operate the works within the Rated Capacity of the Works;

(c) ensure that the effluent from the Works is essentially free of floating and settleable solids and does not contain oil or any other substance in amounts sufficient to create a visible film or sheen or foam or discolouration on the receiving waters.

(3) The Owner shall include in all reports submitted in accordance with Condition 10 a summary of the efforts made and results achieved under this Condition.

7. EFFLUENT LIMITS

(1) The Owner shall design and construct the Proposed Works and operate and maintain the Works such that the concentrations of the materials named below as effluent parameters are not exceeded in the effluent from the Works.

Table 2 - Effluent Limits		
Effluent Parameter	**Average Concentration** (milligrams per litre unless otherwise indicated)	**Average Loading** (kilograms per day unless otherwise indicated)
Column 1	Column 2	Column 2
CBOD5	25.0	28.1
Total Suspended Solids	30.0	33.7
Total Phosphorus	1.0	1.12
pH of the effluent maintained between 6.0 to 9.5, inclusive, at all times		

(2) For the purposes of determining compliance with and enforcing subsection (1):

(a) The Annual Average Concentration of a parameter named in Column 1 of subsection (1) shall not exceed the corresponding maximum concentration set out in Column 2 of subsection (1).

(b) The Annual Average Loading of a parameter named in Column 1 of subsection (1) shall not exceed the corresponding maximum waste loading set out in Column 3 of subsection (1).

(c) The pH of the effluent shall be maintained within the limits outlined in subsection (1), at all times.

(3) The effluent limits set out in Subsection (1) shall apply upon issuance of this Approval.

8. OPERATION AND MAINTENANCE

(1) The Owner shall exercise due diligence in ensuring that, at all times, the Works and the related equipment and appurtenances used to achieve compliance with this Approval are properly operated and maintained. Proper operation and maintenance shall include effective performance, adequate funding, adequate operator staffing and training, including training in all procedures and other requirements of this Approval and the Act and regulations, adequate laboratory facilities, process controls and alarms and the use of process chemicals and other substances used in the Works.

(2) The Owner shall prepare an operations manual within one (1) year of Substantial Completion of the

Proposed Works, that includes, but not necessarily limited to, the following information:

(a) operating procedures for routine operation of the Works;

(b) inspection programs, including frequency of inspection, for the Works and the methods or tests employed to detect when maintenance is necessary;

(c) repair and maintenance programs, including the frequency of repair and maintenance for the Works;

(d) procedures for the inspection and calibration of monitoring equipment;

(e) a spill prevention control and countermeasures plan, consisting of contingency plans and procedures for dealing with equipment breakdowns, potential spills and any other abnormal situations, including notification of the Water Supervisor; and

(f) procedures for receiving, responding and recording public complaints, including recording any followup actions taken.

(3) The Owner shall maintain the operations manual current and retain a copy at the location of the Works for the operational life of the Works.Upon request, the Owner shall make the manual available to Ministry staff.

(4) The Owner shall provide for the overall operation of the Works with an operator who holds a licence that is applicable to that type of facility and that is of the same class as or higher than the class of the facility in accordance with Ontario Regulation 129/04.

9. MONITORING AND RECORDING

The Owner shall, upon commencement of operation of the Works, carry out the following monitoring program:

(1) All samples and measurements taken for the purposes of this Approval are to be taken at a time and in a location characteristic of the quality and quantity of the effluent stream over the time period being monitored.

(2) For the purposes of this condition, the following definitions apply:

(a) Monthly means once every month;
(b) Quarterly means once every three months.

(3) Samples shall be collected at the following sampling points, at the frequency specified, by means of the specified sample type and analyzed for each parameter listed and all results recorded:

Table 3 - Raw Sewage Monitoring Influent to Cell No. 1		
Parameters	**Sample Type**	**Frequency**
BOD5	Composite	Monthly
Total Suspended Solids	Composite	Monthly
Total Phosphorus	Composite	Monthly
Total Kjeldahl Nitrogen	Composite	Monthly

Table 4 - Effluent Monitoring Effluent from Cell No. 2		
Parameters	**Sample Type**	**Frequency**
CBOD5	Composite	Monthly
Total Suspended Solids	Composite	Monthly
Total Phosphorus	Composite	Monthly
Total Kjeldahl Nitrogen	Composite	Monthly
pH	Grab	Monthly

Table 5 - Groundwater Monitoring (downstream of RIBs) Monitoring Stations OW1-86, OW6A-86, OW6B-86 and CW2-86		
Parameters	**Sample Type**	**Frequency**
Total Phosphorus	Grab	Quarterly
Dissolved Reactive Phosphorus	Grab	Quarterly
Total Ammonia Nitrogen	Grab	Quarterly
Nitrites Nitrogen	Grab	Quarterly
Nitrates Nitrogen	Grab	Quarterly
Chlorides	Grab	Quarterly
Dissolved Organic Carbon	Grab	Quarterly

Table 6 - Surface Water Monitoring (Rock Saugeen River) Monitoring Stations SW1-86, SW2-86 and SW3-86		
Parameters	**Sample Type**	**Frequency**
Total Phosphorus	Grab	Quarterly
Dissolved Reactive Phosphorus	Grab	Quarterly

Total Ammonia Nitrogen	Grab	Quarterly
Nitrites Nitrogen	Grab	Quarterly
Nitrates Nitrogen	Grab	Quarterly
Chlorides	Grab	Quarterly
Dissolved Organic Carbon	Grab	Quarterly

(4) The methods and protocols for sampling, analysis and recording shall conform, in order of precedence, to the methods and protocols specified in the following:

(a) the Ministry's Procedure F-10-1, "Procedures for Sampling and Analysis Requirements for Municipal and Private Sewage Treatment Works (Liquid Waste Streams Only), as amended from time to time by more recently published editions;

(b) the Ministry's publication "Protocol for the Sampling and Analysis of Industrial/Municipal Wastewater" (January 1999), ISBN 0-7778-1880-9, as amended from time to time by more recently published editions;

(c) the publication "Standard Methods for the Examination of Water and Wastewater" (21st edition), as amended from time to time by more recently published editions.

(5) The temperature and pH of the effluent from the Works shall be determined in the field at the time of sampling for Total Ammonia Nitrogen. The concentration of un-ionized ammonia shall be calculated using the total ammonia concentration, pH and temperature using the methodology stipulated in "Ontario's Provincial Water Quality Objectives" dated July 1994, as amended, for ammonia (un-ionized).

(6) The Owner shall install and maintain continuous flow measuring device(s), to measure the flowrate of the influent to or effluent from the Works with an accuracy to within plus or minus 15 per cent (+/- 15%) of the actual flowrate for the entire design range of the flow measuring device, and record the flowrate at a daily frequency.

10. REPORTING

(1) One (1) week prior to the start up of the operation of the Proposed Works, the Owner shall notify the Water Supervisor (in writing) of the pending start up date.

(2) Ten (10) days prior to the date of a planned By-pass being conducted pursuant to Condition 5 and as soon as possible for an unplanned By-pass,the Owner shall notify the Water Supervisor (in writing) of the pending start date, in addition to an assessment of the potential adverse effects on the environment and the duration of the By-pass.

(3) The Owner shall report to the Water Supervisor or designate, any exceedence of any parameter specified in Condition 7 orally, as soon as reasonably possible, and in writing within seven (7) days of the exceedence.

(4) In addition to the obligations under Part X of the *Environmental Protection Act* , the Owner shall, within ten (10) working days of the occurrence of any reportable spill as defined in Ontario Regulation 675/98, bypass or loss of any product, by-product, intermediate product, oil, solvent, waste material or any other polluting substance into the environment, submit a full written report of the occurrence to the Water Supervisor describing the cause and discovery of the spill or loss, clean-up and recovery measures taken, preventative measures to be taken and schedule of implementation.

(5) The Owner shall, upon request, make all manuals, plans, records, data, procedures and supporting documentation available to Ministry staff.

(6) The Owner shall prepare and submit a performance report to the Water Supervisor on an annual basis, within ninety (90) days following the end of the period being reported upon. The first such report shall cover the first annual period following the commencement of operation of the Works and subsequent reports shall be submitted to cover successive annual periods following thereafter. The reports shall contain, but shall not be limited to, the following information:

(a) a summary and interpretation of all monitoring data and a comparison to the effluent limits outlined in Condition 7, including an overview of the success and adequacy of the Works;

(b) a description of any operating problems encountered and corrective actions taken;

(c) a summary of all maintenance carried out on any major structure, equipment, apparatus, mechanism or thing forming part of the Works;

(d) a summary of any effluent quality assurance or control measures undertaken in the reporting period;

(e) a summary of the calibration and maintenance carried out on all effluent monitoring equipment; and

(f) a description of efforts made and results achieved in meeting the Effluent Objectives of Condition 6.

(g) a tabulation of the volume of sludge generated in the reporting period, an outline of anticipated volumes to be generated in the next reporting period and a summary of the locations to where the sludge was disposed;

(h) a summary of any complaints received during the reporting period and any steps taken to address the complaints;

(i) a summary of all By-pass, spill or abnormal discharge events;

(j) a copy of all Notice of Modifications submitted to the Water Supervisor as a result of Schedule B, Section 1, with a status report on the implementation of each modification;

(k) a report summarizing all modifications completed as a result of Schedule B, Section 3; and

(l) any other information the Water Supervisor requires from time to time.

(7) The Owner shall, within thirty (30) calendar days of issuance of this Approval, submit a Municipal Wastewater System Profile Information Form, and shall resubmit the updated document every time a notification is provided to the Water Supervisor in compliance with requirements of change of ownership under this Approval.

11. SOURCE WATER PROTECTION

The Owner shall, within sixty (60) calendar days of the Minister of the Environment posting approval of a Source Protection Plan on the environmental registry established under the *Environmental Bill of Rights, 1993* for the area in which this Approval is applicable, apply to the Director for an amendment to this Approval that includes submission of a plan for action to comply with all applicable policies in the approved Source Protection Plan.

12. LIMITED OPERATIONAL FLEXIBILITY

(1) The Owner may make modifications to the Works in accordance with the Terms and Conditions of this Approval and subject to the Ministry's "Limited Operational Flexibility Criteria for Modifications to Sewage Works ", included under Schedule B of this Approval, as amended.

(2) Sewage works proposed under Limited Operational Flexibility shall adhere to the design guidelines contained within the Ministry's publication "Design Guidelines for Sewage Works 2008", as amended.

(3) The Owner shall ensure at all times, that the Works, related equipment and appurtenances which are installed or used to achieve compliance are operated in accordance with all Terms and Conditions of this Approval.

(4) For greater certainty, the following are not permitted as part of Limited Operational Flexibility:

(a) Modifications to the Works that result in an increase of the Rated Capacity of the Works;

(b) Modifications to the Works that may adversely affect the approved effluent quality criteria or the location of the discharge/outfall;

(c) Modifications to the treatment process technology of the Works, or modifications that involve construction of new reactors (tanks) or alter the treatment train process design;

(d) Modifications to the Works approved under s.9 of the EPA, and

(e) Modifications to the Works pursuant to an order issued by the Ministry.

(5) Implementation of Limited Operational Flexibility is not intended to be used for piecemeal measures that result in major alterations or expansions.

(6) If the implementation of Limited Operational Flexibility requires changes to be made to the Emergency Response, Spill Reporting and Contingency Plan, the Owner shall, as deemed necessary in consultation with the Water Supervisor, provide a revised copy of this plan for approval to the local fire services authority prior to implementing Limited Operational Flexibility.

(7) For greater certainty, any modification made under the Limited Operational Flexibility may only be carried out after other legal obligations have been complied with, including those arising from the *Environmental Protection Act, Niagara Escarpment Planning and Development Act, Oak Ridges Moraine Conservation Act, Lake Simcoe Protection Act* and *Greenbelt Act.*

(8) Prior to implementing Limited Operational Flexibility, the Owner shall complete a Notice of Modifications describing any proposed modifications to the Works and submit it to the Water Supervisor.

The reasons for the imposition of these terms and conditions are as follows:

1. Condition 1 is imposed to ensure that the Works are built and operated in the manner in which they were described for review and upon which approval was granted. This condition is also included to emphasize the precedence of Conditions in the Approval and the practice that the Approval is based on the most current document, if several conflicting documents are submitted for review. The condition also advises the Owners their responsibility to notify any person they authorized to carry out work pursuant to this Approval the existence of this Approval.

2. Condition 2 is included to ensure that the Works are constructed in a timely manner so that standards applicable at the time of Approval of the Works are still applicable at the time of construction, to ensure the ongoing protection of the environment.

3. Condition 3 is included to ensure that the Ministry records are kept accurate and current with respect to the approved works and to ensure that subsequent owners of the Works are made aware of the Approval and continue to operate the Works in compliance with it.

4. Condition 4 is included to ensure that the Works are constructed in accordance with the approval and that record drawings of the Works "as constructed" are maintained for future references.

5. Condition 5 is included to indicate that By-pass / Plant Overflows of untreated or partially treated sewage to the receiving watercourse is prohibited, save in certain limited circumstances where the failure to By-pass / Plant Overflow could result in greater injury to the public interest than the Bypass itself where a By-pass / Plant Overflow will not violate the approved effluent requirements, or where the By-pass / Plant Overflow can be limited or otherwise mitigated by handling it in accordance with an approved contingency plan. The notification and documentation requirements allow the Ministry to take action in an informed manner and will ensure the Owner is aware of the extent and frequency of By-pass / Plant Overflow events.

6. Condition 6 is imposed to establish non-enforceable effluent quality objectives which the Owner is obligated to use best efforts to strive towards on an ongoing basis. These objectives are to be used as a

mechanism to trigger corrective action proactively and voluntarily before environmental impairment occurs and before the compliance limits of Condition 7 are exceeded.

7. Condition 7 is imposed to ensure that the effluent discharged from the Works to Rocky Saugeen River meets the Ministry's effluent quality requirements thus minimizing environmental impact on the receiver and to protect water quality, fish and other aquatic life in the receiving water body.

8. Condition 8 is included to require that the Works be properly operated, maintained, funded, staffed and equipped such that the environment is protected and deterioration, loss, injury or damage to any person or property is prevented. As well, the inclusion of a comprehensive operations manual governing all significant areas of operation, maintenance and repair is prepared, implemented and kept up-to-date by the Owner and made available to the Ministry. Such a manual is an integral part of the operation of the Works. Its compilation and use should assist the Owner in staff training, in proper plant operation and in identifying and planning for contingencies during possible abnormal conditions. The manual will also act as a benchmark for Ministry staff when reviewing the Owner's operation of the Works.

9. Condition 9 is included to enable the Owner to evaluate and demonstrate the performance of the Works, on a continual basis, so that the Works are properly operated and maintained at a level which is consistent with the design objectives and effluent limits specified in the Approval and that the Works does not cause any impairment to the receiving watercourse.

10. Condition 10 is included to provide a performance record for future references, to ensure that the Ministry is made aware of problems as they arise, and to provide a compliance record for all the terms and conditions outlined in this Approval, so that the Ministry can work with the Owner in resolving any problems in a timely manner.

11. Condition 11 is included to ensure that the works covered by this Approval will conform to the significant threat policies and designated Great Lakes policies in the Source Protection Plan.

12. Condition 12 is included to ensure that the Works are operated in accordance with the application and supporting documentation submitted by the Owner, and not in a manner which the Director has not been asked to consider. These Conditions are also included to ensure that a Professional Engineer has reviewed the proposed modifications and attests that the modifications are in line with that of Limited Operational Flexibility, and provide assurance that the proposed modifications comply with the Ministry's requirements stipulated in the Terms and Conditions of this Approval, MOE policies, guidelines, and industry engineering standards and best management practices.

Schedule A

1. Application for Approval of Sewage Works submitted by Henderson, Paddon & associates Limited, received on December 4, 2001 together with design brief.
2. Environmental Compliance Approval Application submitted by Ross Slaughter of GSS Engineering Consultants Ltd received on March 25, 2014, including engineering plans and specifications for proposed upgrades to allow year-round discharge.

Schedule B

Limited Operational Flexibility Criteria for Modifications to Municipal Sewage Works

1. The modifications to sewage works approved under an Environmental Compliance Approval (Approval) that are permitted under the Limited Operational Flexibility (LOF), are outlined below and are subject to the LOF conditions in the Approval, and require the submission of the Notice of Modifications. If there is a conflict between the sewage works listed below and the Terms and Conditions in the Approval, the Terms and Conditions in the Approval shall take precedence.

1.1 Sewage Pumping Stations

a. Alter pumping capacity by adding or replacing equipment where new equipment is located within an existing sewage treatment plant site or an existing sewage pumping station site, provided that the modifications do not result in an increase of the sewage treatment plant Rated Capacity and the existing flow process and/or treatment train are maintained, as applicable.

1.2 Sewage Treatment Process

a. Installing additional chemical dosage equipment including replacing with alternative chemicals for pH adjustment or coagulants (non-toxic polymers) provided that there are no modifications of treatment processes or other modifications that may alter the intent of operations and may have negative impacts on the effluent quantity and quality.

b. Expanding the buffer zone between a sanitary sewage lagoon facility or land treatment area and adjacent uses provided that the buffer zone is entirely on the proponent's land.

c. Optimizing existing sanitary sewage lagoons with the purpose to increase efficiency of treatment operations provided that existing sewage treatment plant rated capacity is not exceeded and where no land acquisition is required.

d. Optimizing existing sewage treatment plant equipment with the purpose to increase the efficiency of the existing treatment operations, provided that there are no modifications to the works that result in an increase of the Rated Capacity, and may have adverse effects to the effluent quality or location of the discharge.

e. Replacement, refurbishment of previously approved equipment in whole or in part with Equivalent Equipment, like-for-like of different make and model, provided that the firm capacity, reliability, performance standard, level of quality and redundancy of the group of equipment is kept the same. For clarity purposes, the following equipment can be considered under this provision: screens, grit separators, blowers, aeration equipment, sludge thickeners, dewatering equipment, UV systems, chlorine contact equipment, bio-disks, and sludge digester systems.

1.3 Sewage Treatment Plant Outfall

a. Replacement of discharge pipe with similar pipe size provided that the outfall location is not changed.

1.4 Sanitary Sewers

a. Pipe relining and replacement with similar pipe size within the Sewage Treatment Plant site, where the nominal diameter is not greater than 1,200 mm.

1.5 Pilot Systems

a. Installation of pilot systems for new or existing technologies provided that:

i. any effluent from the pilot system is discharged to the inlet of the sewage treatment plant or hauled off-site for proper disposal,
ii. any effluent from the pilot system discharged to the inlet of the sewage treatment plant or sewage conveyance system does not significantly alter the composition/concentration of the influent sewage to be treated in the downstream process; and that it does not add any inhibiting substances to the downstream process, and
iii. the pilot system's duration does not exceed a maximum of two years; and a report with results is submitted to the Director and Water Supervisor three months after completion of the pilot project.

2. Sewage works that are exempt from section 53 of the OWRA by O. Reg. 525/98 continue to be exempt and are not required to follow the notification process under this Limited Operational Flexibility.

3. Normal or emergency operational modifications, such as repairs, reconstructions, or other improvements that are part of maintenance activities, including cleaning, renovations to existing approved sewage works equipment, provided that the modification is made with Equivalent Equipment, are considered pre-approved.

4. The modifications noted in section (3) above are <u>not</u> required to follow the notification protocols under Limited Operational Flexibility, provided that the number of pieces and description of the equipment as described in the Approval does not change.

Ontario
Ministry of the Environment

Notice of Modification to Sewage Works

RETAIN COPY OF COMPLETED FORM AS PART OF THE ECA AND SEND A COPY TO THE WATER SUPERVISOR (FOR MUNICIPAL) OR DISTRICT MANAGER (FOR NON-MUNICIPAL SYSTEMS)

Part 1 – Environmental Compliance Approval (ECA) with Limited Operational Flexibility

(Insert the ECA's owner, number and issuance date and notice number, which should start with "01" and consecutive numbers thereafter)

ECA Number	Issuance Date (mm/dd/yy)	Notice number (if applicable)

ECA Owner	Municipality

Part 2: Description of the modifications as part of the Limited Operational Flexibility

(Attach a detailed description of the sewage works)

Description shall include:
1. A detail description of the modifications and/or operations to the sewage works (e.g. sewage work component, location, size, equipment type/model, material, process name, etc.)
2. Confirmation that the anticipated environmental effects are negligible.
3. List of updated versions of, or amendments to, all relevant technical documents that are affected by the modifications as applicable, i.e. submission of documentation is not required, but the listing of updated documents is (design brief, drawings, emergency plan, etc.)

Part 3 – Declaration by Professional Engineer

I hereby declare that I have verified the scope and technical aspects of this modification and confirm that the design:
1. Has been prepared or reviewed by a Professional Engineer who is licensed to practice in the Province of Ontario;
2. Has been designed in accordance with the Limited Operational Flexibility as described in the ECA;
3. Has been designed consistent with Ministry's Design Guidelines, adhering to engineering standards, industry's best management practices, and demonstrating ongoing compliance with s.53 of the Ontario Water Resources Act; and other appropriate regulations.

I hereby declare that to the best of my knowledge, information and belief the information contained in this form is complete and accurate

Name (Print)	PEO License Number

Signature	Date (mm/dd/yy)

Name of Employer

Part 4 – Declaration by Owner

I hereby declare that:
1. I am authorized by the Owner to complete this Declaration;
2. The Owner consents to the modification; and
3. The modifications to the sewage works are proposed in accordance with the Limited Operational Flexibility as described in the ECA.
4. The Owner has fulfilled all applicable requirements of the *Environmental Assessment Act*.

I hereby declare that to the best of my knowledge, information and belief the information contained in this form is complete and accurate

Name of Owner Representative (Print)	Owner representative's title (Print)

Owner Representative's Signature	Date (mm/dd/yy)

EAB Form December 2, 2013

Upon issuance of the environmental compliance approval, I hereby revoke Approval No(s). 8294-8U6HMN issued on May 22, 2012.

In accordance with Section 139 of the Environmental Protection Act, you may by written Notice served upon me and the Environmental Review Tribunal within 15 days after receipt of this Notice, require a hearing by the Tribunal. Section 142 of the Environmental Protection Act provides that the Notice requiring the hearing shall state:

1. The portions of the environmental compliance approval or each term or condition in the environmental compliance approval in respect of which the hearing is required, and;
2. The grounds on which you intend to rely at the hearing in relation to each portion appealed.

Pursuant to subsection 139(3) of the Environmental Protection Act, a hearing may not be required with respect to any terms and conditions in this environmental compliance approval, if the terms and conditions are substantially the same as those contained in an approval that is amended or revoked by this environmental compliance approval.

The Notice should also include:

3. The name of the appellant;
4. The address of the appellant;
5. The environmental compliance approval number;
6. The date of the environmental compliance approval;
7. The name of the Director, and;
8. The municipality or municipalities within which the project is to be engaged in.

And the Notice should be signed and dated by the appellant.

This Notice must be served upon:

The Secretary*
Environmental Review Tribunal
655 Bay Street, Suite 1500
Toronto, Ontario
M5G 1E5

AND

The Director appointed for the purposes of
Part II.1 of the Environmental Protection Act
Ministry of the Environment
2 St. Clair Avenue West, Floor 12A
Toronto, Ontario
M4V 1L5

*** Further information on the Environmental Review Tribunal's requirements for an appeal can be obtained directly from the Tribunal at: Tel: (416) 212-6349, Fax: (416) 314-4506 or www.ert.gov.on.ca**

The above noted activity is approved under s.20.3 of Part II.1 of the Environmental Protection Act.

DATED AT TORONTO this 13th day of August, 2014



Edgardo Tovilla
Director
appointed for the purposes of Part II.1 of the
Environmental Protection Act

FL/

c: DWMD Supervisor, MOE Owen Sound
Water Standards Section, MOE Standards Development Branch
Ross Slaughter, GSS Engineering Consultants Ltd.

Wilson, Chris

From: Wilson, Chris
Sent: Wednesday, March 01, 2017 8:55 AM
To: Arvizu, Gustavo
Subject: FW: Markdale Lagoons - Letter regarding Rerating
Attachments: ltr - C. Newton - Rerating of Markdale WWTP Proposed Effluent Limits.pdf

fyi

From: Newton, Craig (MOECC) [mailto:Craig.Newton@ontario.ca]
Sent: Wednesday, March 01, 2017 8:47 AM
To: Wilson, Chris <Chris.Wilson@wspgroup.com>
Cc: Moyer, Shawn (MoyerS@greyhighlands.ca) (MoyerS@greyhighlands.ca) <MoyerS@greyhighlands.ca>; Arvizu, Gustavo <Gustavo.Arvizu@wspgroup.com>; Abernethy, Scott (MOECC) <Scott.Abernethy@ontario.ca>; Finlay, Shayne (MOECC) <Shayne.Finlay@ontario.ca>; Ritchie, John (MOECC) <John.S.Ritchie@ontario.ca>; Mitchell, Ian (MOECC) <ian.mitchell@ontario.ca>
Subject: FW: Markdale Lagoons - Letter regarding Rerating

Good Afternoon Chris:

I am writing to you today in response to WSP's attached letter of February 27th, 2017 with respect to the proposed effluent limits for the proposed re-rating of the Markdale Waste Water Treatment Plant.

Staff of this Ministry's Regional Water Resources Unit have reviewed the 2015 annual report for the Markdale Sewage Lagoons and offer the following comments:

The current ECA 9378-9M2RLX was amended in 2014 to allow year-round discharge from lagoon cell 2 to two rapid infiltration basins retrofitted for winter discharge. Six other infiltration basins are used seasonally in the non-freezing period. Raw sewage is settled and aerated in lagoon cell 1 and 2 which are connected in series with alum dosing of effluent from cell 1 to cell 2. Cell 2 effluent limits on cBOD, TSS and TP are now assessed as annual averages rather than seasonal averages. For the 2015 monitoring year, cell 2 effluent quality was high and well within the effluent limits, sewage flows averaged 65% of design capacity and cBOD loading to cell 1 was only 29% of design capacity. This suggests that the proposed sewage works optimization for an increase in design capacity is a viable concept **subject to an engineering review by this Ministry's Approvals Branch**.

The infiltration basins provide an effluent polishing function after the effluent quality compliance point at cell 2. This function relies on the maintenance of an unsaturated zone in the sub-surface for sewage treatment. Close monitoring of hydraulic loading to the

infiltration basins and groundwater elevations is conducted and is necessary to limit groundwater mounding beneath the basins. The presence of an aerobic unsaturated zone in the sub-surface helps to ensure the conversion of ammonia to the less toxic nitrate form and it promotes further oxidation of sewage organic matter in the groundwater plume.

There is no cell 2 effluent limit on ammonia but ammonia and several other basic chemistry parameters are monitored in both groundwater and surface water as specified in the ECA. The tabulated monitoring data for 2015 show significant attenuation of ammonia and phosphorus as the groundwater plume moves through a cedar swamp to the Rocky Saugeen River. Chloride is a conservative parameter and is not attenuated in the sub-surface. Chloride concentrations in the groundwater are about 20 to 25 times higher than those in the river and this provides a measure of the river's dilution capacity. Overall the monitoring data do not show any evidence of impact or potential impact on the river. This ministry's Regional Water Resources Unit concurs with the recommendations in the annual report for the specified operational and monitoring activities especially careful monitoring of groundwater mounding when the infiltration basins' hydraulic loads are high.

As discussed at the teleconference of February 14, **the proposed increase in design capacity is generally acceptable with two conditions: (1) the effluent concentration limit on TP is lowered such that TP loading is capped and (2) the environmental monitoring program in the current ECA remains in force.**

Yours truly,

Craig Newton
Regional Environmental Planner / EA Coordinator
Ministry of the Environment & Climate Change
Southwestern Region
(519) 873-5014

From: Wilson, Chris [mailto:Chris.Wilson@wspgroup.com]
Sent: February-27-17 9:55 AM
To: Newton, Craig (MOECC)
Cc: Moyer, Shawn (MoyerS@greyhighlands.ca); Arvizu, Gustavo
Subject: Markdale Lagoons - Letter regarding Rerating

Craig,

Please see our attached letter regarding the rerating of the Markdale Lagoons.

Thanks,

Chris Wilson, B.E.Sc., P.Eng.
Environmental Engineer
Team Lead - Municipal Infrastructure

WSP Canada Inc.
1450 1st Ave West, Suite 101,
Owen Sound, ON N4K 6W2
T 519-376-7612 #13208
C 519-379-2663

www.wspgroup.com

Please consider the environment before printing...

You are receiving this communication because you are listed as a current WSP contact. Should you have any questions regarding WSP's electronic communications policy, please consult our Anti-Spam Commitment www.wspgroup.com/casl. For any concern or if you believe you should not be receiving this message, please forward this message to caslcompliance@wspgroup.com so that we can promptly address your request. This message is intended only for the addressee and may contain information which is privileged, confidential, proprietary, or exempt from disclosure under applicable law. If you are not the intended recipient, you are strictly prohibited from disclosing, distributing, copying, or in any way using this message. If you have received this communication in error, please notify the sender and delete any copies you may have received.

Vous recevez cette communication car vous faites partie des contacts de WSP. Si vous avez des questions concernant la politique de communications électroniques de WSP, veuillez consulter notre Engagement anti-pourriel www.wspgroup.com/lcap. Pour toute question ou si vous croyez que vous ne devriez pas recevoir ce message, prière de le transférer au conformitelcap@wspgroup.com afin que nous puissions rapidement traiter votre demande. Ce message est destiné uniquement au destinataire et il peut contenir des informations privilégiées, confidentielles ou non divulgables en vertu de la loi. Si vous n'êtes pas le destinataire du présent message, il vous est strictement interdit de le divulguer, de le distribuer, de le copier ou de l'utiliser de quelque façon que ce soit. Si vous avez reçu la présente communication par erreur, veuillez en aviser l'expéditeur et supprimer le message.

Appendix N

OTHER AGENDAS, MEETING MINUTES AND PRESENTATIONS

GENIVAR

MEETING SUMMARY

Class EA for Markdale Water Storage, Municipality of Grey Highlands and Regional Water and Sewage Master Plan

111-13229-00

Date:	March 11, 2011	**Project:**	111-13229-00
Time:		**Location:**	GENIVAR Inc., Owen Sound Office

Attendees:		
	Wayne Fitzgerald, Mayor	Municipality of Grey Highlands
	Paul McQueen, Deputy Mayor	Municipality of Grey Highlands
	Dan Best, CAO	Municipality of Grey Highlands
	Dave Clarke, Councillor	Municipality of Grey Highlands
	Dave Kell, Councillor	Municipality of Grey Highlands
	Shawn Moyer, Director of Public Utilities	Municipality of Grey Highlands
	Ross Slaughter, P. Eng.	GENIVAR Inc.
	Chris Wilson, P. Eng.	GENIVAR Inc.

Distribution: All Present

Prepared By: Chris Wilson, P. Eng.

The following items were discussed with regard to the Class EA for the Markdale Water Storage facility and a Water and Wastewater Servicing Master Plan for the Markdale-Flesherton-Kimberley-Amik-Eugenia areas in the Municipality of Grey Highlands:

Action by:

1. There was discussion concerning increasing the focus of the current Schedule B Class EA for the Markdale Water Storage, to a Regional Study (i.e. Master Plan) for water and sewage for Markdale, Flesherton, Eugenia, Kimberley and Amik.

2. GENIVAR presented previously completed figures from the year 2000 for a Service Study for expansion of the Kimberley-Amik-Talisman Water Distribution System, which was originally paid for by Beaver Valley Ski Club. It was noted that an application (January 2001) to complete work for water services for the Beaver Valley Ski Club area was originally to be submitted under the OSTAR Grant, however it was withdrawn due to the Walkerton incident, as money was then available for water treatment plant upgrades to meet new regulation requirements.

3. It was noted by GENIVAR that a survey of homes in Beaver Valley was completed in 2000. Bacteriological samples were taken from many wells and inspections of holding tanks were performed. It was noted that a substantial number of wells had water which did not meet drinking water requirements.

Action by

4. It was noted by GENIVAR that the highest elevation in the areas including Markdale, Flesherton, Eugenia, Kimberley and Amik is approximately 440 m, in comparison to the existing base of the water tower in Markdale at approximately 438 m. It was noted by Grey Highlands that the Flesherton School may be higher in elevation at approximately 445 m, but this would have to be verified. — GENIVAR

5. There was discussion concerning the potential to provide a looped system around Eugenia Lake to the other side for connection to Kimberley.

6. Ross Slaughter indicated and showed maps that servicing the Beaver Valley Ski Club area with a communal sewage system treatment at an upgraded Amik WWTP was investigated in 2001.

7. GENIVAR recommended that from a sewage treatment perspective, the existing three (3) sewage treatment plants in Markdale, Flesherton and Kimberley should remain and be utilized rather than one (1) common sewage treatment plant for all areas.

8. The capacity of the three (3) sewage treatment plants was discussed. There is an existing capacity issue at the Markdale Sewage Treatment Plant, as well as the Amik Sewage Treatment Plant (when Talisman is in operation). In regards to the Flesherton Sewage Treatment Plant, there is capacity left, which could likely treat some sewage from Eugenia directed back to Flesherton.

9. Potential re-zoning along Highway 10 from Markdale to Flesherton, whereby future expansion of commercial, residential and industry along this road could be substantial.

10. The following was a preliminary discussion regarding phasing for water and sewage servicing.

    - Phase 1 should include expansion of trunk watermain along Grey Road 30 to Bowls Bluff Road, including the required work for a new water tower in Markdale, as well as potential for a sewage forcemain/pumping station from Bowls Bluff to Markdale (rather than sewage being provided to Amik).

    - Phase 2, a trunk watermain from Markdale to Flesherton would be completed.

Action by

- Phase 3, watermain expansion from Flesherton to Eugenia and potentially looping around Eugenia Lake would be completed.

11. Ross Slaughter indicated that a Regional Study would include hydraulic network modelling and a population study to correctly size the water and sewage systems.

12. The Municipality requested that GENIVAR re-submit a work plan and cost estimate for completing a Regional Water and Wastewater Master Plan as well as a timeline. — GENIVAR

13. The cost estimate and timeline for the Regional Study should be provided to the municipality prior to the March 28, 2011 Council meeting. The municipality has requested that GENIVAR provide a presentation to Council on March 28, 2011, at 1:00 p.m. concerning the proposed Regional Study. — GENIVAR

14. GENIVAR is to provide the Municipality of Grey Highlands pdf's of the figures presented at today's meeting. — GENIVAR

15. The meeting ended at approximately 5:00 p.m.

Prepared by:

GENIVAR Inc.

Chris S. Wilson, P. Eng.
Environmental Engineer
CSW/lem

GENIVAR

MEETING SUMMARY

Water & Wastewater Master Servicing Plan for Markdale-Flesherton-Kimberley-Amik-Eugenia, Municipality of Grey Highlands

Review of Preliminary Information

111-13229-00

Date:	October 13, 2011	**Project:**	111-13229-00
Time:	10:15 a.m.	**Location:**	GENIVAR Inc., Owen Sound Office
Attendees:	Dan Best, CAO		Municipality of Grey Highlands
	Shawn Moyer, Director of Public Utilities		Municipality of Grey Highlands
	Ross Slaughter, P. Eng.		GENIVAR Inc.
	Chris Wilson, P. Eng.		GENIVAR Inc.
Distribution:	All Present		
Prepared By:	Chris Wilson, P. Eng.		

The following items were discussed with regard to the Master Plan for Water and Wastewater Servicing Master Plan, Markdale-Flesherton-Kimberley-Amik-Eugenia, Municipality of Grey Highlands:

	Action by:
1. There was discussion concerning parameters of the master plan that would have to be finalized to proceed further. These items include 1) population increase percent per year, 2) population per equivalent residential unit and 3) phasing options for both water and wastewater servicing.	
2. The municipality requested that a review be completed concerning drilling wells in Flesherton (Beaver Valley watershed).	GENIVAR
3. There was discussion concerning decommissioning of the water treatment plant at Amik, keeping the existing reservoir, and the potential for providing a booster pumping station at the same location.	
4. The municipality requested that GENIVAR review the idea of not having a trunk watermain under Phase 1-3 travelling down Grey Road 30 to connect to Grey Road 13 in Kimberley. Instead, the trunk watermain could follow the 7th Line, up to and along Sideroad 7A towards the Talisman Mountain Resort and proceed back behind the escarpment, north to connect into Amik.	GENIVAR
5. GENIVAR is to review the social issues of the Beaver Valley watershed and the Rocky Saugeen watershed both being utilized as water sources.	GENIVAR

6. A review was completed of the projected population growth for Grey Highlands as per the Growth Management Study Report, April 2008 and Amendment No. 80 of the County of Grey Official Plan, February 2009. As per both plans, the average annual growth increase is estimated at 1.26% and 1.38% respectively. Based on preliminary calculations completed by GENIVAR, a 1% annual growth rate was utilized. Based on discussions with the municipality, it was felt that the 1% annual growth rate was more favourable and would be utilized in the Master Plan.

7. A review was completed to select a population per equivalent residential unit for utilizing in the Master Plan. Based on calculations completed by GENIVAR, 3.0 persons per household was utilized. Through review of municipal records for 2006 for the number of households and population in Grey Highlands, official numbers were 9,480 people per 5,142 homes or approximately 1.84 persons per household. Through discussion, it was decided to use a number of 2.2 persons per household to provide a buffer for varying types of future development.

8. There was discussion concerning the L/capita/day value to be utilized for the Master Plan. Calculations completed by GENIVAR allowed for 450 L/capita/day, whereby approximately 15% of the value was allowed for leakage, etc. Through discussion with the municipality, this value was left the same to help balance out the reductions in the population per equivalent residential unit of 2.2 and the 1% population growth selected.

9. As per request by the municipality, an additional Alternative #3 for sewage servicing would be added. This alternative is the same as Alternative #2 except Phase 1-4 was deleted and will not be serviced. Phase 1-3 will also provide sewage to the existing Amik wastewater treatment facility. GENIVAR

10. As per request by the municipality, an additional Alternative #5 for water servicing would be added. Under this alternative, water would be provided from Markdale to Phase 2-3, Phase 1-4, Phase 1-3 and Phase 1-2 to Kimberley. The existing Kimberley water treatment plant would be decommissioned. Flesherton would provide water to Phase 2-4 all of Eugenia to Phase 3-4. GENIVAR

11. As per discussion, GENIVAR is to look at the option of a mechanical plan for sewage treatment at Amik. GENIVAR

12. It was discussed that the next meeting with the municipality will be on Thursday, November 17, 2011 from 10:00 a.m. to approximately 2:00 p.m. Information will be provided to the municipality prior to the meeting on November 10, 2011. Modifications to the information after the meeting will be completed for the Council meeting on December 5, 2011.

13. The meeting adjourned at 1:00 p.m.

Prepared by:

GENIVAR Inc.

Chris S. Wilson, P. Eng.
Environmental Engineer
CSW/lem

GENIVAR

MEETING SUMMARY

Water and Wastewater Master Servicing Plan for Markdale – Flesherton – Kimberly – Amik – Eugenia, Municipality of Grey Highlands

Review of Draft Master Servicing Plan and Proposed Revisions

111-13229-00

Date:	January 23, 2012	**Project:**	111-13229-00
Time:	1:00 p.m.	**Location:**	Municipal Office, Municipality of Grey Highlands
Attendees:	Wayne Fitzgerald, Mayor		Municipality of Grey Highlands
	Paul McQueen, Deputy Mayor		Municipality of Grey Highlands
	Dan Best, CAO		Municipality of Grey Highlands
	Dave Clarke, Councillor		Municipality of Grey Highlands
	Dave Kell, Councillor		Municipality of Grey Highlands
	Stewart Halliday, Councillor		Municipality of Grey Highlands
	Paul Allen, Councillor		Municipality of Grey Highlands
	Lynn Silverton, Councillor		Municipality of Grey Highlands
	Debbie Robertson, Clerk		Municipality of Grey Highlands
	Shawn Moyer, Director of Public Utilities		Municipality of Grey Highlands
	Ross Slaughter, P. Eng.		GENIVAR Inc.
	Chris Wilson, P. Eng.		GENIVAR Inc.
Distribution:	All Present		
Prepared By:	Chris Wilson, P. Eng.		

The following items were discussed with regard to the Master Plan for Water and Wastewater Servicing for Markdale – Flesherton – Kimberly – Amik – Eugenia, Municipality of Grey Highlands, during the Committee of the Whole Meeting at the Municipal Office of Grey Highlands, January 23, 2012.

Item	Description	Action By:
1.	There was discussion concerning GENIVAR's presentation for the Master Plan. The presentation for the public meeting should be updated to a "black and white" format so the information will stand out clearer and be more readable.	GENIVAR
2.	The selected water and wastewater alternatives by Council are Alternative W.6 for water servicing and S.4 for sanitary sewer servicing.	
3.	Additional costing for potential Niagara Escarpment Commission (NEC) approval is to be included in the cost estimates for the selected water/wastewater Master Plan alternatives.	GENIVAR

Item	Description	Action By:
4.	As per comments from Council, the costs for the new proposed water tower for Phase 1-1 should be split between existing residents and future development within the first 20 years.	
5.	As per the selected water servicing alternative W.6, revised cost estimates are to be completed for only Phase 1 only, which includes individual cost estimates for Phase 1-1 to Phase 1-5.	GENIVAR
6.	As per Council's request, a cost estimate is to be provided for extending the 300 mm dia. trunk watermain from Phase 1-1 to Grey Road 30 (within Phase 1-4).	GENIVAR
7.	As per the selected sanitary servicing alternative S.4, revised cost estimates are to be completed for only Phase 1 only, which includes individual cost estimates for Phase 1-1 to Phase 1-5 (Phase 1 – 4 not to be completed).	GENIVAR
8.	As per Council's request, Phase 1-1 in Markdale will be broken down into Phase 1-1 for Markdale itself and Phase 1-1A for units within the Municipality of West Grey, adjacent to Markdale.	GENIVAR
9.	A different route for the proposed sanitary sewer line after the proposed sewage pumping station No. 2 is to be reviewed (as per Figure 8.2).	GENIVAR
10.	Costing is to be reviewed concerning providing a trunk sewage main along the easement from Bowles Bluff Road and Windy Lane Drive, to Beaver Tail, instead of the current route selected.	GENIVAR
11.	All cost estimates are to be revised to include servicing to individual lots including 200 mm dia. distribution watermain, sanitary sewer, services, valves and hydrants.	GENIVAR
12.	A draft outline of Recommended Sewage and Water Servicing for Phase 1 (with the above listed modifications included), is to be provided to Council for review by February 17, 2012.	GENIVAR

Prepared by:

GENIVAR Inc.

Chris S. Wilson, P. Eng.
Environmental Engineer
CSW/mmo/lem

GENIVAR

AGENDA

Water and Sewage Servicing Master Plan and Optimization
Markdale Wastewater Treatment Plant
Municipality of Grey Highlands

Project #'s 111-13228-00 and 111-13229-00

Owen Sound Offices of GENIVAR Inc.
Wednesday, August 15, 2012 @ 10:30 a.m.

1. Overview and status of Water and Sewage Master Plan for the Municipality of Grey Highlands.

    - Overall Master Plan – Phases 1, 2 and 3
    - Priority Phase 1

2. Description of new aeration equipment installed at the Markdale Wastewater Treatment Plant in 2011 and 2012 – Blue Frog System.

3. Optimization of the Markdale Wastewater Treatment Plant.

4. Class EA requirements for optimization of the Markdale Wastewater Treatment Plant.

5. Further work to be carried out in the Master Plan for Approval of the optimization of the Markdale Wastewater Treatment Plant?

6. Discussion of the planning process for the Beaver Valley – What kind of planning is required for Beaver Valley?

7. Expansion of the Amik Wastewater Treatment Plant.

8. Plans for re-use of the Talisman Resort and developable area.

9. Other Business.

OWEN SOUND 1450 1st Avenue West, Suite 101, Owen Sound, Ontario N4K 6W2 Tel.: (519) 376-7612 Fax: (519) 376-8008

GENIVAR

MEETING SUMMARY

Water and Sewage Servicing Master Plan and Optimization for Markdale Wastewater Treatment Plant, Municipality of Grey Highlands

111-13228-00 and 111-13229-00

Date:	Wednesday, August 15, 2012	**Project:**	111-13228-00 and 111-13229-00
Time:	10:30 a.m.	**Location:**	Owen Sound office of GENIVAR Inc.

Attendees:		
	Dan Best, CAO	Municipality of Grey Highlands
	Shawn Moyer, Director of Public Utilities	Municipality of Grey Highlands
	Ian Mitchell, P.Eng., District Engineer	Ministry of the Environment
	Shiraz Khimji, P.Eng., Senior Water Engineer	Ministry of the Environment
	Scott Abernethy, Surface Water Evaluator	Ministry of the Environment
	Scott Taylor, Planner	County of Grey
	Rick Watt	Niagara Escarpment Commission
	Bill Armstrong, Environmental Planner	Ministry of the Environment
	Ross Slaughter, P. Eng.	GENIVAR Inc.
	Chris Wilson, P. Eng.	GENIVAR Inc.

Distribution: All Present

Prepared By: Chris Wilson, P. Eng.

The following items were discussed with regard to the Water and Sewage Servicing Master Plan for the Markdale – Flesherton – Kimberly – Amik – Eugenia areas, Municipality of Grey Highlands, plus Optimization of the Markdale Wastewater Treatment Plant.

Item	Description	Action By:
1.	There was general consensus that the Water and Wastewater Servicing Master Plan should be organized more clearly to define existing water and wastewater servicing infrastructure in comparison to proposed future water and wastewater servicing infrastructure. There was general consensus that water and wastewater infrastructure growth mapping in the Master Plan should match the Official Plans for the County of Grey, Niagara Escarpment Commission and the Municipality of Grey Highlands including approved and draft approved lots.	GENIVAR
2.	As per comments from the County of Grey, growth in the Phase 1.4 area of the Master Plan along Grey Road 30 (between Markdale and Beaver Valley) is not a priority. It was noted by GENIVAR that the trunk watermain as proposed along this stretch is the "spine" to provide treated water to Kimberley-Amik from Markdale. With treated water provided from Markdale, the municipality would discontinue the operation of the existing water treatment plant at Kimberley due to high operational costs. However, the existing water storage would be maintained for additional treated water storage.	

Item	Description	Action By:
3.	There was general consensus that the Master Plan should be revised to include greater explanation of the "need" for the proposed future water and wastewater servicing infrastructure in the Master Plan. There was general consensus that the Master Plan should provide a Work Plan broken down into three (3) main components including "need and vision", "servicing" and "effects" (e.g. environment, etc.) It was also noted that the Master Plan could more specifically show the steps of the plan, over 5, 10 and 20 year periods, showing components within each stage.	GENIVAR/GREY HIGHLANDS
4.	It was noted by the municipality that Phase 1 of the Master Plan is priority, which includes a proposed new water tower in Markdale (defined as the "crux" of the project).	
5.	It was noted by the municipality that the greater Toronto area is very close to Flesherton and Markdale (1.5 hours). The need for expansion could reach the Flesherton and Markdale area due to other local areas such as Orangeville and Shelburne being almost at their limit for expansion.	
6.	There was general discussion regarding the existing Markdale Wastewater Treatment Plant. There were comments concerning Chapman's Ice Cream wastewater quantities. It was noted by the municipality that no design information is available for the most recent upgrades to Chapman's "in-house" wastewater treatment plant. It was noted however that Chapman's does have an SBR, which discharges approximately 4 to 5 times a day in batches to the municipal sewage system in Markdale.	
7.	It was noted by the municipality that Chapman's Ice Cream is proposing an expansion to their existing facilities in regards to a new process line by the end of 2012. As a requirement, the municipality would request the Design Brief for the additional treatment as well as design flows, loadings, etc., which could affect the operation of the wastewater treatment plant.	GREY HIGHLANDS
8.	There was discussion concerning Class EA requirements for the optimization of the Markdale Wastewater Treatment Plant. As per comments from the Ministry of Environment, the optimization would require a Schedule B Class EA, which would be part of the Master Plan. It was noted by Bill Armstrong that the optimization of the Markdale Wastewater Treatment Plant would be "in the box", therefore not a Schedule C Class EA, even though the existing capacity would be increased. It was also noted by Bill Armstrong that the EA document must be complete and accepted before a design brief for the optimization can be submitted to the Ministry of the Environment to amend the existing CofA.	GENIVAR/GREY HIGHLANDS
9.	It was noted by the municipality that monitoring well data, from wells adjacent to the Rapid Infiltration Basins at the Markdale Wastewater	GENIVAR/GREY

Item	Description	Action By:
	Treatment Plant, is available and can be provided to the Ministry of the Environment. During discharges to the Rapid Infiltration Basins from Cell #2, surface water quality sampling was also completed upstream and downstream on the Rocky Saugeen River.	HIGHLANDS
10.	It was noted that a new CofA amendment for the Markdale Wastewater Treatment Plant has been in place since May 2012, which corrected an error in the shown loading limits. The loading limits have been corrected as per the amendment. It was noted that the loading limits relate to the effluent prior to leaving Cell #2, and not to effluent received at the Rapid Infiltration Basins.	
11.	Existing data for effluent from Cell #2 to the Rapid Infiltration Basin shows low phosphorus values in the range of 0.2 mg/L, much lower than the loading limit of 1.0 mg/L.	
12.	GENIVAR provided a table to all attending the meeting, which noted potential optimization options for the Markdale Wastewater Treatment Plant. These included providing additional aeration treatment in the lagoon cells to increase their hydraulic capacity from 1,122 m^3/day (current) to approximately 1,412 m^3/day. As well, a second option was noted to increase the hydraulic capacity to 1,720 m^3/day, which includes discharge to the Rapid Infiltration Basins during the winter period. The municipality noted that it like to proceed with the second option for continuous year round discharge to the Rapid Infiltration Basins at the estimated increased rate of 1,720 m^3/day. There was general consensus at the meeting that data must be provided and presented in the Master Plan to make the case for the "need" for increasing the capacity and to year round discharge.	GENIVAR/GREY HIGHLANDS
13.	It was noted that when CofA amendments are applied for the optimization of the Markdale Wastewater Treatment Plant, it should be noted that Shiraz Khimji was involved in this initial meeting for discussion of the proposed optimization options.	GENIVAR
14.	It was noted that the Municipality of Grey Highlands will have to initiate a meeting with the four (4) local First Nations for discussion of the Master Plan to satisfy the Master Plan requirements. These First Nations including the Saugeen First Nation, Chippewas of Nawash Unceded First Nation, Historic Saugeen Metis and Great Lakes Metis Council. It was noted that Bill Armstrong would be also contact these First Nations for discussion of the Master Plan.	GREY HIGHLANDS/GENIVAR
15.	There was discussion concerning the issue of the Provincially Significant Wetland Area (as noted on Grey County plans), which overlaps the existing property of the Amik Wastewater Treatment Plant. A small portion of Provincially Significant Wetland crosses Grey Road 7 onto the Amik Wastewater Treatment Plant site. The overlap is within the approved free water surface wetland component of the plant. It was noted by Grey County that GENIVAR must contact the Ministry of Natural Resources in Owen Sound (Mr. Shawn Currie) concerning this	GENIVAR

Item	Description	Action By:
	issue. The County of Grey will consider the area a Provincially Significant Wetland unless otherwise told by the Ministry of Natural Resources.	
16.	There was discussion concerning the Amik Wastewater Treatment Plant in regards to the already approved CofA modifications to increase capacity (not completed to date). It was noted that the current CofA allows for upgrades to the existing facility to increase capacity from 249 m^3/day to 431 m^3/day. It was noted by the municipality that three (3) streams flow through the existing Spray Irrigation Area to the free water surface wetland of the Wastewater Treatment Plant and finally across Grey Road 7 to the adjacent Provincially Significant Wetland. These streams are monitored by the municipality when flow is available (some streams dry up during a portion of year). This information should be provided in the Master Plan. As well, more details should be provided in relation to proposed upgrades, including details regarding potential tertiary treatment requirements.	GENIVAR/GREY HIGHLANDS
17.	It was noted that a P3 Infrastructure Grant Application has been applied for approximately $43 million for completion of Phase 1 of the Master Plan, which includes primary water distribution and sewers only. A copy of the P3 application will be provided to all attendees of this meeting.	GENIVAR
18.	It was also noted that a CIIF Grant for the proposed new water tower in Markdale, as documented in the Master Plan, is currently being drafted by the Municipality of Grey Highlands for submittal.	GREY HIGHLANDS

Meeting ended at approximately 2:30 p.m.

If there are any errors or omissions with regard to these minutes, please contact the undersigned.

Prepared by:

GENIVAR Inc.



Chris S. Wilson, P. Eng.
Environmental Engineer
CSW/lem

Water & Wastewater Servicing Master Plan

Markdale – Flesherton – Kimberley – Amik – Eugenia – Beaver Valley Municipality of Grey Highlands

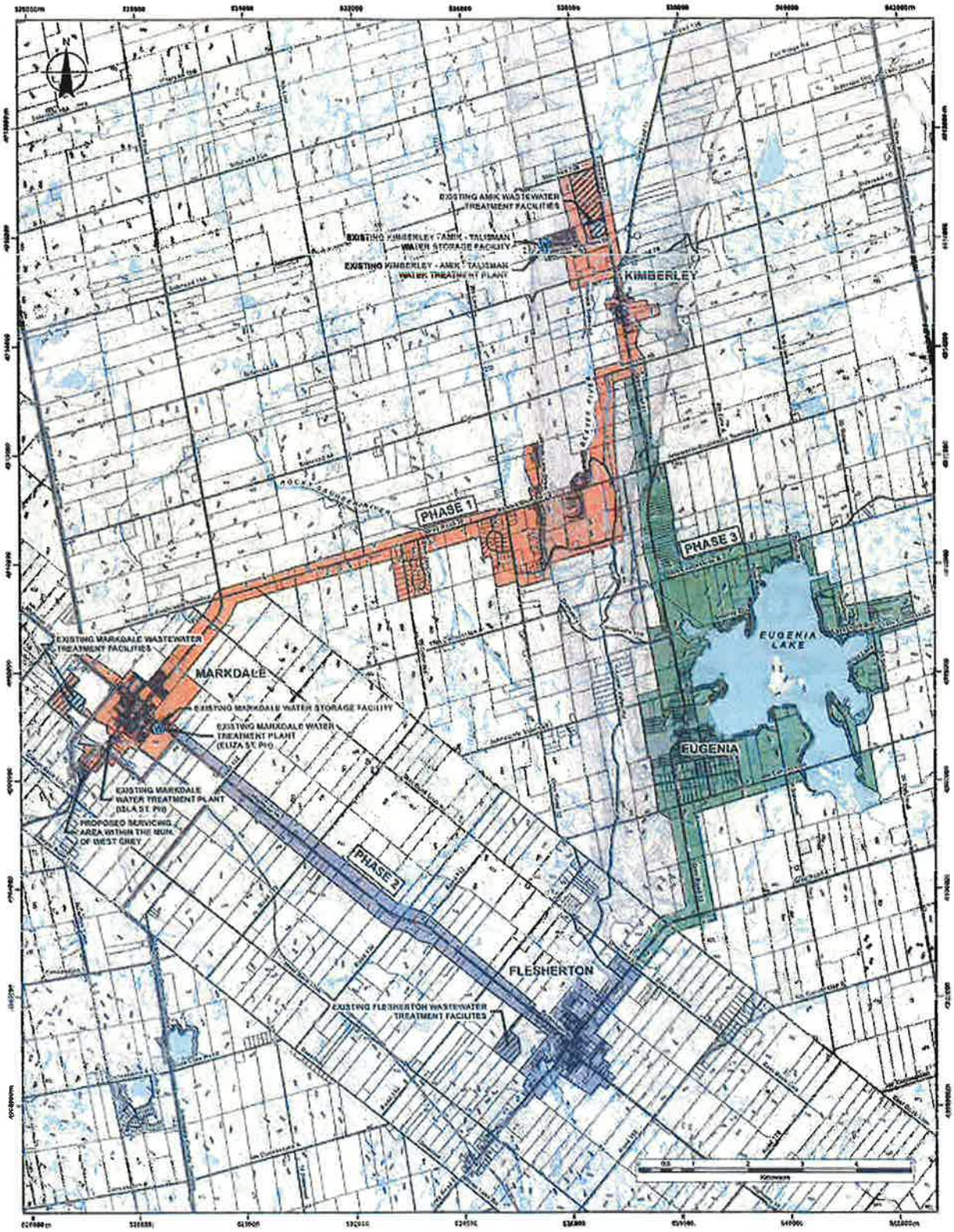
December 12, 2011
Presentation to Council

GENIVAR

Presented by: Ross Slaughter, P. Eng.



111-13229-00



LEGEND

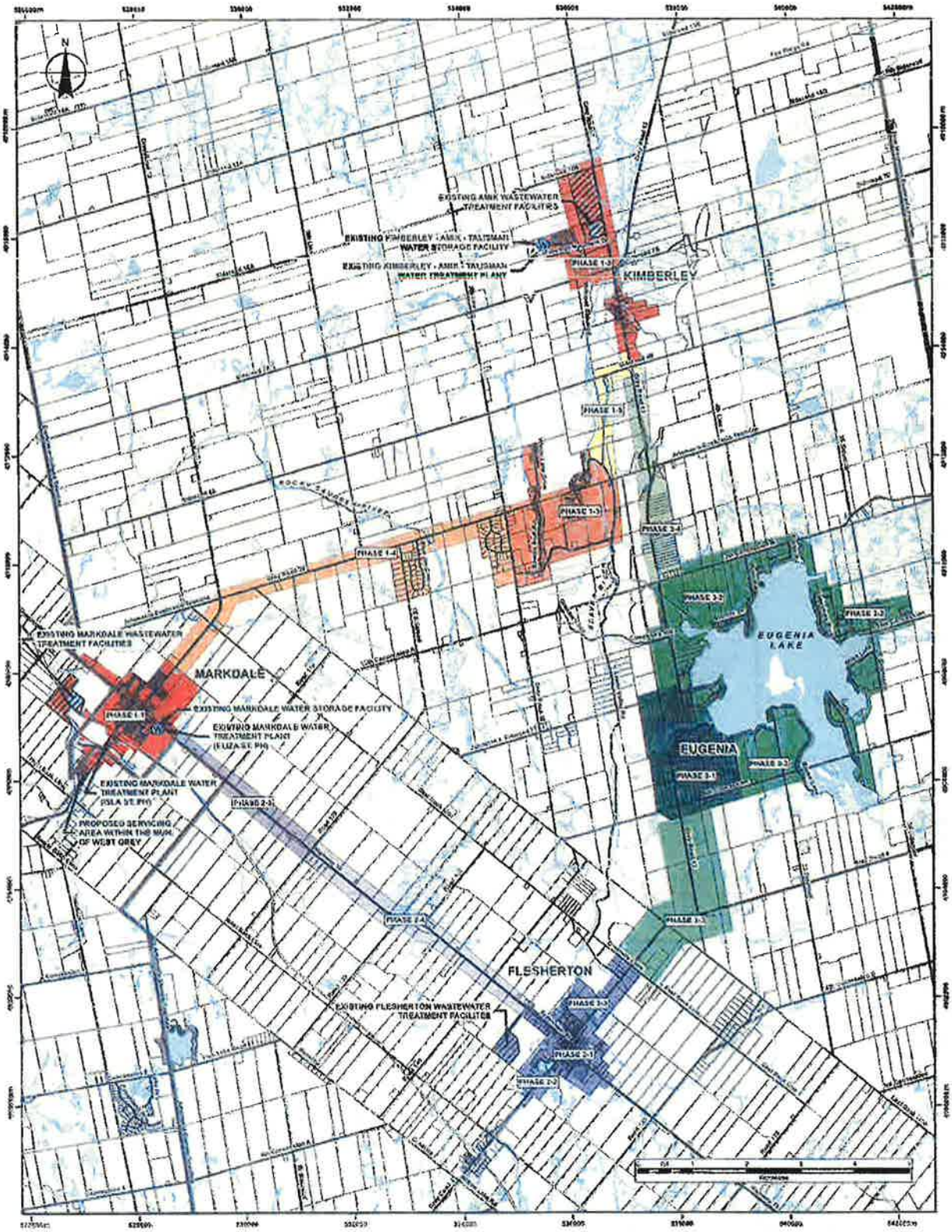
WATER AND WASTEWATER SERVICING MASTER PLAN - MUNICIPALITY OF GREY HIGHLANDS

Property Parcel Description	Parcel Owned by the Servicing Phases			
	Phase 1 (Short-term to Medium-term)	Phase 2 (Medium-term to Medium-term)	Phase 3 (Long-term)	Total # of Allocations
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

Existing Water and Sewage Facilities

Facility	Location	Design Capacity (m^3/day)
Water Treatment	Markdale - Isla Street PS - Well#1 - Eliza Street PS - Well#3 - Well#4	 2,619 2,291** 1,080
	Kimberley Amik-Talisman Water Treatment Plant	1,185
Water Storage	Markdale (Standpipe adjacent to Eliza Street PS)	1,861 (usable storage)
	Kimberley Amik-Talisman (Storage Tanks below WTP)	870
Sewage Treatment	Markdale Wastewater Treatment Plant	1,122
	Flesherton Wastewater Treatment Plant	419
	Amik-Talisman Wastewater Treatment Plant	249***

*Chapmans fire occurred
** Reduced capacity of 2,291 m^3/day until well fully developed to 2,782 m^3/day
*** Future upgraded capacity 431 m^3/day



LEGEND

PROPOSED SERVICING PHASING AREA

PHASE 1

PHASE 2

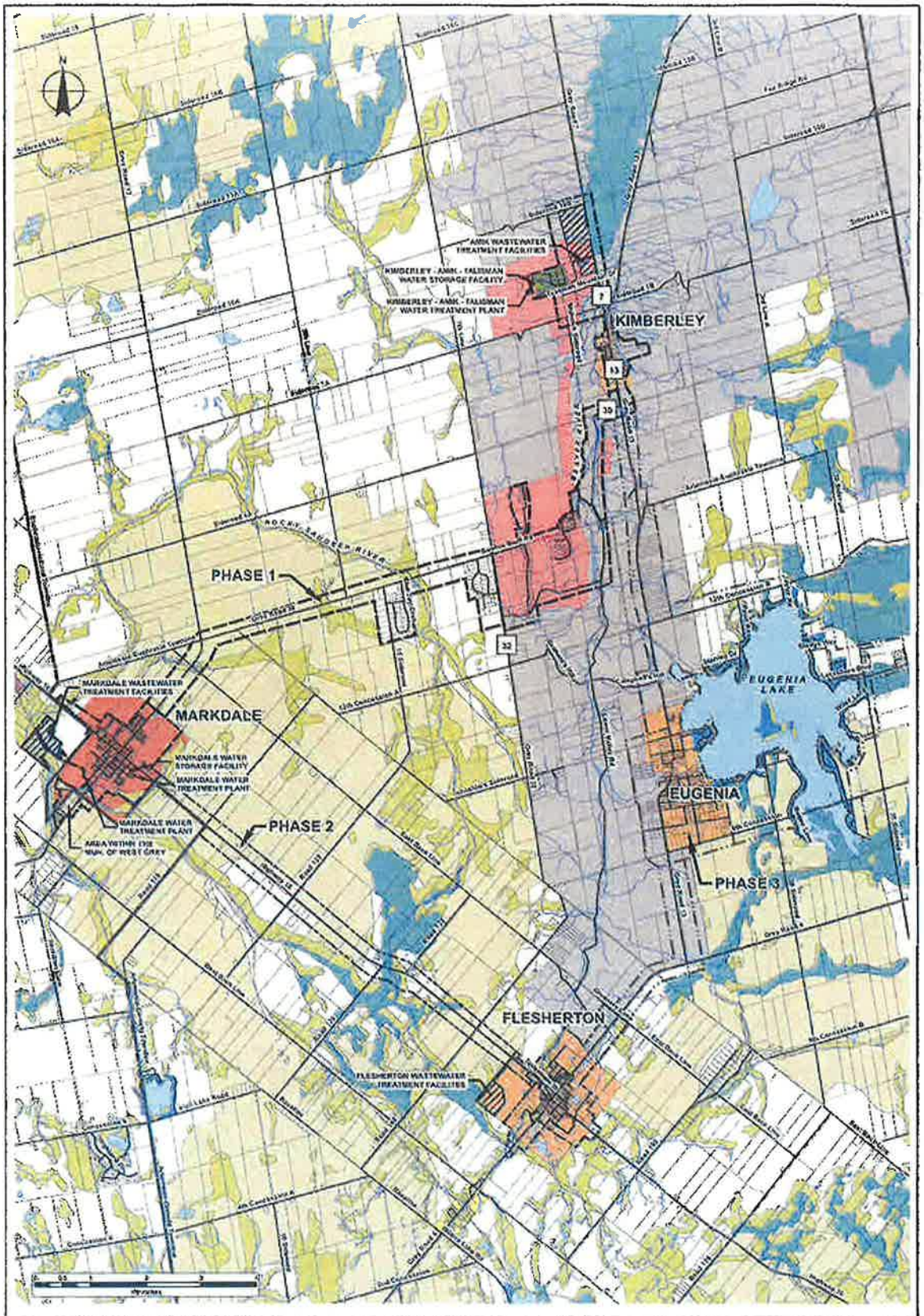
PHASE 3

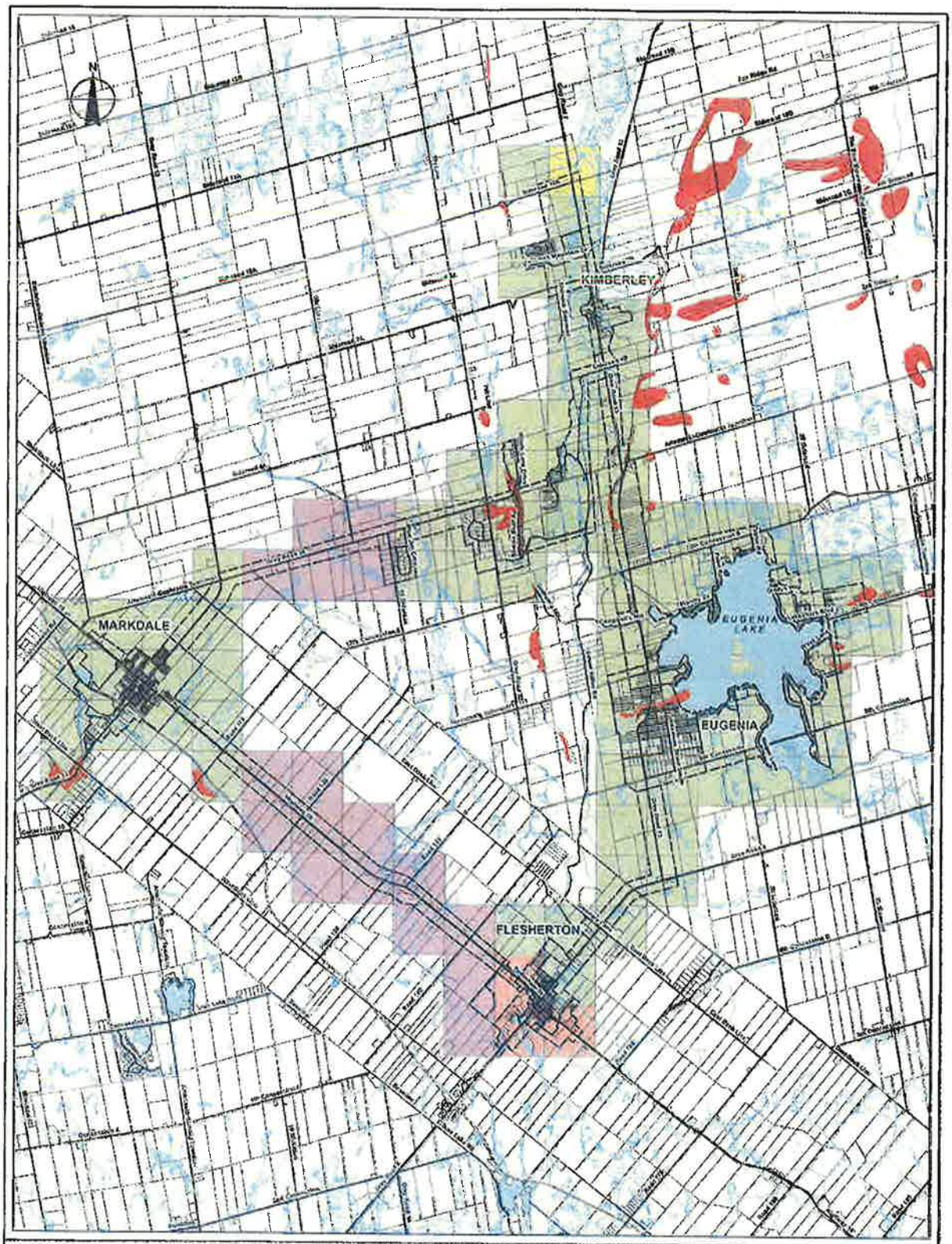
PROPOSED SUB-AREAS FOR SERVICING
WATER & WASTEWATER SERVICING MASTER PLAN
MUNICIPALITY OF GREY HIGHLANDS

PROJECT	111-13229-00
DATE	NOV / 2011
SCALE	1:85,000
DRAWN	JET
APPROVED	CW/MRS

GENIVAR

FIGURE 2.2


AMIK WASTEWATER TREATMENT FACILITIES
KIMBERLEY - AMIK - FALISMAN WATER STORAGE FACILITY
KIMBERLEY - AMIK - FALISMAN WATER TREATMENT PLANT
KIMBERLEY
PHASE 1
MARKDALE WASTEWATER TREATMENT FACILITIES
MARKDALE
MARKDALE WATER STORAGE FACILITY
MARKDALE WATER TREATMENT PLANT
MARKDALE WATER TREATMENT PLANT
AREA WITHIN THE MUN. OF WEST GREY
PHASE 2
EUGENIA LAKE
EUGENIA
PHASE 3
FLESHERTON
FLESHERTON WASTEWATER TREATMENT FACILITIES
LEGEND
PROPOSED SERVICE AREA/PHASE
PHASE 1
PHASE 2
PHASE 3
MUNICIPAL WATER/WASTEWATER MAIN LINES
MUNICIPAL BOUNDARY
PRIMARY/BY PASS LT.
WATERBODY
LAND USE DESIGNATIONS*
Agricultural
Rural
Primary Settlement Area
Secondary Settlement Area
Tertiary Settlement Area
Special Policy Area (including)
Niagara Escarpment Plan Area
Escarpment Protection Area
Recreation Resort Area
Inland Lakes and Shoreline
Provincially Significant Wetlands
Natural Lands
LAND USE DESIGNATIONS
WATER AND WASTEWATER SERVICING MASTER PLAN
MARKDALE - FLESHERTON- KIMBERLEY - AMIK - EUGENIA - BEAVER VALLEY
MUNICIPALITY OF GREY HIGHLANDS
PROJECT: 113-13230-00
DATE: NOV 2015
SCALE: 1:65,000
DRAWN: JBT
APPROVED: CW/MZ9
GENIVAR
FIGURE NO. 3.1



LEGEND

- PROPOSED SERVICE AREA
- KARST
  - KNOWN KARST

Natural Heritage Species at Risk Within Proposed Service Area

- BUTTERNUT
- HART'S-TONGUE FERN
- MILKSNAKE
- NORTHERN MYOTIS

0 0.5 1 2 3 4
Kilometres

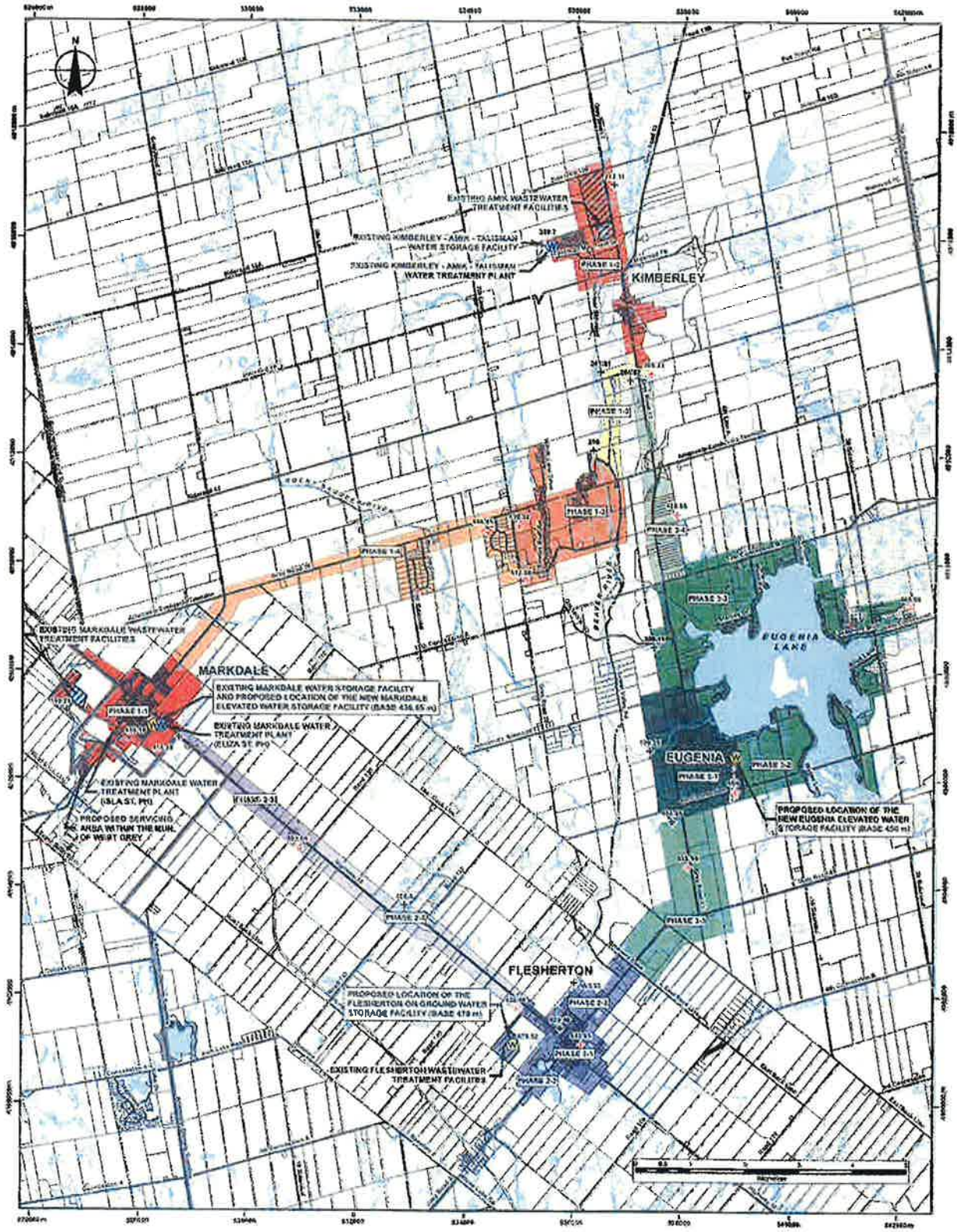
DATA SOURCES: Land Information Ontario Digital data licensed from Ministry of Northern Development and Mines, copyright the Queen's Printer for Ontario. All rights reserved. For more information, please visit www.mndm.gov.on.ca/mndm/lio_e.htm. Ontario Ministry of Natural Resources, Ontario Geological Survey. Bedrock Resource Areas, Ontario Geological Survey, Special Publication 5, Publication Date: October 2011. Ontario Ministry of Natural Resources, Ontario Geological Survey.

KARST AREAS AND NATURAL HERITAGE SPECIES AT RISK
WATER AND WASTEWATER SERVICING MASTER PLAN
MUNICIPALITY OF GREY HIGHLANDS

GENIVAR

GENIVAR INC
HEADFIRST AVE. WEST, SUITE 101
OWEN SOUND, ONTARIO N4K 6W2

Design	CW/MS
Drawn	JET
Check	CW/MS
Date	NOV. 2013
Scale	SEE SCALE BAR
Project	131-13249-00
Figure	3.2



LEGEND

PROPOSED SERVICING PHASE AREA

PHASE 1

PHASE 2

PHASE 3

POTENTIAL LOCATION FOR NEW WATER STORAGE FACILITIES. WATER & WASTEWATER SERVICING MASTER PLAN MUNICIPALITY OF GREY HIGHLANDS

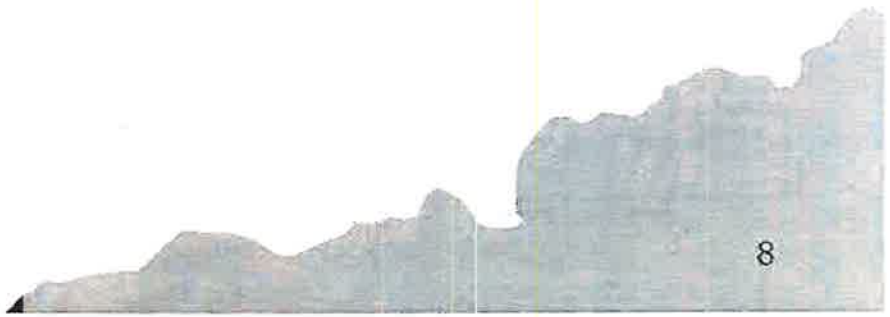
PROJECT	111-13229-00
DATE	NOV/2014
SCALE	1:65,000
DRAWN	JET
APPROVED	CW/MRS

GENIVAR

FIGURE 6.2

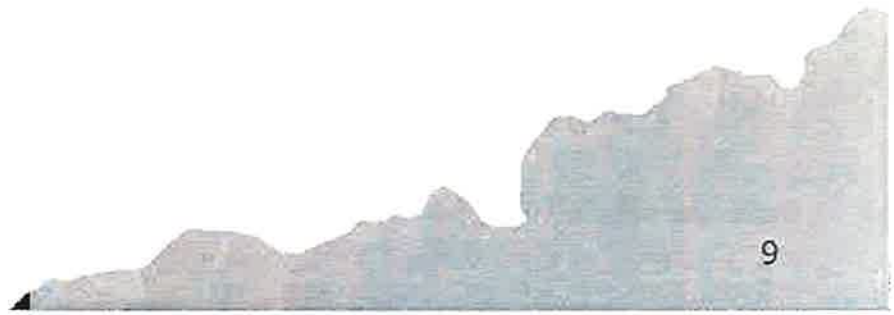
Water Supply Facilities Considered in Study

- Markdale Water Treatment Plant – two (2) new wells and new treatment pumping stations
- Flesherton – two (2) new wells and water treatment plant/pumping station
- Kimberley-Amik-Talisman – use existing water treatment plant, no expansion considered
- Eugenia – two (2) new wells and water treatment plant/pumping station



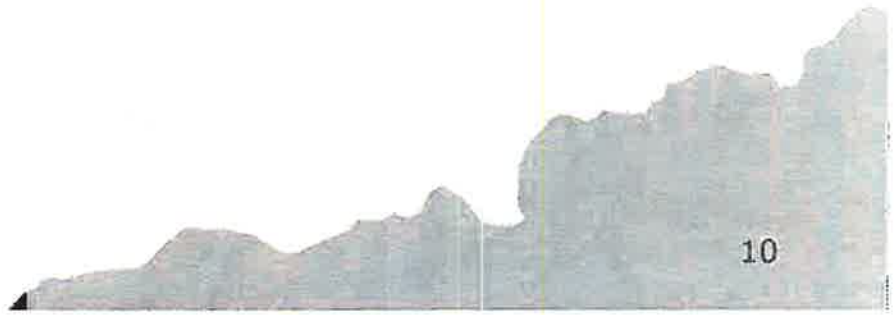
Water Storage Facilities Considered in Study

- Markdale Water Storage Facility - Existing facility to be demolished and elevated storage facility constructed on a concrete pedestal, which is higher and has more storage.
- Flesherton – new on-ground glass fused-to-steel water storage facility at existing Flesherton WWTP site.
- Kimberley-Amik-Talisman – use existing concrete inground water storage facility, no expansion.
- Eugenia – new elevated water storage facility.



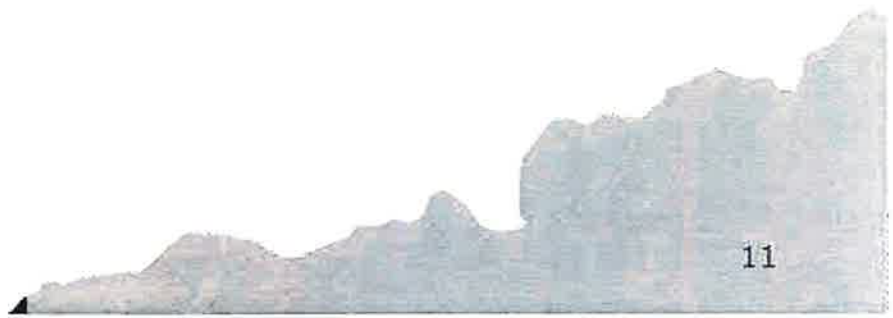
Water Distribution Facilities Considered in Study

- Water Distribution – maximum 300 mm diameter trunk watermains utilized due to potential water quality problems.
- Booster stations where necessary.
- Pressure reducing valves will reduce pressure going down the escarpment into the Beaver River Valley.



Facilities Considered in Study for Sewage Treatment

- Only the existing wastewater treatment plants were considered for upgrading and no new locations for wastewater treatment plants were considered.
- **Markdale** – WWTP Expansion of aerated lagoons and Rapid Infiltration Basins. Winter storage still required.
- **Flesherton** – WWTP Expansion of extended aeration system including addition of membrane filtration.
- **Amik WWTP** – Upgrading of aeration lagoons to continuous aeration all year with new control building, phosphorus removal, increased capacity of polishing lagoon cell #1, discharge of treated sewage into existing wetland for treatment on a continuous basis.
- Sewage Pumping Stations, forcemains and low pressure sanitary sewers where required.



Existing and Future Population and Residential Equivalent Units

	Existing		Total in 20 Years		Total in 50 Years	
	No. of Residential Equivalent Units	Population Equivalent	No. of Residential Equivalent Units	Population Equivalent	No. of Residential Equivalent Units	Population Equivalent
TOTAL PHASE I	1689	3171	3221	7086	4252	9354
TOTAL PHASE II	288	634	680	1496	807	1775
TOTAL PHASE III	0	0	1104	2429	1489	3276
TOTAL PHASES I, II and III	1977	4351	5005	11011	6548	14406

* Used proposed development and increased usage for Chapman's Ice Cream for 20 yr projection.
1% growth per year for the 20 yr to 50 yr population projection plus Chapman's Ice Cream.

Existing and Future Water Demands

	Existing	20 Year	50 Year
	Average Day Water Demand	Average Day Water Demand	Average Day Water Demand
TOTAL PHASE I	1387	2873	3884
TOTAL PHASE II	0	481	607
TOTAL PHASE III	0	1093	1473
TOTAL PHASES I, II and III	1387	4447	5964

Existing and Future Sewage Flows

	Existing Estimated Sewage Flow (m^3/day)	20 Year Estimated Sewage Flow (m^3/day)	50 YearEstimated Sewage Flow (m^3/day)
TOTAL PHASE I	1205	2722	3743
TOTAL PHASE II	174	461	607
TOTAL PHASE III	0	1093	1473
TOTAL PHASES I, II and III	1379	4296	5823

Water System Alternative Solutions

- Alternative 1 – Markdale Water Treatment Plant and Kimberley-Amik-Talisman Water Treatment Plant
- Alternative 2 – Markdale Water Treatment Plant, Kimberley-Amik Water Treatment Plant, New Flesherton Water Treatment Plant and New Eugenia Water Treatment Plant
- Alternative 3 – Markdale Water Treatment Plant, Kimberley-Amik Water Treatment Plant, and New Eugenia Water Treatment Plant
- Alternative 4 – Markdale Water Treatment Plant, Kimberley-Amik Water Treatment Plant, and New Flesherton Water Treatment Plant
- Alternative 5 – Markdale Water Treatment Plant and New Eugenia Water Treatment Plant
- Alternative 6 – Markdale Water Treatment Plant and New Flesherton Water Treatment Plant
- Alternative 7 – Markdale Water Treatment Plant
- Alternative 7A – Markdale Water Treatment Plant (Includes proposed trunk watermain connection west of existing Kimberley WTP)

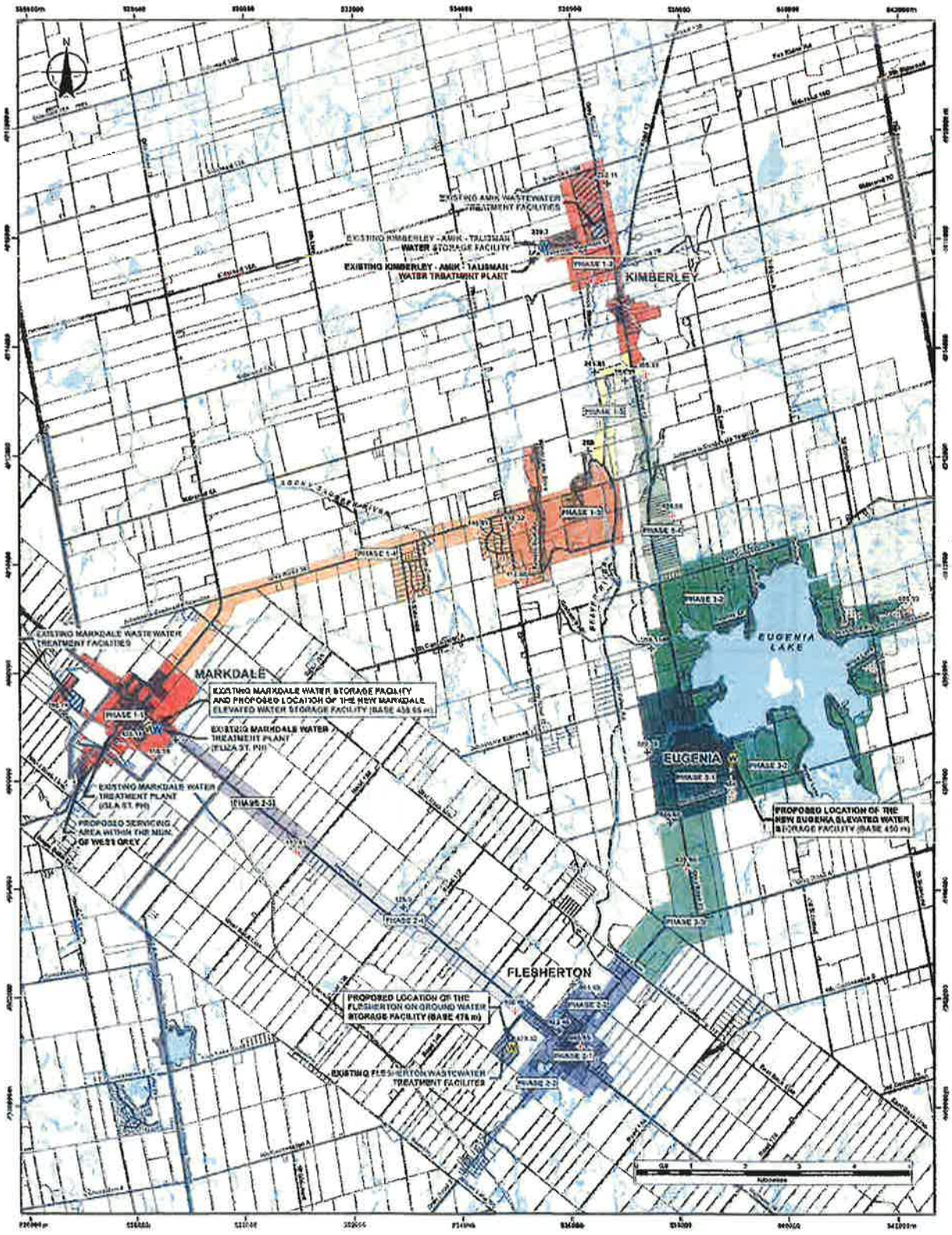
Summary of Potential New Water Storage Facilities (All Alternatives)

Option #	Water Storage Facility	Type of Storage	Design Year	Total Usable Storage (m^3)
1	Markdale (PI-1, PI-2, PI-3, PI-4, PI-5, PII-1, PII-2, PII-3, PII-4, PIII-1, PIII-2, PIII-3 and PIII-4)	New Glass-Fused -To-Steel Elevated Storage	50	6511
2	Markdale (PI-1, PI-3, PI-4, PII-1, PII-2, PII-3, PII-4, PIII-1, PIII-2, PIII-3 and PIII-4)	New Elevated Glass-Fused - To-Steel Tank	50	6275
3	Markdale (PI-1, PI-2, PI-3, PI-4, PI-5, PII-1, PII-2, PII-3 and PII-4)	New Elevated Glass-Fused - To-Steel Tank	50	5218
4	Markdale (PI-1, PI-3, PI-4 PII-1, PII-2, PII-3 and PII-4)	New Glass-Fused -To-Steel Elevated Storage	50	5110
5	Markdale (PI-1, PI-2, PI-3, PI-4, PI-5 and PII-3)	New Elevated Glass-Fused - To-Steel Tank	50	4998
6	Markdale (PI-1, PI-3, PI-4 and PII-3)	New Elevated Glass-Fused - To-Steel Tank	50	4750

Summary of Potential New Water Storage Facilities (All Alternatives)

Option #	Water Storage Facility	Type of Storage	Design Year	Total Usable Storage (m^3)
7	Eugenia (PIII-1, PIII-2, PIII-3 and PIII-4)	New Elevated Glass-Fused - To-Steel Tank	50	1911
8	Flesherton (PII-1, PII-2, PII-4, PIII-1, PIII-2, PIII-3 and PIII-4)	New On-Ground Glass-Fused - To-Steel Tank	50	2577
9	Flesherton (PII-1, PII-2, and PII-4)	New On-Ground Glass-Fused - To-Steel Tank	50	1162

	Number of New Water Storage Facilities Required	Option #
Alternative #1	1	2
Alternative #2	3	6, 9 and 7
Alternative #3	2	4 and 7
Alternative #4	2	6 and 8
Alternative #5	2	3 and 7
Alternative #6	2	5 and 8
Alternative #7	1	1
Alternative #7A	1	1



LEGEND

- MUNICIPAL WATER STORAGE FACILITIES
- MUNICIPAL BOUNDARY
- PROPERTY PARCEL
- EXISTING WATER STORAGE FACILITY
- PROPOSED WATER STORAGE FACILITY
- RIVERS / STREAM
- WATERBODY
- SWELL AND / OR MARSHES
- AREAS WITH ELEVATION >= 450 m
- Highest Elevation in Phase (+)
- Lowest Elevation in Phase (-)

PROPOSED SERVICING PHASE/AREA

PHASE 1
- PHASE 1-1
- PHASE 1-2
- PHASE 1-3
- PHASE 1-4
- PHASE 1-5

PHASE 2
- PHASE 2-1
- PHASE 2-2
- PHASE 2-3
- PHASE 2-4

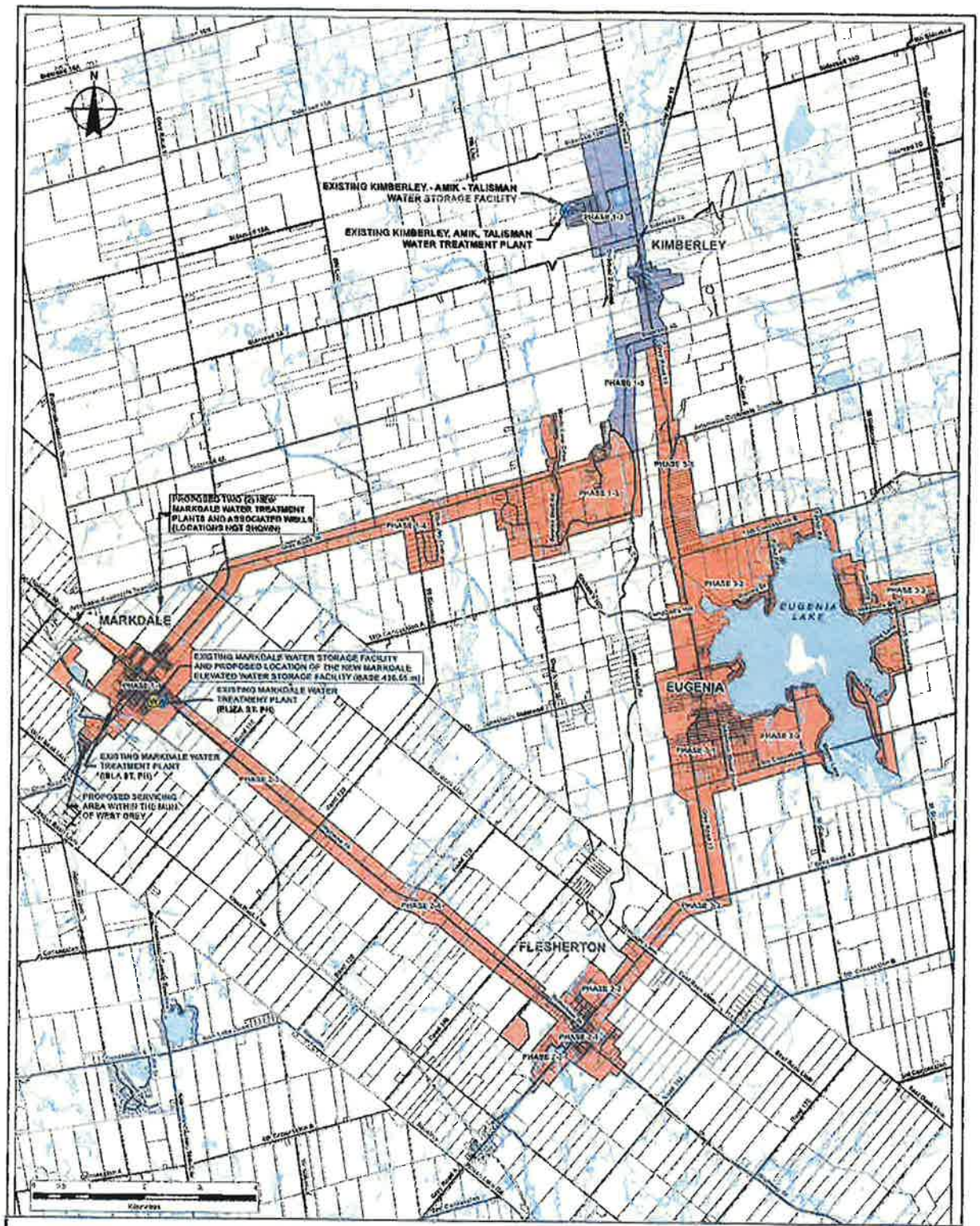
PHASE 3
- PHASE 3-1
- PHASE 3-2
- PHASE 3-3

POTENTIAL LOCATION FOR NEW WATER STORAGE FACILITIES
WATER & WASTEWATER SERVICING MASTER PLAN
MUNICIPALITY OF GREY HIGHLANDS

PROJECT:	111-13329-00
DATE:	NOV 2011
SCALE:	1:65,000
DRAWN:	JET
APPROVED:	CW/MPB

GENIVAR

FIGURE 6.2



Design Water Demands - Water Treatment Plant - Alternative 1

WATER AND WASTEWATER SERVICING MASTER PLAN
MARKDALE FLESHERTON AMIK-KIMBERLEY-TALISMAN SERVICE VALLEY
MUNICIPALITY OF GREY HIGHLANDS

111-12125-00

Water Treatment Plant	Existing		20 Years		50 Years	
	Average Day Water Demand (m³/day)	Maximum Day Water Demand (m³/day)	Average Day Water Demand (m³/day)	Maximum Day Water Demand (m³/day)	Average Day Water Demand (m³/day)	Maximum Day Water Demand (m³/day)
Markdale WTP (PW1, PW2, PW4, PW-1, PW-2, PW-3, PW4, PW-2, PW-3 and PW-4)	1,207	2,484	4,105	7,521	5,007	10,587
Kimberley, Amik, Talisman WTP (PW-1 and PW-2)	166	445	679	816	307	903

LEGEND

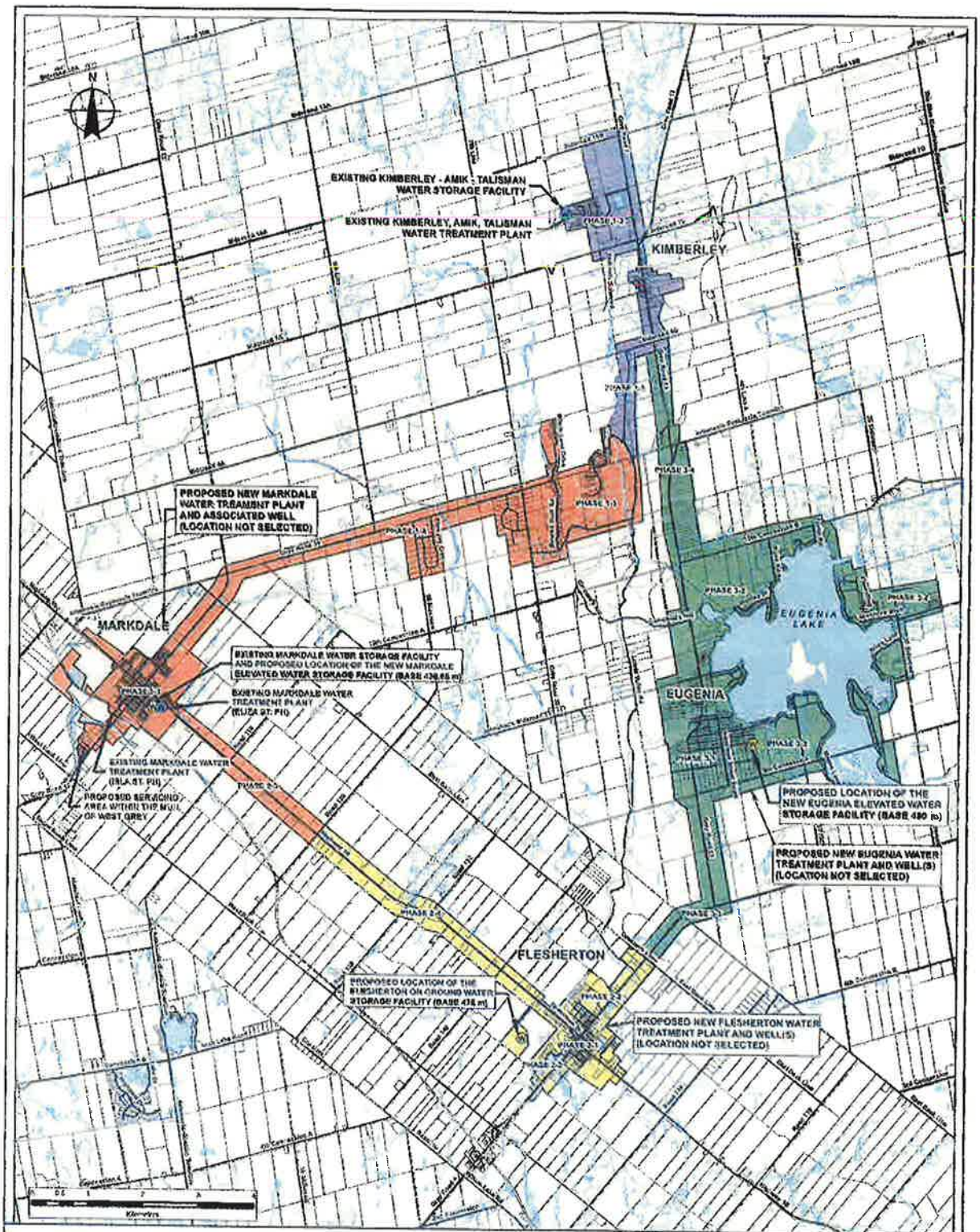
- EXISTING WATER STORAGE FACILITY
- PROPOSED WATER STORAGE FACILITY
- MARKDALE WTP PROPOSED SERVICE AREA
- KIMBERLEY, AMIK, TALISMAN WTP PROPOSED SERVICE AREA
- PROPERTY PARCEL
- WATERBODY
- WETLAND - PERMANENT
- RIVER/STREAM

PROPOSED WATER TREATMENT PLANT SERVICE AREAS
ALTERNATIVE 1
MUNICIPALITY OF GREY HIGHLANDS
WATER AND WASTEWATER MASTER PLAN

GENIVAR

GENIVAR INC
1650 8TH AVE. WEST, SUITE 101
OWEN SOUND, ONTARIO N4K 6W2

DESIGN	CM/MEB
DRAWN	JCP
CHECKED	CM/MEB
DATE	NOV 2011
SCALE	AS SHOWN
PROJECT No.	111-12125-00
DWG No.	6.1A



Water Treatment Plant	10-Year		20-Year		25-Year	
	Average Day Water Demand (L/day)	Maximum Day Water Demand (L/day)	Average Day Water Demand (L/day)	Maximum Day Water Demand (L/day)	Average Day Water Demand (L/day)	Maximum Day Water Demand (L/day)

LEGEND

- EXISTING WATER STORAGE FACILITY
- PROPOSED WATER STORAGE FACILITY
- MUNICIPAL WTP PROPOSED SERVICE AREA
- KIMBERLEY, AMIK, TALISMAN WTP PROPOSED SERVICE AREA
- FLESHERTON WTP PROPOSED SERVICE AREA
- EUGENIA WTP PROPOSED SERVICE AREA
- PROPERTY PARCEL
- WATERBODY
- WATERCOURSE
- MUNICIPALITY

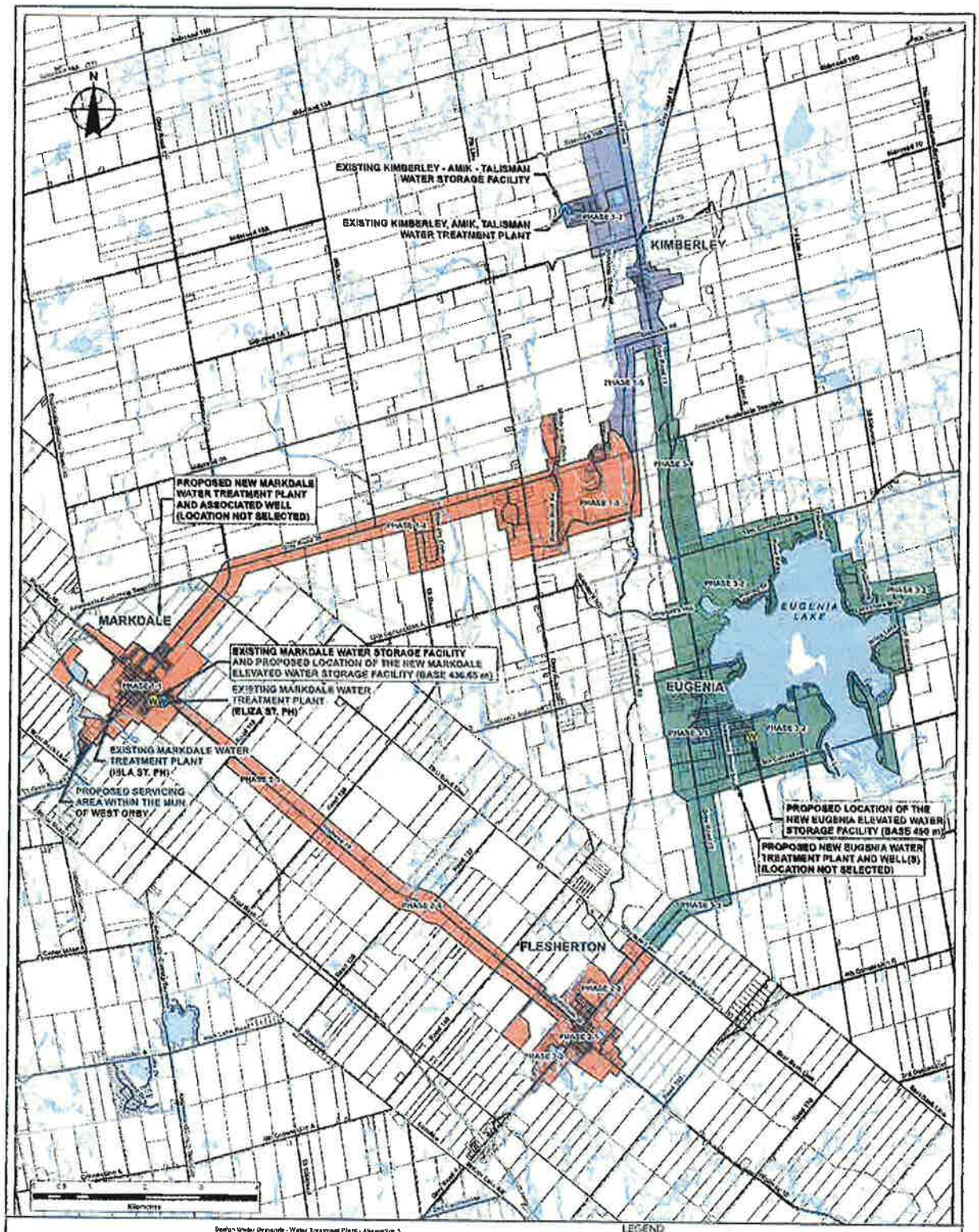
NOTE: THE LOCATION OF THE PROPOSED FLESHERTON & EUGENIA WATER TREATMENT PLANT & WELLS IS TBD.

PROPOSED WATER TREATMENT PLANT SERVICE AREAS
ALTERNATIVE 2
MUNICIPALITY OF GREY HIGHLANDS
WATER AND WASTEWATER MASTER PLAN

GENIVAR

GENIVAR INC
1450 FIRST AVE. W.S.T. SUITE 101
OWEN SOUND, ONTARIO N4K 6W2

SCALE:	1:50,000
DRAWN:	AST
CHECKED:	CM/MS
DATE:	NOV 2010
FILE:	105-SCALE.DWG
PROJECT:	105-13010-00
FIGURE:	6.4B



Design Water Demands - Water Treatment Plant - Alternative 3

WATER AND WASTEWATER SERVICING MASTER PLAN
MARKDALE-FLESHERTON-KIMBERLEY-AMIK-EUGENIA-BEAVER VALLEY
MUNICIPALITY OF GREY HIGHLANDS

Water Treatment Plant	10 Year		20 Year		40 Year	
	Average Day Water Demand (m³/day)	Maximum Day Water Demand (m³/day)	Average Day Water Demand (m³/day)	Maximum Day Water Demand (m³/day)	Average Day Water Demand (m³/day)	Maximum Day Water Demand (m³/day)
Amik WTP (Ph 1, Ph 2, Ph 3, Ph 4, Ph 5 WTP and Wells)	4,324	7,214	5,556	9,451	8,034	8,780
Markdale Well, Eugenia Well (Phase 1 (A))	184	440	259	594	384	865
Eugenia WTP (Ph 1, Ph 2, Ph 3 and Ph 4)	0	0	1,730	2,422	1,472	2,943

LEGEND

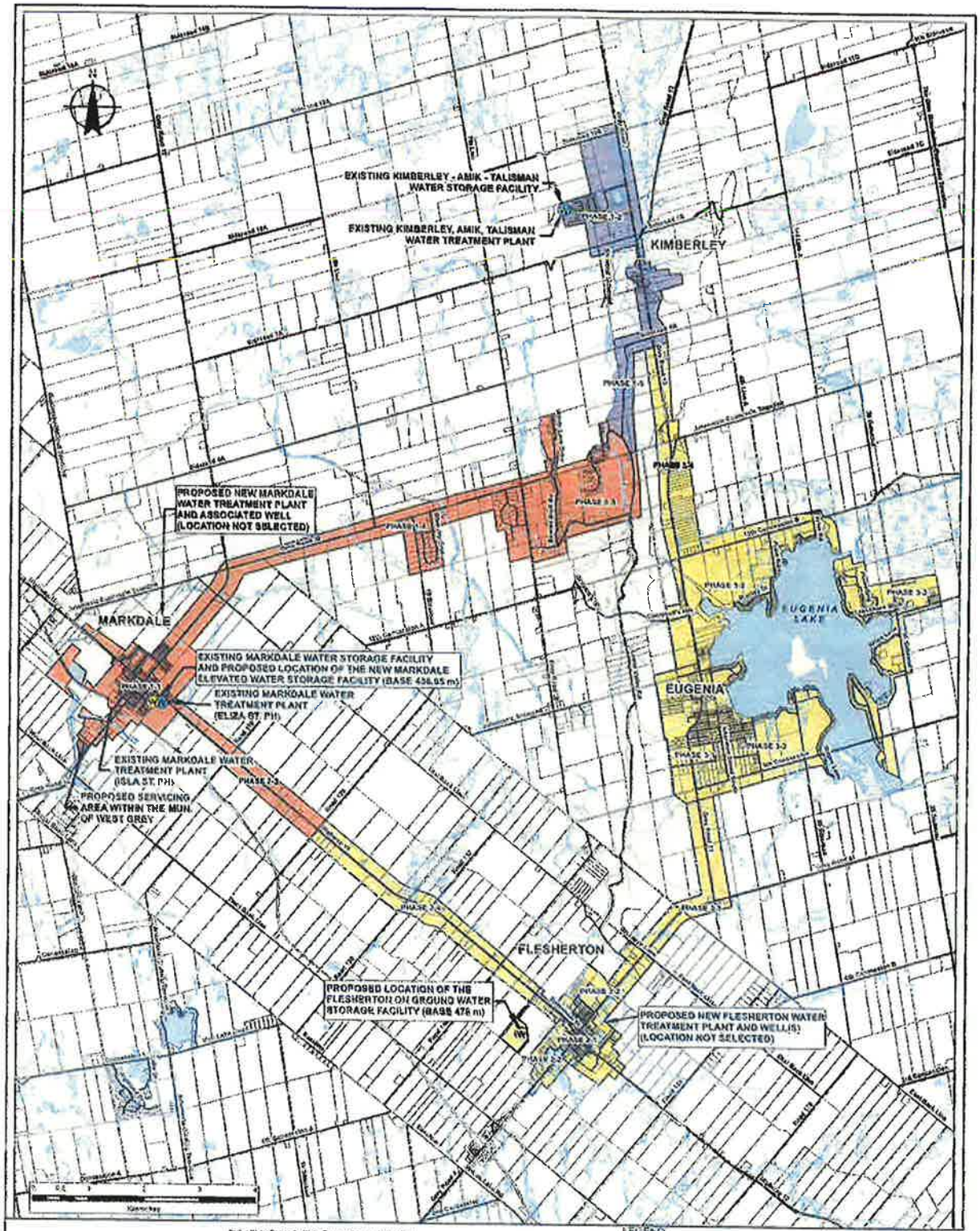
- EXISTING WATER STORAGE FACILITY
- PROPOSED WATER STORAGE FACILITY
- MARKDALE WTP PROPOSED SERVICE AREA
- KIMBERLEY, AMIK, TALISMAN WTP PROPOSED SERVICE AREA
- EUGENIA WTP PROPOSED SERVICE AREA
  * NOTE: THE LOCATION OF THE PROPOSED EUGENIA WATER TREATMENT PLANT IS TBD.
- PROPERTY PARCEL
- WATERBODY
- WETLAND - PEM CLASS
- RIVER/STREAM

PROPOSED WATER TREATMENT PLANT SERVICE AREAS
ALTERNATIVE 3
MUNICIPALITY OF GREY HIGHLANDS
WATER AND WASTEWATER MASTER PLAN

GENIVAR

GENIVAR INC
640 FIRST AVE. WEST, SUITE 107
OWEN SOUND, ONTARIO N4K 4W6

DESIGN	CM/MB
DRAWN	JET
APPROVED	CM/MB
DATE	NOV 2011
SCALE	AS SCALE BAR
PROJECT	111-12722-00
FILE NO.	64C



Design Water Demands - Water Treatment Plant - Alternative 4

WATER AND WASTEWATER SERVICING MASTER PLAN
MUNICIPALITY OF GREY HIGHLANDS

Water Treatment Plant	Existing		20 Years		30 Years	
	Average Day Water Demand (L/s/day)	Maximum Day Water Demand (L/s/day)	Average Day Water Demand (L/s/day)	Maximum Day Water Demand (L/s/day)	Average Day Water Demand (L/s/day)	Maximum Day Water Demand (L/s/day)
Markdale WTP (PH1, PH2, PH4 combined)	1,237	1,457	2,817	5,334	5,012	7,061
Kimberley, Amik, Talisman WTP (PH2 and PH3)	160	640	378	701	397	918
Flesherton WTP (PH1, PH2 (PH1, PH2, PH3 and PH4))	0	0	1,633	3,457	2,949	4,906

LEGEND

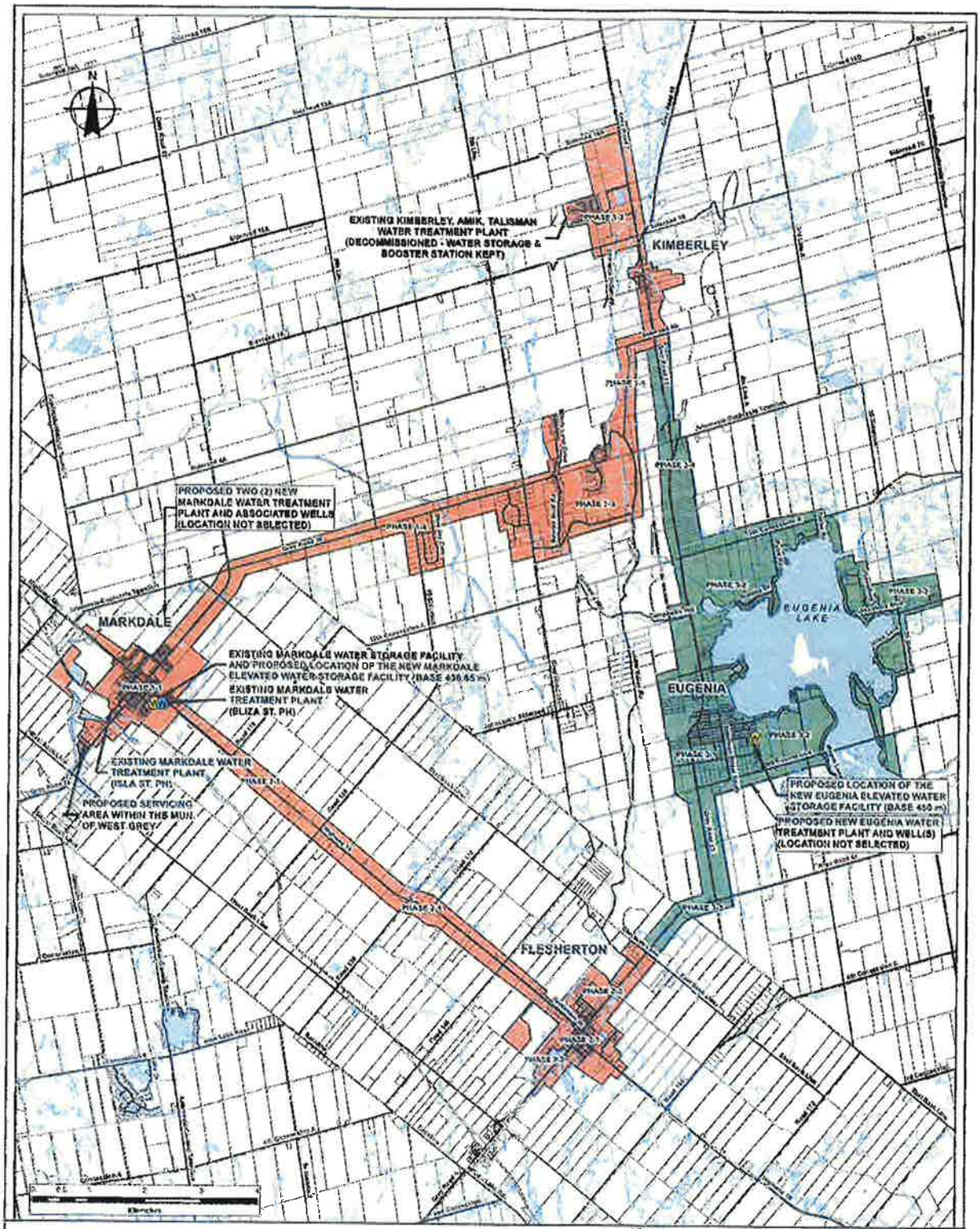
- EXISTING WATER STORAGE FACILITY
- PROPOSED WATER STORAGE FACILITY
- MARKDALE WATER PROPOSED SERVICE AREA
- KIMBERLEY, AMIK, TALISMAN WTP PROPOSED SERVICE AREA
- FLESHERTON WTP PROPOSED SERVICE AREA
- PROPERTY PARCEL
- WATERBODY
- WETLAND - PERMANENT
- RIVER/STREAM

PROPOSED WATER TREATMENT PLANT SERVICE AREAS
ALTERNATIVE 4
MUNICIPALITY OF GREY HIGHLANDS
WATER AND WASTEWATER MASTER PLAN

GENIVAR

GENIVAR INC
MAHER STAVE WEST, SUITE 101
OWEN SOUND, ONTARIO M4K 0H3

Drawn:	CW/MR
Check:	JTS
Approved:	CW/MR
Date:	NOV 2011
Scale:	SEE SCALE BAR
Project:	111-13735-00
File:	6-4D



Design Water Demands - Water Treatment Plant - Alternative 5

WATER AND WASTEWATER SERVICING MASTER PLAN
MARKDALE-FLESHERTON-KIMBERLEY-AMIK EUGENIA-BEAVER VALLEY
MUNICIPALITY OF GREY HIGHLANDS

111-13256-00

Water Treatment Plant	Existing		20 Year		50 Year	
	Average Day Water Demand (m³/day)	Maximum Day Water Demand (m³/day)	Average Day Water Demand (m³/day)	Maximum Day Water Demand (m³/day)	Average Day Water Demand (m³/day)	Maximum Day Water Demand (m³/day)
Markdale WTP (PW1, PW2, PW3, PW4, PW5, PW7, PW8, PW9 and PW10)	1,991	2,774	3,364	4,700	4,451	6,533
Eugenia WTP (PW1, PW2, PW3 and PW4)	0	0	1,003	2,460	1,473	2,644

LEGEND

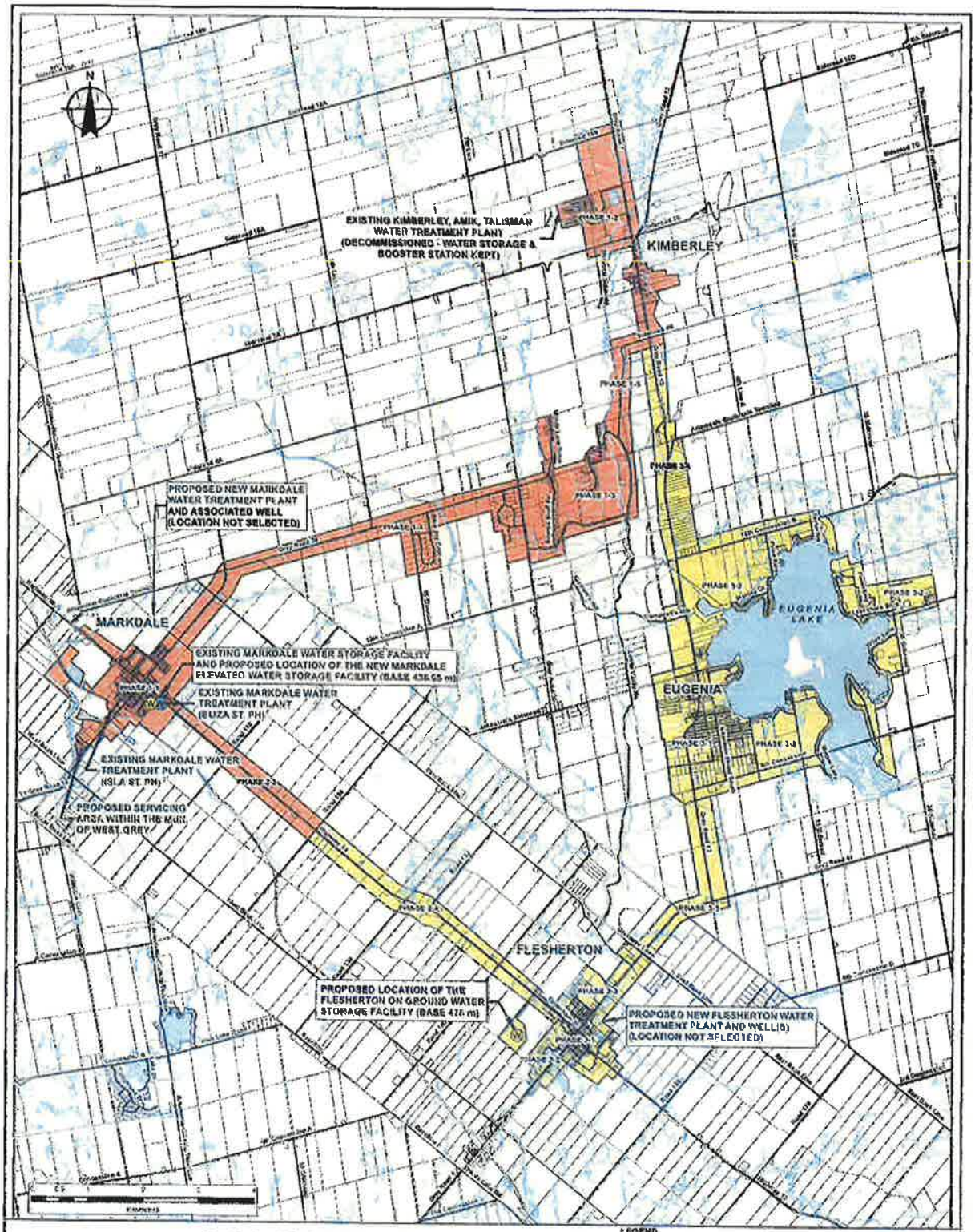
- EXISTING WATER STORAGE FACILITY
- PROPOSED WATER STORAGE FACILITY
- MARKDALE WTP PROPOSED SERVICE AREA
- EUGENIA WTP PROPOSED SERVICE AREA - NOTE: THE LOCATION OF THE PROPOSED EUGENIA WATER TREATMENT PLANT IS TBD.
- PROPERTY PARCEL
- WATERBODY
- WETLAND - PERMANENT
- RIVER/STREAM

PROPOSED WATER TREATMENT PLANT SERVICE AREAS
ALTERNATIVE 5
MUNICIPALITY OF GREY HIGHLANDS
WATER AND WASTEWATER MASTER PLAN

GENIVAR

GENIVAR INC
1550 FIRST AVE. WEST, SUITE 101
OWEN SOUND, ONTARIO N4K 4W6

DESIGN	CANNEFO
DRAWN	JET
CHECKED	CANNEFO
DATE	NOV 2011
SCALE	AS SHOWN
PROJECT	111-13256-00
DRAWING	5.4E



Design Water Demands - Water Treatment Plant - Alternative 6

WATER AND WASTEWATER SERVICING MASTER PLAN
MUNICIPALITY OF GREY HIGHLANDS

Water Treatment Plant	Existing		25 Year		50 Year	
	Average Day Water Demand (m³/day)	Maximum Day Water Demand (m³/day)	Average Day Water Demand (m³/day)	Maximum Day Water Demand (m³/day)	Average Day Water Demand (m³/day)	Maximum Day Water Demand (m³/day)
Markdale WTP (Ph1-1&2 and Ph2-1, Ph3-1, Ph3-2 and Ph3-3)	1,347	2,775	2,828	5,827	3,516	7,678
Flesherton WTP (Ph1-1&2 and Ph2-1, Ph3-1, Ph3-2 and Ph3-3)	0	0	1,550	3,195	2,090	4,100

LEGEND

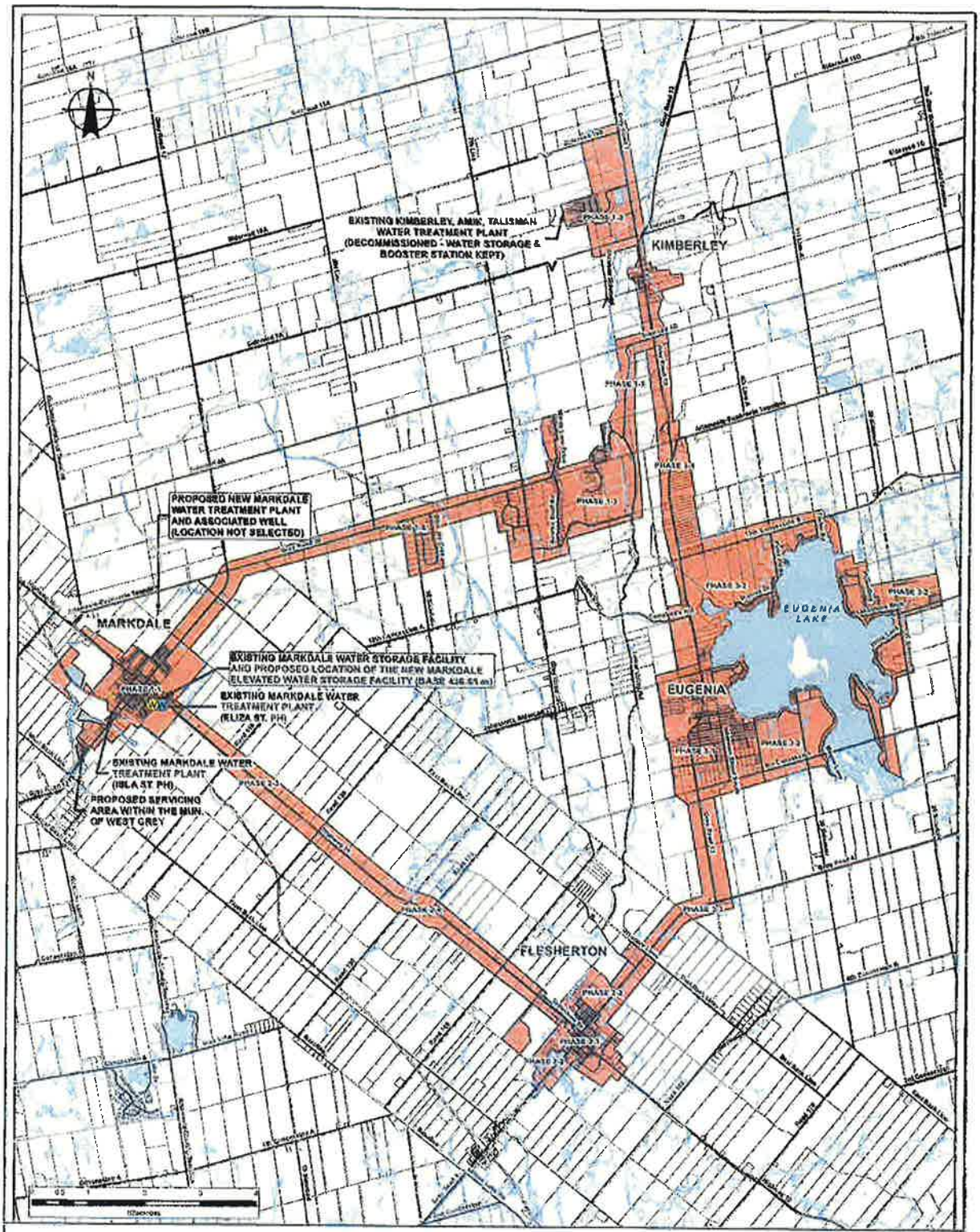
- EXISTING WATER STORAGE FACILITY
- PROPOSED WATER STORAGE FACILITY
- MARKDALE WTP PROPOSED SERVICE AREA
- FLESHERTON WTP PROPOSED SERVICE AREA*
  * NOTE: SITE LOCATION OF THE PROPOSED FLESHERTON WATER TREATMENT PLANT IS TBD.
- PROPERTY PARCEL
- WATERBODY
- WETLANDS - PERMANENT
- RIVER/STREAM

PROPOSED WATER TREATMENT PLANT SERVICE AREAS
ALTERNATIVE 6
MUNICIPALITY OF GREY HIGHLANDS
WATER AND WASTEWATER MASTER PLAN

GENIVAR

GENIVAR INC
160 FIRST AVE. WEST, SUITE 101
OWEN SOUND, ONTARIO N4K 3N2

DRAWN:	CW/WB
CHECKED:	JCT
DATE:	NOV 2011
SCALE:	AS SHOWN
PROJECT NO.	111-13729-00
DWG. NO.	6.4F



Design Water Demands - Water Treatment Plant - Alternative 2

WATER AND WASTEWATER SERVICING MASTER PLAN
MARKDALE, FLESHERTON, KIMBERLEY AMIK, EUGENIA, BEAVER VALLEY
MUNICIPALITY OF GREY HIGHLANDS

111-13220-00

Water Treatment Plant	Existing		20-Year		50-Year	
	Average Day Water Demand (m³/day)	Maximum Day Water Demand (m³/day)	Average Day Water Demand (m³/day)	Maximum Day Water Demand (m³/day)	Average Day Water Demand (m³/day)	Maximum Day Water Demand (m³/day)
Markdale WTP (PS-1, PS-3, PS-5, PS-6, PS-8, PS-7, PS-9, PS-4, PS-1, PS-2, PS-5 and PS-7)	3,351	7,774	4,487	8,443	5,904	11,372

LEGEND

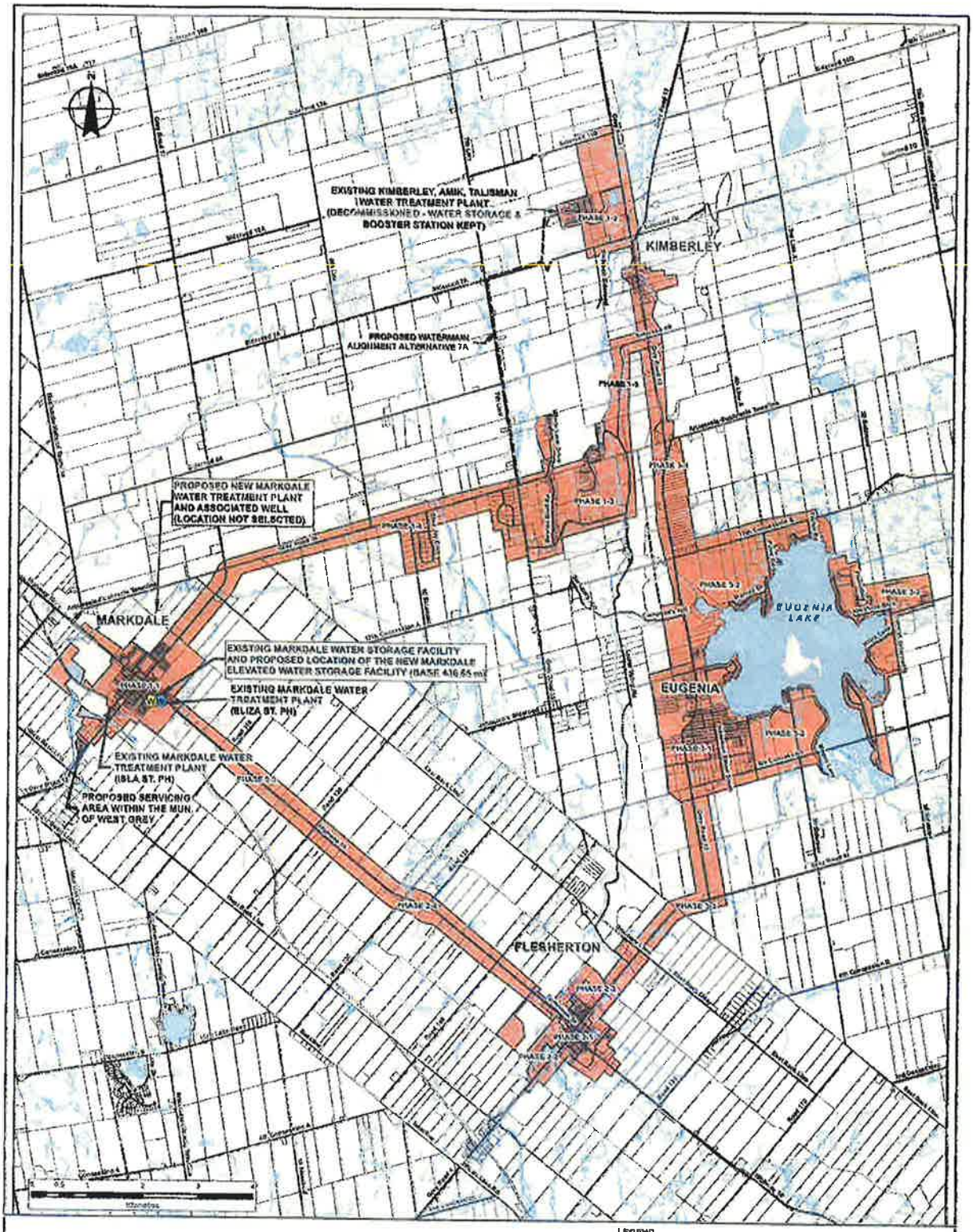
- EXISTING WATER STORAGE FACILITY
- PROPOSED WATER STORAGE FACILITY
- MARKDALE WTP PROPOSED SERVICE AREA
- PROPERTY PARCEL
- WATER BODY
- WETLANDS / FLOODPLAIN
- RIVER/STREAM

PROPOSED WATER TREATMENT PLANT SERVICE AREAS
ALTERNATIVE 2
MUNICIPALITY OF GREY HIGHLANDS
WATER AND WASTEWATER MASTER PLAN

GENIVAR

GENIVAR INC
[illegible]

SET No.	09/10/15
DRAWN	JLT
APPROVED	09/10/12
DATE	NOV. 2010
SCALE	AS SCALE ONE
FILE No.	111-13220-00
DWG. No.	64G



Design Water Demands - Water Treatment Plant - Alternative 7A

WATER AND WASTEWATER SERVICING MASTER PLAN
MARKDALE-EUGENIA-TOWNSHIP OF AMIK-GLENELG-GRAVER VALLEY
MUNICIPALITY OF GREY HIGHLANDS

115-132908-00

Water Treatment Plant	Existing		20 Year		25 Year	
	Average Day Water Demand (m³/day)	Maximum Day Water Demand (m³/day)	Average Day Water Demand (m³/day)	Maximum Day Water Demand (m³/day)	Average Day Water Demand (m³/day)	Maximum Day Water Demand (m³/day)
Markdale WTP (PW1, PW2, PW3, PW4, PW5, PW6, PW7, PW8, PW9, PW10, PW11, PW12, PW13 and PW14)	1,987	3,778	4,447	8,453	5,684	11,357

LEGEND

- EXISTING WATER STORAGE FACILITY
- PROPOSED WATER STORAGE FACILITY
- MARKDALE WTP PROPOSED SERVICE AREA
- PROPERTY PARCEL
- WATERBODY
- WETLAND - PERMANENT
- RIVER STREAM
- PROPOSED WATERMAIN ALIGNMENT ALTERNATIVE 7A

PROPOSED WATER TREATMENT PLANT SERVICE AREAS
ALTERNATIVE 7A
MUNICIPALITY OF GREY HIGHLANDS
WATER AND WASTEWATER MASTER PLAN

GENIVAR

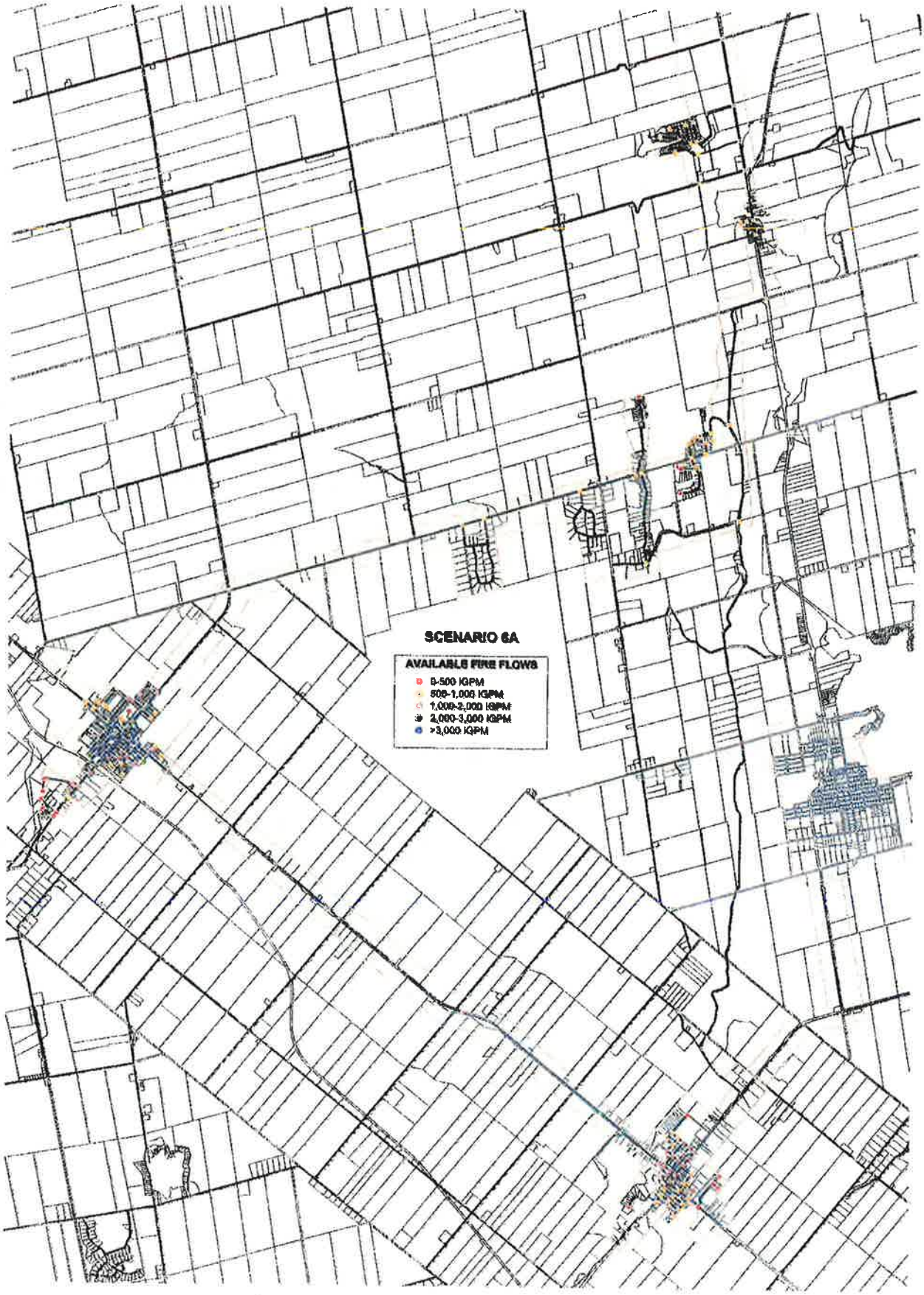
GENIVAR INC
1660 FIRST AVE. WEST, SUITE 101
OWEN SOUND, ONTARIO, N4K 4K5

6:4H

Fire Flows from Water Distribution Network Model

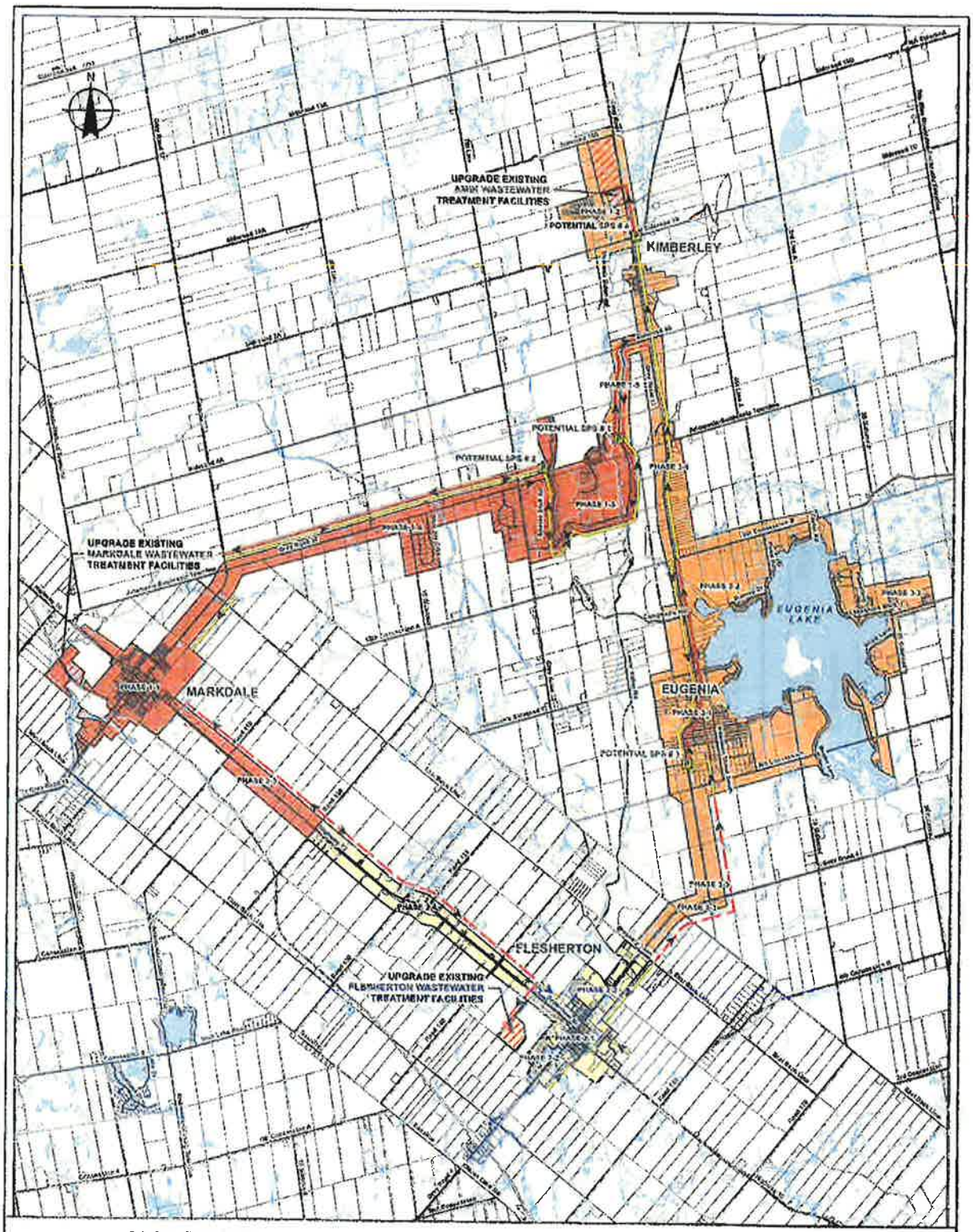
Alternative 6A – Water Storage Facilities – Markdale, Flesherton and Kimberley-Amik-Talisman. No service to Eugenia at this time. 300 mm dia. trunk watermain.

Fire Flow Node	Location	Description	Fire Flow	
		Street/Road	Litres/Min.	IGPM
J-38	Markdale	Toronto St. & Main St.	14,300	3,146
J-59	Markdale	Main St. & Lawler Dr.	8,200	1,804
J-29	Markdale	Wellington St. & Hill St.	10,000	2,200
J-5	Markdale	Toronto St. South End	12,500	2,750
J-62	Flesherton	Collingwood St. & Beachell St.	5,500	1,210
J-74	Flesherton	Collingwood St. & Victoria St.	5,500	1,210
J-100	Flesherton	Campbell St. west of Alice	2,300	506
J-187	Beaver Valley Ski Club Area	West end of subdivision at Beaver Valley	1,800	396
J-179	Beaver Valley Ski Club Area	At Ski Club	2,600	572
J-189	Beaver Valley Ski Club Area	County Rd. 30 at Lower Valley Road	2,600	572
J-211	Kimberley	Downtown	3,900	858
J-221	Amik	West end of Amik Cres.	2,800	616
J-260	Talisman	Talisman Mountain Resort	3,700	814


SCENARIO 6A
AVAILABLE FIRE FLOWS
0-500 IGPM
500-1,000 IGPM
1,000-2,000 IGPM
2,000-3,000 IGPM
>3,000 IGPM

Sanitary Sewer Service Area Alternatives

Wastewater Treatment Plants	20 Year Flow (m^3/day)	Existing Sewage Flows (m^3/day)	Existing WWTP Capacity (m^3/day)
Alternative 1			
Markdale WWTP (Includes PI-1, PI-3, PI-4 and PII-3)	2,307	988	1122
Arnik WWTP (Includes PI-2, PI-5, PIII-1, PIII-2, PIII-3 and PIII-4)	1,530	217	249
Flesherton WWTP (Includes PII-1, PII-2 and PII-4)	459	174	419
Alternative 2			
Markdale WWTP (Includes PI-1, PI-3, PI-4 and PII-3)	2,307		
Arnik WWTP (Includes PI-2, PI-5 and PIII-4)	501		
Flesherton WWTP (Includes PII-1, PII-2, PII-4, PIII-1, PIII-2 and PIII-3)	1,489		
Alternative 3			
Markdale WWTP (Includes PI-1 and PII-3)	1,880		
Arnik WWTP (Includes PI-2, PI-3, PI-5 and PIII-4)	799		
Flesherton WWTP (Includes PII-1, PII-2, PII-4, PIII-1, PIII-2 and PIII-3)	1,488		
Alternative 4			
Markdale WWTP (Includes PI-1 and PII-3)	1,880		
Arnik WWTP (Includes PI-2, PI-3, PI-5, PIII-1, PIII-2 and PIII-4)	1,811		
Flesherton WWTP (Includes PII-1, PII-2 and PII-4)	459		



Refer Drawings Dated - As Noted On 1

WATER AND WASTEWATER SERVICING MASTER PLAN
MARKDALE-FLESHERTON-KIMBERLEY-ARK WATER CENTRE
MUNICIPALITY OF GREY HIGHLANDS

Wastewater Treatment Plants	Existing Sewage Flow (m^3/day)	20 Year Flow (m^3/day)	50 Year Flow (m^3/day)
Markdale WWTP (includes PS1, PS 5 and PS6)	1178	2,527	3,157
Ark WWTP (includes PS2, PS3, PS4 and PS8)	2917	5,520	6,809
Flesherton WWTP (includes PS7, PS 9 and PS10)	174	409	577

LEGEND:

- EXISTING MUNICIPAL WASTEWATER FACILITY
- MARKDALE WWTP PROPOSED SERVICE AREA
- ARK WWTP PROPOSED SERVICE AREA
- FLESHERTON WWTP PROPOSED SERVICE AREA
- PROPERTY PARCEL
- PROPOSED WASTEWATER MAINS
- FORCEMAIN(SPS)
- FORCEMAIN(WITH GRINDER PUMPS)
- GRAVITY MAIN
- POTENTIAL LOCATIONS OF SEWAGE PUMP STATION (APPROX.)
- DIRECTION OF FLOW

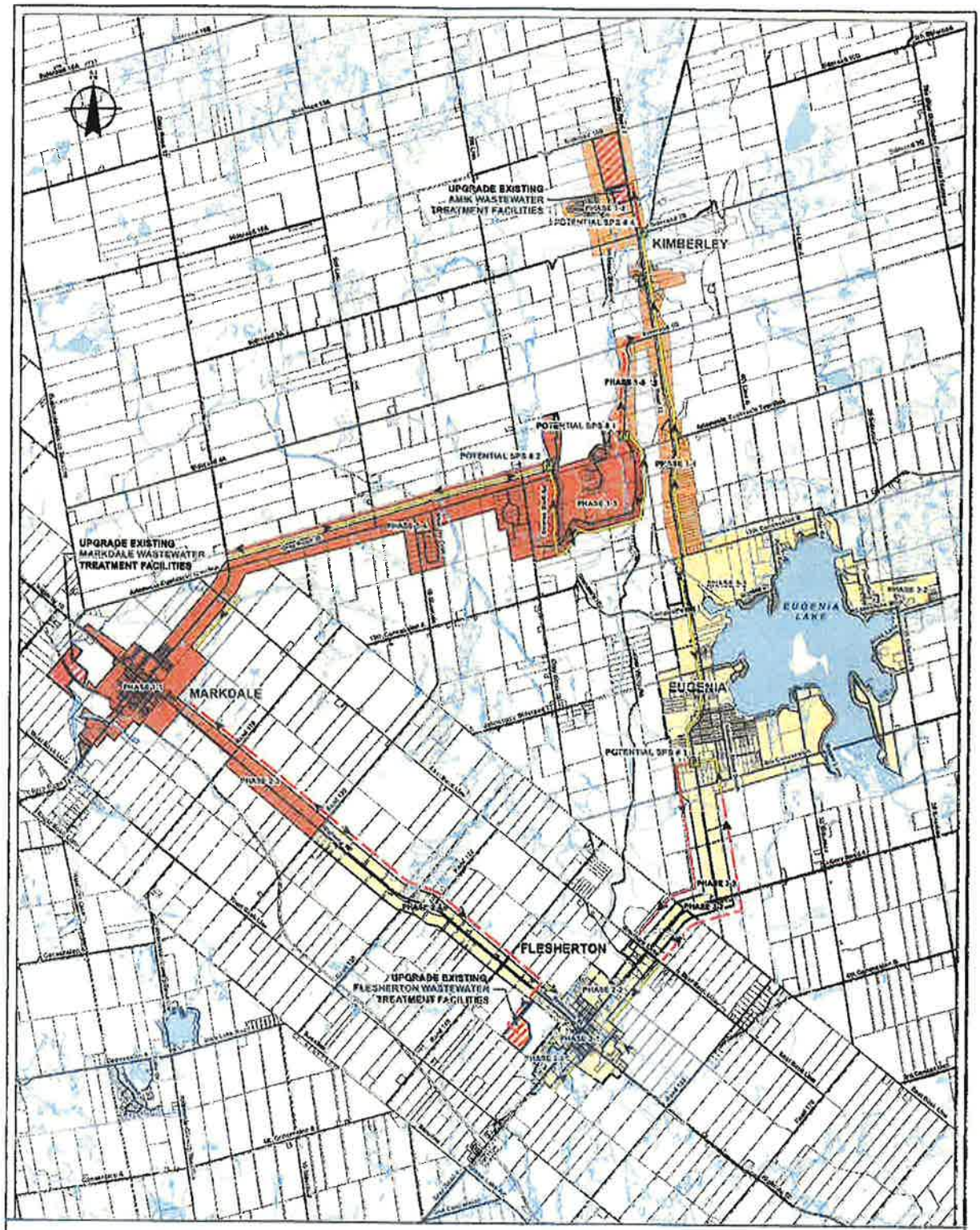
0 0.5 1 2 3 4
Kilometres

PROPOSED WASTEWATER SERVICE AREAS
ALTERNATIVE 1
MUNICIPALITY OF GREY HIGHLANDS
WATER AND WASTEWATER MASTER PLAN

GENIVAR

GENIVAR INC.
101-237 FIRST AVE. WEST, SUITE 101
OWEN SOUND, ONTARIO N4K 6W2

DRAWN:	CW/MS
CHECKED:	JS1
DATE:	NOV 2011
SCALE:	AS INDICATED
PROJECT:	111-10272-00
FIG. NO.:	6.6A



Design Sewage Flows - Alternative 2

WATER AND WASTEWATER SERVICING MASTER PLAN
MARKDALE, FLESHERTON, KIMBERLEY, AMIK, EUGENIA & BEAVER VALLEY
MUNICIPALITY OF GREY HIGHLANDS

Wastewater Treatment Plants	Existing Sewage Flow (m³/day)	20-Year Flow (m³/day)	35-Year Flow (m³/day)
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]

LEGEND

- MUNICIPAL WASTEWATER FACILITY
- MARKDALE WWTP PROPOSED SERVICE AREA
- AMIK WWTP PROPOSED SERVICE AREA
- FLESHERTON WWTP PROPOSED SERVICE AREA
- PHASE NO.
- PROPOSED WASTEWATER MAINS
- FORCEMAIN (SAN)
- FORCEMAIN (WITH GRINDER PUMPS)
- GRAVITY MAIN
- POTENTIAL LOCATION FOR SEWAGE PUMP STATION (APPROX.)
- DIRECTION OF FLOW

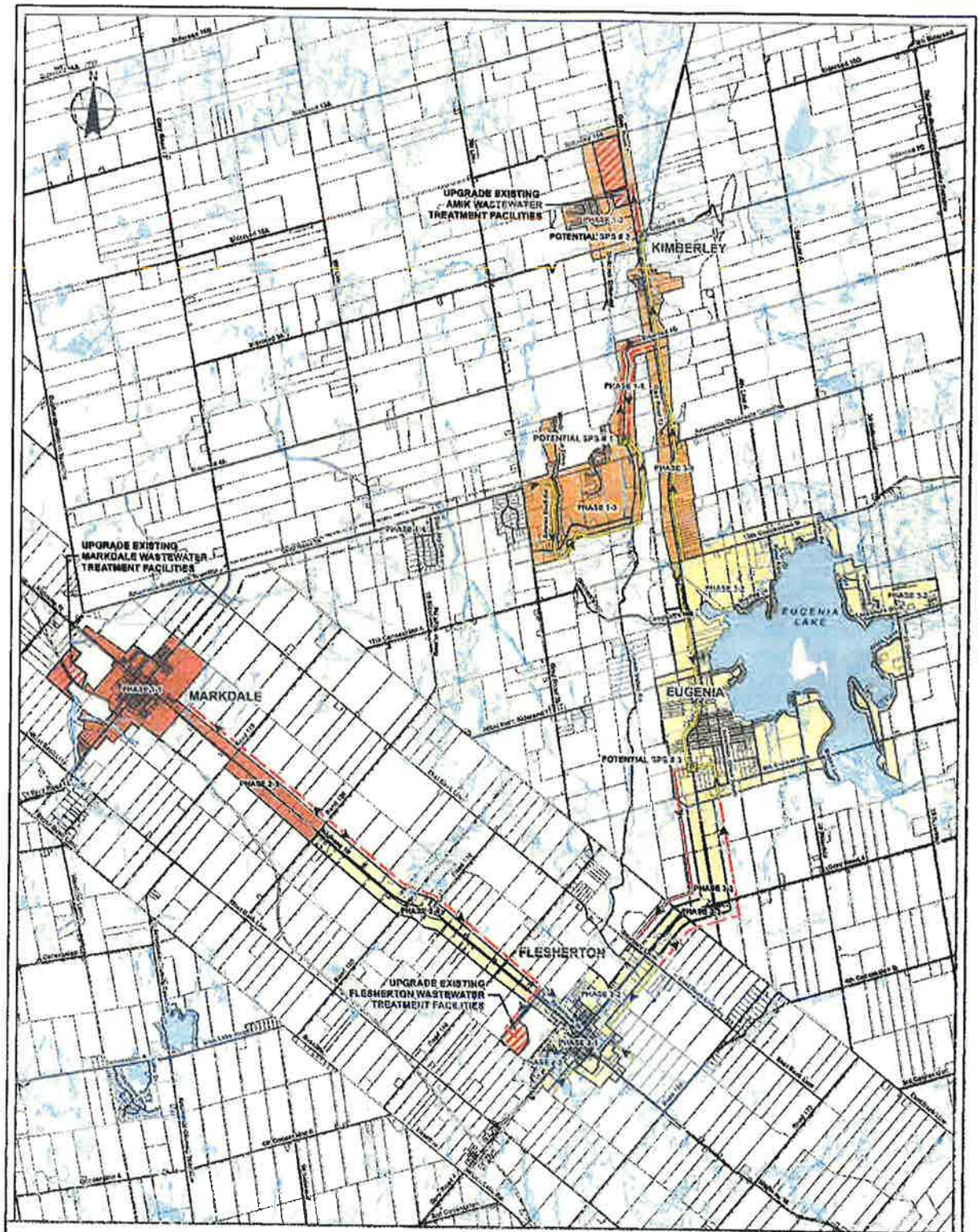
0 0.5 1 2 3 4
Kilometres

PROPOSED WASTEWATER SERVICE AREAS
ALTERNATIVE 2
MUNICIPALITY OF GREY HIGHLANDS
WATER AND WASTEWATER MASTER PLAN

GENIVAR

GENIVAR INC
[illegible]
OWEN SOUND, ONTARIO N4K 6N3

6.6B



Design Sewage Flows - Alternative 3 (Water & Wastewater Servicing)

WATER AND WASTEWATER SERVICING MASTER PLAN
MARKDALE / FLESHERTON SERVICING EVALUATION / BEAVER VALLEY
MUNICIPALITY OF GREY HIGHLANDS

111-10370-00

Wastewater Treatment Plants	Existing Sewage Flow (m^3/day)	20-Year Flow (m^3/day)	50 Year Flow (m^3/day)
Markdale WWTP (collects P1-1 and P2-3)	967	1,880	2,631
Amik WWTP (collects P1-2, P1-3, P1-5 and P2-4)	217	750	1,050
Flesherton WWTP (collects P2-1, P2-2, P2-5, P3-1, P3-2 and P3-3)	314	1,400	1,900

LEGEND

- MUNICIPAL WASTEWATER FACILITY
- MARKDALE WWTP PROPOSED SERVICE AREA
- AMIK WWTP PROPOSED SERVICE AREA
- FLESHERTON WWTP PROPOSED SERVICE AREA
- PHASE 1-A (NOT SERVICED UNDER ALTERNATIVE 3)
- PROPERTY PARCEL

PROPOSED WASTEWATER MAINS

- FORCEMAIN (AMIK)
- FORCEMAIN (WITH GRINDER PUMPS)
- GRAVITY MAIN
- POTENTIAL LOCATION FOR SEWAGE PUMPING STATION (APPROX.)
- DIRECTION OF FLOW

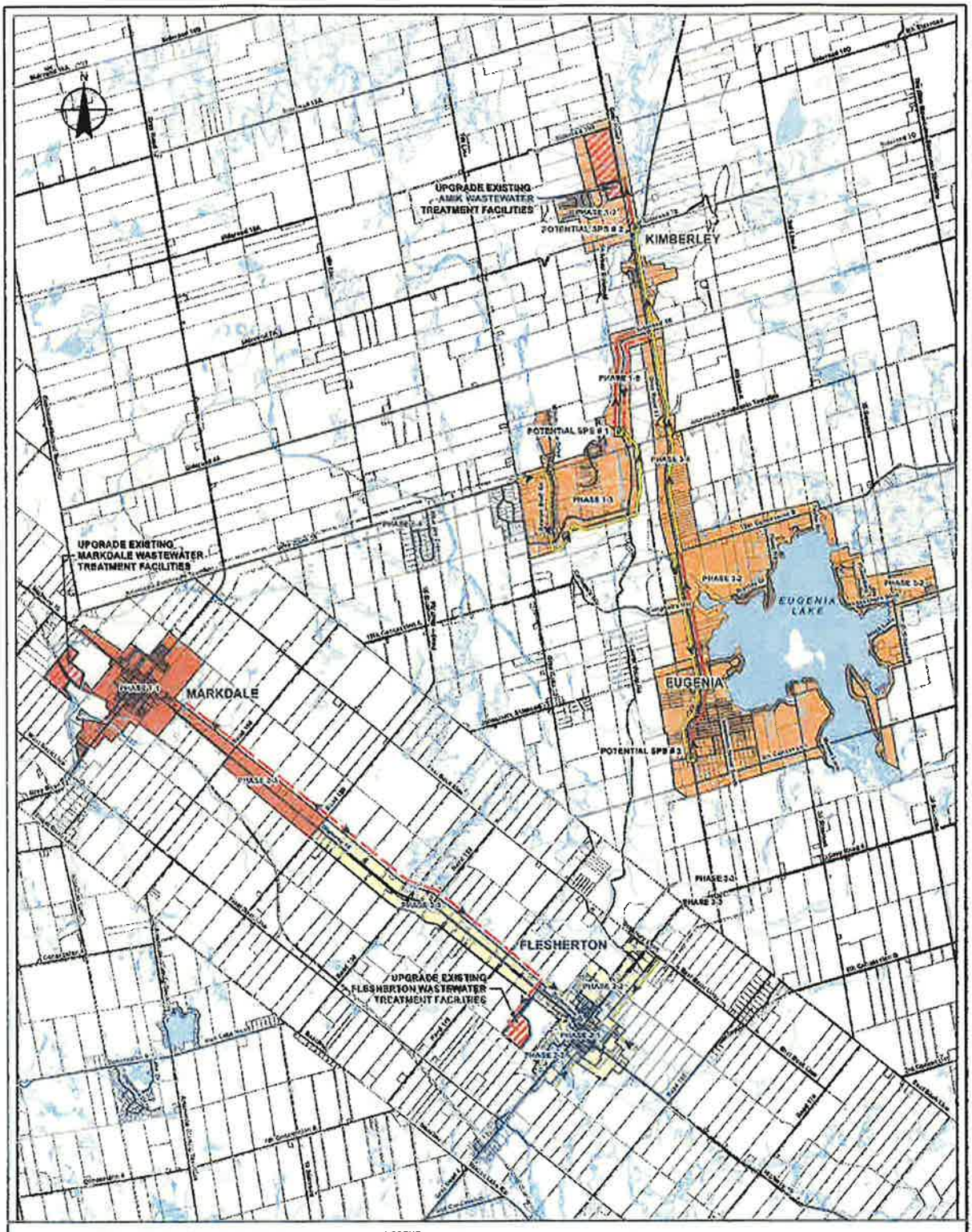
0 0.5 1 2 3 4
Kilometres

PROPOSED WASTEWATER SERVICE AREAS
ALTERNATIVE 3
MUNICIPALITY OF GREY HIGHLANDS
WATER AND WASTEWATER MASTER PLAN

GENIVAR

GENIVAR INC
ARCHIVES AVE WEST, SUITE 101
OWEN SOUND, ONTARIO N4K 6W4

Work	GW/WWP
Drawn	JCT
Checked	GW/WWP
Date	NOV 2010
Scale	AS SHOWN
File	111-10370-00
Drawing	6.6C



Design Sewage Flows - Alternative 4 (Phase 1-4 and 3-3 not Serviced)

WATER AND WASTEWATER SERVICING MASTER PLAN
MARKDALE, EUGENIA/KIMBERLEY, AMK, EUGENIA PLANK, EUGENIA HEAVER VALLEY
MUNICIPALITY OF GREY HIGHLANDS

111-13279-00

Wastewater Treatment Plants	Existing Sewage Flow (m^3/day)	20 Year Flow (m^3/day)	50 Year Flow (m^3/day)
Markdale WWTP (excludes P1-1 and P2-1)	960	1,920	2,031
AMK WWTP (includes P1-2, P1-3, P1-4, P2-2 AND P3-1)	917	1,811	2,418
Flesherton WWTP (INCLUDE P2-1, P2-2 AND P2-3)	525	756	972

LEGEND

- MUNICIPAL WASTEWATER FACILITY
- MUNICIPAL WWTP PROPOSED SERVICE AREA
- AMK WWTP PROPOSED SERVICE AREA
- FLESHERTON WWTP PROPOSED SERVICE AREA
- PHASE 1-4 AND 3-3 (NOT SERVICED UNDER ALTERNATIVE 4)
- PROPERTY PARCEL

PROPOSED WASTE WATER MAINS

- FORCEMAIN (EXIST.)
- FORCEMAIN (WITH GRINDER PUMPS)
- GRAVITY MAIN
- POTENTIAL LOCATION FOR SEWAGE PUMP STATION (APPROX.)
- INTERSECTION POINTS

0 0.5 1 2 3 4
Kilometres

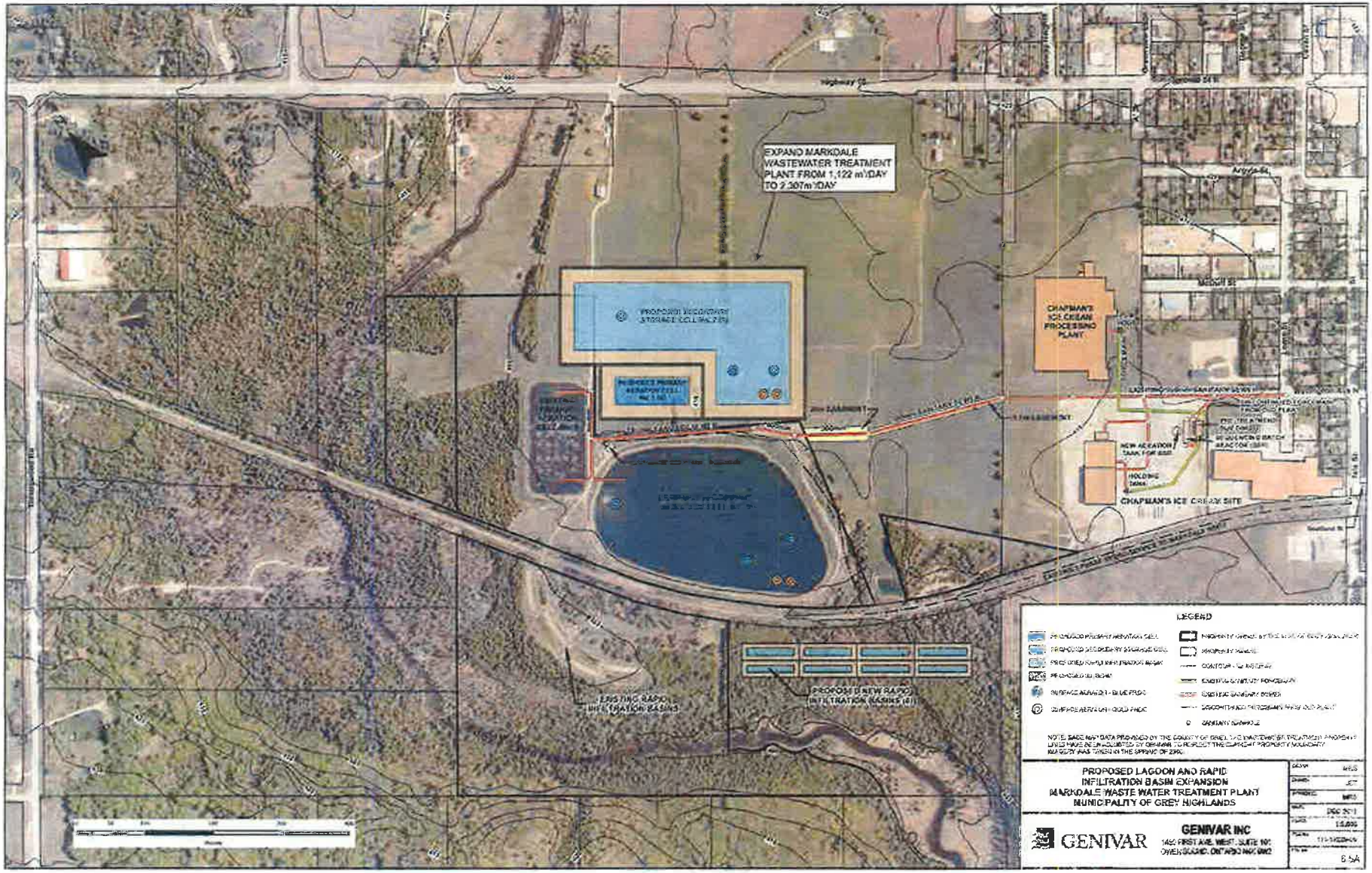
PROPOSED WASTEWATER SERVICE AREAS
ALTERNATIVE 4
MUNICIPALITY OF GREY HIGHLANDS
WATER AND WASTEWATER MASTER PLAN

GENIVAR

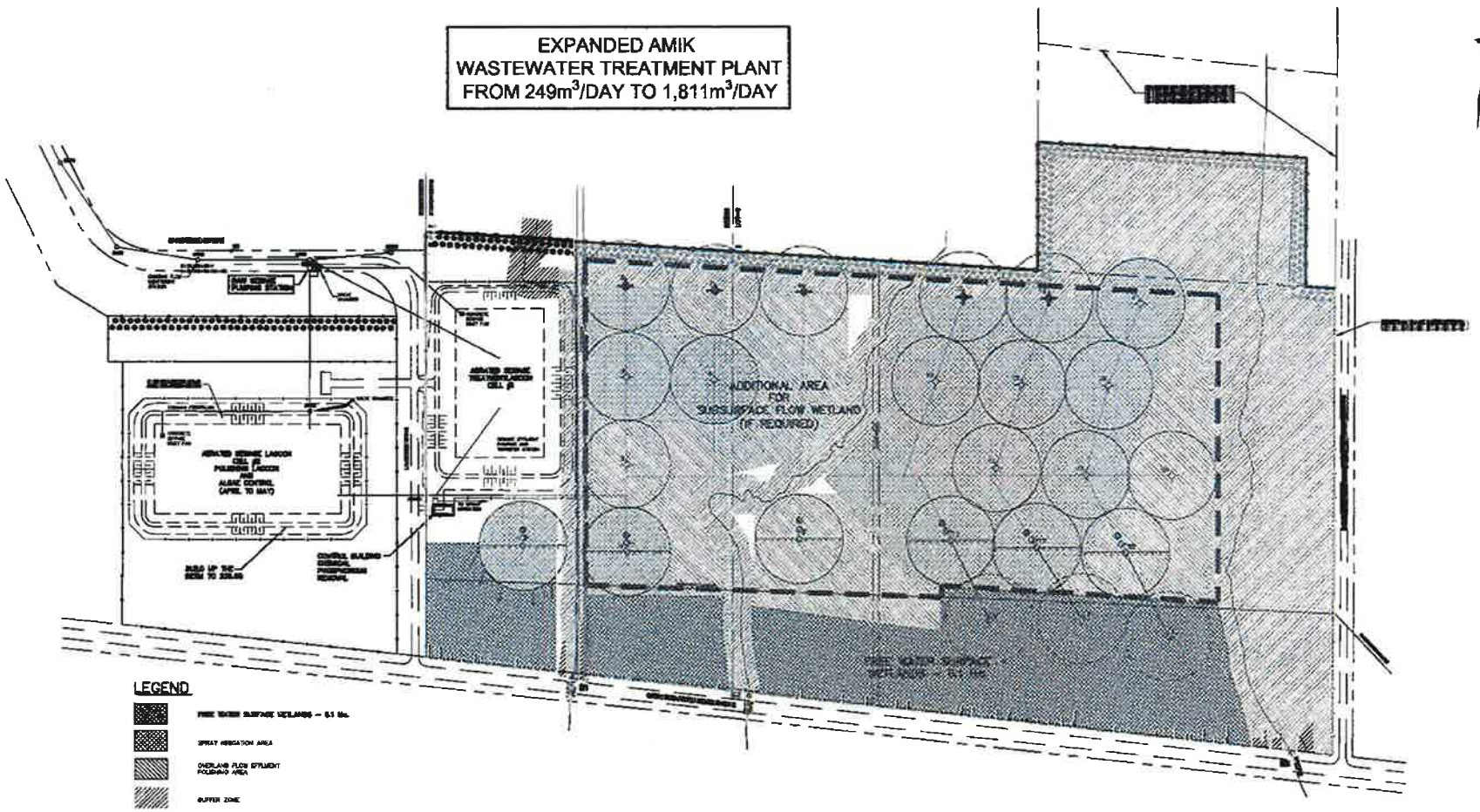
GENIVAR INC
1550 FIRST AVE. WEST, SUITE 150
OWEN SOUND, ONTARIO N4K 6W2

111-13279-00

6.6(2)


EXPAND MARKDALE WASTEWATER TREATMENT PLANT FROM 1,122 m³/DAY TO 2,307m³/DAY
CHAPMAN'S ICE CREAM PROCESSING PLANT
CHAPMAN'S ICE CREAM SITE
EXISTING RAPID INFILTRATION BASINS
PROPOSED NEW RAPID INFILTRATION BASINS (4)
LEGEND
PROPOSED LAGOON AND RAPID INFILTRATION BASIN EXPANSION
MARKDALE WASTE WATER TREATMENT PLANT
MUNICIPALITY OF GREY HIGHLANDS
GENIVAR
GENIVAR INC
1442 FIRST AVE. WEST, SUITE 101
OWEN SOUND, ONT. N4K 6W2

EXPANDED AMIK WASTEWATER TREATMENT PLANT FROM 249m^3/DAY TO 1,811m^3/DAY

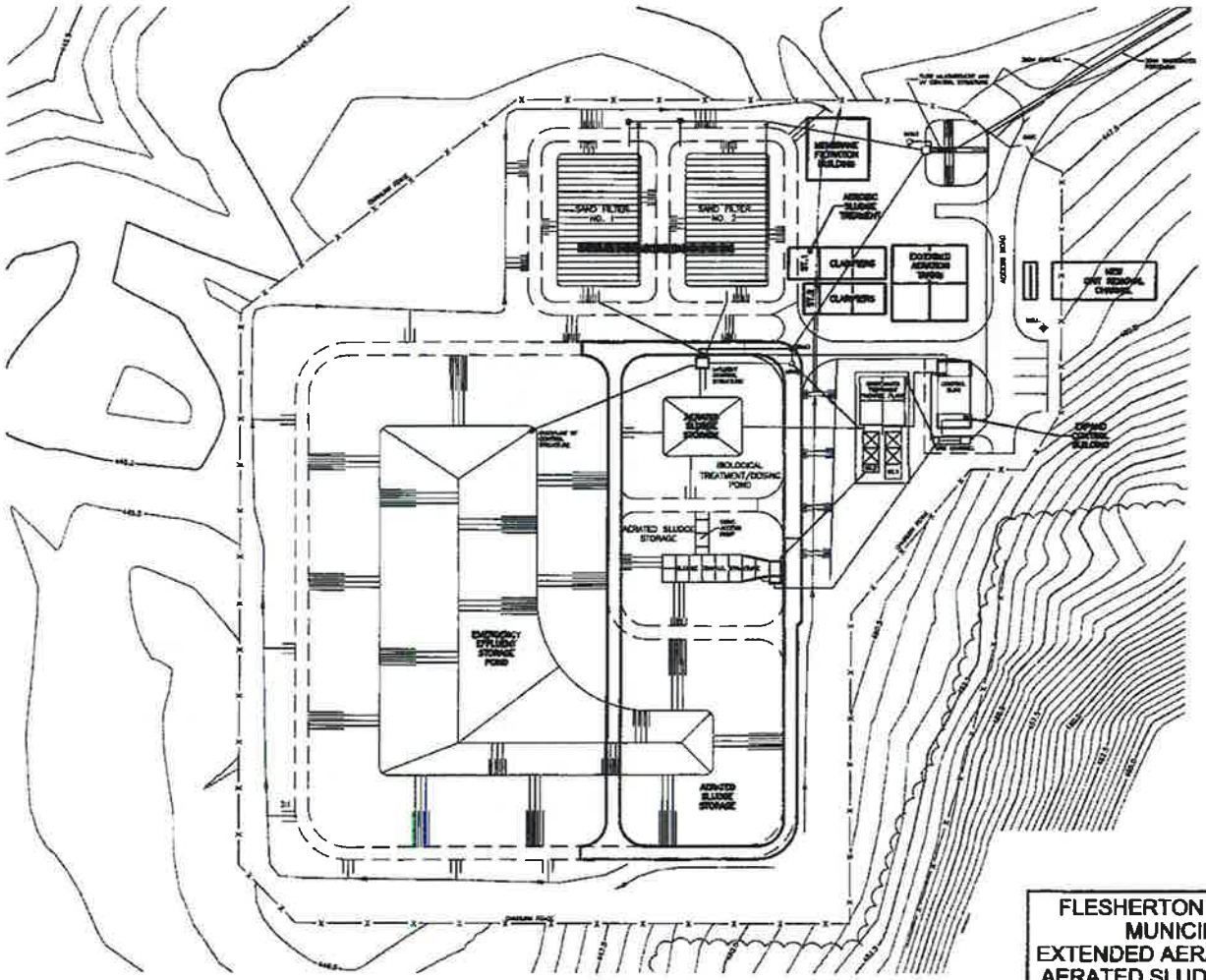


AMIK WASTEWATER TREATMENT PLANT
MUNICIPALITY OF GREY HIGHLANDS
PROPOSED EXPANSION

GENIVAR
1450 1st Ave W, Suite 101, Owen Sound, ON, N4K 6W2
Telephone: (519) 376-7012 / Fax: (519) 376-8008
Toll Free: 1-866-376-7012

DESIGN	M R S
DRAWN	T C G
APPROVED	M R S
DATE	DEC 1, 2011
SCALE	1:4000
FILE No.	111-13229-00
FIG. No.	6.5B

COPYRIGHT © GENIVAR INC.



EXPANDED FLESHERTON
WASTEWATER TREATMENT PLANT
FROM 419m^3/DAY TO 1488m^3/DAY

FLESHERTON WASTEWATER TREATMENT PLANT
MUNICIPALITY OF GREY HIGHLANDS
EXTENDED AERATION WITH MEMBRAHE FILTRATION,
AERATED SLUDGE STORAGE AND UV DISINFECTION

GENIVAR
1400 1st Ave W, Suite 101, Owen Sound, ON, N4K 6W2
Telephone: (519) 376-7811 / Fax: (519) 376-8008
Toll Free: 1-888-376-7812

DESIGN	M R S
DRAWN	T C G
APPROVED	M R S
DATE	DEC 1, 2011
SCALE	1:1000
FILE No.	111-13229-00
DWG. No.	6.5C

COPYRIGHT © GENIVAR INC.

Capital Costs
Water Systems Alternative Solutions

Alternative No.	Alternative Description	Capital Breakdown Cost (2012)	Total Capital Cost
W.1	Markdale (PI-1, PI-3, PI-4, PII-1, PII-2, PII-3, PII-4, PIII-1, PIII-2, PIII-3 and PIII-4)	$33,304,000.00	$36,957,000.00
	Kimberley, Amik, Talisman (PI-2 and PI-5)	$3,653,000.00	
W.2	Markdale (PI-1, PI-3, PI-4 and PII-3)	$17,549,000.00	$41,141,000.00
	Kimberley, Amik, Talisman (PI-2 and PI-5)	$3,653,000.00	
	Flesherton (PII-1, PII-2 and PII-4)	$7,180,000.00	
	Eugenia (PIII-1, PIII-2, PIII-3 and PIII-4)	$12,759,000.00	
W.3	Markdale (PI-1, PI-3, PI-4, PII-1, PII-2, PII-3 and PII-4)	$22,957,000.00	$39,369,000.00
	Kimberley, Amik, Talisman (PI-2 and PI-5)	$3,653,000.00	
	Eugenia (PIII-1, PIII-2, PIII-3 and PIII-4)	$12,759,000.00	
W.4	Markdale (PI-1, PI-3, PI-4, and PII-3)	$17,549,000.00	$36,370,000.00
	Kimberley, Amik, Talisman (PI-2 and PI-5)	$3,653,000.00	
	Flesterton (PII-1, PII-2, PII-4, PIII-1, PIII-2, PIII-3 and PIII-4)	$15,168,000.00	
W.5	Markdale (PI-1, PI-2, PI-3, PI-4, PI-5, PII-1, PII-2, PII-3 and PII-4)	$28,225,000.00	$40,984,000.00
	Eugenia (PIII-1, PIII-2, PIII-3 and PIII-4)	$12,759,000.00	
W.6	Markdale (PI-1, PI-2, PI-3, PI-4, PI-5 and PII-3)	$21,478,000.00	$36,646,000.00
	Flesherton (PII-1, PII-2, PII-4, PIII-1, PIII-2, PIII-3 and PIII-4)	$15,168,000.00	
W.7	Markdale (PI-1, PI-2, P1-3, PI-4, PI-5, PII-1, PII-2, PII-3, PII-4, PIII-1, PIII-2, PIII-3 and PIII-4)	$37,264,000.00	$37,264,000.00
W.7A	Markdale (PI-1, PI-2, P1-3, PI-4, PI-5, PII-1, PII-2, PII-3, PII-4, PIII-1, PIII-2, PIII-3 and PIII-4)	$41,306,000.00	$41,306,000.00

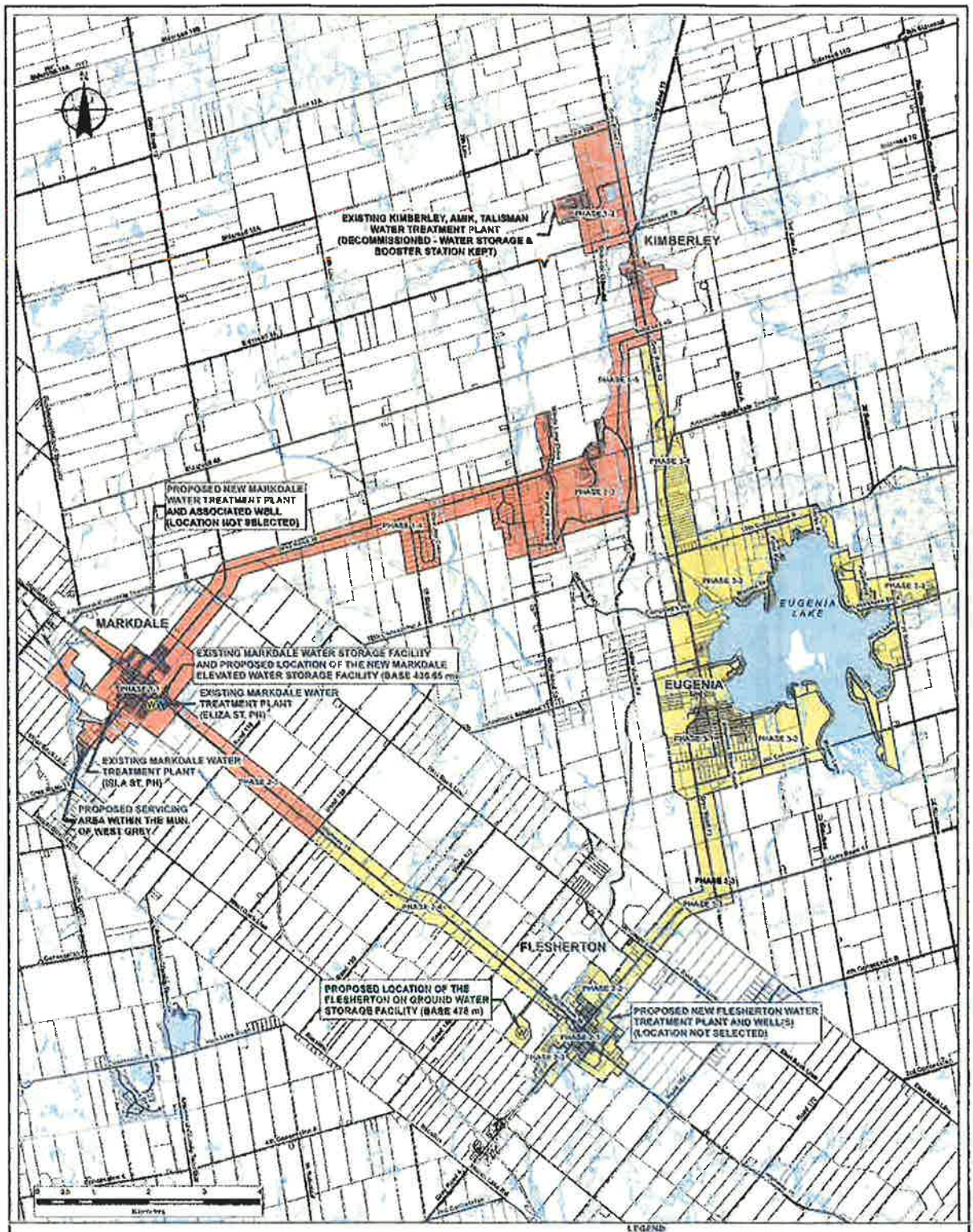
Capital Costs
Sewage Systems Alternative Solutions

Alternative No.	Alternative Description	Capital Breakdown Cost (2012)	Total Capital Cost
S.1	Markdale (PI-1, PI-3, PI-4 and PII-3)	$15,774,000.00	$35,114,000.00
	Amik (PI-2, PI-5, PIII-1, PIII-2, PIII-3, and PIII-4)	$13,871,000.00	
	Flesherton (PII-1, PII-2 and PII-4)	$5,469,000.00	
S.2	Markdale (PI-1, PI-3, PI-4 and PII-3)	$15,774,000.00	$34,778,000.00
	Amik (PI-2, PI-5 and PIII-4)	$6,730,000.00	
	Flesherton (PII-1, PII-2, PII-4, PIII-1, PIII-2, and PIII-3)	$12,274,000.00	
S.3	Markdale (PI-1 and PII-3)	$1,612,000.00	$25,911,000.00
	Amik (PI-2, PI-3, PI-5 and PIII-4)	$12,038,000.00	
	Flesherton (PII-1, PII-2, PII-4, PIII-1, PIII-2, and PIII-3)	$12,261,000.00	
S.4	Markdale (PI-1 and PII-3)	$10,016,000.00	$39,311,000.00
	Amik (PI-2, PI-3, PI-5, PIII-1, PIII-2 and PIII-4)	$23,187,000.00	
	Flesherton (PII-1, PII-2 and PII-4)	$6,108,000.00	

Recommended Water System
Alternative 6

Water Treatment Plant		Storage		Phases Serviced
Plant	Firm Capacity (m^3 average day)	Water Facility	Quantity of Storage m^3	
Markdale	5,790		5,000	PI-1, PI-2, PI-3, PI-4, PI-5 and PII-3
Flesherton	3,100		2,580	PII-1, PII-2, PII-4, PIII-1, PIII-2, PIII-3 and PIII-4
		Kimberley Amik-Talisman	880	

Capital Cost = $36,646,000



Design Water Scenario - Water Treatment Plant - Alternative 6

WATER AND WASTEWATER SERVICING MASTER PLAN
MARKDALE-FLESHERTON-KIMBERLEY-AMIK-EUGENIA-BEAVER VALLEY
MUNICIPALITY OF GREY HIGHLANDS

116-13209-00

Water Treatment Plant	Existing		20 Year		50 Year	
	Average Day Water Demand (m³/day)	Maximum Day Water Demand (m³/day)	Average Day Water Demand (m³/day)	Maximum Day Water Demand (m³/day)	Average Day Water Demand (m³/day)	Maximum Day Water Demand (m³/day)
Markdale WTP (PH-1, PH-2, PH-3, PH-4, PH-5 and PH-6)	1 357	2 771	2 825	5 767	3 018	7 423
Flesherton WTP (PH-1, PH-2 and PH-3, PH-1, PH-2, PH-3 and PH-4)	0	0	1 552	3 104	2 000	4 100

LEGEND

- EXISTING WATER STORAGE FACILITY
- PROPOSED WATER STORAGE FACILITY
- MARKDALE WTP PROPOSED SERVICE AREA
- FLESHERTON WTP PROPOSED SERVICE AREA *
- * NOTE: THE LOCATION OF THE PROPOSED FLESHERTON WATER TREATMENT PLANT IS TBD
- PROPERTY PARCEL
- WATER BODY
- WETLAND - PERMANENT
- RIVER/STREAM

PREFERRED SOLUTION FOR WATER TREATMENT, WATER STORAGE AND WATER DISTRIBUTION
ALTERNATIVE - W6
MUNICIPALITY OF GREY HIGHLANDS
WATER AND WASTEWATER MASTER PLAN

GENIVAR

GENIVAR INC
1859 FIRST AVE. WEST, SUITE 101
OWEN SOUND, ONTARIO, N4K 3E3

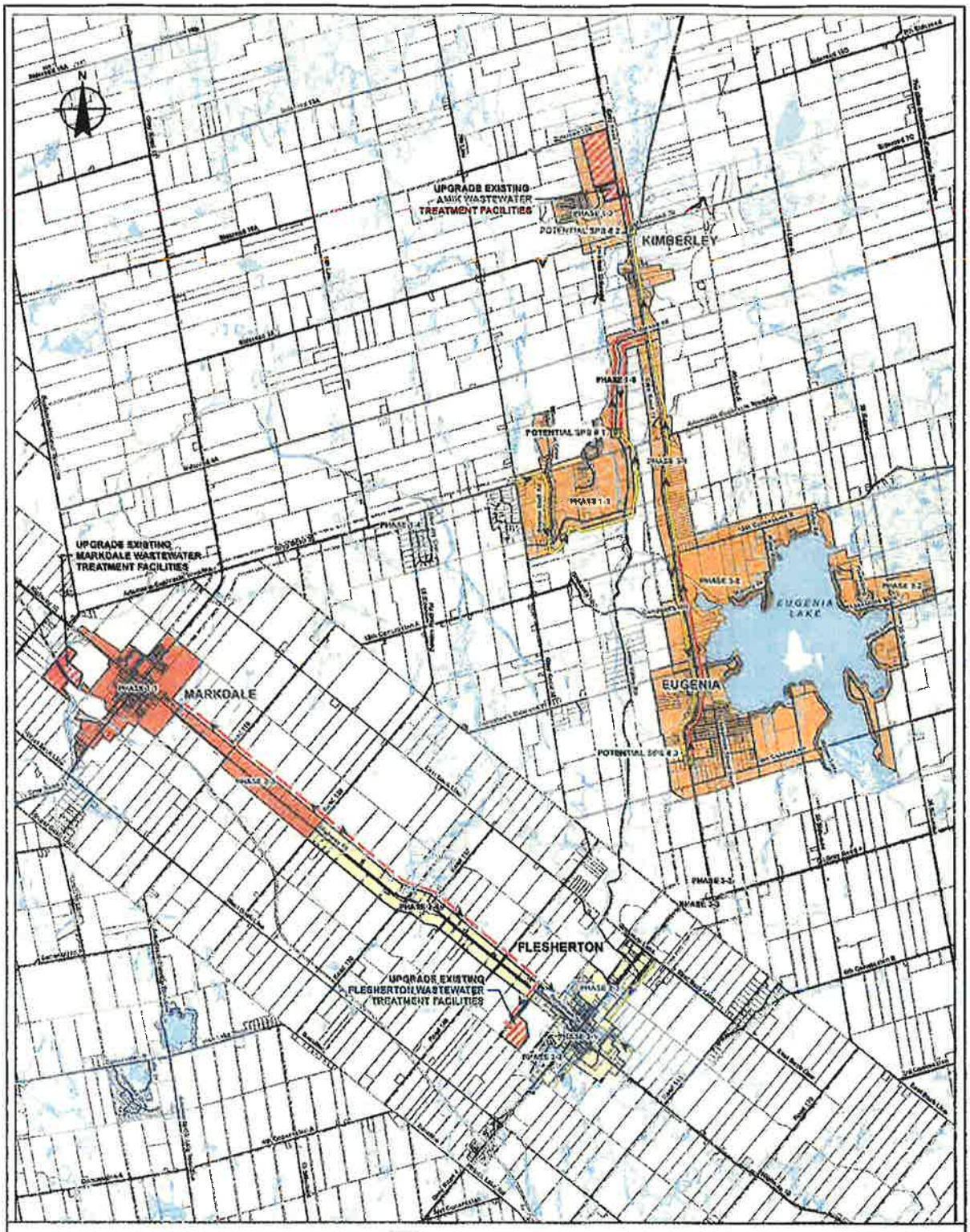
DRAWN	CM/MB
CHECKED	JFT
APPROVED	CM/MB
DATE	NOV 2011
SCALE	AS SCALE BAR
PROJECT	116-13209-00
REVISION	

G-1

Recommended Sanitary Sewer System
Alternative 4

WWTP	New Capacity m^3/day	Phases Serviced
Markdale WWTP	1,880	PI-1 and PII-3
Amik WWTP	1,811	PI-2, PI-3, PI-5, PIII-1, PIII-2 and PIII-3
Flesherton WWTP	459	PII-1, PII-2 and PII-4

Capital Cost = $39,311,000



Design Sewage Flows - Alternative 4 (Phase 1-4 and 3-3 not Serviced)

WATER AND WASTEWATER SERVICING MASTER PLAN
MARKDALE-FLESHERTON-KIMBERLEY-EUGENIA-BEAVER VALLEY
MUNICIPALITY OF GREY HIGHLANDS

111-03720-00

Wastewater Treatment Plants	Existing Sewage Flow (m^3/day)	20 Year Flow (m^3/day)	50-Year Flow (m^3/day)
Markdale WWTP (includes PH1 and PH3)	904	1,663	2,631
Amik WWTP (includes PH2, PH3, PH4, PH1 AND PH4)	218	1,611	2,418
Flesherton WWTP (includes PH1, PH2 AND PH4)	174	459	577

LEGEND

- MUNICIPAL WASTEWATER FACILITY
- MARKDALE WWTP PROPOSED SERVICE AREA
- AMIK WWTP PROPOSED SERVICE AREA
- FLESHERTON WWTP PROPOSED SERVICE AREA
- PHASE 1-4 AND 3-3 (NOT SERVICED UNDER ALTERNATIVE 4)
- PROPERTY PARCEL

PROPOSED WASTEWATER MAINS

- FORCEMAIN (SPS)
- FORCEMAIN (WITH GRINDER PUMPS)
- GRAVITY MAIN
- POTENTIAL LOCATION FOR SEWAGE PUMP STATION (APPROX)
- DIRECTION OF FLOW

0 0.5 1 2 3 4
Kilometres

PREFERRED SOLUTION FOR WASTEWATER TREATMENT, SEWAGE PUMPING STATION AND SANITARY SEWER COLLECTION
ALTERNATIVE - S.4
MUNICIPALITY OF GREY HIGHLANDS
WATER AND WASTEWATER MASTER PLAN

GENIVAR

GENIVAR INC.
1656 FIRST AVE. WEST SUITE 101
OWEN SOUND, ONTARIO N4K 4W2

DRAWN	CARDIN S.
CHECKED	JEF
APPROVED	Cardenas
DATE	NOV 2011
SCALE	SEE SCALE BAR
PROJECT	111-03720-00
FIGURE	8.2

Recommended Alternative

	Capital Costs	Operation Costs
Water System – Alternative W.6	$36,646,000	$1,450,000
Sanitary Sewer System – Alternative S.4	$39,311,000	$1,300,000
Total	**$75,957,000**	**$2,750,000/yr**

20 year capital cost/unit $75,957,000 ÷ ±5,000 = $15,200/residential equivalent unit

If 2/3 funding from Federal and Provincial Governments – cost will be $5,100/ residential equivalent unit for water and sewage.

Operating Cost/Year = $550/Residential Equivalent Unit (Water and Sewage)

