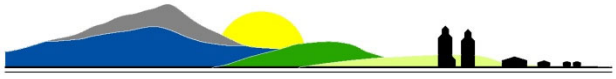
NORTH HEADGATES

AREA REDEVELOPMENT PLAN

Bylaw No. 1941-19

April 2019



Prepared for the County of Newell

COUNTY OF NEWELL
IN THE PROVINCE OF ALBERTA

BYLAW NO. 1941-19

BEING a bylaw of the County of Newell in the Province of Alberta, to adopt Bylaw No. 1941-19 being the North Headgates Area Redevelopment Plan;

WHEREAS the Council of the County of Newell wishes to adopt a comprehensive land use plan for certain land contained within portions of the SW ¼ 5-18-14 W4M, adjacent to Lake Newell Reservoir;

AND WHEREAS the purpose of the area redevelopment plan is to provide a comprehensive implementation strategy which will address the current substandard infrastructure in terms of water, wastewater and stormwater development, including identifying existing development which needs to be upgraded to current provincial and municipal standards;

AND WHEREAS the Council wishes to regulate and control development and redevelopment of these said lands with policies to facilitate the safe, orderly and practical subdivision and redevelopment of the subject parcel;

AND WHEREAS the municipality may adopt an area redevelopment plan pursuant to section 634(1)(b) of the Municipal Government Act, RSA 2000, Chapter M-26, and provide for its consideration at a public hearing.

NOW THEREFORE, under the authority and subject to the provisions of the Municipal Government Act, RSA 2000, Chapter M-26, the Council of the County of Newell in the Province of Alberta, duly assembled does hereby adopt Bylaw No. 1941-19 being the North Headgates Area Redevelopment Plan.

READ a **first** time this 21st day of March, 2019.

***Reeve** – Molly Douglass*

***Chief Administrative Officer** – Kevin Stephenson*

READ a **second** time this 25th day of April, 2019.

***Reeve** – Molly Douglass*

***Chief Administrative Officer** – Kevin Stephenson*

READ a **third** time and finally PASSED this 25th day of April, 2019.

***Reeve** – Molly Douglass*

***Chief Administrative Officer** – Kevin Stephenson*

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PART 1: INTRODUCTION

North Headgates is a historic residential development, consisting of approximately 40 developed residential sites which occupies approximately 26 acres (10.5 ha) of an existing 123 acre (49.85 ha) parcel legally known as a portion of the SW¼ 5-18-14 W4M. The development, adjacent to the reservoir right-of-way of Lake Newell Reservoir, has changed and intensified since the early 1940s without much attention or consideration given to provincial or municipal requirements for construction and permitting. The original purpose of the development was a summer rural recreation area but in recent decades several sites have been utilized for year-round accommodations and principal residences despite a lack of adequate and/or permanent servicing.

The County of Newell has attempted to work with the landowners to address the outstanding issues regarding unauthorized and non-compliant development on the site with little success. The County is concerned with the substandard infrastructure, specifically the lack of approvals and permits in accordance with provincial standards and setbacks for wastewater treatment systems on site. This Area Redevelopment Plan is the outcome of an agreement with the landowners in response to a Stop Order issued September 30, 2015 under section 645 of the *Municipal Government Act, Revised Statutes of Alberta, 2000, Chapter M-26, as amended (MGA).*

1.1 Purpose and Intent of the Plan

The North Headgates Area Redevelopment Plan will seek to accomplish the following objectives:

- Provide Council with sufficient information to make planning decisions which will lead to the safe and orderly redevelopment of the subject lands.
- Provide a comprehensive plan that will set guidelines for appropriate land use and facilitate the safe, orderly and practical subdivision and redevelopment of the subject parcel.
- Provide a comprehensive implementation strategy which will address the current substandard infrastructure in terms of water and wastewater development, including identifying existing development which needs to be upgraded to current provincial and municipal standards or removed.
- Inform landowners and interested parties of the process involved and the expectations of them when taking actions to have existing development become compliant with current regulations or redevelopment of existing or new improvements.
- Provide a design which integrates land uses with the requirements for transportation, water and wastewater infrastructure and other necessary utilities across the entire plan area.

1.2 Legislative Requirements

Pursuant to Part 17 of the *Municipal Government Act*, a municipality is responsible for the control of land use and development on private land within its boundaries. Several planning tools are available to the municipality to manage and control development for a particular area, one of which is the area redevelopment plan (ARP) — a statutory document a municipality can approve pursuant to section 634 of the *Municipal Government Act*.

Area redevelopment plans

634 *A council may*

(a) designate an area of the municipality as a redevelopment area for the purpose of any or all of the following:

(i) preserving or improving land and buildings in the area;

(ii) rehabilitating buildings in the area;

(iii) removing buildings from the area;

(iv) constructing or replacing buildings in the area;

(v) establishing, improving or relocating roads, public utilities or other services in the area;

(vi) facilitating any other development in the area,

(b) adopt, by bylaw, an area redevelopment plan,

(c) in accordance with this section and Division 6, provide for the imposition and collection of a levy to be known as a "redevelopment levy", and

(d) authorize a designated officer, with or without conditions, to perform any function with respect to the imposition and collection of that redevelopment levy.

Plan contents

635 *An area redevelopment plan*

(a) must describe

(i) the objectives of the plan and how they are proposed to be achieved,

(ii) the proposed land uses for the redevelopment area,

(iii) if a redevelopment levy is to be imposed, the reasons for imposing it, and

(iv) any proposals for the acquisition of land for any municipal use, school facilities, parks and recreation facilities or any other purposes the council considers necessary,

and

(b) may contain any other proposals that the council considers necessary.

1.3 History of SW¼ 5-18-14 W4M

Existing Permitting of Development in North Headgates

In the 1940s and 1950s, a municipality, including the County of Newell, was not required to have a land use bylaw or a development control bylaw. In 1963, the *Planning Act* was introduced which provided guidance on municipal planning and municipalities were required to meet *Planning Act* requirements. In 1969, the County of Newell joined the Southeast Regional Planning Commission to provide planning and development services. A municipal land use bylaw was not required until the Alberta *Planning Act* was amended in 1977 which required a municipality of a specific size to have a land use bylaw. The County of Newell adopted the first Land Use Bylaw in 1980, Bylaw 691-80. Therefore, development prior to 1980 most likely did not have a requirement for a development permit but all development that has occurred in the ensuing years would have been required to comply with these bylaws and obtain approved permits.

A review of historic permits issued by the County since 1980 reveal that only six permits have been issued. Three permits were issued between 1980 and 1990, 1 for a dwelling and 2 for additions to existing dwellings but approximately 5 other structures (4 dwellings, 1 garage) assumed to have been constructed during this period do not have permits. From 1990 to 2003, Land Use Bylaw 1004-90 was in effect and all development that occurred during this period should have complied with the bylaw. Approximately 7 structures (3 dwellings, 4 garages) were built during this time and none of them have permits on record.

From 2003 to 2007, Land Use Bylaw 1443-03 was in effect. All development that occurred during this period should have complied with this bylaw. Approximately 3 more structures (2 garages, 1 clubhouse) were built during this time with no permits issued. In October 2005, Council passed a resolution prohibiting further development on the parcel without an approved Area Redevelopment Plan for the site and rezoned the parcel to Direct Control. Since the prohibition on development, additional structures have continued to be constructed at North Headgates which include the following:

- 26 sheds,
- 4 dwellings,
- 5 decks,
- 1 addition to dwelling, and
- 1 garage.

Almost all of the existing development will need to be reviewed on a lot-by-lot basis once the Area Redevelopment Plan is approved and subdivision occurs to start to bring the development into compliance. This will ensure development going forward will be in alignment with municipal and provincial regulations.

Bantry Bay

Development on this quarter section of land has a complicated history. As North Headgates started to develop in the early 1940s, it was not limited to its current location. The adjacent subdivision (File 80SE175 and 82SE087), known as Bantry Bay, was also once part of the original development and was required to apply for subdivision in 1980 when issues arose regarding the need to obtain separate titles for a number of existing summer cottages. The cottages, adjacent to Lake Newell Reservoir, had also been under an unregistered lease scenario prior to the adoption of planning regulations in the County of Newell. At the time, the County of Newell and the Southeast Regional Planning Commission, a department of the provincial government, was very concerned about the possible pollution of Lake Newell Reservoir as it was, and still is, the source of the potable water supply for the region. At the time, obtaining separate title for the lands on which each of the dwellings was located would remove a barrier to prosecution of any future violations. The final subdivision containing 12 fee simple lots was registered in 1983.

1.4 Process to Remove Development Moratorium and Stop Order

In respect of the aforementioned, the following general "actions" required for Council to consider in deciding to lift the stop order and moratorium and allowing redevelopment in North Headgates include:

1. Council and the County administration must be satisfied that solutions for wastewater disposal, stormwater management and access to the site meet all municipal, provincial and federal standards and regulations in order to proceed with the necessary improvements to bring the existing development into compliance.
2. A final Area Redevelopment Plan for North Headgates must be adopted by County Council. The ARP will be used as the mechanism to guide future infrastructure improvements, access requirements, building/dwelling relocations or removals and future development.
3. A subdivision plan must be prepared, approved and endorsed and fee simple titles issued by the Alberta Land Titles Office prior to any development or construction permits being issued on any of the lands or lots subject to this Area Redevelopment Plan.

PART 2: PROFILE OF AREA AND DESIGN CONSIDERATIONS

2.1 Location

The lands to which the Area Redevelopment Plan affects is located in the western portion of the SW¼ 5-18-14 W4M adjacent to the northeast extents of Lake Newell Reservoir. The parcel is accessed via Township Road 180 and Range Road 144A from Highway 873, approximately 1.6 km (1 mile) to the east. Highway 873 provides direct access to the City of Brooks, approximately 6.4 km (4 miles) north from the subject site.

2.2 Physical Characteristics

A significant portion of the parcel contains saline wetland which occupies the centre portion of the land. The cottage/residential development has historically been contained to the area between the western property boundary, nearest the reservoir right-of-way, and the edge of the wetlands. The developed area is well treed with mature vegetation while the undeveloped portions are grassed.

2.3 Wetland Assessment

Most activities that have an impact on any class of wetland in Alberta require either a *Water Act* approval, licence or a notification under a *Water Act* Code of Practice. Municipal planning requires that ownership of all lands subject to future development is known to ensure that provincial interests in regards to wetlands are identified and handled appropriately. If a wetland is crown-owned, this may have implications that may impact the design of any future development.

A Desktop Wetland Assessment of the SW¼ 5-18-14 W4M was completed by Aquality Environmental Consulting Ltd. in June 2017, with further field work and a supplementary report completed in September 2017. A Wetland Permanence Assessment was also completed in March 2018 and both reports are found in Schedule A. Alberta Environment and Parks (AEP) Provincial Wetland and Water Boundaries Section responded to the Wetland Permanence Assessment and indicated that *"feature 1 (large central basin) meets the criteria of permanence and therefore has a Crown-owned bed and shore."* This crown interest will need to be considered at the subdivision stage.

It is the intent to avoid physical disturbance of the wetlands and as part of the *Water Act* approval for this project, consideration of the wetland will be reviewed by Alberta Environment and Parks (AEP). It has been determined that any stormwater management component of the project which may involve the existing wetlands will require a *Water Act* Approval.

2.4 Wildlife Assessment

Based on the Landscape Analysis Tool (LAT), sensitive wildlife features within the development area include 'Burrowing Owl Range', 'Piping Plover Waterbodies', 'Sensitive Amphibians Range', 'Sensitive Raptor Range', 'Sharp-tailed Grouse Survey', and 'Other Sensitive and Endangered Species'. The presence of these elements indicates that a number of conditions must be met or mitigated in order to proceed with development of the property. Below is a summary of survey recommendations, setback distances, and restricted activity periods. Setback buffers that show a range of distances in meters (e.g. 100-1000) are dependent on the level of disturbance, and are based on Alberta's Recommended Land Use Guidelines for Protection of Selected Wildlife Species and Habitat within Grassland and Parkland Natural Regions in Alberta *(Government of Alberta, 2011)*. Survey recommendations are based on Alberta's Sensitive Species Inventory Guidelines.

Wildlife

- The landowner is required to conduct a wildlife sweep of the immediate area (site plus 100 metres) prior to entry and construction to identify wildlife features.
- Where the presence of an important wildlife feature including mineral licks, raptor nests, active den sites, and hibernacula, is known or identified through a Wildlife Sweep, the landowner shall leave a buffer zone of a minimum width of 100 m undisturbed vegetation, where an established buffer does not already exist (e.g. Species at Risk). If species are identified during the wildlife sweep, the landowner must submit the wildlife sweep to the regulatory body for review before continuing with the approved activity.

Sensitive Raptor Range

- Pre-construction wildlife surveys (May 1 - June 30; one visit)
- Setback buffer of 1000 m (March 15 - July 15) and 50-1000 m (July 16 - March 14)

Burrowing Owl Range

- Pre-construction wildlife surveys (May 15 - July 15; one visit)
- Setback buffer of 200-500 m (April 1 - October 15) and 50-500 m (October 16 - March 31)

Sharp-tailed Grouse Survey

- Pre-construction wildlife surveys (mid-March to early/mid-May; two visits)
- Setback buffer of 500 m (March 15 - June 15) and 100-500 m (June 16 - March 14)

Piping Plover Waterbodies

- Pre-construction wildlife surveys (May 20 - June 15; two visits)

- No activities within 100 m from the bed and shore of known or identified piping plover water bodies
- Setback buffer of 100-200 m (year-round)

Sensitive Amphibians Ranges

- Pre-construction wildlife surveys (second week of April to second week of June; three surveys)
- No activities within 100 m of non-permanent seasonal (Class III) wetlands
- No activities within 100 m of northern leopard frog breeding ponds (year-round)

Other Sensitive and Endangered Species

- Pre-construction wildlife surveys (May 15 - July 1; two visits, three for short-eared owls)
- No activities on native grassland unless grassland bird surveys are completed as per the Sensitive Species Inventory Protocol (April 15 - August 15)
- Setback buffer of 100 m (April 1 - July 15)

Additionally, most species of migratory birds are protected under the *Migratory Bird Convention Act*, and active nests should have a species-specific setback buffer established around them. Finally, wildlife sweeps should be completed immediately prior to any construction activity, to identify nests or other sensitive features that may be impacted.

2.5 Existing Land Uses

The existing residential development consists of approximately 45 residential sites, containing 40 developed dwelling units and associated garages, sheds, decks and miscellaneous development and the other without a principal dwelling. The development of the area has intensified since the early 1940s with some of the original development still located on site 75 years later. These specific developments are nearing the end of their useful life and upgrades or replacements will be necessary in the future. As such, the installation of adequate servicing will aid in making certain that development at the site is sustainable into the future.

The remainder of the parcel is vacant grazing land with three active gas wells in the northeast corner of the quarter section. Development cannot occur within 100 m of an oil or gas well measured from the wellhead but it is not expected that the location will impact the redesign of the area (see Maps 1 and 2).

2.6 Existing Services and Utilities

Since the development has grown over the last several decades, no comprehensive utility plans are available for the property (see Map 3). AMEC Foster Wheeler Environment and Infrastructure provided an *Independent Review of Infrastructure Deficiencies at North Headgates* in November 2015 on behalf of

the County of Newell and provided the following general observations regarding current services. The entire report is attached in Schedule B.

Non potable water: Irrigation water is currently supplied by the Eastern Irrigation District (EID). There is a series of small diameter mains which originate in a pump house located near the headworks, which provide irrigation water to an unidentifiable number of dwelling sites.

Potable water: Currently potable water is supplied to each of the dwellings either through individual cisterns or bottled water in individual units.

Wastewater: Properties either have septic tanks and fields, pump out tanks or outdoor privies.

Gas / Propane: The majority of the dwellings are serviced by the Dinosaur Gas Co-op Limited and meters are typically attached to the residential dwellings. There is no documentation identifying gas mains routing within the development. In addition, some of the units are serviced by propane and the location, size and required setbacks should be a consideration in the final design layout.

Electrical Service: There are several lines of power poles servicing the developed area and dwellings but there are no easements or design scheme evident. In some cases, overhead power mains travel directly over dwellings.

2.7 Stormwater Site Conditions

WSP Canada Inc. completed preliminary work on the stormwater analysis of the site and have determined that the land drains both east, towards the existing wetlands and west towards Lake Newell Reservoir. A review of the existing development on site was completed and then utilized to calculate an estimate of average lot coverage for the entire redevelopment site, which was determined to be approximately 8 percent. This will be used in the design of the stormwater management plan which will accommodate the current and future volumes of stormwater runoff generated at full build out of the development.

2.8 Road Network

As part of *North Head Gate Estates County of Newell Independent Review of Infrastructure Deficiencies (AMEC Foster Wheeler, Environment and Infrastructure, 2015)*, the consultant provided a summary review of the existing road network in the North Headgates development. Interior roads currently consist of a series of laneways and abbreviated lanes where looping is incomplete and are terminated by fencing, gates and dwelling/accessory structure construction.

Part of the review included a site inspection and it was found that generally, all roads within the North Headgates Area failed to meet current standards, specifically:

- less than 20.12 m (66 feet) right-of-way,
- road surfaces were less than 8.0 m (26 feet) wide,

- lack of defined ditches and culverts,
- existence of dead-end roads without ability for vehicles to turn around, and
- lack of defined legal access to dwellings.

2.9 Geotechnical Assessment

A geotechnical assessment report was prepared for the site (*GEM Testing Ltd. November 2015)* to determine the subsurface soil conditions and groundwater conditions present in order to provide geotechnical design and construction recommendations for the development. Six test holes were drilled throughout the site to a depth of 7.5 m. The report recommended that the soils found on site are not suitable to be used for septic fields. In addition, it indicates that groundwater is flowing away from Lake Newell Reservoir towards the wetlands to the east. The full report can be found in Schedule E.

2.10 Environmental Site Assessment – Phase I

An Environmental Site Assessment Phase I Report was prepared for the site (*GEM Testing Ltd. November 2015)* to assess the environmental condition of a site and/or building(s). It assesses the risk of potential environmental liability at a property associated with current or historical activities at the site and neighboring properties. The report found there are no apparent underground storage facilities on or within close proximately of site and no ownership of the property that would indicate any environmental concern. A review of historic aerial photos showed nothing developed on or near the site that would contribute to any environmental concern. Observations during the field inspection did indicate sign of minor surface staining and contamination and it was recommended those areas be removed and disposed or during the development of the parcel. The full report can be found in Schedule F.

PART 3: DESIGN

3.1 Plan Design and Concept

North Headgates is presently a single titled parcel containing an organic development pattern with no definite lot size or layout. The redevelopment strategy of this site includes:

- meeting the provincial and municipal regulations for servicing, access, and separation of development;
- maintaining as much of the existing development as possible while providing access and utility servicing appropriate for the existing density; and
- providing land ownership or lease opportunities to the existing tenants through the registration of fee simple titles.

The North Headgates Development, upon completion of the upgraded infrastructure, is envisioned to be a recreational community with the potential for year-round occupancy. This will be based on the premise that existing and future development of dwelling units will adhere to the *Alberta Safety Codes Act* and Alberta Building Code requirements. The development will be serviced by individual water supplies (cisterns) and individual holding tanks on each lot which will ensure the protection of the water quality of the adjacent Lake Newell Reservoir.

The majority of the existing development will be preserved and new property lines will be established with respect to current development and historic occupation of the land. That statement is caveated with the understanding that since much of the existing development has occurred without the benefit of development or building permits, some of the structures will be required to be removed or relocated in order to achieve the desired outcome and some historic site occupancy will be lost to the design concept. A new road network has been prepared to provide congruent legal and physical access to all of the proposed lots and a stormwater management plan has been created to safeguard individual properties, Lake Newell Reservoir, and the adjacent wetland (see Maps 3 and 4, Schedule B).

Chart 1
North Headgates Area Redevelopment Plan
Developable Land in SE¼ 5-18-14 W4M

Gross Developable Land	Ha	Acres	Percentage
Titled area	49.97	123.57	100.0
Less Existing Wetland	8.879	21.94	17.8
Net Developable	41.09	101.63	82.2

Chart 2
North Headgates Area Redevelopment Plan
Land Required for North Headgates Development

Area needed for North Headgates	Ha	Acres	Percentage
Residential Lots	5.47	13.52	51.3
Municipal Reserve	0.97	2.39	9.4
Road (internal to parcel)	2.65	6.54	24.2
Total Area of Proposed Development (SW 5-18-14)	9.70	23.98	90.2
Land for Road (external to be acquired from EID)	0.97	2.39	9.4
Total Area of Proposed Development	10.66	26.36	100.0

3.2 Lot Layout and Density

The new conceptual Plan Design illustrates the proposed subdivision layout and specifies the overall lot density at full build-out of the area. The concept is to work with the historical pattern of development that has been established while attempting to dedicate roads and utility rights-of-way in a way that will minimize the development that is required to be removed. Maps 4 and 5 depict the most logical layout to proceed, based on the existing development, including access corridors.

The maximum build-out density of North Headgates as illustrated in Map 4, shall be 44 residential lots, 1 municipal reserve parcel and a dedicated road right-of-way which would provide legal access to all of the development. Upon the ultimate build-out of the development area, the projected population is 110 persons based on 44 residential parcels with 2.5 persons/parcel.

There may be a little flexibility afforded in the final lot sizes and boundaries, but the overall layout and density is to be adhered to. Lots sizes will generally range from 0.21 acre to 0.75 acres and lots will not be allowed to be further subdivided or consolidated without an amendment to this plan. Further subdivision is constrained due to the parameters of the stormwater management plan and the provincial Water Act approval. Future consolidation has direct impacts to the Local Improvement Tax.

Chart 3 illustrates the proposed lot sizes as well as an estimated size of current dwelling and accessory uses on each of the proposed lots. In addition, the chart depicts the estimated total percentage of the lot which is utilized for development and the estimated percentage of existing lot coverage. This chart will be important when preparing controls for future redevelopment and restrictions on development to meet the requirements for onsite stormwater management.

Chart 3
North Headgates Area Redevelopment Plan
Lot Information

Lot Number	Proposed Lot Area (Acres)	Proposed Lot Area (Estimated ft²)	Dwelling (Estimated ft²)	Principal Accessory (Estimated ft²)	Additional Accessory (Estimated ft²)	Total Lot Coverage (Estimated ft²)	Percentage of Lot Coverage (Percentage)
1	0.24	10454.4	0	0	0	0	0.00
2	0.21	9147.6	0	0	50	0	0.55
3	0.21	9147.6	0	0	0	0	0.00
4	0.20	8712.0	0		320	320	3.67
5	0.31	13503.6	0	499	367	866	6.41
6	0.27	11761.2	1586	735		2321	19.73
7	0.31	13503.6	1102		282	1384	10.25
8	0.32	13939.2	885		133	1018	7.30
9	0.26	11325.6	1554		129	1683	14.86
10	0.22	9583.2	839		31	870	9.08
11	0.29	12632.4	655		83	738	5.84
12	0.32	13939.2	988		326	1314	9.43
13	0.33	14374.8	542	318	154	1014	7.05
14	0.33	14374.8	1007		279	1286	8.95
15	0.24	10454.4	0	689		689	6.59
16	0.40	17424.0	1446		120	1566	8.99
17	0.30	13068.0	0	0	0	0	0.00
18	0.33	14374.8	707		426	1133	7.88
19	0.76	33105.6	1485			1485	4.49
20	0.71	30492.0	1366		118	1484	4.87
21	0.31	13503.6	0	0	422	0	0.00
22	0.18	7840.8	0			0	0.00
23	0.18	7840.8	0			0	0.00
24	0.30	13068.0	1784		65	1849	14.15
25	0.25	10890.0					00
26	0.28	12196.8	1330	296	70	1696	13.91
27	0.44	19166.4	1257	527	283	2067	10.78
28	0.26	11325.6	756	680	101	1537	13.57
29	0.36	15681.6	1115		281	1396	8.90
30	0.34	14810.4	1479	433		2337	15.78
31	0.32	13939.2	978	277	263	1518	10.89
32	0.23	10018.8	1184		83	1267	12.65
33	0.26	11325.6	841	389	132	1362	12.03
34	0.53	23086.8	1277		266	1543	6.68
35	0.42	18295.2	1131	296	392	1819	9.94
36	0.32	13939.2	1504	910	133	2547	18.27
37	0.30	13068.0	2919	521		3440	26.32
38	0.28	12916.8	1217		173	1390	10.76
39	0.28	12916.8	785		130	915	7.08
40	0.27	11761.2	0	1025	958	1983	16.86
41	0.29	12632.4	1241	1099	415	2755	21.81
42	0.27	11761.2	680		201	881	7.49
43	0.18	7840.8	748			748	9.54
44	0.40	17424.0	2100	777	103	2980	17.10
45MR	2.40	104544.0	—	—	—	—	—

3.3 Existing Development Identified for Removal / Relocation

The design of the development has been created on two critical factors:

- lot lines that respect current structures as much as possible, and
- a road network that provides congruent legal and physical access to all proposed lots and dwellings.

Proposed Dwelling Removal

The final lot design, while respecting as many dwellings as possible, does result in the need for existing dwellings which fall on lot lines, on proposed road right-of-way or represent more than one dwelling on a lot to be removed and/or relocated as part of the implementation process. Four dwellings have been identified for removal and/or relocation. Costs associated with the removal or relocation of the dwellings will need to be included in the costing of the project.

Proposed Accessory Structure Removal

As well as the dwellings, approximately 35 accessory buildings, sheds, garages, etc. will need to be removed or relocated to ensure that structures are contained with the defined property boundaries after subdivision has occurred. There will be costs associated with the removal or relocation of those structures. It will need to be determined how the cost will or will not be included in the overall costing of the project.

Proposed Fence Removal

The historic pattern of use by existing tenants has been defined over time by vegetation (trees, scrubs, etc.), fencing or maintenance of a specific area (i.e. mowing the grass). With the move towards fee simple titles, which may be owned by individuals, there will be a need to redefine the lots in the area to ensure that new property lines are respected along with municipal road right-of-way and lands under the ownership of the Eastern Irrigation District. Existing fences not located on proposed lot lines will need to be removed.

3.4 Servicing

The following section describes both the proposed infrastructure and servicing requirements or standards applicable to the Plan Area to proceed with subdivision of the lands and the subsequent development or redevelopment of the area. The County of Newell's *Urban and Rural Design Guidelines* will be applied in the absence of specifically described or stipulated standards.

As the proposed development will be eventually subdivided into fee simple lots, it has been determined that the development will be considered a year-round community and no longer just a seasonal, recreational development.

3.4.1 Wastewater Collection

There is an identified need to address the current deficiencies for the existing methods in which wastewater is treated on site. Considerations for determining the optimal treatment method included the following:

- the soil is not suitable for the installation of individual septic fields;
- the proposed density of residential units;
- the potential volumes of effluent to be generated on a peak day demand basis; and
- the proximity of the existing development to Lake Newell Reservoir, the raw water source for the Newell region.

The proposed system to service North Headgates will consist of individual holding tank collection system which will be pumped out and trucked to a wastewater treatment facility within the County by individual lot owners or tenants. Some concerns with this system may include odour control, containment, operational costs, and truck access which shall be determined and or mitigated through appropriate measures to ensure that the completed system operates as intended and provides the assurance that wastewater will be handled appropriately. Each onsite wastewater collection system, when designed and constructed, will meet the provincially regulated Code of Practice.

3.4.2 Water

Potable Water

The proposed water system will require each lot to install and maintain an individual cistern or holding tank for domestic water use. Water may be obtained by either trucking in potable water or applying to hook into the County of Newell's Rural Water System, which is currently located in the vicinity of North Headgates. The rural water system supplies approximately 300 gallons per day (946 ml per minute) for each service connection.

Irrigation Water

The Eastern Irrigation District has indicated that the proposed subdivided lots will be classified as "dry" and a rural water purposes agreement will need to be entered into by the County of Newell to provide irrigation water to the proposed lots in North Headgates and the existing lots in Bantry Bay. A raw water irrigation system will be installed to the satisfaction of the EID and the County. Detailed design work will be required prior to construction and must be accepted by the EID and County. Individual lot owners will be responsible for the yearly water costs assessed by the EID and a Homeowner's Association will need to be created to manage the ongoing operation and maintenance of the system.

3.4.3 Stormwater Management

WSP Canada Inc., consulting engineers for the County of Newell, have completed a preliminary stormwater management plan for the Area Redevelopment Plan. Generally, the plan is to create a management strategy that adequately manages the existing drainage as well as any additional volumes of runoff. Two key components of the drainage plan are water quality and water quantity. Steps will be taken to ensure the quality of the stormwater runoff does not degrade prior to entering the receiving storm water areas. The quantity aspect will be maintained through restricted lot coverage rates regulated in the Area Redevelopment Plan, the Land Use Bylaw and restrictive covenants registered on title. As well, any increase in stormwater generation from further development will be properly collected and conveyed in order to achieve additional storage capacity on site, increasing stormwater retention times, and thereby ensuring that release rates to the adjacent waterbodies does not increase with additional development. A copy of the Design Basis Memorandum is found in Schedule D.

3.4.4 Roads

Roads are needed to accommodate access for the existing development that will be subdivided in accordance with this Area Redevelopment Plan. A portion of the current road on Eastern Irrigation District land is proposed to be purchased and dedicated as a public road. The road system will be located within the right-of-way identified in the proposed plan of subdivision and will meet County standards.

3.4.5 Fire Suppression

Other than the local fire departments that provide service for the area, there presently is no formal or municipally managed system of fire suppression operating in North Headgates. There will be no requirement for fire suppression infrastructure as part of the Area Redevelopment Plan.

3.4.6 Third Party Utilities

Utilities, such as gas, electricity, telephone, etc. service the existing developments located in North Headgates. A coordinated utility plan will be developed in consultation with the various utility agencies regarding the provision of such services. All utilities shall be installed to each of the lots proposed on the final utility layout plan approved by the County of Newell and the utility companies. Individual propane tanks will not be allowed on individual lots to provide heating for existing or new dwelling units.

3.5 Local Improvement Tax Bylaw

A Local Improvement Tax (LIT) is sometimes imposed on a specific area within a municipality to fund a service or improvement applied to that particular area only. Since improvement benefits that particular area rather than the municipality as a whole, the owners of the land are responsible for paying the local improvement tax. A Local Improvement Tax Bylaw will be implemented by the County to install the required infrastructure.

3.6 Municipal Reserve

As part of the subdivision application approval process a municipality may require a portion of the land proposed to be subdivided to be dedicated as reserve land. Municipal reserve can be used for a public park, recreation area, school board purposes, or to separate lands that are used for different purposes (e.g., as a buffer). The County will require the dedication of land for municipal reserve purposes pursuant to section 661 of the *Municipal Government Act.* Map 4 shows the proposed location of the municipal reserve parcel, approximately 2.39 acres in size which represents the required 10 percent allocation in land in accordance with section 661 of the *Municipal Government Act*.

3.7 Restrictive Covenants

A restrictive covenant is a document that a developer, landowner or a municipality may register against a land title. A covenant runs with the land and is binding on future buyers/owners of a property. It serves as a notice to future landowners and generally outlines an interest to control use and development, indicate concerns or issues, or to ensure consistency related to a parcel.

A restrictive covenant will be prepared and registered on title to limit and control the site coverage for each lot to ensure compliance with the stormwater management plan and *Water Act* approval to manage stormwater on the site. The County of Newell, in order to have authority to enforce a restrictive covenant, will need to be identified in the covenant and either needs to be an owner of lands identified within the covenant or be the party that has registered the covenant and benefits by the restriction. This covenant will be prepared and executed at the time of subdivision and registered prior to endorsement.

PART 4: LAND USE AND IMPLEMENTATION POLICES

The Area Redevelopment Plan is to be used to support lifting of the moratorium on development and construction permits and enable the existing development to move towards compliance with the applicable regulations. The following policy section will accomplish the following:

- Provide a comprehensive plan that will set guidelines for appropriate land use and facilitate the safe, orderly and practical subdivision and redevelopment of the subject parcel.
- Provide a comprehensive implementation strategy which will address the current substandard infrastructure in terms of water and wastewater development, including identifying existing development which needs to be upgraded to current provincial and municipal standards or removed.
- Inform landowners and interested parties of the process involved and the expectations of them when taking actions to have existing development become compliant with current regulations or redevelopment of existing or new improvements.

4.1 General Policy

The following policies shall apply:

4.1.1 The maximum build-out density of North Headgates as illustrated, shall be 44 residential lots, contingent on the area of land required for stormwater management facilities, roads and reserve land. Lots will not be allowed to be further subdivided or consolidated without an amendment to this plan.

4.1.2 There is some flexibility allowed in regards to the final lot configuration and lot sizes, due to final road dedications, existing improvements, etc.; however, in no instance shall a resulting lot be less than 0.20 acres (809 m^2) in size.

4.1.3 The landowner shall be responsible for all associated expenses with the implementation of this Area Redevelopment Plan and the subdivision of their land, including any legal survey costs, local improvement levies, execution of required agreements, removal and/or relocation of structures and improvements, ensuring individual water cisterns and septic holding tanks meet provincial requirement, and the dedication of lands required for road, third party utilities and reserves which shall be part of the Local Improvement Tax Bylaw.

4.1.4 Baseline site coverage for each lot shall be established as indicated in Chart 3 and may be used in the calculation of the total lot site coverage for any development or redevelopment proposed in the future. Specific lot site coverage will be established in the Direct Control District for the development.

4.2 Transportation and Road Policy

The following policies shall apply:

4.2.1 The landowner will be responsible for the costs associated with the construction of any required roads through the Local Improvement Tax Bylaw. At the time of subdivision, the developer/ landowner will be required to enter into a development agreement which will establish the road construction requirements and the assignment of costs.

4.2.2 The landowner shall dedicate road right-of-way (roads and lanes), as stipulated in this Area Redevelopment Plan, at the time of subdivision. It is recognized that the County shall negotiate and purchase the required land for road right-of-way on the west side of the development from the Eastern Irrigation District and the costs associated with the acquisition shall be included in the Local Improvement Tax Bylaw for the area.

4.2.3 The dedication of the required road right-of-way is to adhere to the overall North Headgates design plan and is based on access management and limiting the number of access points to Township Road 180.

4.2.4 The road must be prepared and constructed to proper municipal specifications in accordance with *County of Newell Urban/Rural Design Guidelines*.

4.2.5 The provision and cost of providing roads to municipal standards shall be funded through the Local Improvement Tax paid by the landowners/developers and not the County of Newell.

4.2.6 Wherever feasible, the private access driveways should mirror those on adjacent lots and single joint or shared approaches should be utilized to reduce the number of access points in close proximity onto the internal municipal road network.

4.2.7 The municipality shall be responsible for constructing approaches from the municipal road to property line of individual lots and construction costs will be included in the local improvement tax bylaw. Any changes to these approaches in the future shall be the responsibility of the landowner and subject to County approval.

4.2.8 As the project site is located approximately 1.6 km (1 mile) west of the intersection of Highway 873 and Township Road 180, the final Area Redevelopment Plan shall be circulated to Alberta Transportation for comments. Any traffic studies or impact assessments required by the department shall be prepared and submitted for review.

4.3 Infrastructure and Servicing Policy

The following policies shall apply:

Wastewater System

4.3.1 The use of an individual holding tanks are considered suitable and practical in consideration of the existing and future density of North Headgates.

4.3.2 The individual holding tank for an existing dwelling must be as per Section 4.7.2. All new development will require the installation of a holding tank as per Section 4.7.11.

4.3.3 The operation and on-going maintenance of the individual collection systems will be the sole responsibility of the lot owners.

Potable Water System

4.3.4 The use of an individual cisterns for water are considered suitable and practical in consideration of the existing and future density of North Headgates.

4.3.5 The individual water system for an existing dwelling must be as per Section 4.7.2. All new development will require the installation of a water system as per Section 4.7.11.

4.3.6 The operation and on-going maintenance of the individual water systems will be the sole responsibility of the lot owners.

Raw Water Irrigation System

4.3.11 A rural water use purposes agreement shall be entered into between the County and the Eastern Irrigation District to provide irrigation water to the proposed lots and the existing lots in Bantry Bay.

4.3.12 A raw water irrigation system shall be installed to the satisfaction of the Eastern Irrigation District and the County. Detailed design work will be completed prior to construction and must be accepted by the Eastern Irrigation District and the County of Newell.

4.3.13 Individual lot owners will be responsible for the yearly water costs assessed by the Eastern Irrigation District. A homeowners' association or water cooperative shall be created to manage the ongoing upkeep and maintenance of the system.

Stormwater Management

4.3.14 The County of Newell will be responsible for securing all necessary authorizations/approvals from Alberta Environment and Parks (AEP) for the stormwater management plan, which may include

obtaining AEP approval under the *Water Act*. The Eastern Irrigation District must also be consulted and grant an approval of a more detailed stormwater management plan regarding drainage and outlets proposed to enter stormwater receiving areas.

4.3.15 A Lot Grading Plan, or portion of the plan if the information is included in the overall stormwater management plan, should be provided for each lot. It should specify design elevations, surface gradients, lot types, swale locations, and other drainage related information required for lot grading as well as establish the drainage relationship between adjacent properties.

4.3.16 The number of lots and configuration will be dependent on the final stormwater management plan. The proposed subdivision plan shall be designed to accommodate the facilities for storage or ponds if required, and the final number of lots may be reduced from what is depicted in this Plan.

4.3.17 Site coverage will be restricted in accordance with the stormwater management plan and the required *Water Act* approval. Site coverage of the lot shall be regulated in the Area Redevelopment Plan, the Land Use Bylaw and through a restrictive covenant registered on title in order to maintain the existing volume of stormwater discharge.

4.3.18 If any drainage easements are needed in respect of the functioning of the engineered stormwater system and conveyance of drainage water, the securing and registering of those documents and plans shall be provided by the landowners to the satisfaction of the County of Newell.

Third Party Utilities and Garbage Collection

4.3.19 The development is proposed to be serviced by Dinosaur Gas Cooperative and as such all dwellings and accessory structures will be required to connect to the service and individual propane tanks will not be allowed to be installed in the development.

4.3.20 The development will not have curbside garbage pickup and the arrangement for municipal garbage collection at a centralized location should be considered at the time of subdivision.

4.4 Local Improvement Tax and Municipal Reserve

The following policies are applicable:

4.4.1 As the County requires that North Headgates is upgraded to ensure safe and sustainable development, the County shall impose a local improvement tax to pay for the local infrastructure improvements.

4.4.2 Unless otherwise specified and agreed to by the County of Newell, municipal reserve will be provided as land as identified on Map 4.

4.5 Development of a Site Specific Direct Control District

Currently the land is designated as Direct Control with site specific restrictions on development. Once the plan has received Council approval, an amendment to the Land Use Bylaw shall be prepared which will amend the Direct Control District to align with the development plan and design concept as presented in the Area Redevelopment Plan. The process to amend the Land Use Bylaw, is outlined in the *Municipal Government Act.* Council will make the final decision to approve the land use district regulations proposed for the parcel and there is no appeal of this decision.

4.5.1 Prior to consideration of any subdivision applications, the Land Use Bylaw must be amended to provide for specific criteria for development based on the information and policies contained in the Area Redevelopment Plan.

4.5.2 Council should give consideration to the conformity of the land use amendment proposal to the overall Area Redevelopment Plan requirements.

4.5.3 The land use amendment to the Direct Control District of the Land Use Bylaw shall follow the process outlined in the *Municipal Government Act, Revised Statutes of Alberta 2000, and Chapter M-26*.

4.5.4 Any subdivision or development proposals as proposed by landowners or developers must adhere to the layout and road network as stipulated in this Area Redevelopment Plan and the Land Use Bylaw.

4.5.5 There is no obligation on the part of County Council to rezone any parcel of land and they will review each application on its own merits against the Area Redevelopment Plan.

4.6 Subdivision

Once the amendment to the Direct Control District is approved, a subdivision application may be processed.

4.6.1 The Area Redevelopment Plan is to be used as a guideline for subdivision. The proposed density and minimum lot size shall be adhered to. Any major proposed deviations in the lot layout will require an amendment to this ARP by Council.

4.6.2 A tentative plan of subdivision shall correspond to the approved lot layout and road network of the Plan Area. The tentative plan must be prepared by certified Alberta Land Surveyor and shall include the exact dimensions of the lot(s) to be subdivided and the dimension of all structures on site along with dimensions to proposed property lines.

4.6.3 At the time of subdivision, Municipal Reserve shall be provided by way of land in an amount not exceeding 10 percent of the acreage of the parcel being subdivided.

4.6.4 Utility easement(s) as required by utility companies or County of Newell shall be established prior to finalization of the subdivision application and the landowner must provide any necessary utility easements or right-of-way.

4.6.5 Prior to submission of an application for subdivision, an application to Alberta Environment and Parks for an approval under the *Water Act* for the stormwater management plan must be submitted with proof included as part of the subdivision application.

4.6.6 Plans regarding the construction of the municipal water and wastewater system design shall be included as part of the subdivision application.

4.6.7 There may be encroachments of existing structures, sidewalks, and/or decks across proposed property lines and those encroachments shall be identified on a separate drawing with the intention to remove, relocate or enter into encroachment agreements as part of the final approval.

4.7 Development and Construction Permits

Once the parcel has been subdivided, conditions met and separate titles issued, the landowners shall be required to apply to the County of Newell for a development permit to bring existing development into compliance in regards to the site specific Direct Control District as contained in the County of Newell Land Use Bylaw. County of Newell records indicate the following permits have been issued for the following development:

Lot Number	Permit Number	Year Issued	Development Authorized
18	454	1984	Addition to dwelling
19	1171/1172	1993	Dwelling
20	429	1984	Addition to dwelling
34	2407	2002	Addition to dwelling
41	1165	1993	Mobile Dwelling and 2 decks
43	449	1984	Dwelling

Existing Development

The development approval process for existing development will include the following:

4.7.1 This Area Redevelopment Plan is to be used as a guideline for development in conjunction with the Land Use Bylaw when considering a development permit application.

4.7.2 All dwellings shall be required to install individual potable water systems and a wastewater holding tank.

4.7.3 The landowner/developer will be required to submit an application form for an "as built" permit which will include a fee, a site plan showing the location of the existing building(s) on the lot and may include building plans and a grading plan as requested by the County.

4.7.4 Safety code inspections may be required for existing dwellings and structures that request a development permit.

4.7.5 As part of the development permit process, any costs associated with survey or engineering work that may be required shall be at the expense of the lot owner.

4.6.6 Specific setback shall be identified for dwellings and structures in the Direct Control District for North Headgates and consideration shall be given to relaxing the setbacks in specific situations where hardship exists.

4.7.7 The development authority may require that as a condition of issuing a development permit, the applicant enter into a development agreement with County of Newell.

4.7.8 If a development permit is issued by the County of Newell, the developer/applicant is responsible for ensuring the necessary building permits and other safety code approvals that may be required by the County, are in place.

4.7.9 Landowners will be required to provide and adhere to the stormwater management plan as applicable to their lot and proposed development. Proof of site coverage may be required. There are no waivers to maximum site coverage once established as part of the *Water Act* approval.

New Development

The development approval process for new development will include the following:

4.7.10 This Area Redevelopment Plan is to be used as a guideline for development in conjunction with the Land Use Bylaw when considering a development permit application.

4.7.11 All new dwellings shall be required to install individual water systems and a wastewater holding tank.

4.7.12 The landowner/developer will be required to submit an application form with fee, a site plan showing the location of the proposed dwelling, a building plan, the location and size of all existing or proposed accessory buildings and a grading plan.

4.7.13 Any costs associated with survey or engineering work that may be required shall be at the expense of the developer.

4.7.14 The development authority may require that as a condition of issuing a development permit, the applicant enter into a development agreement with County of Newell.

4.7.15 If a development permit is issued by the County of Newell, the landowner/developer is responsible for ensuring the necessary building permits and any other safety code approvals that may be required under the Alberta *Safety Code Act* are in place.

4.7.16 Landowners will be required to provide and adhere to the stormwater drainage management plan as applicable to their land parcel and proposed development. Proof of site coverage will be required. Existing structures may need to be removed to adhere to the maximum site coverage. There are no waivers to maximum site coverage once established as part of the *Water Act* approval.

4.7.17 Builders/developers must give proper consideration to lot grades when choosing a house/ building design. The final building grades must ensure that drainage patterns created on the lots will cause water to be channelled on all sides, away from the building and onto adjacent drainage ditches or swales. Lot drainage patterns must relate to the adjoining lots and the rest of the subdivision, and be in conformance to approved stormwater management plans. Landscaping may be required to the satisfaction of the development authority to mitigate drainage issues, in accordance with the Land Use Bylaw.

4.7.18 The development authority may require the developer to provide additional standards of development (landscaping, screening of storage/goods, etc.) in conjunction with the Land Use Bylaw.

4.7.19 The developer/applicant is responsible for contacting the applicable private utility companies prior to undertaking any excavation or development work.

4.8 Adoption of Plan

4.8.1 The Area Redevelopment Plan is to be used to support lifting the moratorium for development. The landowner shall be responsible to meet the requirements of the ARP and provide the necessary engineered plans, to the satisfaction of the County of Newell, to proceed with submitting subdivision applications.

4.8.2 The Area Redevelopment Plan shall be adopted by bylaw in accordance with the *Municipal Government Act*.

4.8.3 Once the County of Newell Council adopts the *North Headgates Area Redevelopment Plan 2019* by bylaw, any proposed amendments must be approved by County Council through the amendment process in accordance with the *Municipal Government Act*.

SCHEDULE A

Wetland Assessment & Wetland Permanence Assessment (Crown Claimability)

AQUALITY CONSULTING

Aquality
Environmental Consulting Ltd.

Wetland Assessment of Land Parcel SW-5-18-14-W4M

Prepared for:

Ms. Alyce Wickert
County of Newell
1803037 Range Road 145
P.O. Box 130
Brooks, Alberta T1R 1B2

6 September 2017

Prepared by:
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Edmonton, AB, Canada, T6B 3J4

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1 Introduction

Aquality Environmental Consulting Ltd. (Aquality) was retained by Newell County to carry out a wetland assessment for a parcel located at SW-5-18-14-W4M. A previous desktop-based assessment identified three wetland habitats on the property, as well as the presence of a number of sensitive or protected wildlife species. The present study is a brief interim report on a field wetland assessment conducted on 17 August 2017 by Joshua Haag and Javan Green of Aquality. The assessment included refinement of wetland boundaries and classification, valuation, and initial wildlife surveys.

2 Methods

2.1 Desktop Wetland Assessment

A previous report prepared by Aquality[1] outlines the desktop-based components of the wetland assessment that were carried out prior to carrying out the field assessment. Results will not be re-iterated in this report for brevity, but were used to guide the required field assessments and wildlife surveys.

2.2 Field Assessment

A field assessment of the three wetlands was conducted on 17 August 2017. The wetlands were classified and boundaries refined from the initial desktop assessments, and the wetlands were evaluated using the Alberta Wetland Rapid Evaluation Tool (ABWRET). Surveys were also conducted for some wildlife species identified in the desktop assessment as being likely to occur within the wetland or surrounding habitats. The surveys were based on conversations with the provincial wildlife biologist concerning appropriate timing windows.

[1] Aquality Environmental Consulting Ltd. 2017. Desktop Wetland Assessment of Land Parcel SW-5-18-14-W4M. Edmonton, Alberta

3 Results

3.1 Wetland Assessment and Delineation

Boundaries for all wetlands were identified using a combination of soil and vegetative characteristics at each site. In all cases, the boundaries identified in the field resulted in smaller wetlands than those initially identified in the desktop assessment, which were conservative to ensure the full extent of the wetland was captured.

Wetland 1, the large central basin in the complex, was classified as a Shallow Open Water, Bare, sub-saline, semi-permanent wetland, totaling 7.46 ha in area. Wetland 2 to the north was classified as a Marsh, Graminoid, slightly brackish, seasonal wetland, totaling 1.00 ha in area. Wetland 3 to the south was classified as a Marsh, Graminoid, slightly brackish, seasonal wetland, totaling 0.419 ha in area. Wetland boundaries, Alberta Wetland Classification System (AWCS) classification, and areas are summarized in Figure 1. These results agree well with the desktop assessment conducted by Aquality including the permanence assessment, which indicated that Wetland 1 would be considered Crown-claimable, but Wetlands 2 and 3 would not.

Results for the valuation of the wetlands using the Province's ABWRET tool were not available at the time of preparation of this report. Once this information has been supplied by the Province, rates of compensation will be determined should disturbance of the wetland be required.

The wetlands on the subject property appear to be in a draw-down (drying) phase because of drought conditions, resulting in less standing water than would normally be expected and an expansion of vegetation into the central basins of the wetlands. The draw-down phase was accounted for in both the delineations and classifications under the assumption that this is not a permanent condition. If drought conditions persist, further accretion may occur, resulting in a reduction in size and permanence of the wetlands. However, currently there is no evidence that this is not part of a natural cycle of draw-down and refilling which occurs for most prairie pothole wetlands.

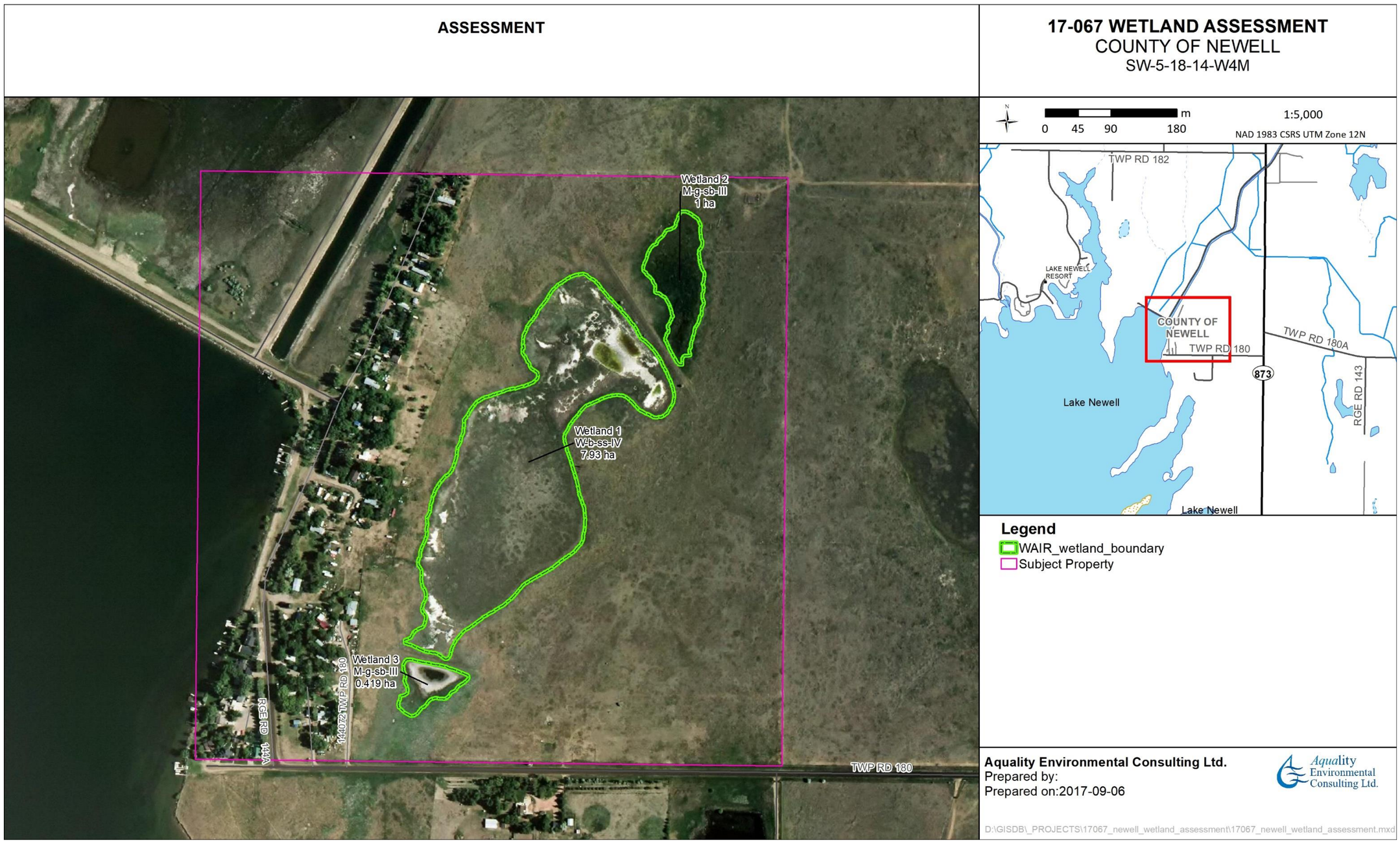

Figure 1. Field-delineated wetland boundaries, classifications, and areas.

3.2 Wildlife Surveys

Wetlands were completely dry at the time of assessment due to drought conditions, and no amphibians were observed. Based on the conditions, it will need to be assumed that Plains Spadefoot and Great Plains Toads may be hibernating in the area.

Numerous ground squirrels and dens were observed on the subject property and adjacent properties, with evidence of badger activity in several areas. These provide potential habitat for burrowing owls, which in combination with known occurrence in the area will necessitate a follow-up survey in the spring to identify active burrows. If a survey is not conducted to identify active burrows, then all potential burrows will be considered active, with the concomitant buffers and restricted activity periods.

Trees to the west and south around the houses offer potential habitat for raptors, for species that are resilient to the presence of human activities. Trees northwest of wetlands on the property to the north are more likely to be used, and the Swainson's hawk behaviour was suggestive of their use of this habitat. A pair of ferruginous hawks was observed to the east of the property, and they may nest in the vicinity.

Other incidental species observations from the field assessment are presented in Table 1.

Table 1. Incidental species observations from field assessment conducted 17 August 2017.

Location	Species
In or around wetlands	• Western Meadowlark • Mourning Dove • Barn Swallow • Swallow sp. • Eastern Kingbird • Western Kingbird • Clay-Colored Sparrow • Sparrow sp. • Richardson Ground Squirrel • Meadow Vole • American Badger (sign) • Coyote (scat)
Adjacent upland fields	• Swainson's Hawk • Ferruginous Hawk
Adjacent upland wooded areas/trees	• Baltimore Oriole • House Sparrow • American Robin • Yellow Warbler • House Wren
Lake	• American White Pelican
Fly-over	• Chestnut-Collared Longspur • American Goldfinch • Northern Harrier

4 Conclusions and Recommendations

The present study confirmed the classification and boundaries of the wetlands located on the subject property. Boundaries were smaller than the initial desktop assessment, due to accretion during the present draw-down phase of the wetlands as a result of ongoing drought conditions.

No amphibians were observed on site at the time of the assessment, due to multi-year low water conditions. Further wildlife surveys will be required in the spring to determine the presence or absence of amphibian species. Surveys for Burrowing Owls in the spring will also be required to determine the location of any active nests, based on the presence of appropriate habitat. Other bird species surveys will be conducted at that time, but it is likely that the requirements based on Burrowing Owls will be the most stringent, based on timing windows and setback requirements from the Landscape Analysis Tool (LAT) report.

The present report is a summary of findings of the site assessment and does not include all information required for a Wetland Assessment and Impact Report, nor for wildlife mitigation during proposed activities on site. Information from spring surveys for breeding birds and amphibians will be required to determine appropriate wildlife setbacks and timing windows. If development of the wetland will occur, then rates of compensation will be determined by the forthcoming results from the ABWRET valuation. If the wetlands are to be avoided, then appropriate buffers for avoidance will be determined by a combination of the results of this assessment, the ABWRET valuation, and additional wildlife surveys to be conducted in the spring.

Aquality
Environmental Consulting Ltd.

Wetland Permanence Assessment of Land Parcel SW-5-18-14-W4M

23 March 2018

Prepared by:
Aquality Environmental Consulting Ltd.
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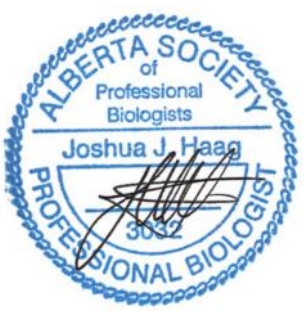
Name and professional designation of the individual(s) who conducted the Wetland Permanence Assessment: Joshua Haag, P. Biol.

Name and professional designation of the individual(s) who authenticated the Wetland Permanence Assessment: Jay S. White, P. Biol.

Name of company represented by the authenticating professional: Aquality Environmental Consulting Ltd.

Assessment Conducted by:



Joshua Haag, B.Sc., P.Biol.
Biologist

Authenticated and Approved by:

Jay S. White, M.Sc., P.Biol., QAES,
Authenticating Professional
Senior Biologist and Principal

Aquality Environmental Consulting Ltd. (Aquality) was retained by Newell County to conduct a wetland assessment for a parcel located at SW-5-18-14-W4M, approximately 5 km south of the City of Brooks, in Newell County, Alberta (Figure 1). Field assessments of the property were conducted in 2017 to classify and delineate the wetland in accordance with the Alberta Wetland Classification System. A complete report on the wetland assessment has not yet been completed while additional project scope and regulatory requirements are determined, so no further reports are available for inclusion as appendices to this document.

PROJECT LOCATION

17-057 DESKTOP WETLAND ASSESSMENT
COUNTY OF NEWELL
SW-5-18-14-W4M

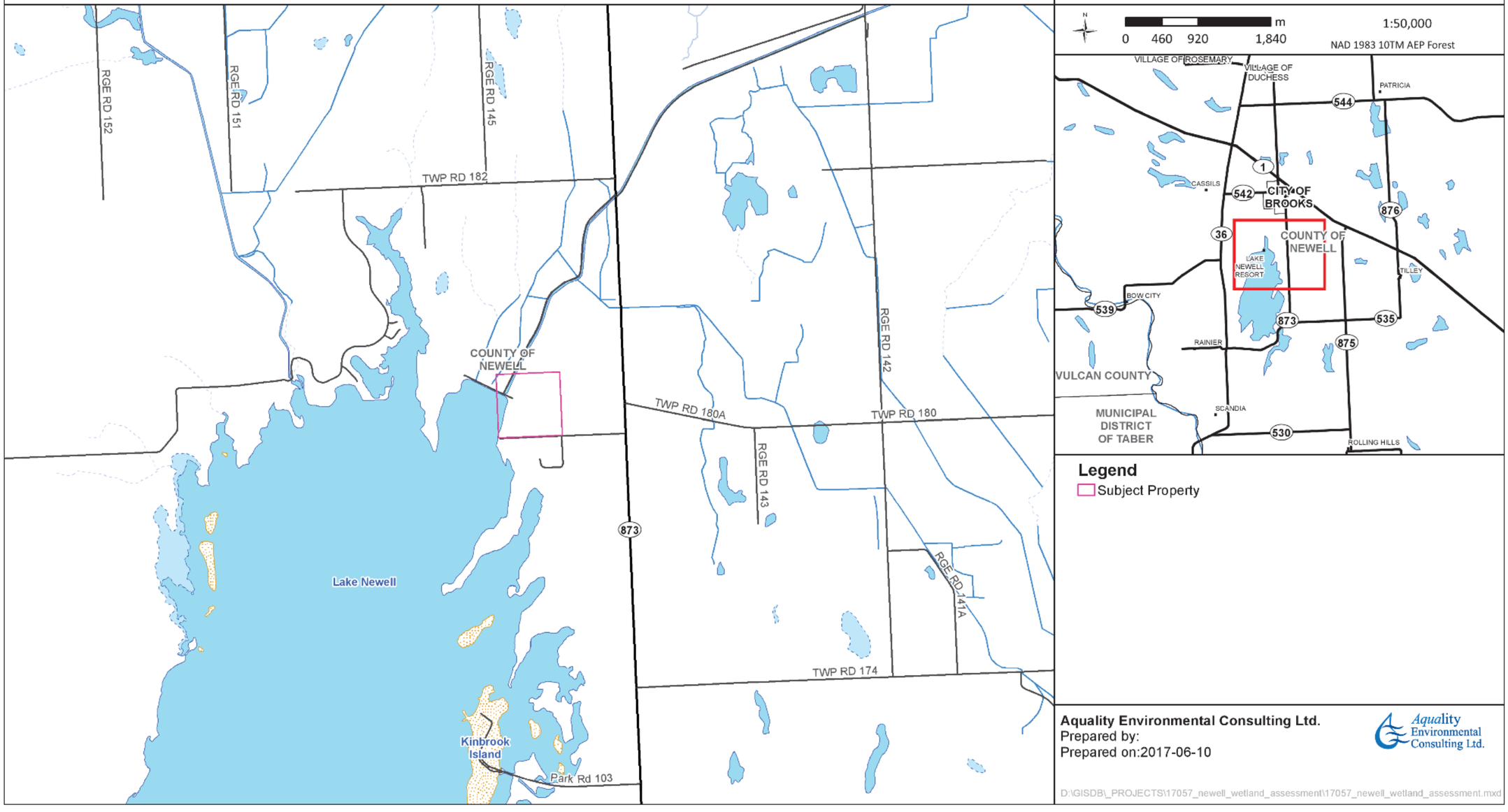


Figure 1. Project location in the County of Newell, Alberta, approximately 5 km south of the Town of Brooks.

2 Wetland Delineation and Classification

Boundaries for all wetlands were identified in the field using a combination of soil and vegetative characteristics at each site per the Alberta Wetland Identification and Delineation Directive (Government of Alberta, 2015). In all cases, the boundaries identified in the field resulted in smaller wetlands than those initially identified in the desktop assessment, which were conservative to ensure the full extent of the wetland was captured. Wetlands were classified in accordance with the Alberta Wetland Classification System (Government of Alberta, 2015).

Wetland 1, the large central basin in the complex, was classified as a Shallow Open Water, Bare, sub-saline, semi-permanent wetland (W-B-ss-iv), totaling 7.46 ha in area. Wetland 2 to the north was classified as a Marsh, Graminoid, slightly brackish, seasonal wetland (M-G-sb-iii), totaling 1.00 ha in area. Wetland 3 to the south was classified as a Marsh, Graminoid, slightly brackish, seasonal wetland (M-G-sb-iii), totaling 0.419 ha in area. Wetland boundaries, the Alberta Wetland Classification System (AWCS) classification, and areas are summarized in Figure 1. All wetlands received a value of "A" based on ABWRET-A results from the Province.

The wetlands on the subject property appear to be in a draw-down (drying) phase because of drought conditions, resulting in an absence of surface water and an expansion of vegetation into the central basins of the wetlands. The draw-down phase was accounted for in both the delineations and classifications under the assumption that this is not a permanent condition. If drought conditions persist, further shoreline accretion may occur, resulting in a reduction in size and permanence of the wetlands. However, currently there is no evidence that this is not part of a natural cycle of draw-down and refilling which occurs for most prairie pothole wetlands.

Representative photographs from the field assessment are provided in Appendix A: Site Photographs.

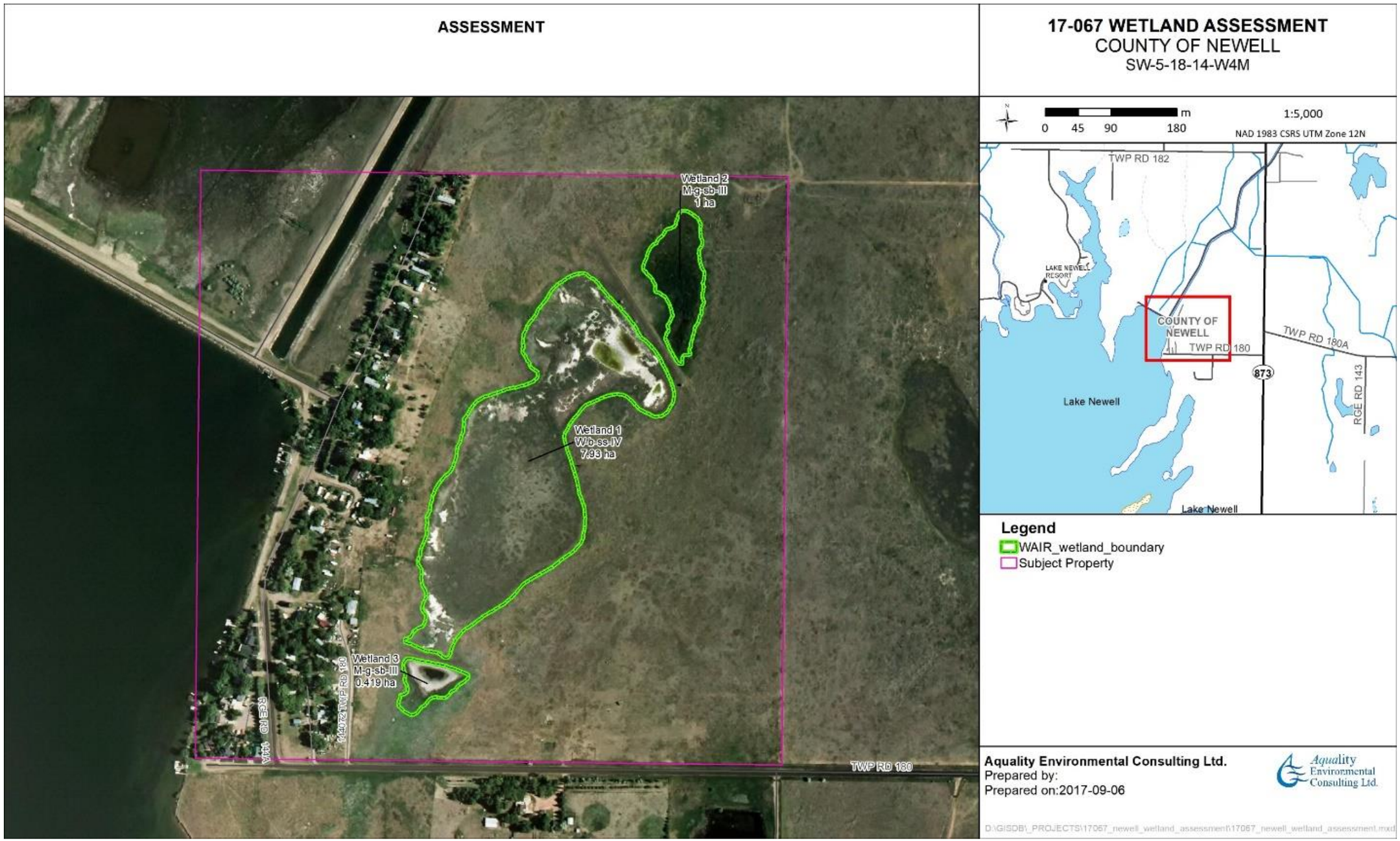


Figure 2. Wetland delineation and classification.

3 Wetland Permanence Assessment

Aerial photographs from approximately decadal intervals from 1949 to 2012 were selected for analysis based on a search of the Air Photo Record System (APRS) available for the Provincial Air Photo Distribution Office. Photos were selected that provided a range of seasons in both wet and dry years to ensure a complete picture of the conditions on the property could be reviewed. Selection of wet/dry/normal years was aided with the use of precipitation data interpolated to SW-5-18-14-W4M from the Alberta Climate Information Center (Alberta Agriculture and Forestry, 2017) (Figure 3). Wetland permanence was assessed using the Guide for Assessing Permanence of Wetland Basins (Alberta Environment and Parks, 2014). Wetland delineation boundaries were mapped using current aerial imagery. Historical air photos were obtained from the Air Photo Library located in Edmonton, Alberta (Appendix A).

Three wetlands were identified (Figure 2), which were originally part of a single complex that has fluctuated substantially in extent and water level. This complex has now been divided into three hydrologically isolated basins by the construction of two berms across the wetland sometime between 1983 and 1991.

Wetland 1, located at the central portion of the historical basin, is a semi-permanent body of water, with open water present in five of the seven images used in the assessment, including the spring and summer seasons and in years considered wetter than normal and normal (Table 1; Figure 4 to Figure 10). This wetland is believed to meet the requirements of permanence and subject to determination of Crown ownership.

Wetland 2, located to the north of the central portion of the historical basin, is a seasonal body of water, with open water present in only one of the seven images used in the assessment (Table 2; Figure 4 to Figure 10). Hydrology in the wetland has been altered as a result of the construction of the berm on the southwest edge of this wetland, which may impact permanence. Prior to construction of the berm, this wetland fell within the wet-meadow vegetation zone of the larger complex. This wetland is not believed to meet the requirements of permanence and therefore not subject to a Crown ownership determination.

Wetland 3, located to the south of the central portion of the historical basin, is a seasonal body of water, with open water present in only one of the seven images used in the assessment (Table 3; Figure 4 to Figure 10). Hydrology in the wetland has been altered as a result of the construction of the berm on the northeast edge of this wetland, and appears to have increased the permanence of this body of water over historical conditions. Prior to construction of the berm, this wetland fell within the wet-meadow vegetation zone of the larger complex. This wetland is not believed to meet the requirements of permanence and therefore not subject to a Crown ownership determination.

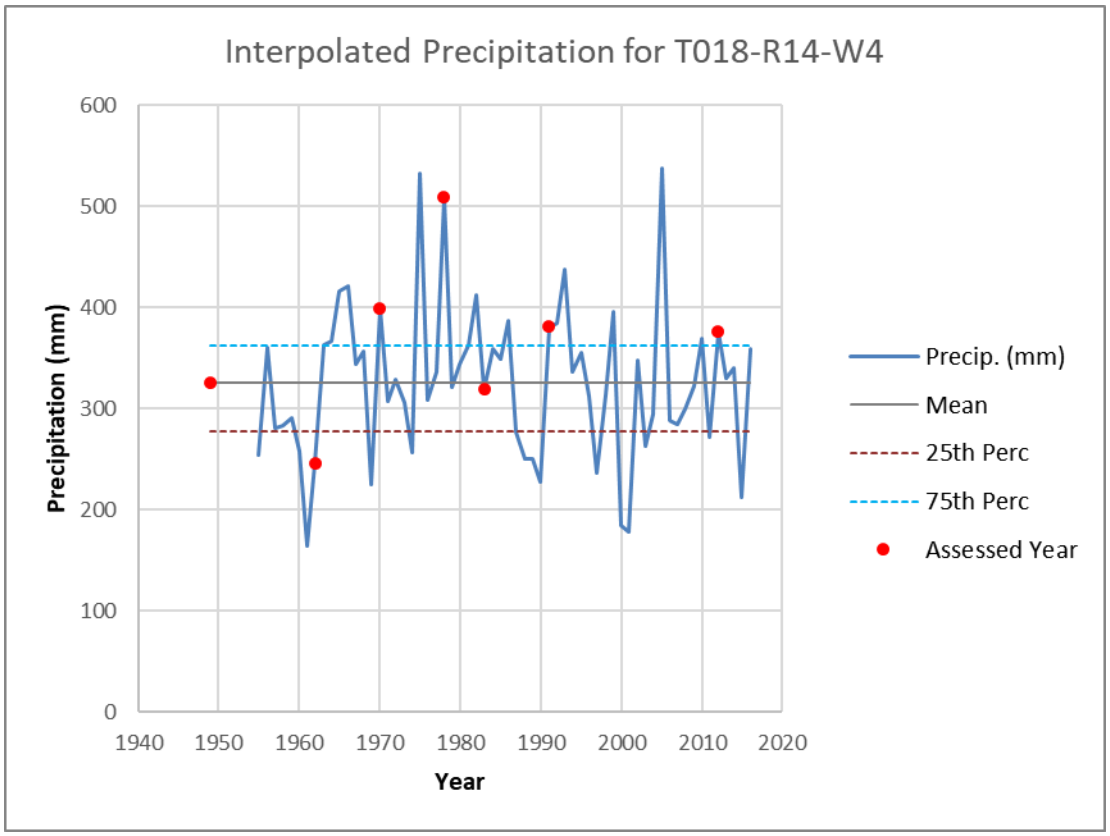


Figure 3. Precipitation data from 1955-2016 interpolated to Township 018 and Range 14, West of the Fourth Meridian. Data from the Alberta Climate Information Service (Alberta Agriculture and Forestry, 2017).

Table 1. Summary of historical aerial photographs and assessment of permanence for Wetland 1.

Wetland ID	Legal Land Description					Photo Date (MM/DD/YYYY)	Photo ID (Roll AS# Photo #)	Image Source	Resolution	AWCS Wetland Class	Season [1]	Precipitation Year [2]	Open Water Visible or Consistent Wetland Vegetation Signature [3]	Photo Notes	Assessment of Permanence
	Qtr	Sec	Twp	Rge	M										
1	SW	5	18	14	W4	05/10/1951	AS0173 172-173	Digital BW Copy	40,000		Spring	N/A	W		Y
1	SW	5	18	14	W4	06/24/1962	AS0837 089-090	Digital BW Copy	31,680		Summer	D	DV	Some salt/alkali deposit presence at margins	Y
1	SW	5	18	14	W4	05/04/1970	AS1054 092-093	Digital BW Copy	31,680		Spring	N	D		Y
1	SW	5	18	14	W4	05/19/1978	AS1610 025-026	Digital BW Copy	16,000		Spring	W	W		Y
1	SW	5	18	14	W4	04/19/1983	AS2648 239-240	Digital BW Copy	10,000		Spring	N	W	Some salt/alkali deposit presence at margins	Y
1	SW	5	18	14	W4	08/04/1991	AS4191 051-052	Digital BW Copy	30,000		Summer	N	W	Some salt/alkali deposit presence at margins; berm present at NE margin and SW	Y
1	SW	5	18	14	W4	07/30/2012	DS2012021 214-215	Digital Colour Copy	30,000		Summer	N	W	Strong salt/alkali deposit presence	Y
Additional Comments:												**# Years Dry**	**2**	**AEP Evaluation/ Ownership Claim**	
												# Photo Pairs	**7**		

1 Spring = April to June; Summer = June to September; Fall = September to November
2 D=Drier; N=Normal; W=Wet; N/A=Not available
3 W=Water; D=Dry; DV= Dry, vegetated; DVI= Dry, vegetated, indistinguishable
4 Y=Yes; N=No

Table 2. Summary of historical aerial photographs and assessment of permanence for Wetland 2.

Wetland ID	Legal Land Description					Photo Date (MM/DD/YYYY)	Photo ID (Roll AS# Photo #)	Image Source	Resolution	AWCS Wetland Class	Season [1]	Precipitation Year [2]	Open Water Visible or Consistent Wetland Vegetation Signature [3]	Photo Notes	Assessment of Permanence[4]
	Qtr	Sec	Twp	Rge	M										
2	SW	5	18	14	W4	05/10/1951	AS0173 172-173	Digital BW Copy	40,000		Spring	N/A	DV		N
2	SW	5	18	14	W4	06/24/1962	AS0837 089-090	Digital BW Copy	31,680		Summer	D	DV		N
2	SW	5	18	14	W4	05/04/1970	AS1054 092-093	Digital BW Copy	31,680		Spring	N	DV		N
2	SW	5	18	14	W4	05/19/1978	AS1610 025-026	Digital BW Copy	16,000		Spring	W	DV		N
2	SW	5	18	14	W4	04/19/1983	AS2648 239-240	Digital BW Copy	10,000		Spring	N	DV		N
2	SW	5	18	14	W4	08/04/1991	AS4191 051-052	Digital BW Copy	30,000		Summer	N	DV	Berm present at SW margin	N
2	SW	5	18	14	W4	07/30/2012	DS2012021 214-215	Digital Colour Copy	30,000		Summer	N	W	Some salt/alkali deposit presence	N
Additional Comments:												**# Years Dry**	**6**	**AEP Evaluation/ Ownership Claim:**	
												# Photo Pairs	**7**		

[1] Spring = April to June; Summer = June to September; Fall = September to November
[2] D=Drier; N=Normal; W=Wet; N/A=Not available
[3] W=Water; D=Dry; DV= Dry, vegetated; DVI= Dry, vegetated, indistinguishable
[4] Y=Yes; N=No

Table 3. Summary of historical aerial photographs and assessment of permanence for Wetland 3.

Wetland ID	Legal Land Description					Photo Date (MM/DD/YYYY)	Photo ID (Roll AS# Photo #)	Image Source	Resolution	AWCS Wetland Class	Season [1]	Precipitation Year [2]	Open Water Visible or Consistent Wetland Vegetation Signature [3]	Photo Notes	Assessment of Permanence
	Qtr	Sec	Twp	Rge	M										
3	SW	5	18	14	W4	05/10/1951	AS0173 172-173	Digital BW Copy	40,000		Spring	N/A	DVI		N
3	SW	5	18	14	W4	06/24/1962	AS0837 089-090	Digital BW Copy	31,680		Summer	D	DVI		N
3	SW	5	18	14	W4	05/04/1970	AS1054 092-093	Digital BW Copy	31,680		Spring	N	DVI		N
3	SW	5	18	14	W4	05/19/1978	AS1610 025-026	Digital BW Copy	16,000		Spring	W	DV		N
3	SW	5	18	14	W4	04/19/1983	AS2648 239-240	Digital BW Copy	10,000		Spring	N	DVI		N
3	SW	5	18	14	W4	08/04/1991	AS4191 051-052	Digital BW Copy	30,000		Summer	N	DV	Berm present at NE margin	N
3	SW	5	18	14	W4	07/30/2012	DS2012021 214-215	Digital Colour Copy	30,000		Summer	N	W	Some salt/alkali deposit presence	N
Additional Comments:												**# Years Dry**	**6**	**AEP Evaluation/ Ownership Claim:**	
												# Photo Pairs	**7**		

[1] Spring = April to June; Summer = June to September; Fall = September to November
[2] D=Drier; N=Normal; W=Wet; N/A=Not available
[3] W=Water; D=Dry; DV= Dry, vegetated; DVI= Dry, vegetated, indistinguishable
[4] Y=Yes; N=No

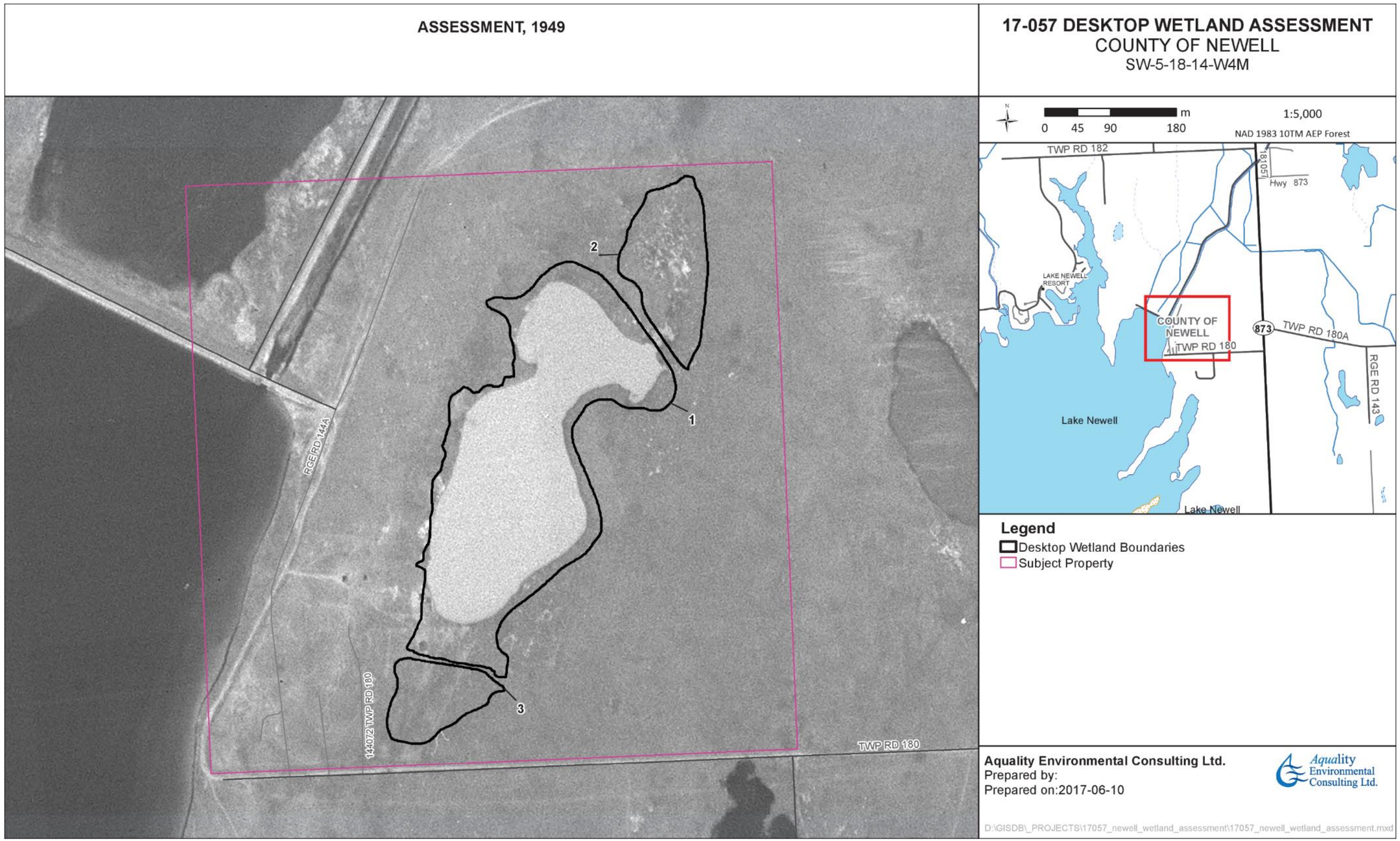


Figure 4. Historical imagery from 1949 of Wetlands 1 to 3.

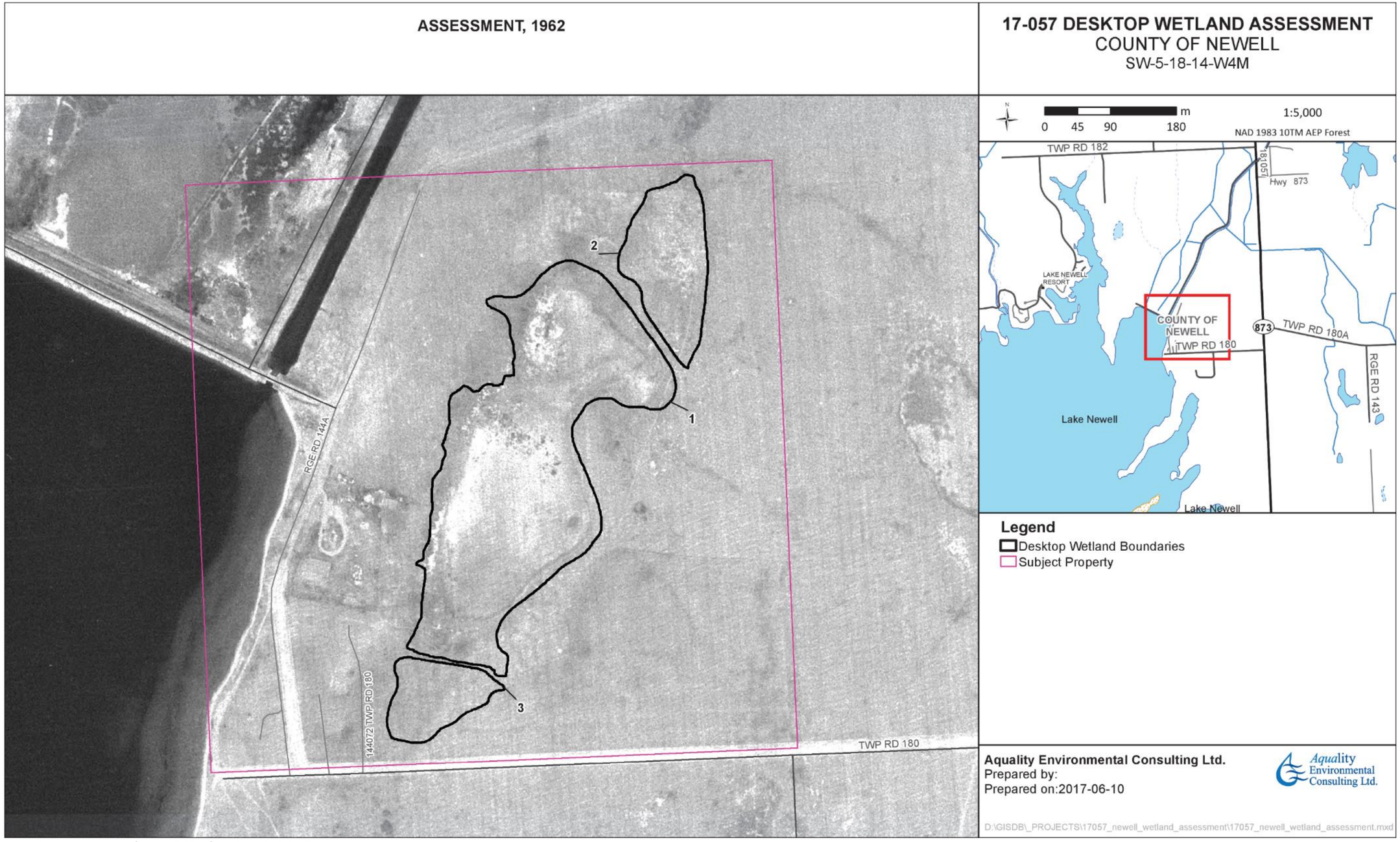


Figure 5. Historical imagery from 1962 of Wetlands 1 to 3.

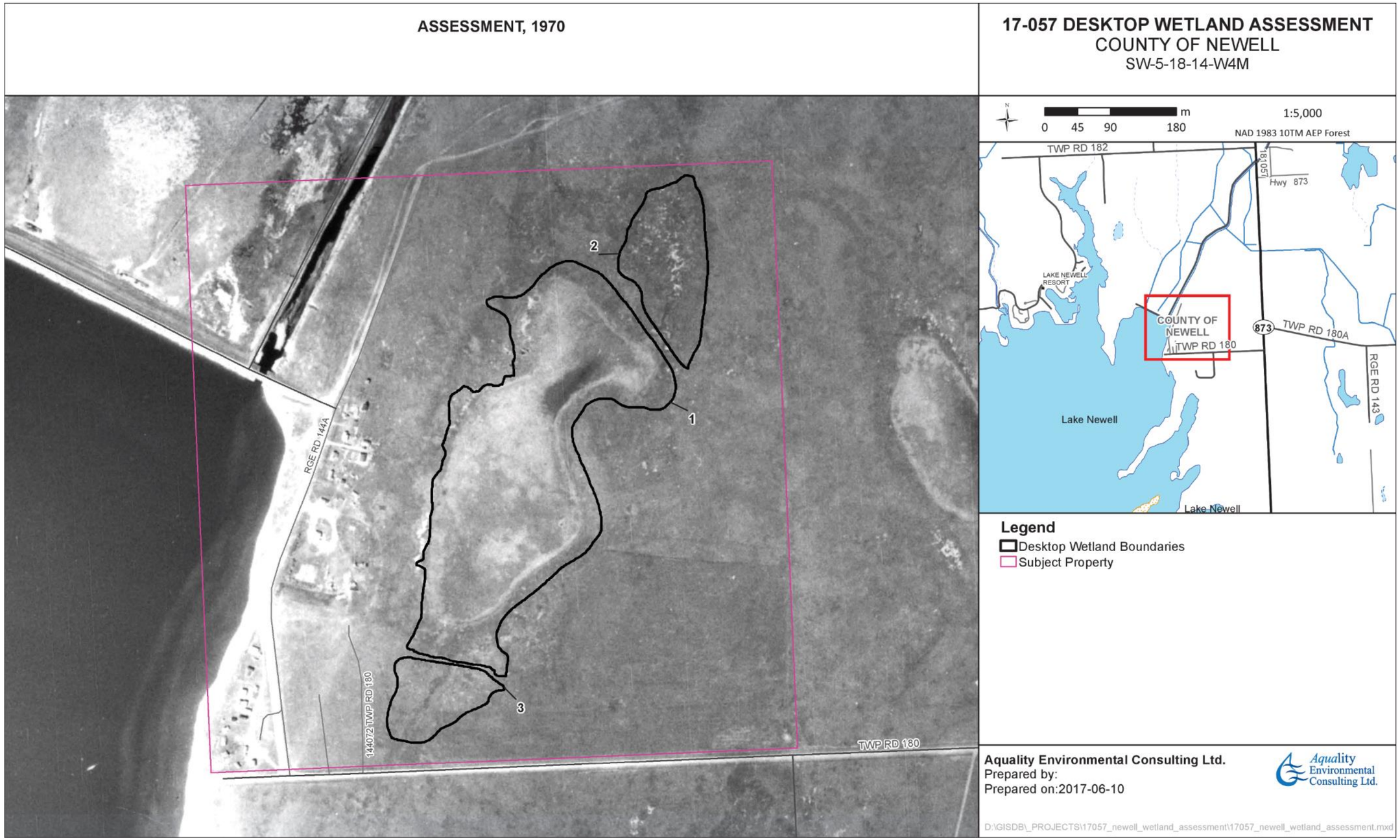


Figure 6. Historical imagery from 1970 of Wetlands 1 to 3.

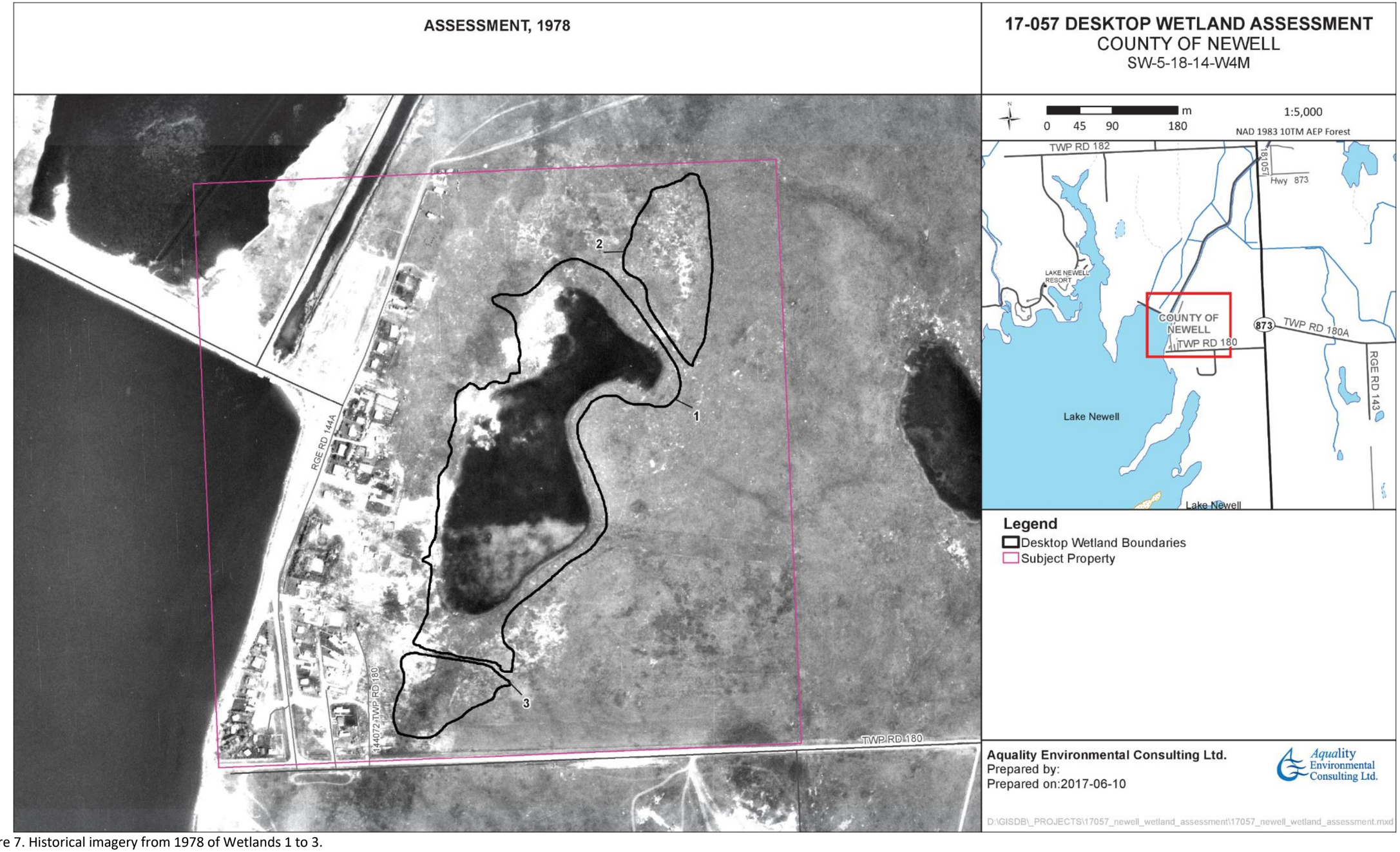


Figure 7. Historical imagery from 1978 of Wetlands 1 to 3.

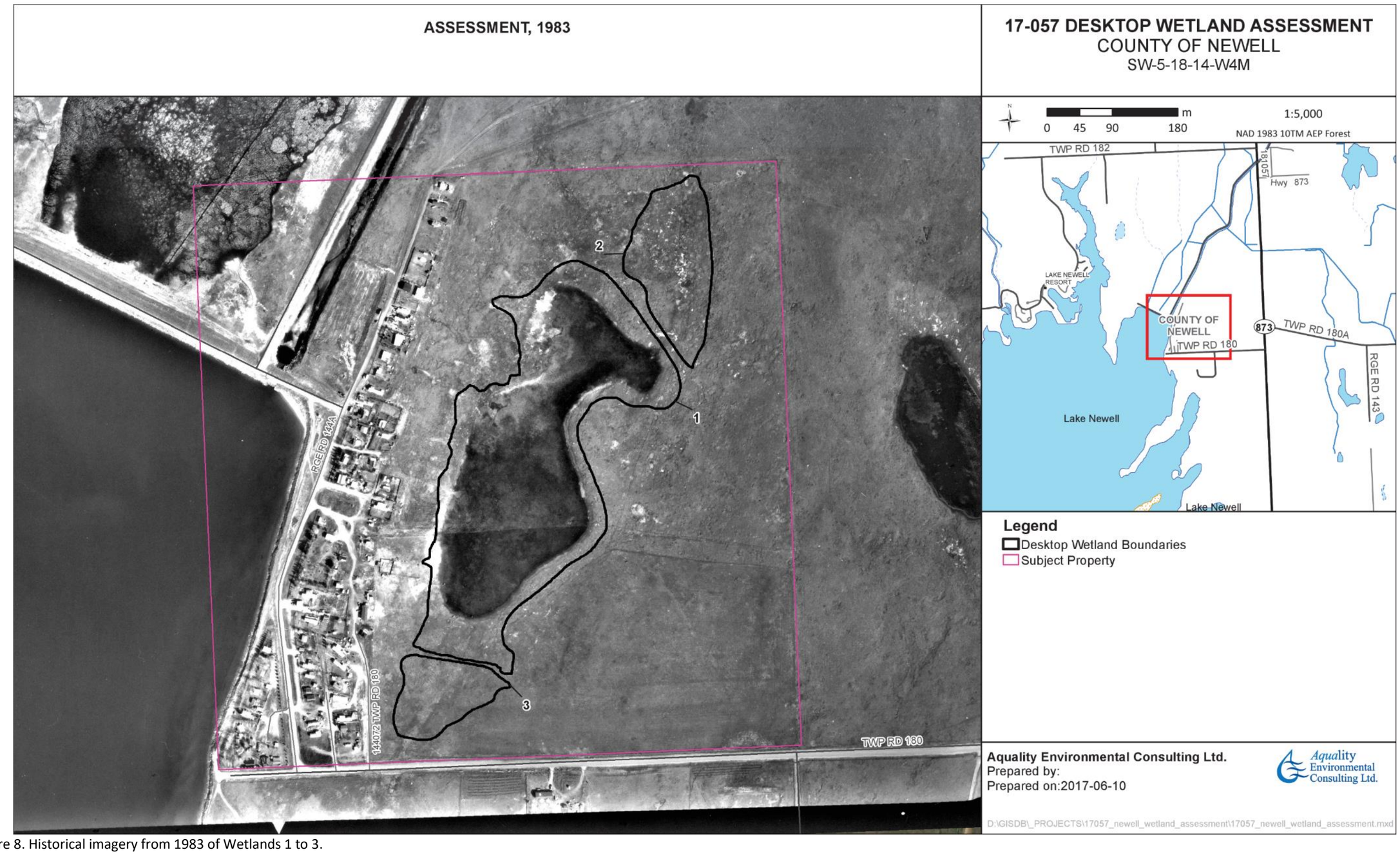


Figure 8. Historical imagery from 1983 of Wetlands 1 to 3.

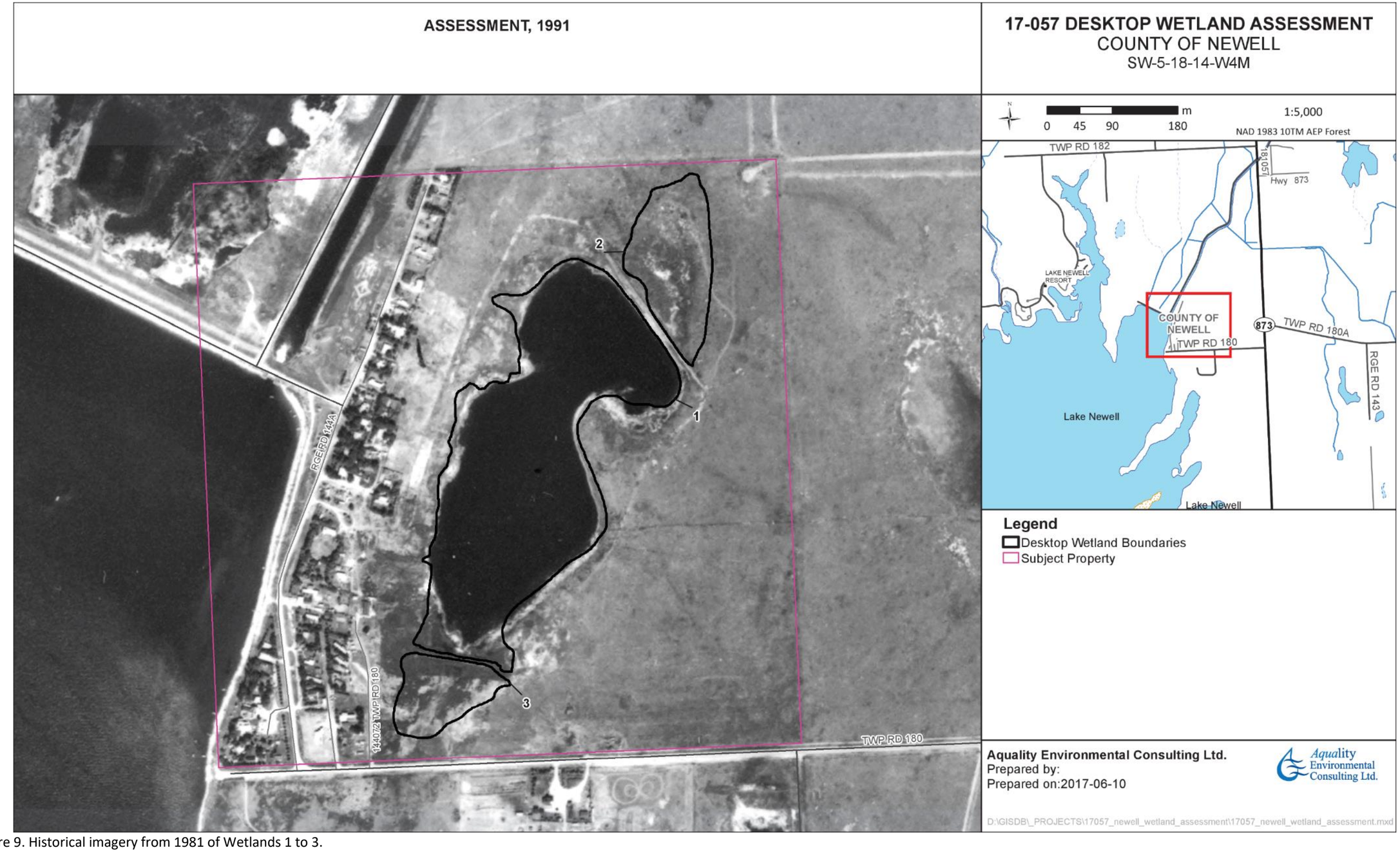


Figure 9. Historical imagery from 1981 of Wetlands 1 to 3.

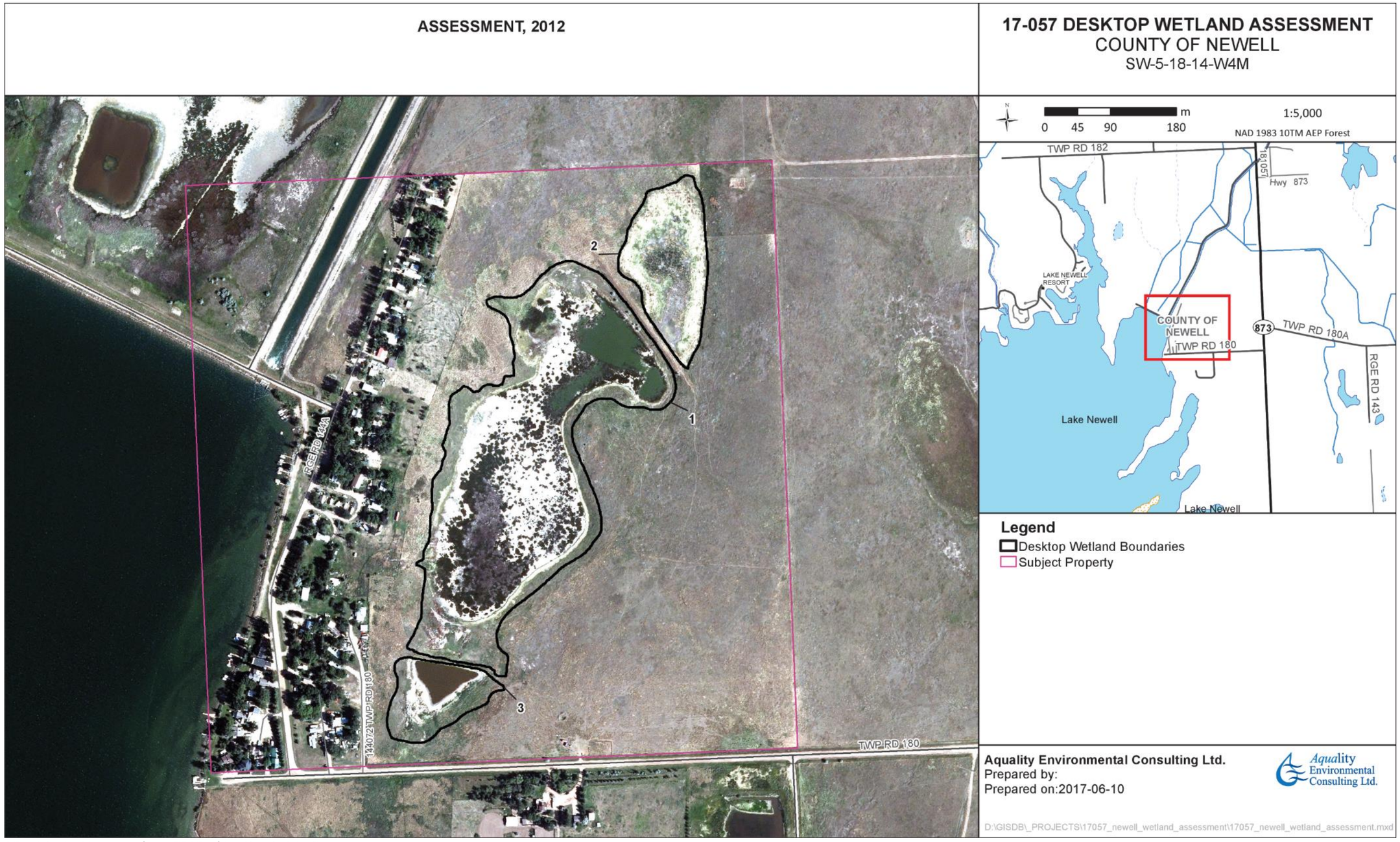


Figure 10. Historical imagery from 2012 of Wetlands 1 to 3.

4 References

Alberta Agriculture and Forestry. (2017). *Interpolated Weather Data Since for Alberta Townships*. Retrieved from Alberta Climate Information Service: https://agriculture.alberta.ca/acis/township-data-viewer.jsp

Alberta Environment and Parks. (2014). *Guide for Assessing Permanence of Wetland Basins.* Edmonton, Alberta: Land Policy Branch, Policy and Planning Division.

Government of Alberta. (2015). *Alberta Wetland Classification System.* Edmonton, Alberta: Alberta Environment and Parks, Government of Alberta.

Government of Alberta. (2015). *Alberta Wetland Identification and Delineation Directive.* Edmonton, Alberta: Alberta Environment and Parks, Government of Alberta.

6 Appendix A: Site Photographs

Photo 1 : Wetland 01	Date: 12 August 2017
Location: 12U 436368 5593480	Direction: SW
Description: Overview of wetland from the northern berm over the deepest part of the central basin, facing approximately southwest.	

Photo 2 : Wetland 01	Date: 12 August 2017
Location: 12U 436172 5593292	Direction: S
Description: Wetland from middle of basin looking towards the northern berm, facing approximately northeast.	

Photo 3 : Wetland 02	Date: 12 August 2017
Location: 12U 436367 5593497	Direction: N
Description: Overview of wetland from the northern berm over the deepest part of the central basin, facing approximately north.	

Photo 4 : Wetland 02	Date: 12 August 2017
Location: 12U 436389 5593584	Direction: WSW
Description: Wetland from deepest part of basin facing approximately west by southwest.	

Photo 5 : Wetland 0	Date: 12 August 2017
Location: 12U 436058 5593068	Direction: SSW
Description: Overview of wetland from the southern berm over the deepest part of the central basin, facing approximately south by southwest.	

Photo 6 : Wetland 03	Date: 12 August 2017
Location: 12U 436055 5593054	Direction: W
Description: Wetland from deepest part of basin facing approximately west.	

SCHEDULE B

North Head Gates Independent Review of Infrastructure Deficiencies

AMEC FOSTER WHEELER ENVIRONMENT AND INFRASTRUCTURE

North Head Gate Estates
County of Newell

Independent Review of Infrastructure Deficiencies
Date: 2015-11-10

Amec Foster Wheeler, Environment and Infrastructure

Table of Contents

1. Introduction

At the north east corner of Lake Newell, an undocumented summer residential village identified as North Head Gates has been constructed. Consisting of approximately fifty built up lots, eleven future lots and a campground area, this area is largely undocumented and has grown up without attention to Municipal zoning requirements or permitting. The original purpose of this development was as a summer rural recreational area but as it develops some units are being used year around despite a lack of permanent servicing. With the prospect of further development, The County of Newell has endeavored to bring the subdivision into compliance and has instructed the developer Redelback to develop engineering drawings and submit the required development applications.

Amec Foster Wheeler, Environment and Infrastructure was engaged to conduct an independent review of the property to assess the current condition of the property and assess deficiencies and compare conditions to the requirements of the MGA and the County of Newell land Use Bylaw. This shall include road setbacks, building spacing, non-conforming usages, Water and Septic infrastructure. We shall review road construction and report on their conditions. Identification of new construction (since 2004 Midwest Survey). Contemplated zoning is Direct Control but for the purposes of this review, the Grouped Rural Residential Zoning shall apply.

The second priority was to identify potentially hazardous conditions that may represent a liability to the County and the development. This will include observation of uncovered septic tanks and substandard decking used as alternate emergency exits. In addition, any other observed hazards will be reported.

Inspection of the property was conducted October 13, 2015 by Dwayne Harvie, P.Eng. and Stephen Briggs of Amec Foster Wheeler.

2. Overview and Observed Deficiencies

The property known as North Gate is located in the northeast corner of Lake Newell, an irrigation impoundment belonging to the Eastern Irrigation District. North gate consists of approximately fifty cottages, mobile homes and cabins. There are some vacant areas projected for future development. The development runs in a north, north east direction for approximately 400 meters from the Township Road to the south. In addition, in the middle of the development there is a campground area consisting of pads for approximately 13 semi-permanent and temporary trailers and one building. It was reported that the campground would be decommissioned.

The property is owned by Ron Redelback and family and due to ongoing construction has been the subject of several stop work orders. As the property is officially under one ownership and few permits have been taken out, there are no official lot lines or conformance to any zoning requirements. The property has been developed over time with some residents indicating histories back into the 1960's.

Zoning for the property is presently Direct Control – DC. This allows maximum flexibility for incorporating the existing development into the County Database. An alternate zoning for this property would be Grouped Rural Residential – GRR. It should be noted that many of the units do not meet the GRR standards including lot size or front and side yard setbacks, 6 and 3 meters respectively.

There are no Public Service or Parks and Recreation lots laid out or designated.

Midwest Surveys created a potential lot layout in 2004 but many properties have minimal lot size, setbacks or adequate clearances between buildings. Due to the lack of established property lines, it was difficult to determine setbacks for front yardage and sideyards. A relaxed standard appropriate to the development may be required. In a number of cases garages, sheds and ancillary buildings have been built on the assumed property line. In order to achieve registration these may require grandfathering.

3. Identified Hazards

As identified in previous inspections, deficiencies representing a hazard to occupancy were noted. It is recommended that the unit owners be required to bring the deficient elements up to standards as represented in the building Code. Deficiencies noted included:

- Several of the units inspected were serviced by septic and cistern systems including pump-outs and underground cisterns, some coverings were structurally inadequate including plywood covers in varying conditions. It is recommended that all deficient covers be replaced by appropriate steel or concrete covers structurally competent to support traffic conditions. This is a safety concern that must be addressed.
- Many of the units inspected were serviced by propane tanks of varying age and condition. It is recommended that the propane tanks be inspected by the appropriate authority and substandard systems be removed.
- A number of the units had structurally deficient decking. In cases where the decking represented alternate emergency egress they must be replaced with decking conforming to Code. Deficiencies included rotted structural members and or deck boards, missing handrails and inadequate foundation support. It is recommended that those decks deemed deficient be brought to code.

A list of the affected lots and the deficiencies are found in *Appendix C - Deficiencies*

4. Existing Services

No comprehensive utility plans are available for these properties. Utilities noted were

Water: There is a series of small diameter mains from a pump house located near the headworks, providing water from the irrigation district to many lots, especially along the western boundary. Service to all lots were not picked up in the site visit. It should be noted that this is non-potable water and cannot be used for drinking or cooking.

Potable water is supplied either through individual cisterns or through the supply of potable water to individual units. This may not be acceptable as the subdivision develops into a year around facility.

Sewer: Several properties had septic tanks and fields but, due to the small size of the lots, setbacks and adequacy could not be determined. Many of the units were serviced by pumpouts. In some cases the covers on the pumpouts were inadequate structurally. As these represent a safety hazard, they must be upgraded to structurally sound covers or otherwise be protected to ensure safety. Several outhouses were noted but it was determined that these were mostly decorative and not active.

Gas/ Propane: The majority of the lots are serviced by the Dino gas company and meters are typically attached to the residential units. In some cases the service has been disconnected and the unit removed. In these cases the gas meter should be properly disconnected. There is no documentation indicating gas main routing. It is recommended that the supply main routes and depths be determined.

Some of the units are supplied by propane. In several cases the propane tanks are old and require replacement as a safety issue.

Power: There are several lines of power poles servicing the subdivision. There are no easements or layout evident. In some cases the overhead power mains travel directly over units in the subdivision. It is recommended that the County and developer work with the power authority to realign the pole layout too conform to the proposed road row layout. It was also noted that there several cases where branches are

required to be trimmed back from power laterals. Some laterals also travel over adjacent lots and easements may be required. Underground laterals have not been mapped.

Telecom: There are two lines of pedestals for telecom services, one along the west side of the western road row and one through the middle of the subdivision in the lower section. Residents indicated that there are some hardwired telephone services but most residents rely on cell phones.

It is recommended that the developer supply a utility plan defining main layout, offsets and depth of bury for both the shallow and deep utilities. In addition, individual lots shall supply plot plans locating on-site services

5. Roads

Amec Foster Wheeler conducted a field site inspection on October 13, 2015 by Dwayne Harvie and Stephen Briggs as part of the overall inspection of North Head Gates Subdivision. The site inspection was part of the overall review of the subdivision requested by the County of Newell as part of the compliance inspection.

The subdivision is located within SW Section 05 – Twp. 18 Rge. 14 W4M on the northeast side of Lake Newell with the only access on Twp. Rd. 18-0 from Hwy 873. Twp. Rd. 18-0 also provides access to another subdivision located on the east side of Lake Newell within the same legal land description but is not within this report.

The existing network of internal roads were reviewed to determine if the roads meet current County of Newell Rural and Urban Guidelines Standards – Dated September 2014.

Generally, all road within the subdivision fail to meet current standards as per Urban Design Guidelines Section 2.16.2 Road Design and Construction – Local Roads. Main points for substandard roads are as follows but not limited to:

- Right of Width – less than 20.12 m
- Width of Road Surface – less than 8 m
- Drainage – no define ditches / culverts
- Dead End Roads – vehicles unable to turn around
- One landowner has no define legal access to property
    - Currently using neighbors lot to access their property

Summary table of all roads within subdivision are attached within Appendix D. Site Inspection notes are included in this appendix for review.

Currently, there is only one access road, Twp. Rd. 18-0, which potentially causes a safety concern during emergencies to gain access to both subdivisions. North Head Gate subdivision, the residents at the north end have only the main east / west road to access Twp. Rd. 18-0 which also caused potential access and egress options to gain access to Twp. Rd. 18-0.

There is a frontage road on the western boundary that runs the full length of the subdivision. In places this is narrowed and obstructed by individual lot holders via construction and ornaments. It is recommended that this road be constructed to the full width required by the Municipality and the obstructions removed.

On the eastern boundary there is no defined road right of way. It is recommended that a road be constructed for the full length of the subdivision and to connect to the eastern ROW to accommodate a loop for emergency access.

Interior access consists of a series of laneways and abbreviated lane rows. Looping is incomplete and lanes and road row are terminated by fencing, gates and unit construction. A complete road plan conforming to provincial guidelines is required. Roads are natural earth with some gravel added. No ditching or drainage

exists leading to probable ponding It is recommended that interior roadways and lanes be constructed to municipal standards.

COUNTY OF NEWELL

NORTH HEAD GATE SUBDIVISION

Within SW 05 Twp. 18 Rge. 14 W4M

SUMMARY OF ROADS WITHIN SUBDIVISION

Prepared By: Cyril Mitchell, RET November 5, 2015

Road	Length	Start	End	Surface Type	R/W		Meet County Standards	Comments
					Proposed	Required		
#	m				m	m		
					Note 1	Note 3	Note 2	
1	190	Twp. Rd. 180	Lot 36	Gravel	9	20.12	No	Dead End - No Cul-Da-Sac
Bantry Bay Road	355	Twp. Rd. 180	Chris Crescent	Gravel	9	20.12	No	
Chris Crescent	180	Main Road (#4)	Main Road (#4)	Gravel	8 - 9	20.12	No	Loop around Campground
Main Road (#4)	855	Twp. Rd. 180	Lot 116	Gravel	Varies	20.12	No	Main Access South and North
Bantry Bay Way	145	Main Road (#4)	No Name (#8)	Gravel	Varies	20.12	No	Service on East Side of Road # 4
Bantry Bay Drive	90	Main Road (#4)	Lot 152 / 148	Gravel	9	20.12	No	Dead End - No Cul-Da-Sac
7	35	Bantry Bay Way	Lot 144	Gravel	No	20.12	No	Provides access to Lot 64 & 144 Only
8	105	Main Road (#4)	Bantry Bay Road	Undeveloped	9	20.12	No	Undeveloped R/A Provides Access to Lot 36 & 40

Note 1 Widths are noted within Mid West Survey Plan - Reference MW-0070-15-TPO Dated September 04 2015 Revision 2

Note 2 Reference - County of Newell Rural Design Standards - 2 Design Guidelines For 'Rural Development' - Setpember 2014

Note 3 Reference - County of Newell Urban Design Standards - 2.16.1 Road Classification and 2.16.2 Road Design Construction Point 3 - Local Roads September 2014

6. Drainage

The property is located to the north east of Lake Newell and east of the EID canal. Contour information is lacking but the following observations were noted during the field reconnaissance. The southern section generally drains to the east to several defined wetlands. The north section, above the WID canal head gates drains generally west into the canal.

There is no road drainage and or defined ditches within the subdivision. In addition, on individual lots, poor grading practices have led to the risk of flooding individual units in the event of a significant rainfall event. Some of the lots on flat slabs may have concave grading leading to possible flooding. As per the Rural Design Guidelines – Section 2.9 Drainage / Stormwater Management 3rd paragraph – it notes 3 or more lots – Drainage / Stormwater Management Plan and Report is required

It is recommended that the developer be required to produce a drainage plan to accommodate specified rainfall events and produce a grading plan for individual lots.

7. Summary

At present the Subdivision does not meet requirements for zoning, roads, serving or layout. To meet statutory requirements the following may be required:

Rezone land as required to meet current and future planned uses.

Multiple home owners are currently using portions of a single titled parcel for their own personal use and making improvements on the land. Create a bylaw compliant lot layout which ensures that improvements (houses, garages, decks, sheds, septic fields, wells, concrete pads, etc.) are located on private land. Consider size, dimensions, setbacks to existing structures, frontage, and road access.

- Each lot must have direct access to road. Where it is not possible to provide legal and physical access to a road, access easements may be granted over adjacent lots. Ensure road widths meet minimum requirements under County of Newell bylaws and cover the entire extent of road structure accounting for planned future upgrades. Drainage ditches may be kept within the roads or covered under easement on private lots.
- Natural features such as coulees, ravines, steep slopes or water bodies should be protected as reserve lots.
- Area taken for road may not exceed 30% of the area of the subdivision parcel minus any land taken for environmental reserve

- Register a subdivision plan at Land Titles with lot and road boundaries approved by the County of Newell subdivision authority. Title to reserves and public utility lots will be vested in the County. Title to roads will be vested in the crown.
- Discharge caveats, leases and utility rights of way from current title concurrently with subdivision registration. Some Notices of Security Interest may carry forward to individual lots if applicable.
- Register utility rights of way / easements where required to cover utilities located on private land. Where possible, limit utilities to a surveyed alignment on a registered utility right of way plan.
- Transfer title of freehold lots to intended owners.
- Develop Road layout conforming to Provincial Standards
- Produce a Water and Sewer Servicing plan where required
- Produce a Shallow Utility plan incorporating existing and proposed servicing
- Produce a drainage and grading plan to

- Produce Lot Grading Certificates.

In addition to the above there are deficiencies in safety involving septic systems, access and propane services. These are summarized in the table in Appendix C.

References consulted included:
Province of Alberta Municipal Government Act, 2015
County of Newell Rural Design Guidelines, 2014
County of Newell – Policy Handbook Road Standards, 2013
County of Newell Land Use Bylaw, Direct Control, Grouped Rural Residential

LOT #4

General Description:

- Drains to East
- Loam
- Shed 6x8’

Site Buildings:

- Fencing posts
- Shrubs
- Non-conformance electrical, water, gas

Services:

- Water system – Tap
- No visible septic system
- Meter stand gas propane
- Overhead & Pedestal

Road/Access:

- No ditch

Identified Deficiencies/Hazards:

- None

LOT #8

General Description:

- Drains to east
- Mobile home has been moved
- Photos as in 4

Site Buildings:

- Removed

Services:

- Water pipe 1” HDPR Bent
- Septic system not visible
- Gas meter
- Power/telecom removed

Road/Access:

- No ditch

Identified deficiencies/Hazards:

- None

LOT #12

General Description:

- Topography to S.E.
- Loam

Site Buildings:

- Foundation not visible

Services:

- Water system – Well
- Septic system not visible
- No gas propan, power/telecom

Road/Access:

- No ditch

Identified deficiencies/Hazards:

- Well

LOT #16

General Description:

- House shed fair 1960's

Site Buildings:

- Building, deck, fencing conditions – good
- Tree back from powerline

Services:

- Water cistern
- Septic field
- To pole east lane clear branches
- Telecom ped

Road/Access:

- No ditching

Identified Deficiencies/Hazards:

- Branches near roof vent (Chimney?)

LOT #16

LOT #20

General Description:

- Poor Drainage
- Dished possible
- House some outbuildings

Site Buildings:

- Wood foundation some rot
- Good egress

Services:

- Pipe to front picture
- Septic tank not visible
- Gas Propane not found
- Power/telecom over neighbor's trailer +/- 1'

Road/Access:

- No ditching

Identified Deficiencies/Hazards:

- Septic not found

LOT #20

LOT #24

GENERAL DESCRIPTION:

- Mobile home with add-ons & shed

SITE BUILDINGS:

- Older trailer
- Plywood skirting
- Rear stairs, no railing, repair
- Front deck no railing 3’ high

SERVICES:

- Tank on South side
- Septic system, gas propane not visible
- Pole clear. No telecom visible

ROAD/ACCESS:

- Potential Ponding

IDENTIFIED DEFICIENCIES/HAZARDS:

- Rear steps

LOT #24

LOT #28

General Description:

- Buildings fair condition

Site Buildings:

- Older mobile home
- Plywood skirting
- Good deck condition, no railing
- Old plywood/chipboard fencing
- Mature trees
- Only one exit from building

Services:

- Septic tank - Underground tank c/w plywood corner
- Gas meter present
- Power/telecom from pole

Road/Access:

- No ditching

Identified deficiencies/Hazards:

- Septic tank covers- plywood. Replace with concrete. Also on north side pump

LOT #28

LOT #32

General Description:

- Small cabin & shed
- Mobile home & garage removed

Site Buildings:

- Relocated cabin, fair condition on conc. Slab
- Chain-link fence/misc.

Services:

- Water system not visible
- Septic system not visible
- Propane tank
- Power Trim tree limbs

Road/Access:

- No ditching

Identified deficiencies/Hazards:

- Old propane tank

LOT #32






LOT #32

LOT #36

General Description:

- Dished topography
- Cabin
- Drains to middle of lot

Site Buildings:

- Good building condition
- Flat access to deck
- Fair chain-link fence
- Non-conformance issue – drainage

Services:

- Water system – well, northside
- Septic tank not visible
- Gas propane – trailer tanks
- Power/telecom to rear

Road/Access:

- No ditching

Identified deficiencies/Hazards:

- Well cover
- Plywood septic tank cover

LOT #36

LOT #40

General Description:

- N/A

Site Buildings:

- Rotting deck
- Repair/Replace front, side deck. Replace stairs
- No fencing
- Trees present

Services:

- By Ped. Heavy steel cover
- Gas propane – south side meter
- Power/telecom – Ped.

Road/Access:

- No ditch

Identified deficiencies/Hazards:

- Old propane tanks at back
- Barrel onsite
- Front deck & side deck rotting

LOT #40

LOT #40

LOT #44

GENERAL DESCRIPTION:

- None

SITE BUILDINGS:

- Setbacks into lot 48

SERVICES:

- None

ROAD/ACCESS:

- No ditching

IDENTIFIED DEFICIENCIES/HAZARDS:

- None

LOT #48

General Description:

- N/A

Site Buildings:

- Good house condition
- Good deck condition
- Travel trailer 9m
- Setback tight to PL
- 3 board fence

Services:

- Water, septic system not visible
- Propane
- Gas incorporating most of lot 44

Road/Access:

- No ditch

Identified deficiencies/Hazards:

- Check dinosaur gas

LOT #48

LOT #48

LOT #52

General Description:

- None

Site Buildings:

- Good building, deck conditions
- 3 doors at grade
- Setback approx. 3m
- Fencing, good
- Mature trees
- No non-conformance issues

Services:

- Water tank U/G
- Pump out steel cover
- Gas
- Power/telecom at rear limbs trimmed

Road/Access:

- No ditch

Identified deficiencies/Hazards:

- None

LOT #56

GENERAL DESCRIPTION:

- Drainage to West
- 2 + Older garages
- Graveled

SITE BUILDINGS:

- House and Approx. 30’ trailer, building shortened
- Deck – Concrete at grade
- Setback – Good
- Chain-link fence
- Non-conformance issues – possible encroachment into lane (lane 6m wide)

SERVICES:

- Water system, Power/telecom to rear
- Septic system, gas propane not found

ROAD/ACCESS:

- No ditch

IDENTIFIED DEFICIENCIES/HAZARDS:

- None

LOT #56

Campground






Campground

LOT #60

General Description:

- Slopes to West
- Shared D/W

Site Buildings:

- Good building condition
- Good Deck condition. Replace board on step
- Hedge fencing
    - Mature trees

Services:

- Irrigation water system
- Septic system not found. Outhouse?
- Propane tank to rear
- Southside door plywood poor.(Sign closed)

Road/Access:

- No ditch

Identified deficiencies/Hazards:

- Possible encroachment into lane

LOT #60

LOT #64

GENERAL DESCRIPTION:

- Slopes to West
- House & Garage present

SITE BUILDINGS:

- Fair garage condition
- Solid deck
- Mature trees

SERVICES:

- Irrigation system
- Septic system not found
- Propane – old tank present
- Power to rear pole

ROAD/ACCESS:

- None

IDENTIFIED DEFICIENCIES/HAZARDS:

- Garage at rear lot line

LOT #64

LOT #68

General Description:

- House/sheds
- Drains east

Site Buildings:

- Good building condition
- Good deck condition
- Other access at grade

- Setbacks – check south side
- No fencing
- Mature trees

Services:

- Irrigation at front + Cistern
- Pump out at rear
- Grey water discharges to rear yard
- Power to rear o/c

Road/Access:

- No ditch

Identified deficiencies/Hazards:

- Tubs rock and ornaments encroach on road – remove

LOT #68

LOT #72

General Description:

- Drains to West
- Mobile home/shrubs present

Site Buildings:

- Building, deck in good condition
- Setbacks – shrubs only
- No fencing

Services:

- Front cistern irrigation
- Septic tank & field
- Gas at front
- Power at front
- Telecom across street

Road/Access:

- No ditch

Identified deficiencies/Hazards:

- None

LOT #76

General Description:

- Drains to West to canal

Site Buildings:

- Fair building conditions
- Deck at grade
- Setbacks – shed
- No fencing
- Medium trees

Services:

- Irrigated water system at front
- Septic system pump out
- Power O/H easement required

Road/Access:

- No ditch

Identified deficiencies/Hazards:

- None

LOT #80

General Description:

- Drains to west to canal
- House & garage present

Site Buildings:

- Good deck, fencing conditions

Services:

- Irrigation water system
- Septic tank under rear deck – field area small
- Gas propane not found
- Power at rear

Road/Access:

- No ditching

Identified deficiencies/Hazards:

- Ornaments encroachment roadway
- Tank next to house, no basement

LOT #80

LOT #84

General Description:

- Drains to west
- House, garage, shed present

Site Buildings:

- Poor building condition, repair required (original house added to)
- No deck
- Mature trees

Services:

- Water system – Filters at rear
- Tank & septic field not found
- Old propane tank
- Power/telecom at rear

Road/Access:

- No ditching

Identified deficiencies/Hazards:

- None

LOT #88

General Description:

- Mobile home, garage & sheds present

Site Buildings:

- Good building, deck conditions
- No setbacks
- Wire fencing
- Mature trees

Services:

- Irrigation cistern not found
- Septic system - Tank & septic concrete cover
- Gas at front
- Power underground to rear

Road/Access:

- Possible encroachment on road ROW

Identified deficiencies/Hazards:

- Setback 1.5m on North side

LOT #88

LOT #92

GENERAL DESCRIPTION:

- Drains to West

SITE BUILDINGS:

- Good building condition

SERVICES:

- Irrigation water system at front (North)
- No septic system information
- Gas at Southside
- Power at rear

ROAD/ACCESS:

- No ditch

IDENTIFIED DEFICIENCIES/HAZARDS:

- None

LOT #96

General Description:

- 2 workshops & newer house present (12+16’ +/-)
- 3 trailers in rear

Site Buildings:

- Good building conditions
- New deck
- Side deck 4x4 posts on ground
- No fencing
- Mature trees

Services:

- Irrigation at front
- Pump out by 2nd workshop
- Connection point – not connected
- U/G power

Road/Access:

- None

Identified deficiencies/Hazards:

- Some mechanical work
- Gas tanks

LOT #96

LOT #100

General Description:

- None

Site Buildings:

- Garage condition – fair
- Good mobile/home condition
- Good deck condition
- Northside of deck collapsed
- Zero setbacks on clubhouse

Services:

- Water system not found
- Septic system at rear tank & field
- Gas propane not found
- U/G meter on back of clubhouse

Road/Access:

- None

Identified deficiencies/Hazards:

- None

LOT #104

General Description:

- Drains east west (split)

Site Buildings:

- Modular Building poor condition, foundation not visible
- Poor stair condition
- Rv trailer home back of lot
- Tarp covering west roof
- Setback more than 6m
- Fencing at east & south
- Mature trees

Services:

- Water system unknown
- U/G septic tank & field
- Propane tank by rv
- Gas side of house

Road/Access:

- No ditch

Identified deficiencies/Hazards:

- None

LOT #104

LOT #104

LOT #104

LOT #104

LOT #104

LOT #108

GENERAL DESCRIPTION:

- Mowed green field
- No buildings
- East/west split drainage
- Possible derelict vehicles

SITE BUILDINGS:

- Mature trees

SERVICES:

- Power pole

ROAD/ACCESS:

- No ditch

IDENTIFIED DEFICIENCIES/HAZARDS:

- None

LOT #108

LOT #112

GENERAL DESCRIPTION:

- Drains west

SITE BUILDINGS:

- House fair
- Deck foundation not visible - fair
- Setback over 6m
- Mature trees
- Building foundation not visible

SERVICES:

- Water system unknown

- Possible outhouse

- Propane tank and hoses – Partially buried and along the side of house.

ROAD/ACCESS:

- No ditching

IDENTIFIED DEFICIENCIES/HAZARDS:

- None

LOT #112

LOT #112

LOT #112

LOT #116

General Description:

- East/west split drainage
- Derelict vehicles
- Barrels stored on lot

Site Buildings:

- Modular home – fair. Foundation not visible
- Shed north end of lot
- New deck, no railing. Concrete block on grade?
- Hot tub installed in deck
- Deck/stairs from rear house poor
- Setback 23’
- Fencing at north
- Mature trees
- Building foundation not visible

Services:

- U/G septic tank removed? – filled in.
- Possible U/G septic north side of lot
- Gas side of house

Road/Access:

- No ditch

Identified deficiencies/Hazards:

- None

LOT #116

LOT #116

LOT #116

LOT #116

LOT #116

LOT #116

LOT #144

General Description:

- Drains east
- Barrels on lot

Site Buildings:

- Building fair condition-foundation not visible
- New deck – foundation not visible
- Stairs on conc. slab
- Fencing around perimeter
- Mature trees

Services:

- U/G septic tank and field
- Propane tank - old

Road/Access:

- No ditch

Identified deficiencies/Hazards:

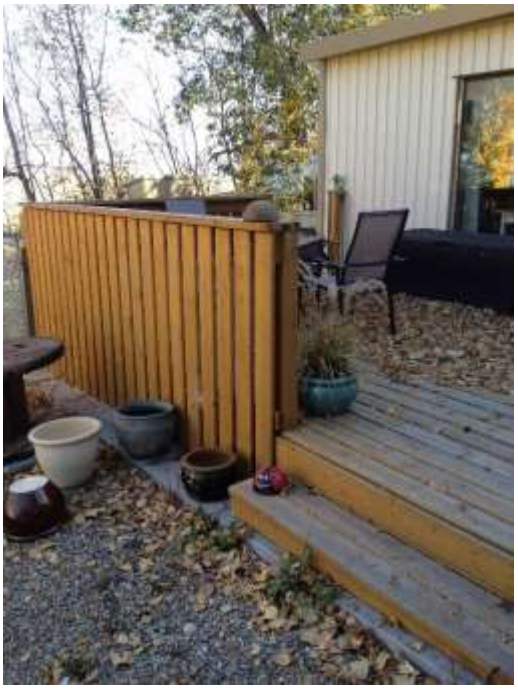
- Septic tank covers – yes

LOT #144

LOT #144

LOT #144

LOT #144



LOT #148

General Description:

- Drains to east

Site Buildings:

- Building condition good
- Building foundation not visible
- New deck- No guard rail, 4x4 with concrete footings.

- Two storey garage fair condition
- Rear garage deck stairs hanging.
- Garage deck possible unsafe support
- Garage foundations not visible

- Setbacks 24’ to garage, approx. 28’ to house
- Mature trees

Services:

- Underground septic tank to filed
- Gas services
- u/g elec

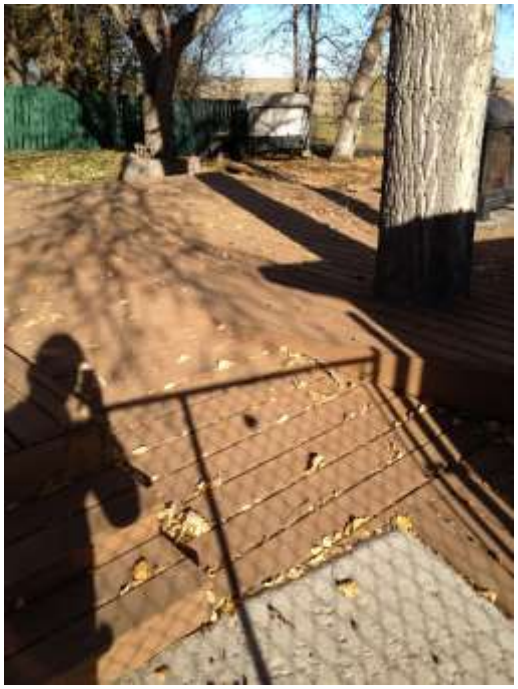
Road/Access:

- None

Identified deficiencies/Hazards:

- None

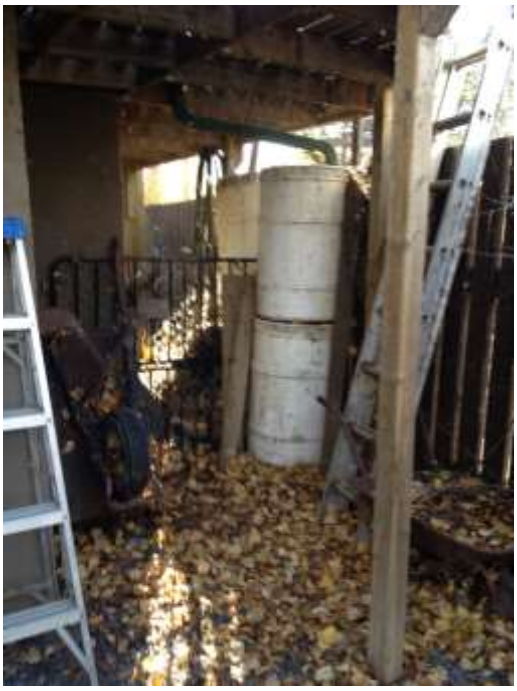
LOT #148



LOT #148

LOT #148

LOT #148



LOT #148

LOT #148

LOT #152

General Description:

- Slope to east

Site Buildings:

- Building foundation not visible
- New deck – foundation not visible. Concrete blocks on grade? No guardrail
- Mature trees

Services:

- Could not locate septic tank
- Gas meter
- Power

Road/Access:

- No ditch/drain

Identified deficiencies/Hazards:

- None

LOT #152

LOT #152

LOT #156

General Description:

- Shed present, foundation not visible
- Drains to east
- Possible derelict vehicles

Site Buildings:

- Old building demolished, debris not removed
- Old deck in place, no guard rail
- Cut cables protruding from ground
- Mature trees/shrubs

Services:

- No water system information
- u/g tank under deck
- Old underground utility lines(elec., gas) cut, left in place

Road/Access:

- No ditch

Identified deficiencies/Hazards:

- None

LOT #156

LOT #156

LOT #160

GENERAL DESCRIPTION:

- Batteries/junk stored on side of house
- Drains east/south

SITE BUILDINGS:

- Building foundation not visible
- Poor deck condition. Resting on conc. blocks?
- Mature trees/shrubs

SERVICES:

- Water system unknown
- Septic system removed. Could not located new septic system. Old tank stored above ground.
- Gas propane unknown
- Elec pole, overhead

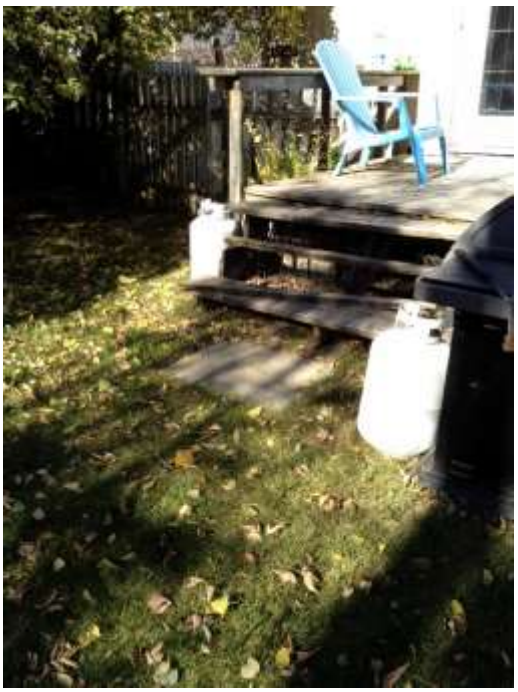
ROAD/ACCESS:

- No ditch

IDENTIFIED DEFICIENCIES/HAZARDS:

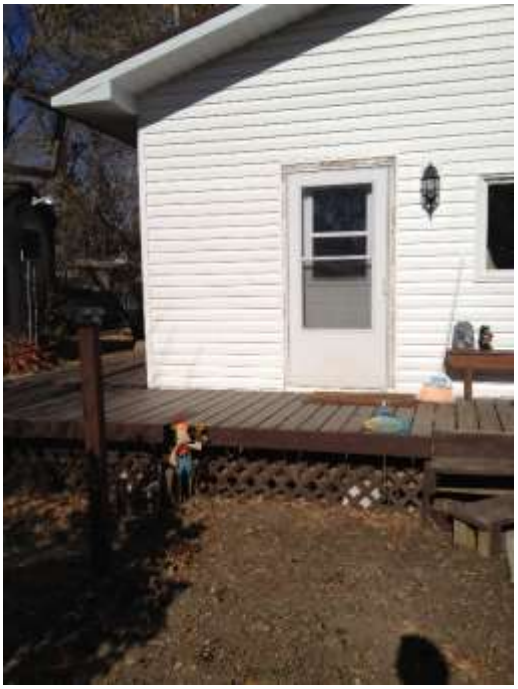
- None

LOT #160



LOT #160

- Septic tank; could not access



LOT #164

General Description:

- Drains southeast

Site Buildings:

- Building good condition, foundation not visible
- Building added on to N.E corner
- Deck – no guard rail, 67” wide
- Setbacks 21’ to house
- Mature trees

Services:

- Could not locate water system

- Gas meter
- Power pole & overhead

Road/Access:

- No ditch

Identified deficiencies/Hazards:

- None

LOT #164

LOT #168

GENERAL DESCRIPTION:

- Over grown grass
- Littered with scrap, garbage, junk
- Unsafe & inhabitable

SITE BUILDINGS:

- derelict

SERVICES:

- Power pole
- Abandoned

ROAD/ACCESS:

- No ditch

IDENTIFIED DEFICIENCIES/HAZARDS:

- Abandoned. Derelict & unsafe

LOT #168

LOT #172

General Description:

- Green field
- Small amounts of debris (metal)
- Possible south drainage
- Tanks stored

Site Buildings:

- No buildings

- Mature trees

Services:

- None

Road/Access:

- No ditching

Identified deficiencies/Hazards:

- None

LOT #176

General Description:

- Drains north
- Tree house, unsafe structure
- Barrels on lot. Motor oil?

Site Buildings:

- Modular home, siding not complete
- Foundation wood block on grade?

- New deck – foundation wood blocks on grade? Framing incorrect. Stairs have no railing
- Mature, some dead trees
- 9’x11’ structure north end of lot. Wood on grade. Framing

Services:

- Water tank under east deck
- Septic tank under west deck
- Elec. Power pole
- Propane tanks

Road/Access:

- No ditch

Identified deficiencies/Hazards:

LOT #176

LOT #176

LOT #176

LOT #180

General Description:

- Derelict vehicles, scrap metal, tanks
- South east west split drainage
- Junk and tanks

Site Buildings:

- Modular building fair condition – Wood skirts foundation not visible
- Unknown green circular structure back of lot
- Mature trees

Services:

- Water tank on property to south
- Irrigation system back of lot
- Septic tank & field
- Gas propane tank appears old
- Elec. Overhead
- Low overhead cables from house to shed
- Satellite dishes east side of lot

Road/Access:

- None

Identified deficiencies/Hazards:

- Low cables

LOT #180

LOT #180

LOT #180

LOT #184

General Description:

- Derelict vehicles
- Back drains to east
- Front drains to south
- Barrels

Site Buildings:

- Modular building fair-poor condition – skirting. Foundation not visible
- Mature trees

Services:

- Water cistern
- U/G septic tanks
- Gas meter
- Elec. Underground
- Satellite dish

Road/Access:

- No ditching

Identified deficiencies/Hazards:

- None

LOT #184

LOT #184

LOT #184

LOT #188

General Description:

- Back drains to east
- Front drains to south

Site Buildings:

- New Building. Foundation not visible – wood skirting
- New deck condition. Wood on conc. blocks
- Wire mesh fencing & post
- Mature trees

Services:

- Water system unknown
- Pump out septic system S.E. of house
- Outhouse? N. of house
- Gas propane tank
- Unknown u/g tank front of house

Road/Access:

- No ditching

Identified deficiencies/Hazards:

- None

LOT #188

LOT #188

LOT #192

General Description:

- Drains to east

Site Buildings:

- Building foundation not visible – wood skirting
- 10’ setback from PL
- Fencing around road
- Mature trees

Services:

- Water tap south east of house
- Septic tank covered steel & field
- Gas meter at southeast corner
- Elec. pole

Road/Access:

- No ditch

Identified deficiencies/Hazards:

- Possible infringement into road

LOT #192

LOT #196

General Description:

- Drains South & East
- Barrels/Scrap Metals
- Derelict vehicles

Site Buildings:

- 16~17’ setback
- Mature trees

Services:

- Wood skirting foundation not visible Hydrant, unconnected
- Water connection at house, Cistern system
- Septic tank & field wood board covered
- Propane tank
- Elec. overhead

Road/Access:

- No ditch

Identified Deficiencies/Hazards:

- Car batteries stored by road

LOT #196

LOT #200

General Description:

- Shed
- Drains East
- Old vehicles, misc. tractors, trailers
- Lots of scrap materials (metal, tires, wood, unknown barrels)
- Derelict vehicles

Site Buildings:

- Mature trees

Services:

- None

Road/Access:

- No ditching

Identified Deficiencies/Hazards:

- None

LOT #200

LOT #200




LOT #204

General Description:

- Drains to east
- Ditch at south end
- Vehicles/misc. trailers on lot
- Metal scrap

Site Buildings:

- Mature trees

Services:

- Possible septic. Uncovered

Road/Access:

- No ditch

Identified deficiencies/Hazards:

- Uncovered septic tank

LOT #228

General Description:

- Drains back east. Partial towards house

Site Buildings:

- Building foundation not found – wood skirts
- Garage south of hosue
- Deck foundation not found

- Mature trees & shrubs

Services:

- Water tank at north end
- U/G septic tank and pump out in front of house
- Power overhead
- Satellite dishes on house
- Gas back of house

Road/Access:

- No ditch

Identified deficiencies/Hazards:

- None

LOT #228

LOT #228

No lot numbers




Summary of Field Observations

County of Newell, North Head Gate

Date of Inspection: October 13, 2015

Inspection Conducted: Dwayne Harvie, P.Eng. Steven Briggs

Lot Number	Deficiency	Action
	Deck/ Stairs	
# 24	Rear steps	Replace steps
# 28	No Railing	Install Railing
# 40	Deck and steps rotting	Repair deck, steps
# 96	Possible inadequate foundation for deck (new)	Inspect
# 104	Poor steps	Repair deck, steps
# 116	No handrail on deck	
# 148	Lack of support on upper deck	Reinforce or remove
# 184	Requires steps on rear door	
	Septic System	Action
# 12	Plywood Cover	Replace with Structurally sound cover
# 28	Plywood Cover	Replace with Structurally sound cover
# 36	Plywood Cover	Replace with Structurally sound cover
# 64	Plywood Cover	Replace with Structurally sound cover
#80	Septic tank adjacent to house foundation	
# 204	Septic uncovered	Replace with Structurally sound cover

Amec Foster Wheeler Environment & Infrastructure
a division of Amec Foster Wheeler Americas Limited
140 Quarry Park Boulevard SE
Calgary, Alberta, CANADA T2C 3G3
Tel: +1 (403) 248-4331
Fax: +1 (403) 258-1016
www.amec.com

Continued…

Lot Number	Deficiency	Action
	Propane Tanks/ Gas Service	
# 32	Older Tank	Inspect, replace if required
# 40	Older Tank	Inspect, replace if required
#48	5 meter clearance to Dinosaur Gas to Mobile home Propane tank	Check Clearance with Dinosaur Gas Inspect, replace if required
# 64	Propane tank	Inspect, replace if required
# 80	Propane tank	Inspect, replace if required
# 112	Propane tank	Inspect, replace if required
# 144	Propane tank	Inspect, replace if required
# 180	Propane tank	Inspect, replace if required
# 196	Propane tank	Inspect, replace if required
	Drainage	
# 24	Poor Drainage	Improve lot grading
# 36	Poor Drainage	Improve lot grading
	Other Deficiency	
# 4	Gas Water Electrical service disconnected, may be unsafe	Inspect by service provider
# 12	Branches near overhead electrical service	Trim branches
# 48	Additional mobile home placed on lot, minimal clearance	
# 56	Trailer placed on lot, possible encroachment into lane	
# 60	Possible encroachment of fence into lane	
# 64	Garage at lot line No clearance between house and garage	
#68	Rocks and lawn ornaments in road Right of Way	Remove from ROW
#80	Rocks and lawn ornaments in road Right of Way	Remove from ROW
# 84	Soffit/ fascia in poor repair	

Continued…

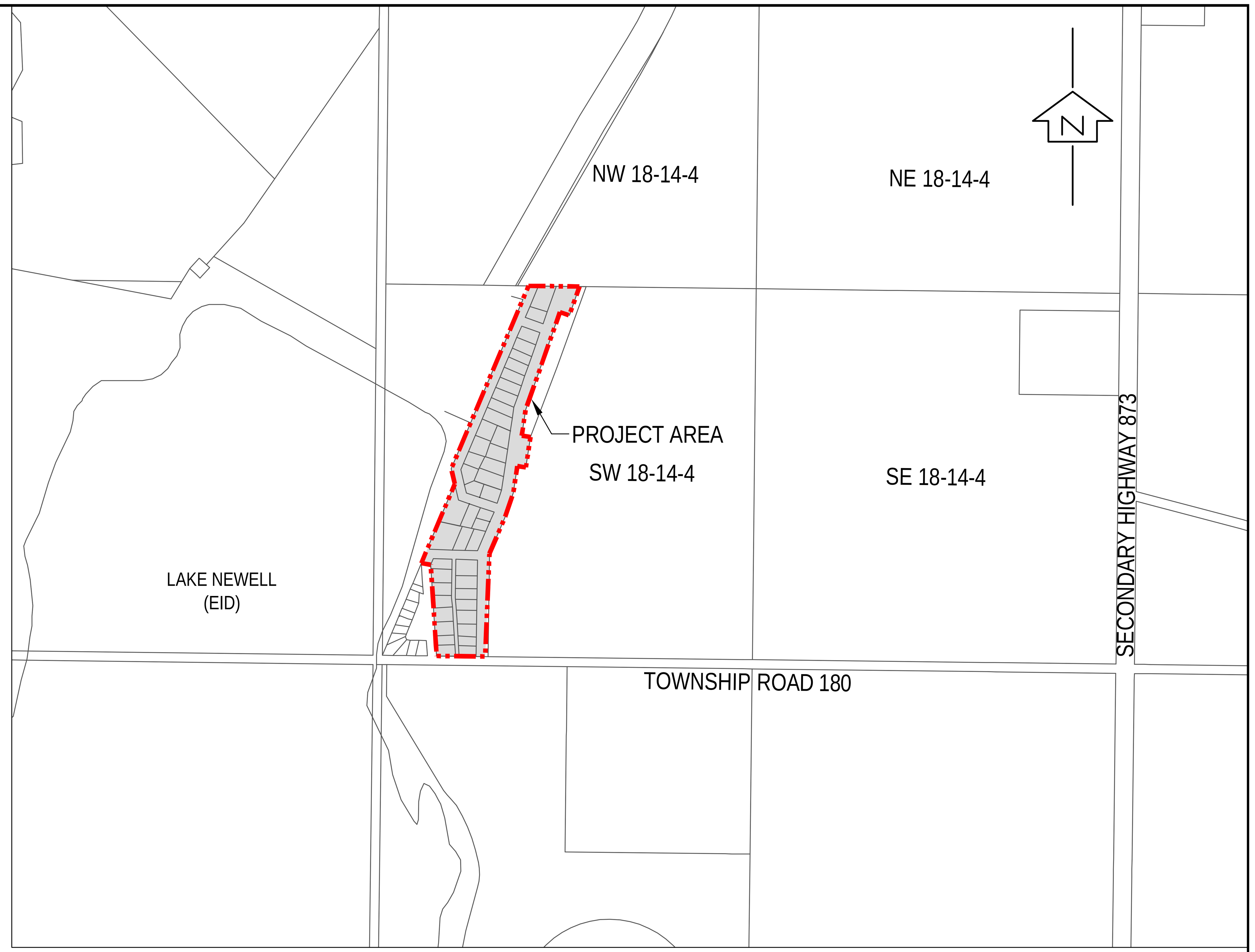
Lot Number	Deficiency	Action
# 88	Possible encroachment into Road Right of Way	
# 116	Possible abandoned vehicles	
# 144	Requires easement to garage	
# 160	Batteries, debris stored on site	Remove
# 168	Possibly abandoned Debris on site House removed, trailer only	Possible safety hazard
# 176	Playhouse? Possibly in Road Right of Way new construction	
# 196	Car batteries stored on site	
# 200	Possible derelict vehicles stored on site	
# 204	Debris on site	

SCHEDULE C

Preliminary Engineering Drawings

WSP CANADA INC.

NORTH HEADGATES SUBDIVISION SERVICING



KEY PLAN
SCALE 1:7500m

COUNTY OF NEWELL

LIST OF DRAWINGS

SUITE 110, 1222 BRIER PARK ROAD NW
MEDICINE HAT, ALBERTA T1C 0B7
TEL: 403-528-8818 | FAX: 403-928-8917| WWW.WSPGROUP.COM

ISSUED FOR CLIENT REVIEW

DISCLAIMER: COPYRIGHT:

ISS/REV	DATE	DESCRIPTION	DES	CHK	PM
0	2019-03-15	ISSUED FOR CLIENT REVIEW	MA	TA	JA

SEAL:

CLIENT: COUNTY OF NEWELL

CLIENT REF. NO:

WSP
SUITE 110, 1222 BRIER PARK ROAD NW
MEDICINE HAT, ALBERTA T1C 0B7
TEL: 403-528-8818 | FAX: 403-928-8917 | WWW.WSPGROUP.COM

PROJECT: NORTH HEADGATES SUBDIVISION SERVICING

PROJECT NO: 171-15210-00

ORIGINAL SCALE: 1:1250

DATE: 2019-03-15

DESIGNED BY: MA

DRAWN BY: MA

DISCIPLINE: CIVIL

TITLE: EXISTING CONDITIONS PLAN

DRAWING NO: 001

SHEET NO: OF

ISSUE: ISSUED FOR CLIENT REVIEW 2019-03-15

ISS/REV: 0

Iso A1, L:\PROJECTS\County of Newell\181-03875-00 - North Headgate Re-Development (Newell)\Design and Drafting\01 PRODUCTION\171-15210-00-001

2019/03/15 1:18PM

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SUITE 110, 1222 BRIER PARK ROAD NW
MEDICINE HAT, ALBERTA T1C 0B7
TEL: 403-528-8818 | FAX: 403-928-8917| WWW.WSPGROUP.COM

PROJECT: NORTH HEADGATES SUBDIVISION SERVICING

PROJECT NO: 171-15210-00

ORIGINAL SCALE: 1:1250

DATE: 2019-03-15

DESIGNED BY: MA

DRAWN BY: MA

DISCIPLINE: CIVIL

TITLE: DEMOLITION PLAN

DRAWING NO: 002

SHEET NO: OF

ISSUE: ISSUED FOR CLIENT REVIEW 2019-03-15

ISS/REV: 0

2019/03/15 1:19PM

NW5 18-14-4
EID CANAL
LAKE NEWELL (EID)
EXISTING ROADWAY TO BE REMOVED AND REPLACED WITH TOP SOIL AND SEED MIX TO MATCH EXISTING GRADE
INSTALL CHAIN AND BOLLARD FENCE ALONG PROPERTY LINE
EDGE OF ROAD 1 TO BE TIED TO EXISTING ROAD EDGE
TIE TO EXISTING ACCESS ROAD
ROAD 2
8.0m GRAVEL ROAD
EXISTING ROAD
ROAD 1
FUTURE LANE
LANE 1
4.0m GRAVEL LANE
MAIN ACCESS ROAD
8.0m GRAVEL ROAD
EXISTING ACCESS TO BE UPGRADED
CROWN CLAIMABLE WETLAND BOUNDARY ESTABLISHED BY AQUALITY ENVIRONMENTAL CONSULTING LTD. IN THEIR WETLAND PERMANENCE ASSESSMENT DATED MARCH 23, 2018
SW5 18-14-4
TOWNSHIP ROAD 180
LEGEND
EDGE OF ROAD
CENTRE LINE OF ROAD
CHAIN AND BOLLARD FENCE
EXISTING ROAD STRUCTURE TO BE REMOVED
EXISTING
TYPE 1 MANHOLE
BLOCK PROFILE NUMBER

Iso A1, L:\PROJECTS\County of Newell\181-03875-00 - North Headgate Re-Development (Newell)\Design and Drafting\01 PRODUCTION\171-15210-00 101

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PROJECT: NORTH HEADGATES SUBDIVISION SERVICING

PROJECT NO: 171-15210-00

ORIGINAL SCALE: 1:1250

DATE: 2019-03-15

DESIGNED BY: MA

DRAWN BY: MA

DISCIPLINE: CIVIL

TITLE: STREETS LAYOUT PLAN

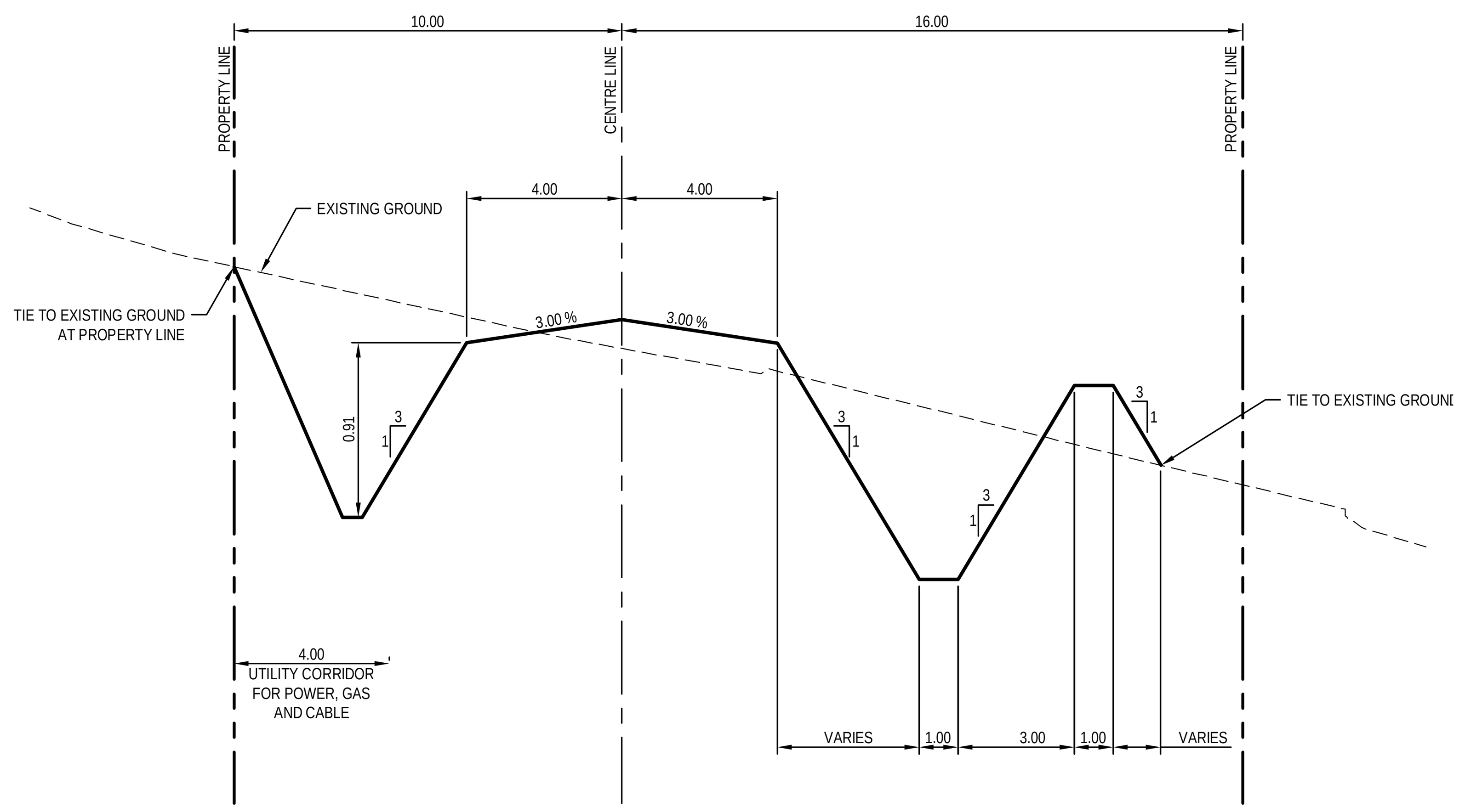
DRAWING NO: 101

SHEET NO: OF

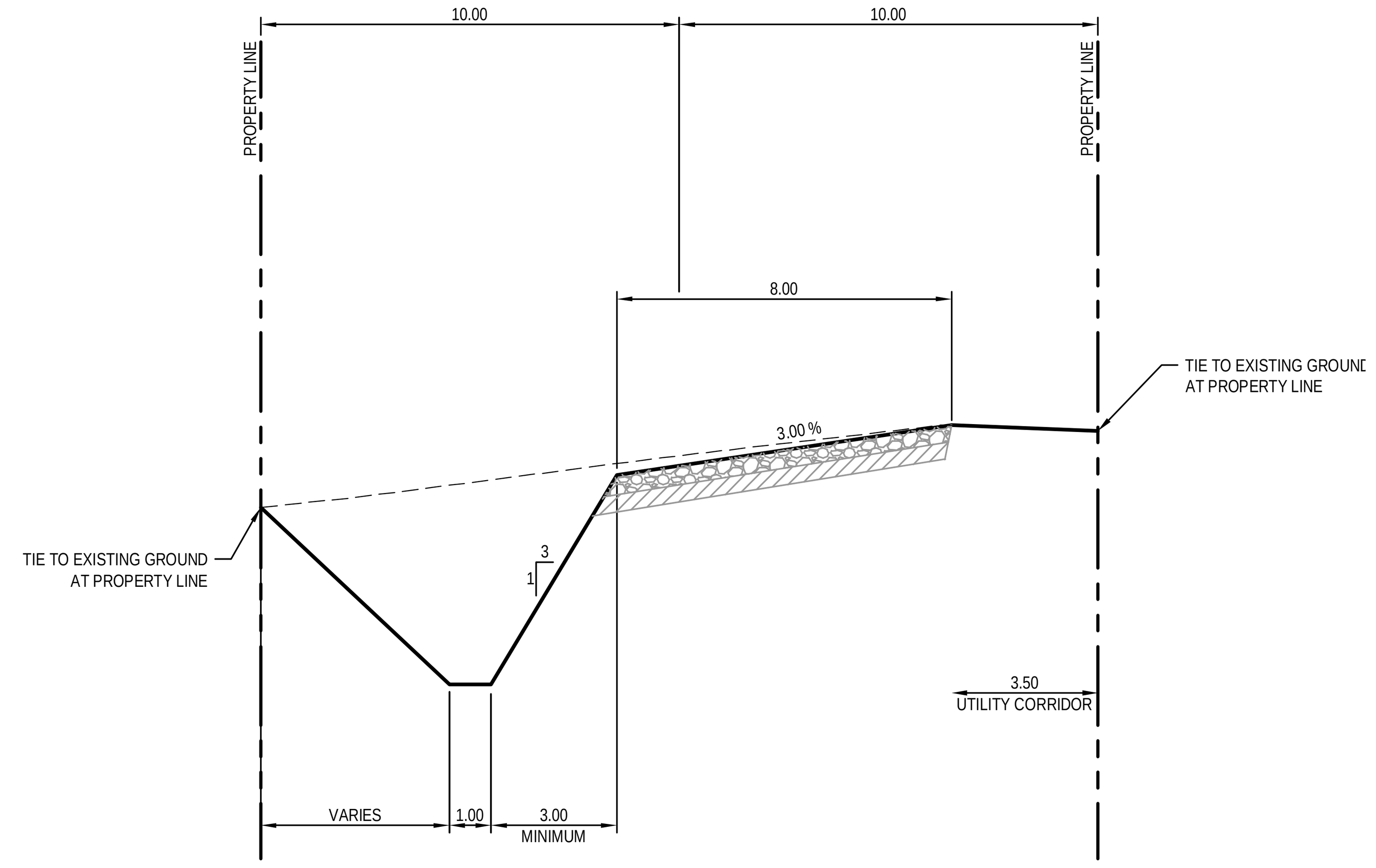
ISSUE: ISSUED FOR CLIENT REVIEW 2019-03-15

ISS/REV: 0

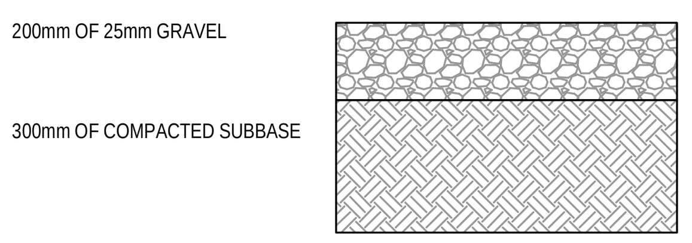
2019/03/15 1:19PM



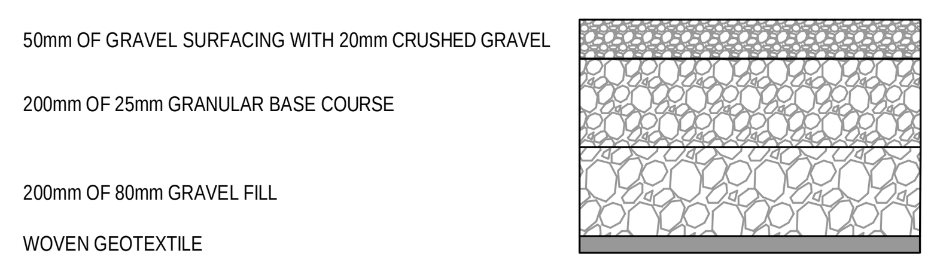
MAIN ACCESS ROAD CROSS SECTION
STA 1+000 - 1+500
SCALE N.T.S.



ROAD 1 CROSS SECTION
STA 2+000 - 2+125
ROAD 2 CROSS SECTION
STA 4+000 - 4+130
SCALE N.T.S.

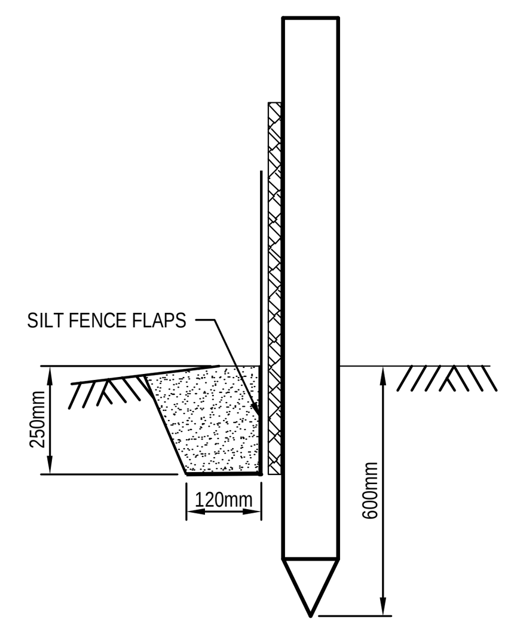


LANE STRUCTURE
N.T.S.



ROAD STRUCTURE
N.T.S.

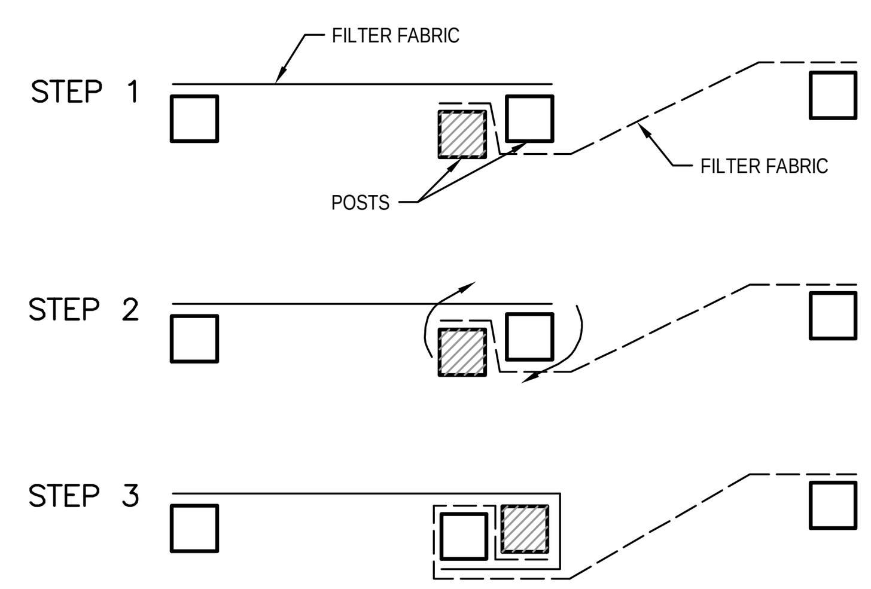
NOTE:
1. GEO-GRID AS A PROVISIONAL ITEM TO BE PLACED BETWEEN 2-100mm LIFTS OF THE GRANULAR BASE COURSE, WHERE DIRECTED BY THE ENGINEER.



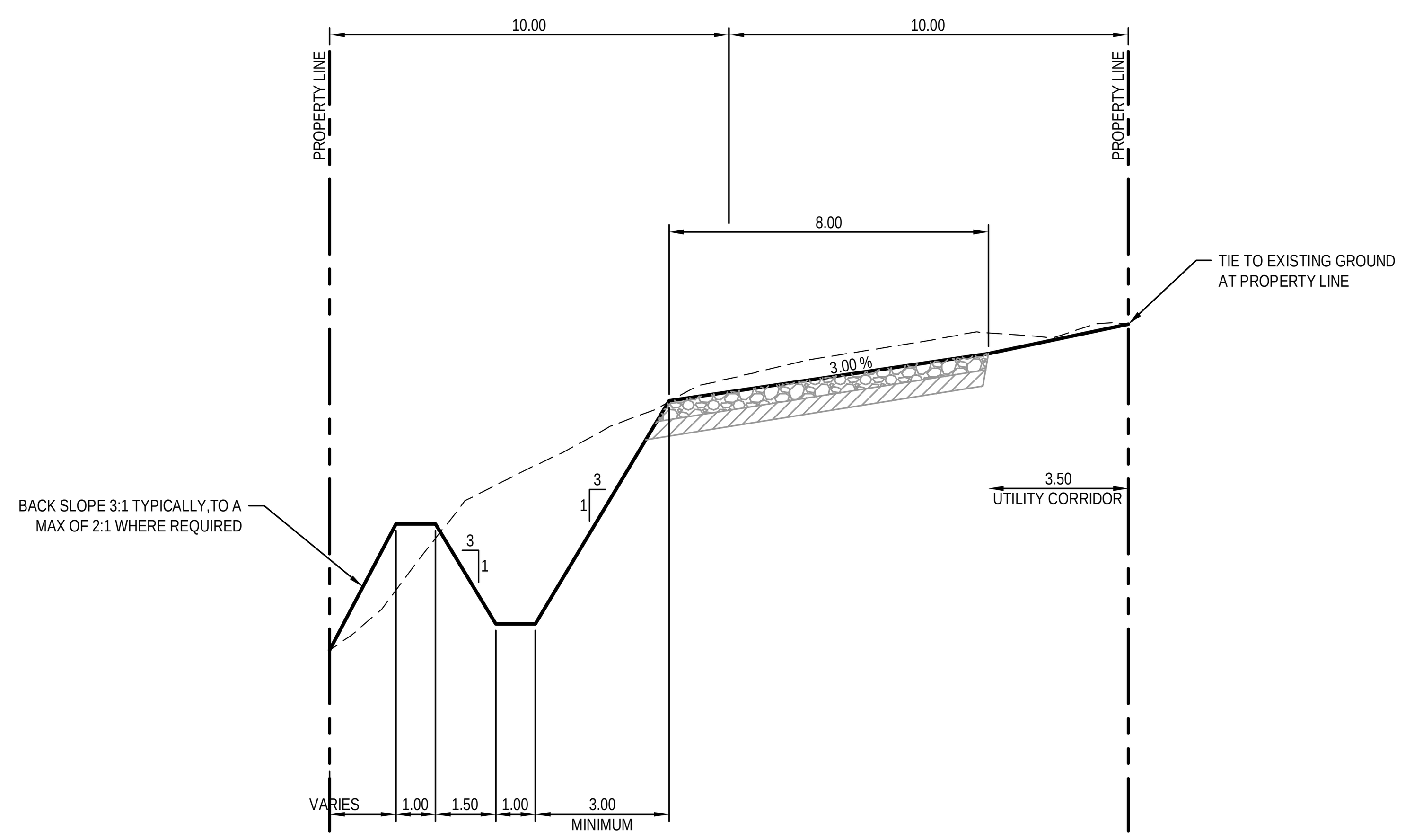
SILT FENCE DETAIL
N.T.S.

ATTACHMENT INSTRUCTION

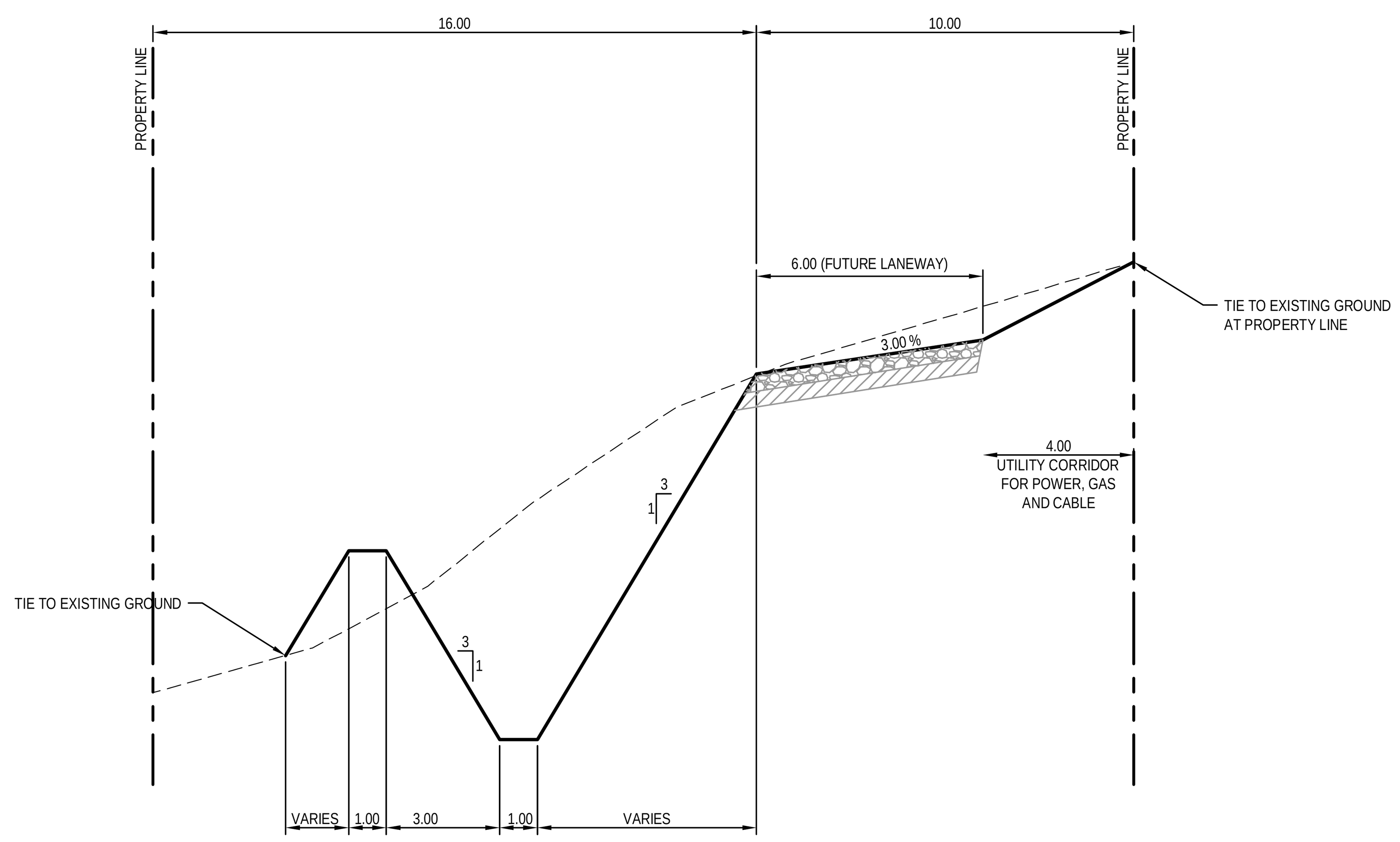
1. PLACE THE END POST OF THE SECOND FENCE INSIDE THE END POST OF THE FIRST FENCE.
2. ROTATE BOTH POSTS AT LEAST 100 DEGREES CLOCKWISE DIRECTION TO CREATE A TIGHT SEAL WITH BOTH ENDS OF THE FABRIC MATERIAL.
3. DRIVE BOTH POSTS A MINIMUM OF 25cm (APPROX 10") INTO THE GROUND & BURRY THE FLAP.



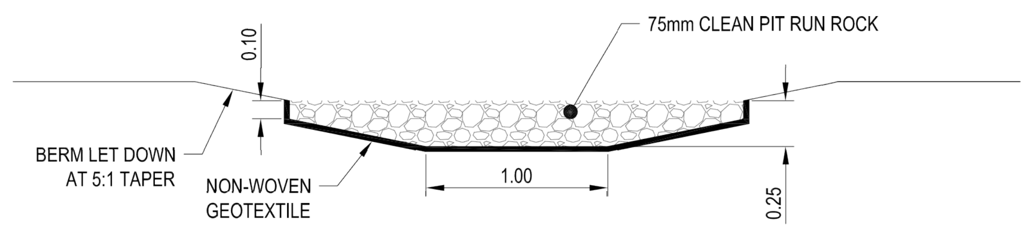
TWO SILT FENCES
N.T.S.



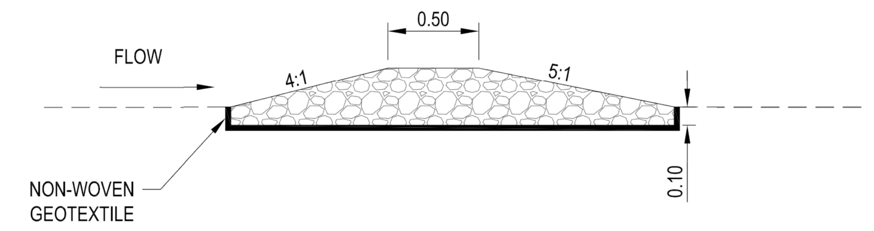
ROAD 2 CROSS SECTION
STA 4+140 - 4+560
SCALE N.T.S.



FUTURE LANEWAY CROSS SECTION
STA 5+000 - 5+285
SCALE N.T.S.

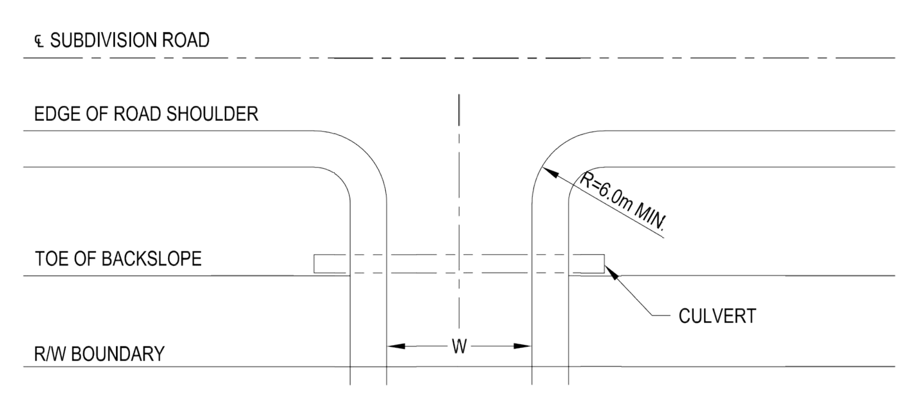


ROCK CHECK DAM - FRONT VIEW
SCALE 1:40

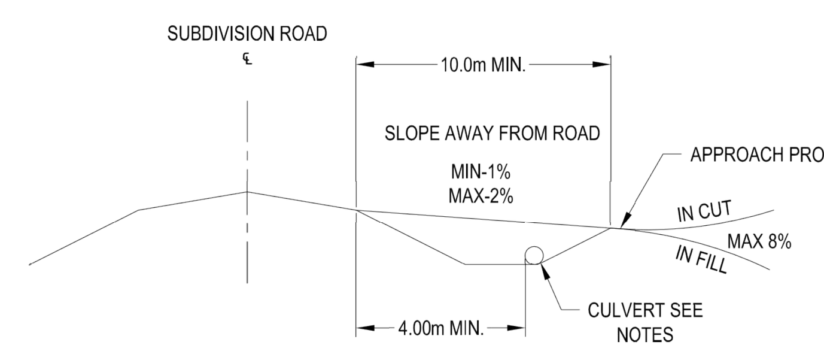


ROCK CHECK DAM - SIDE VIEW
SCALE 1:40

CLIENT: COUNTY OF NEWELL	SCALE: AS SHOWN	PROJECT: NORTH HEADGATES SUBDIVISION SERVICING	
wsp	DESIGNED BY: TA	TITLE: ROCK CHECK DAM DETAIL	
	DRAWN BY: JW		
	CHECKED BY: TA		
	DATE:	DRAWING NO: WSP-01	ISSUE: / ISS/REV:
	PROJECT NO: 171-15210-00		



APPROACH PLAN
SCALE 1:1000



DITCH AND CULVERT LOCATION
SCALE 1:1000

NOTES:

1. WHEN CULVERTS ARE REQUIRED THEY MUST BE C.S.P. CULVERTS AND BE A MINIMUM DIAMETER OF 0.500m
2. CULVERTS MUST BE SET BACK A MINIMUM OF 4m FROM SHOULDER OF ROAD
3. ALL DIMENSIONS SHOWN ARE IN METRES.
4. APPROACH WIDTH, W, WILL VARY DEPENDING ON EXISTING CONDITIONS OF EACH LOT.
5. 16 LOTS ON WEST DITCH OF MAIN ACCESS ROAD TO HAVE APPROACHES COMPLETE WITH 300mm CULVERT INSTALLED.

CLIENT: COUNTY OF NEWELL	SCALE: AS SHOWN	PROJECT: NORTH HEADGATES SUBDIVISION SERVICING	
wsp	DESIGNED BY:	TITLE: TYPICAL APPROACH AND CULVERT INSTALLATION	
	DRAWN BY: JW		
	CHECKED BY: TA		
	DATE:	DRAWING NO: WSP-01	ISSUE: / ISS/REV:
	PROJECT NO: 171-15210-00		

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PROJECT: NORTH HEADGATES SUBDIVISION SERVICING
PROJECT NO: 171-15210-00
ORIGINAL SCALE: AS SHOWN
DATE: 2019-03-15
DESIGNED BY: TA
DRAWN BY: MA
DISCIPLINE: CIVIL

TITLE: TYPICAL CROSS SECTIONS AND DETAILS
DRAWING NO: 102
SHEET NO: OF
ISSUE: ISSUED FOR CLIENT REVIEW
2019-03-15
ISS/REV: 0

2019/03/15 1:19PM

NOTES

PRE-CONSTRUCTION

THE CONTRACTOR SHALL ENSURE:

1. A PRE-CONSTRUCTION MEETING SHALL BE COORDINATED BY WSP AND THE CONTRACTOR PRIOR TO CONSTRUCTION ACTIVITIES COMMENCING.

DURING CONSTRUCTION

THE CONTRACTOR SHALL ENSURE:

2. MAINTAIN ALL EXISTING ESC MEASURES ALREADY IN PLACE. MAINTENANCE MAY INCLUDE, BUT ARE NOT LIMITED TO: TOP DRESSING GRAVEL PADS WHEN REQUIRED, REMOVE ACCUMULATED SEDIMENT FROM ESC MEASURES PRIOR TO THE SEDIMENT REACHING 1/3 THE HEIGHT OF THE MEASURE. ANY ACCUMULATED SEDIMENT OR WATER CAN BE REDISTRIBUTED BACK INTO THE PROJECT AREA.
3. CONFINE ALL CONSTRUCTION TRAFFIC TO WITHIN THE PROJECT AREA AND ADEQUATELY CONTAIN HAULED MATERIAL IN VEHICLES AND KEEP ALL ROUTES CLEAR OF MUD AND DEBRIS THAT ARE A RESULT OF CONSTRUCTION ACTIVITIES.
4. COMPLY WITH ALL REGULATORY REQUIREMENTS WITH REGARDS TO EROSION AND SEDIMENT CONTROL AT THE CONSTRUCTION SITE.
5. A WATER TRUCK SHALL BE PROVIDED BY THE CONTRACTOR FOR DUST CONTROL DURING CONSTRUCTION ACTIVITIES.

DETAILS

6. SEE DWG 401 FOR ALL EROSION AND SEDIMENT CONTROL DETAILS.

INITIAL GRADING

THE CONTRACTOR SHALL:

7. THE TEMPORARY STORAGE BASINS SHALL BE INSPECTED MONTHLY AND DURING/AFTER SIGNIFICANT RAINFALL/RUN-OFF OR SNOW MELT EVENTS. CAPACITY SHALL BE MAINTAINED BY REMOVING SEDIMENT WHEN IT REACHES NO MORE THAN 1/3RD OF THE SETTLING VOLUME. ACCUMULATED SEDIMENT MAY BE DISPOSED OF THROUGHOUT THE PROJECT BOUNDARIES IN AREAS NOT SUBJECT TO HEAVY RUN-OFF.
8. INSTALL SILT FENCE ALONG THE WEST AND EAST PERIMETER BOUNDARY. THE SILT FENCE SHALL BE INSTALLED PARALLEL TO THE NATURAL CONTOURS OF THE EXISTING TOPOGRAPHY. AN ANCHOR TRENCH ALONG THE CONTOUR ON THE UPSLOPE SIDE SHALL BE EXCAVATED FIRST. THE SILT FENCE FABRIC WILL BE ATTACHED TO THE POSTS AND/OR EXISTING CHAIN LINK FENCE ON THE UP-GRADIENT SIDE. THE SILT FENCE FABRIC WILL THEN BE INSTALLED EXTENDING INTO THE TRENCH AND ATTACHED TO THE POSTS. ONCE COMPLETED THE TRENCH SHALL BE BACKFILLED AND COMPACTED OVER THE FILTER FABRIC ENSURING THAT THERE ARE NO GAPS BETWEEN THE GROUND AND FABRIC. THE FENCE SHALL EXTEND A MINIMUM OF 600mm INTO THE TRENCH AND SHALL NOT EXCEED 1m ABOVE THE GROUND. AT A MINIMUM THE SILT FENCE SHALL BE INSPECTED EVERY SEVEN DAYS, AND DURING OR IMMEDIATELY AFTER A SIGNIFICANT STORM EVENT OR SNOWMELT.

FINAL GRADING

9. ALL STOCKPILES NOT BEING ACTIVELY USED ARE TO BE STABILIZED. THIS MAY INCLUDE THE INSTALLATION OF SILT FENCE 2m FROM THE TOE OF SLOPE AND STABILIZATION WITH A TACKIFIER\MULCH MIXTURE.

ADDITIONAL NOTES

10. AT A MINIMUM THE SITE SHALL BE INSPECTED MONTHLY, AND IMMEDIATELY AFTER A SIGNIFICANT STORM, WIND EVENT OR SNOWMELT. AN APPROVED COPY OF THE ESC PLAN AND INSPECTION LOGS SHALL BE KEPT ON SITE BY WSP IF SITE CONDITIONS WARRANT A CHANGE TO THE ESC PLAN.
11. TEMPORARY ESC MEASURES SHALL BE REMOVED PRIOR TO FINAL INSPECTIONS AND AT THE CONCLUSION OF THE PHASE CONSTRUCTION.
12. SEDIMENT LOGS TO BE INSTALLED AS PER B.M.P. #38 OF THE ALBERTA TRANSPORTATION EROSION AND SEDIMENT CONTROL MANUAL.

LEGEND

936.00	ROUGH GRADING CONTOURS (0.25 INTERVAL)
	SILT FENCE
	SEDIMENT LOGS

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MEDICINE HAT, ALBERTA T1C 0B7
TEL: 403-528-8818 | FAX: 403-928-8917| WWW.WSPGROUP.COM

PROJECT: NORTH HEADGATES SUBDIVISION SERVICING

PROJECT NO: 171-15210-00

ORIGINAL SCALE: 1:1250

DATE: 2019-03-15

DESIGNED BY: MA

DRAWN BY: MA

DISCIPLINE: CIVIL

TITLE: EROSION AND SEDIMENT CONTROL PLAN

DRAWING NO: 401

SHEET NO: OF

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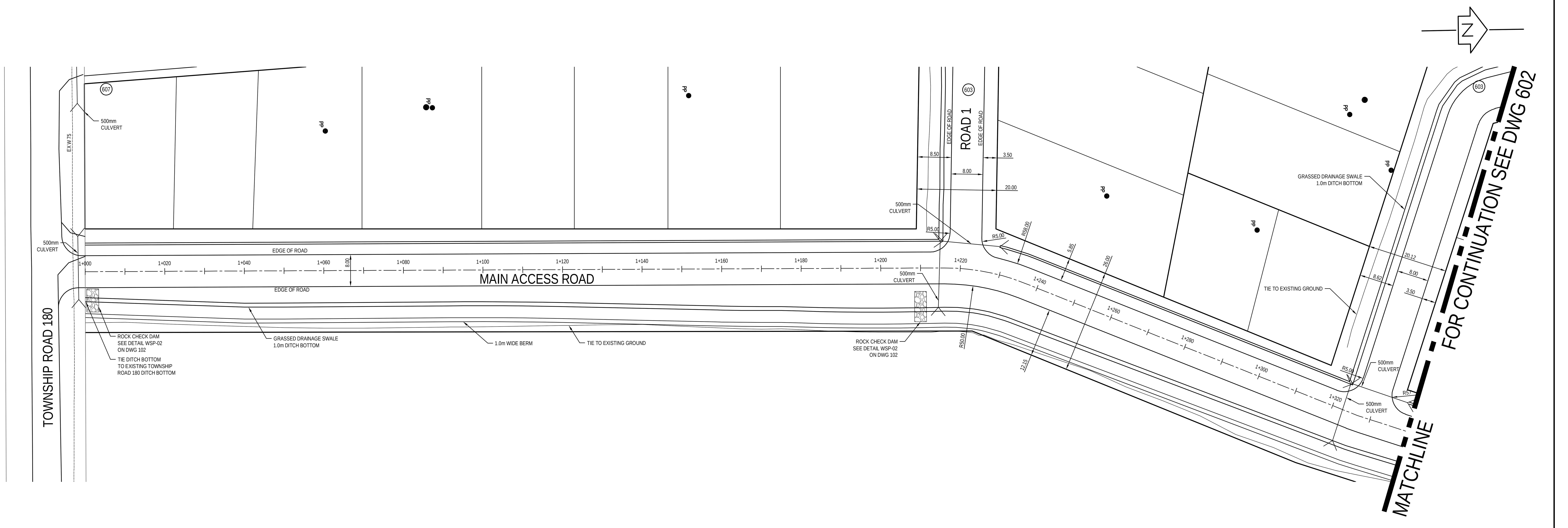

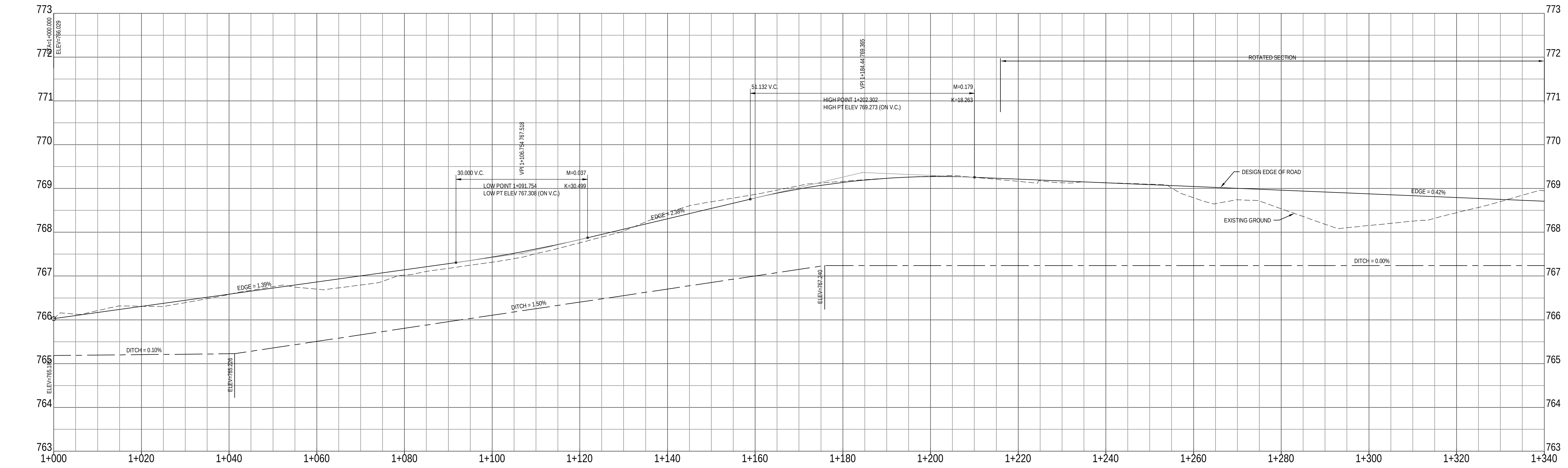

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PROJECT NO: 171-15210-00

ORIGINAL SCALE: H=1:500 V=1:50

DATE: 2019-03-15

DESIGNED BY: MA

DRAWN BY: MA

DISCIPLINE: CIVIL

TITLE: MAIN ACCESS ROAD PLAN AND PROFILE - 1 OF 2

DRAWING NO: 601

SHEET NO: OF

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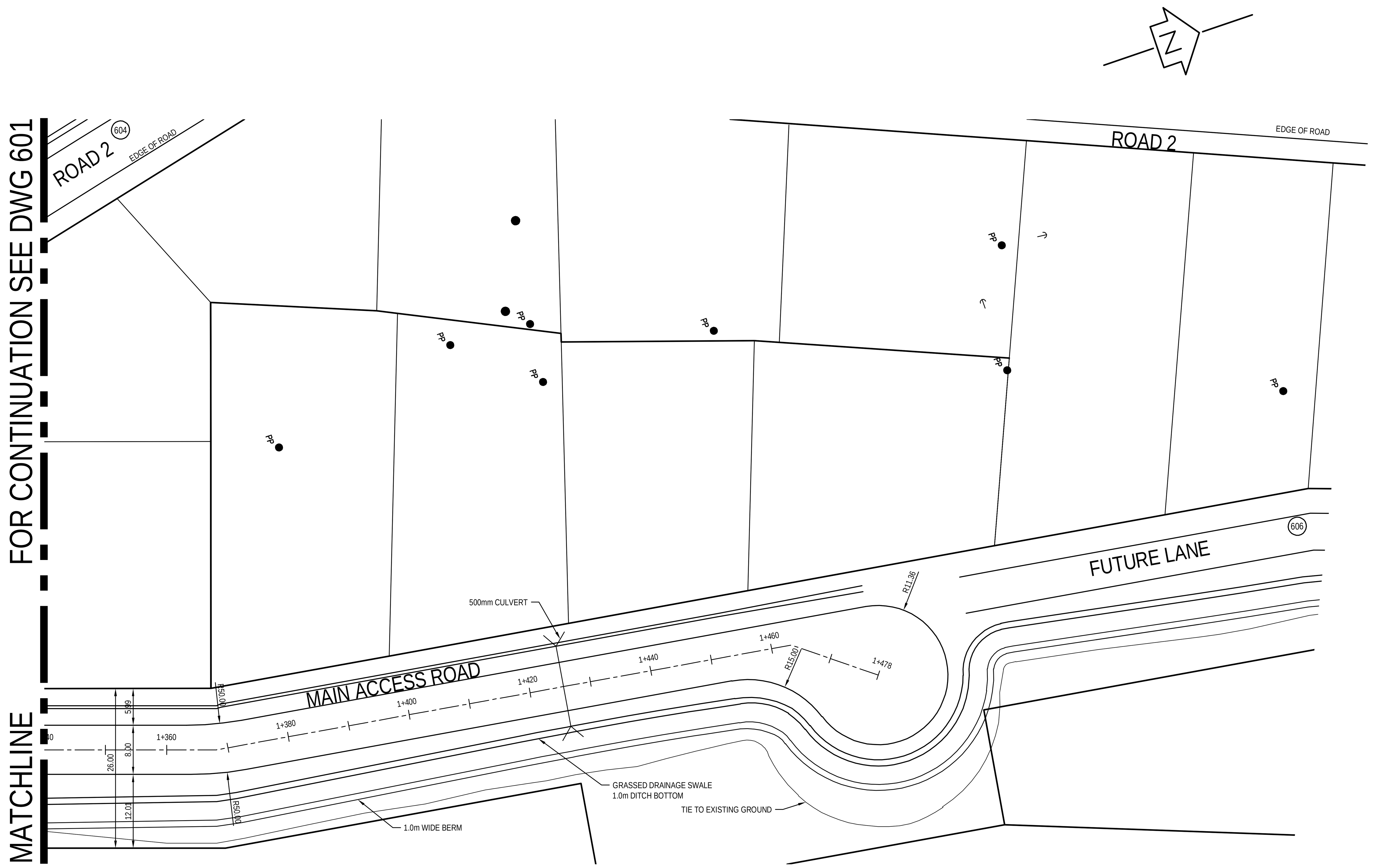

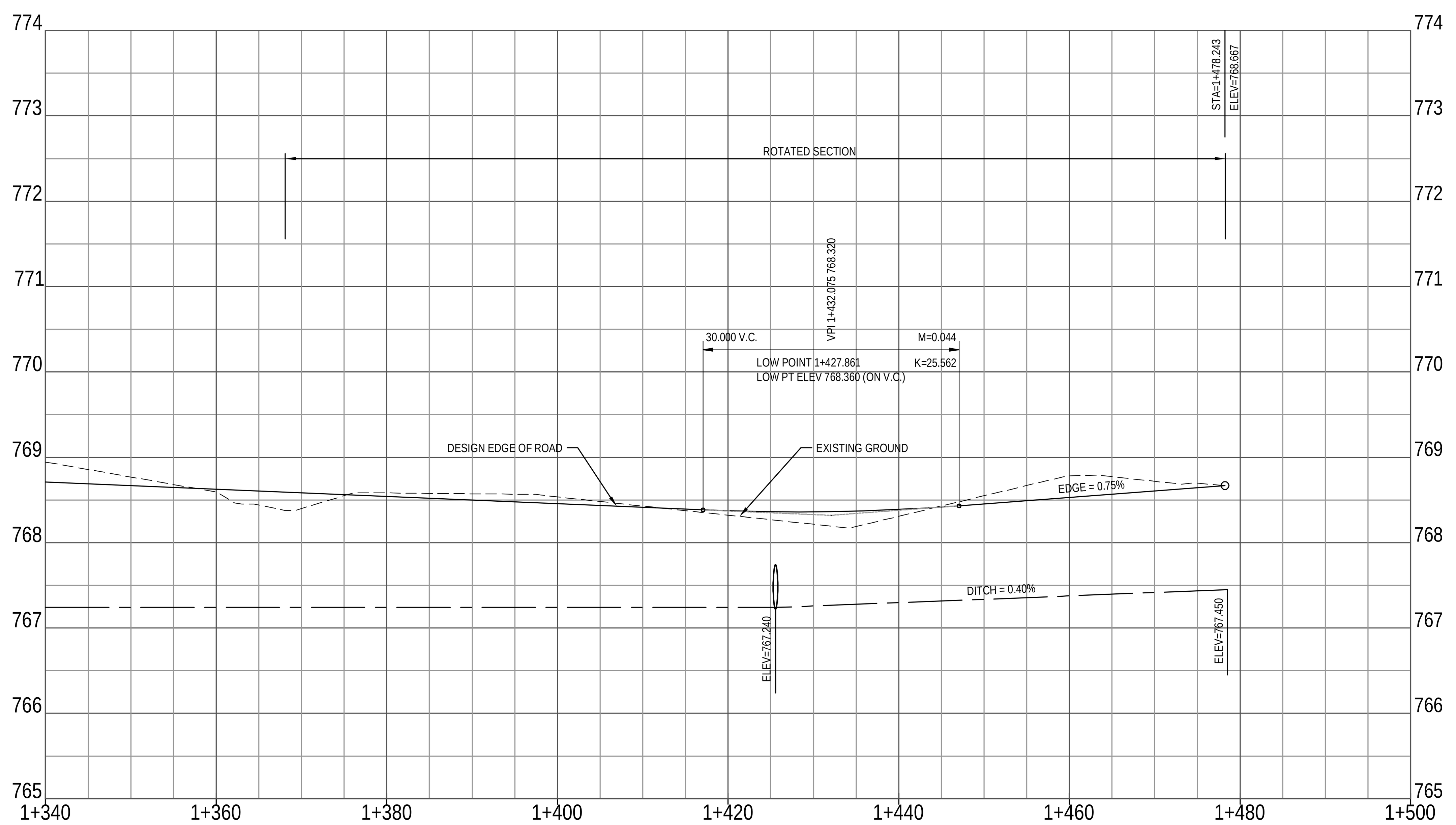

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PROJECT NO: 171-15210-00

ORIGINAL SCALE: H=1:500 V=1:50

DATE: 2019-03-15

DESIGNED BY: MA

DRAWN BY: MA

DISCIPLINE: CIVIL

TITLE: MAIN ACCESS ROAD PLAN AND PROFILE - 2 OF 2

DRAWING NO: 602

SHEET NO: OF

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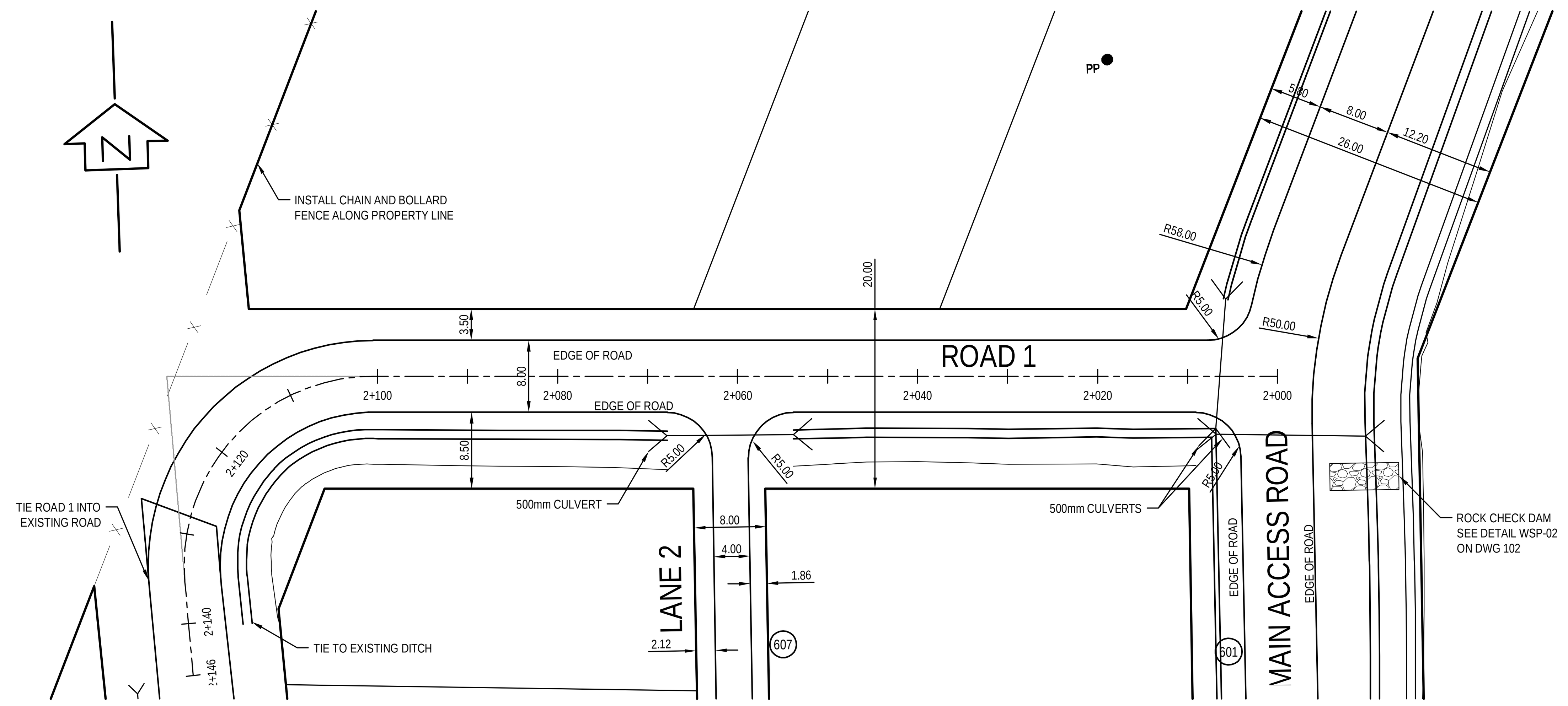
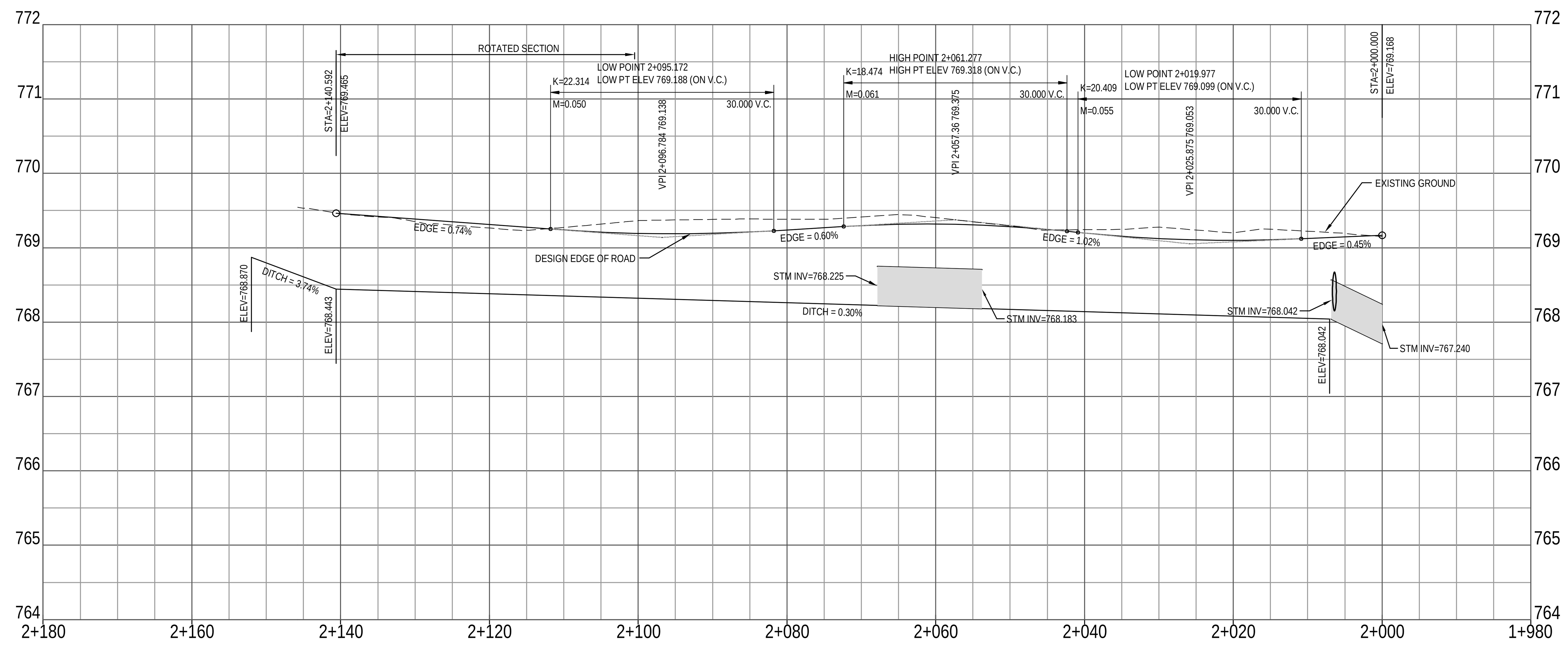
2019/03/15 1:21PM





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PROJECT NO: 171-15210-00

ORIGINAL SCALE: H=1:500 V=1:50

DATE: 2019-03-15

DESIGNED BY: MA

DRAWN BY: MA

DISCIPLINE: CIVIL

TITLE: ROAD 1 PLAN AND PROFILE

DRAWING NO: 603

SHEET NO: OF

ISSUE: ISSUED FOR CLIENT REVIEW 2019-03-15

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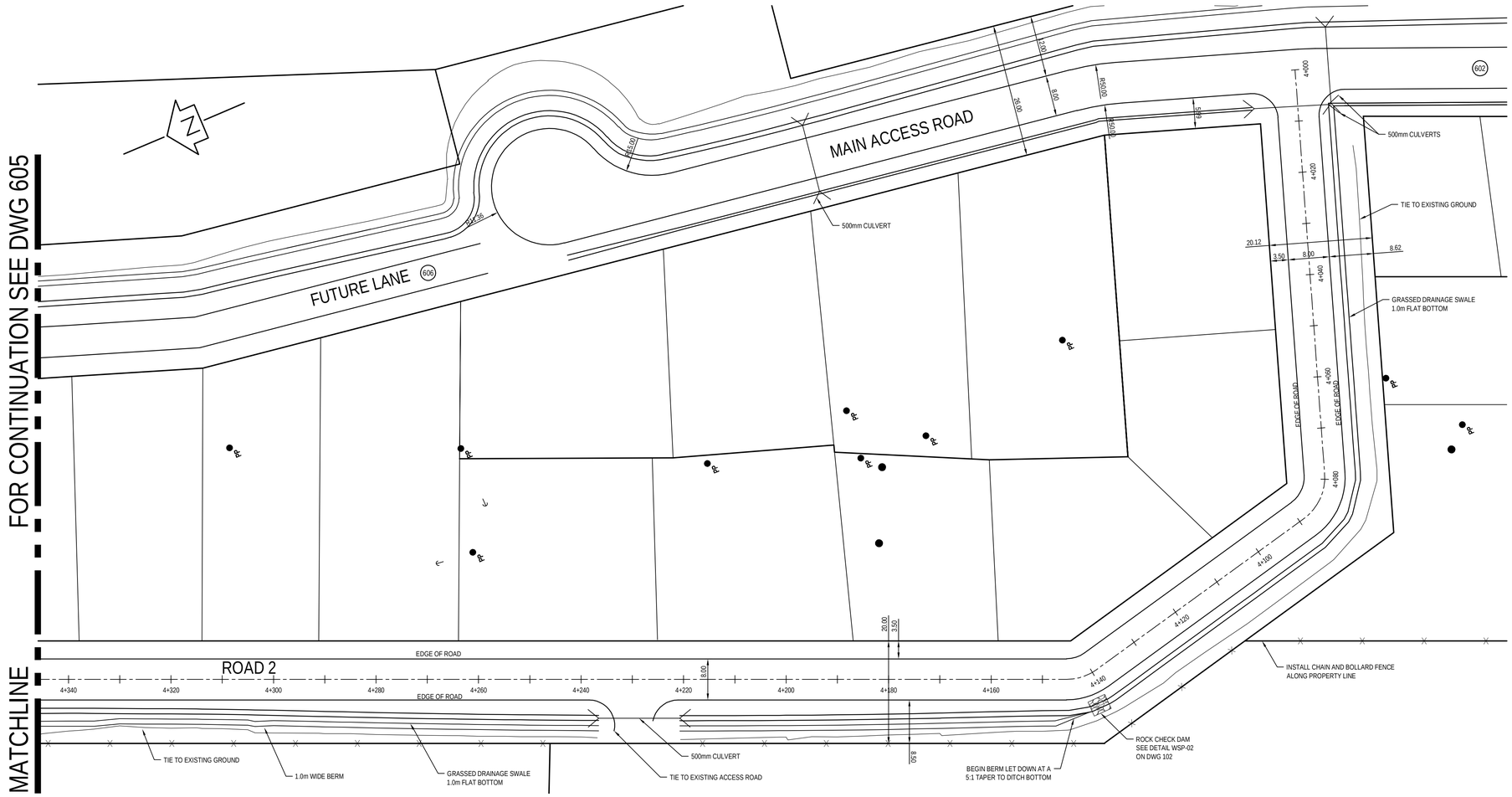

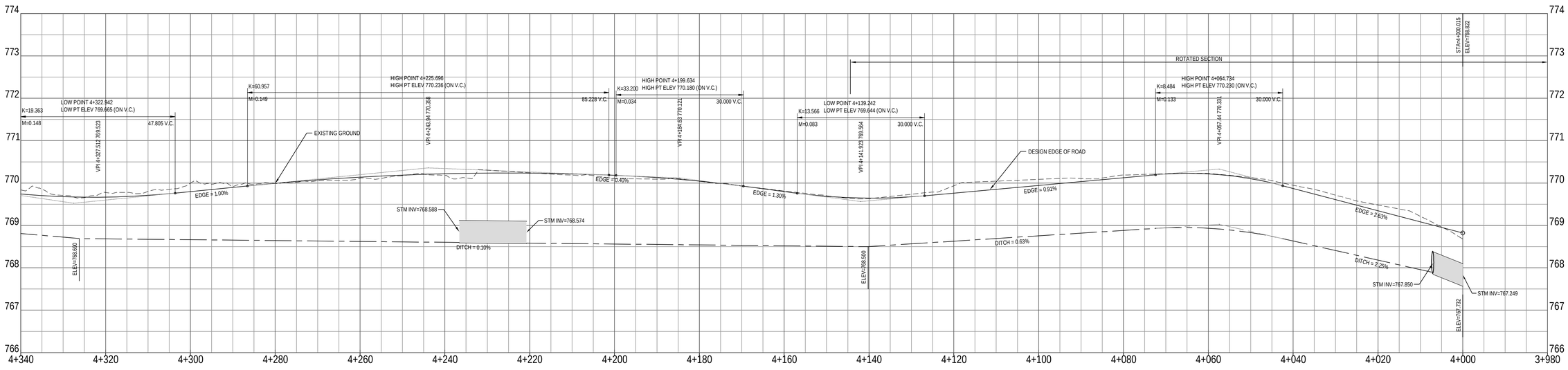

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PROJECT NO: 171-15210-00

ORIGINAL SCALE: H:1:500 V:1:50

DATE: 2019-03-15

DESIGNED BY: MA

DRAWN BY: MA

DISCIPLINE: CIVIL

TITLE: ROAD 2
PLAN AND PROFILE - 1 OF 2

DRAWING NO: 604

SHEET NO: OF

ISSUE: ISSUED FOR CLIENT REVIEW

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2019-03-15

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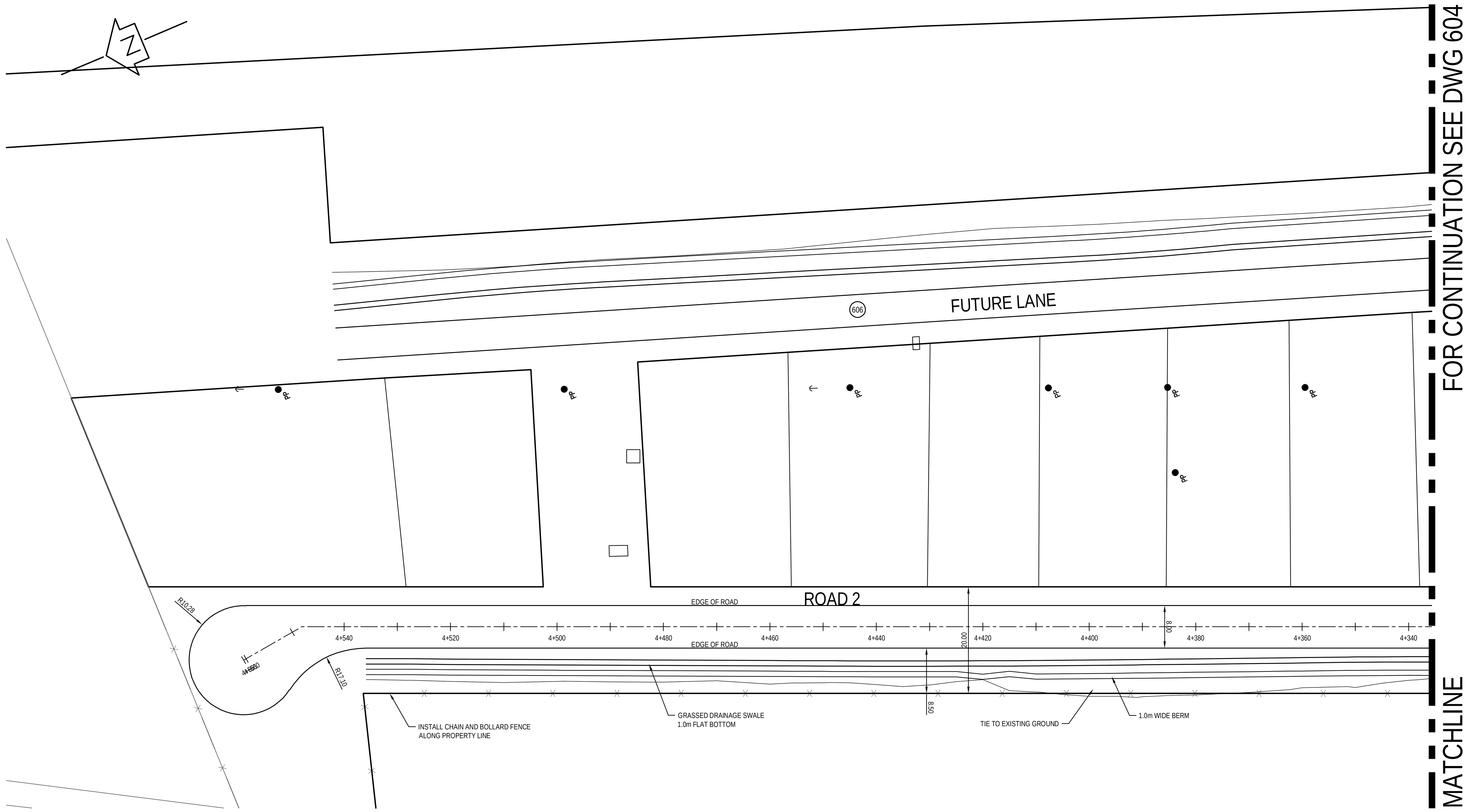

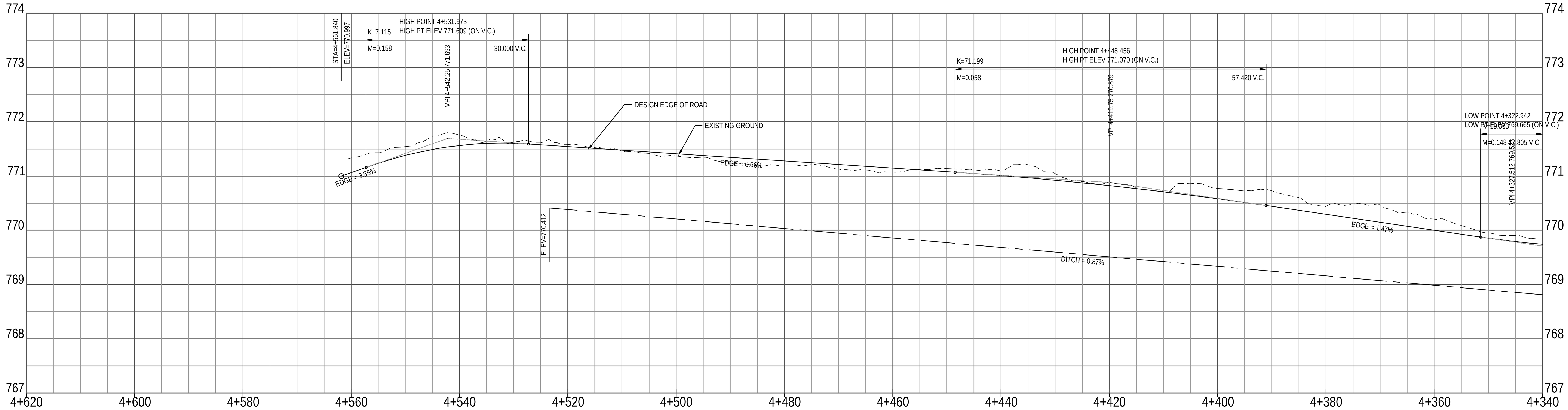

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DATE: 2019-03-15

DESIGNED BY: MA

DRAWN BY: MA

DISCIPLINE: CIVIL

TITLE: ROAD 2 PLAN AND PROFILE - 2 OF 2

DRAWING NO: 605

SHEET NO: OF

ISSUE: ISSUED FOR CLIENT REVIEW 2019-03-15

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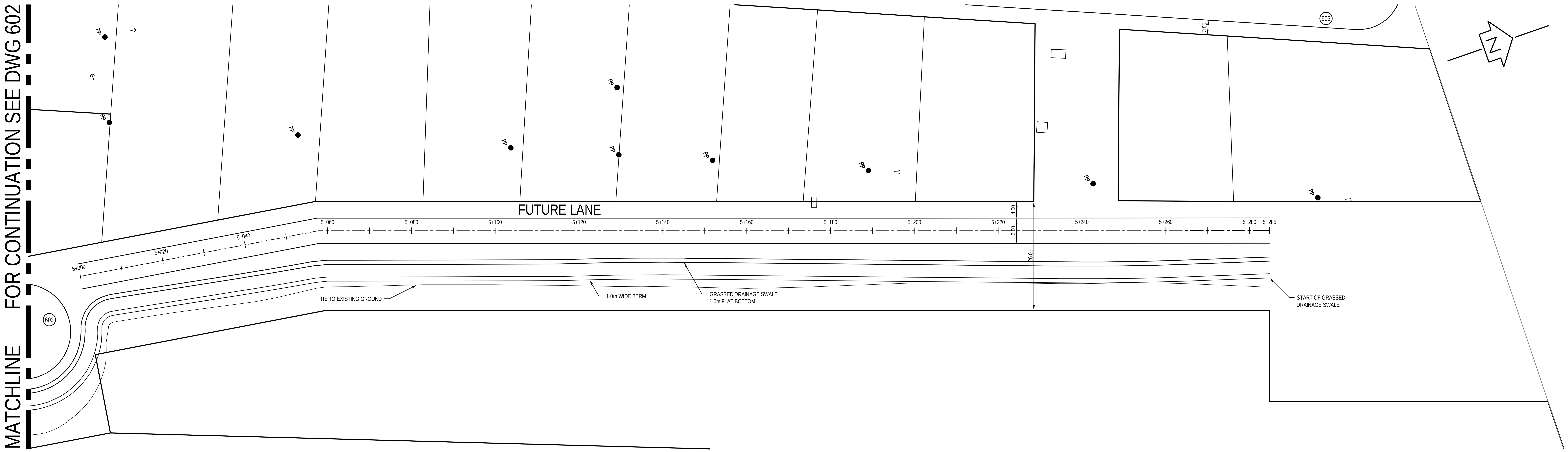

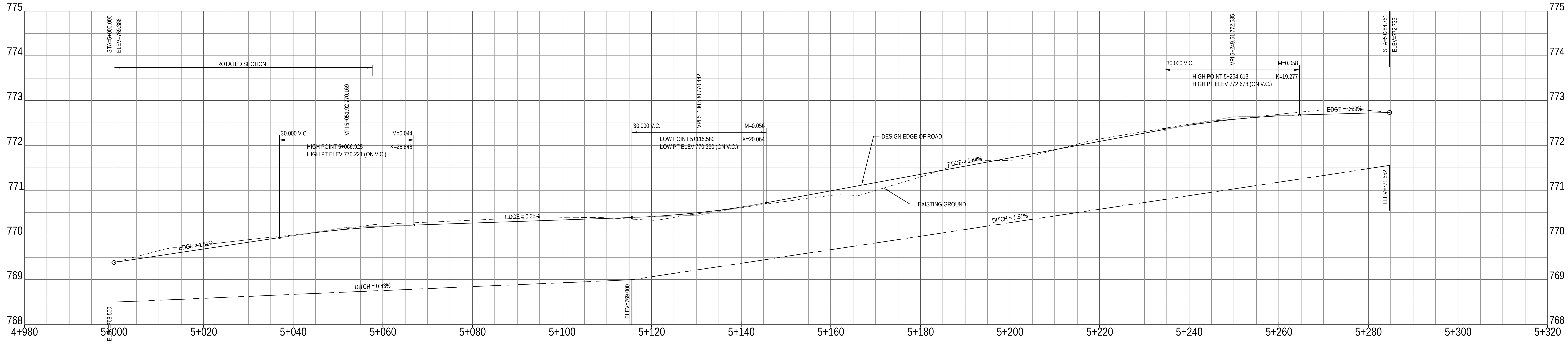

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ORIGINAL SCALE: H=1:500 V=1:50

DATE: 2019-03-15

DESIGNED BY: MA

DRAWN BY: MA

DISCIPLINE: CIVIL

TITLE: FUTURE LANE PLAN AND PROFILE

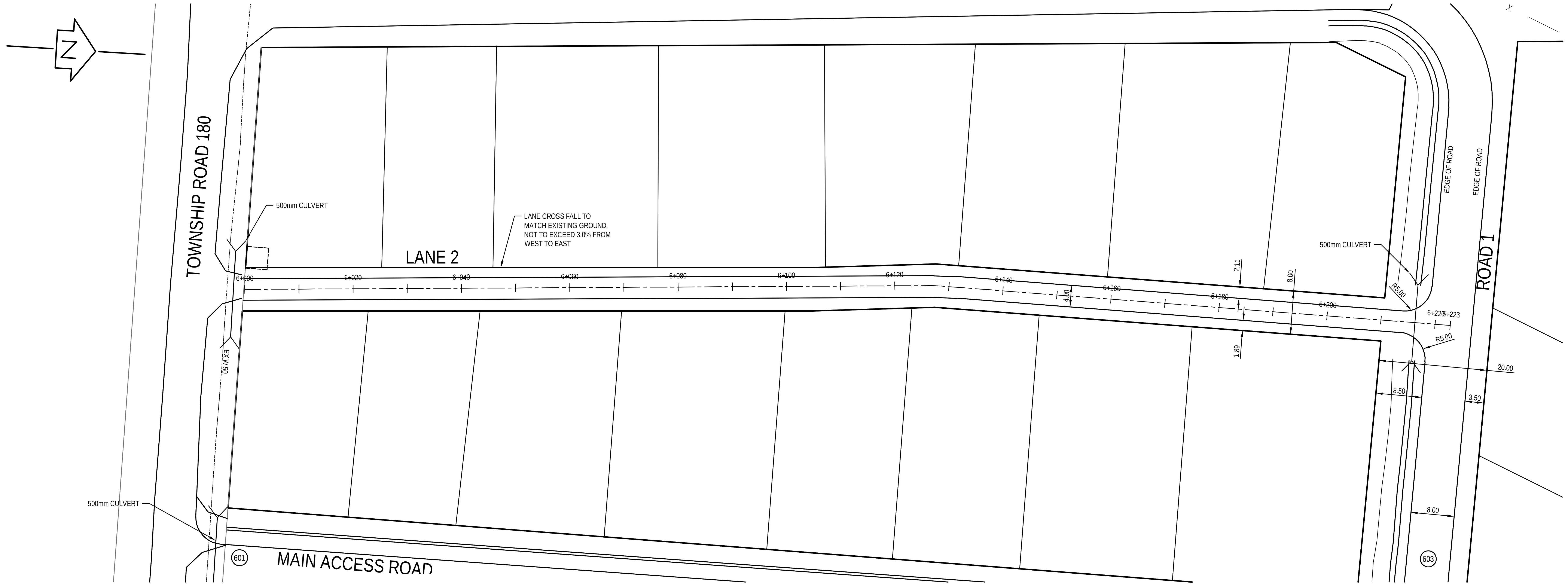
DRAWING NO: 606

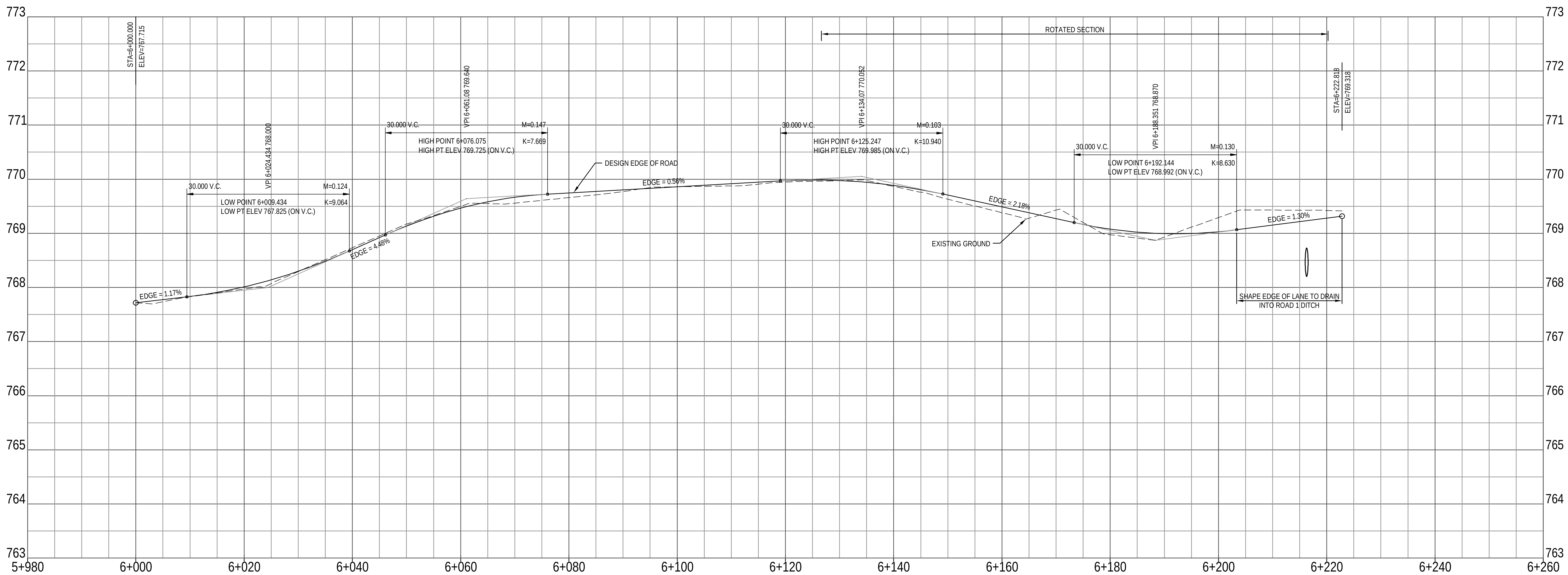
SHEET NO: OF

ISSUE: ISSUED FOR CLIENT REVIEW

2019-03-15

ISS/REV: 0





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THIS DRAWING IS NOT TO BE SCALED.

ISS/REV	DATE	DESCRIPTION	DES	CHK	PM
0	2019-03-15	ISSUED FOR CLIENT REVIEW	MA	TA	JA

SEAL:

CLIENT: COUNTY OF NEWELL

CLIENT REF. NO:

WSP
SUITE 110, 1222 BRIER PARK ROAD NW
MEDICINE HAT, ALBERTA T1C 0B7
TEL: 403-528-8818 | FAX: 403-928-8917| WWW.WSPGROUP.COM

PROJECT: NORTH HEADGATES SUBDIVISION SERVICING

PROJECT NO: 171-15210-00

ORIGINAL SCALE: H=1:500 V=1:50

DATE: 2019-03-15

DESIGNED BY: MA

DRAWN BY: MA

DISCIPLINE: CIVIL

TITLE: LANE 2 PLAN AND PROFILE

DRAWING NO: 607

SHEET NO: OF

ISSUE: ISSUED FOR CLIENT REVIEW 2019-03-15

ISS/REV: 0

2019/03/15 1:23PM

SCHEDULE D

Design Basis Memorandum

WSP CANADA INC.

DESIGN BASIS MEMORANDUM

TO: Geoff Tiffin, EIT

FROM: Taylor Appleton, P. Eng

SUBJECT: **County of Newell - North Head Gates Redevelopment Project**

DATE: **March 21, 2019**

Introduction

This design basis memorandum provides the all supplemental information required regarding the design of the redevelopment plan for the existing developed area located within the quarter section SW-5-18-15-W4M, in the County of Newell.

Background Information and Scope of Project

WSP was approached by the County of Newell to conduct a servicing design for the redevelopment of an existing parcel of land in the County of Newell. The parcel currently contains approximately 35 dwellings, which are all located within a single legal parcel of land, with each dwelling leasing a portion of this land from the landowner. It is the intention of the County to redevelop this area with proper legal subdivision of the entire area and provide County maintained roads and road right-of-way to service these existing dwellings.

Previous work has been completed to date by the County of Newell and the Oldman River Regional Services Commission to prepare an Area Redevelopment Plan for the area. This plan was prepared to limit the impact to the existing residents in terms of location of existing structures and proposed legal lot lines and road right-of-way location and alignments.

Pre-Design Information Gathering

Potential disturbance to land, water, fish and wildlife resources along with third-party impacts have been investigated in detail and supplemental studies and undertakings have been completed.

- **Location of the Work**

  The project is located within the ¼ section SW-5-18-15-W4M, with the neighbouring property to the west being the Eastern Irrigation District (EID) property, and to the east, a low-lying area where semi-permanent wetlands are present. To the north is native grass lands, and to the south is an adjacent farm house and farm land.

- **Nature of the Disturbance**
  The disturbance required for the successful completion of this project is the excavation and earthwork required to build access roads within the existing development with a cross section that would meet the County standard. This would include, top soil stripping, grading of the roadway subgrade, and construction of gravel roads, installation of culverts, topsoil placing and seeding of the finished ditches.

- **Recommended Timing of Work - Pre-Disturbance Wildlife Assessment**
  STRIX Ecological Consulting prepared a Pre-Disturbance Wildlife Assessment for the entire area including a 200m buffer from the site, and contained recommendations regarding timing of the required work. Timing for vegetation removal was recommended to be limited during the period of March 15 to September 30, with area searches conducted by a Biologist to determine whether any occupied dens or nests are present, with ongoing wildlife surveys conducted throughout construction and operation including the ongoing monitoring for snakes, amphibians, breeding birds, and waterbirds.

- **Background Information on Adjacent Wetlands**

  As part of the preliminary design, the County of Newell retained Aquality Environmental Consulting Ltd. to carry out a wetland permanence assessment for the wetland areas to the east of the redevelopment area. The initial desktop study identified three wetland habitats adjacent to the site, and a corresponding field assessment refined the wetland boundaries along with the classification, and valuation of each one. The largest, and the central basin of the adjacent wetland areas was indeed classified in this report as a Shallow Open Water, Bare, sub-saline, semi-permanent wetland totalling 7.46 ha in area, indicating that this wetland would indeed be Crown-claimable, whereas the other two adjacent wetlands would not be. Response was received via email on March 28, 2018 from the Wetlands and Water Boundaries Section of Alberta Environment, confirming that the central basin has crown owned bed and shore.

  The importance of these naturally occurring wetland areas has not been overlooked in the stormwater re-design. Wetlands play an important role in the biodiversity of the surrounding environment, provide important groundwater recharging, and habitat for diverse plants and animals to name a few of the many benefits these wetlands provide. As such, it will not be the intent to divert any of the existing runoff water that currently aids in the re-charge of these wetlands. In fact runoff water being released into the wetlands area will be considered positive, and essential to the health of these wetland areas.

  No work will be conducted within the wetland, or within the wetland margins along the edge of the refined boundary identified in the wetland assessment study. Work will only occur upstream of the wetland fringe area to enhance the quality of the runoff prior to its release into the adjacent non- crown claimable wetland, south of the central basin.

- **Existing Stormwater Site Conditions**

  Existing conditions of the site include split drainage of the site with the western portion draining to the Eastern Irrigation District property, and the eastern portion draining to the low-lying area and wetlands to the east.

Utilizing information provided by the County, existing lot coverages including existing dwellings and all accessory structures, were calculated and formulated to determine the average of the lot coverage for the entire redevelopment area. This average was determined to be just over 8%. This was utilized to determine the weighted runoff coefficient of the area in order to compare the volume of water that is being directed to the adjacent waterbodies currently, with the volume of stormwater runoff generated after the full build out of the development area.

Proposed Stormwater Drainage Design

There are many constraints to a potential stormwater drainage design for a re-development plan of an existing parcel of land that is inhabited and partially developed with dwellings and other permanent structures. A complete redesign of the stormwater on this site is not feasible, as well as not the intention of the County. The main goal of the drainage plan is to create a plan that properly conveys the existing, as well as any additional volume of stormwater runoff, and does not degrade the quality of the runoff prior to release off site. This will be achieved by means of proper stormwater best management practices in terms of stormwater conveyance strategies, increased stormwater retention times, as well as restricted lot coverage allocations for future development.

The quantity aspect will be maintained through restricted lot coverage rates governed in the Area Redevelopment Plan. As well the increase in stormwater generation from further development will be properly collected and conveyed to achieve additional storage capacity on site, increasing stormwater retention times, and thereby ensuring that release rates do not increase with additional future development. This will be achieved by utilizing conservative design parameters for a rational method determination for stormwater runoff during a major 1 in 100 year rainfall event. The estimated full buildout of the development equates to a volume of water during a 1 in 100 year rainfall event for a 24 hour duration equates to an additional 300m^3 running off to the west, and 422m^3 flowing to the east. By providing storage capacity within the grassed drainage swale that is designed to retain this additional runoff volume required during this major 1 in 100 year rainfall event, discharge rates can be maintained below the existing release rate with a rock check dam. It should be noted as well that these full buildout runoff volumes assumed a 20% lot coverage as an additional buffer for the potential cases where existing lots contain permanent structures and future owners wish to build a new dwelling in addition to the existing structures on site. This will ensure that any potential special circumstances throughout the development process are accounted for in the stormwater design, and also means that these calculated pre-design volumes are very much an overestimation of what will actually occur on site.

The quality aspect of the stormwater runoff entering the adjacent receiving waterbodies will be maintained by means of capturing the existing overland drainage and conveying it by means of a vegetated conveyance channel, or grassed swale, in order to provide pre-treatment, and aid in depositing unwanted sediment and contaminant particulate prior to release. The cross section of the grassed swale will be designed as per section 5.3.4.3 of the current Alberta Standards and Guidelines and includes a maximum grade of 1%, a designed flat bottom of no less than 1 metre wide. Currently runoff that flows to the low-lying area to the east is by way of sheet flow, which could allow for unwanted sediment and nutrient loading releasing into the wetlands during large rainfall events. Providing this designed grassed swale the runoff water will be provided with additional pre-

treatment that was not provided previously. Stormwater runoff will have increased retention time within the grassed swale itself allowing suspended sediment additional time to be deposited prior to release. As well the previously mentioned check dam will act as an additional filter providing additional sediment removal potential. Similarly runoff that drains to the west will have increased pre-treatment by means of a grassed swale which again will allow for further sediment and contaminant particulate deposition and removal prior to release.

Closing

Every effort will be made in the design and construction of the redevelopment of these existing lands, to not only minimize any potential adverse effects occurring to the receiving waterbodies caused by future development, but will actually attempt to provide improved stormwater runoff quality, and thereby enhancing the conditions that are currently existing on site.

Please don't hesitate to contact myself with any questions, concerns, or feedback regarding this Design Memorandum.

Best Regards,

Taylor Appleton, P. Eng.
Project Engineer

Quality Assurance Review:
Trent Purvis, P. Eng.

Copy provided to:
Ken Jacobs, PL Eng., WSP

SCHEDULE E

Geotechnical Assessment Report

GEM TESTING LTD.

GEOTECHNICAL ASSESSMENT REPORT

PROPOSED LAKE NEWELL HEAD GATE SUBDIVISION
NEWELL COUNTY, ALBERTA

PREPARED FOR:

SCHEFFER ANDREW LTD.
UNIT 102, 505 1ST STREET SE
MEDICINE HAT, ALBERTA
T1A 0A9

PREPARED BY:

GEM TESTING LTD
2 – 2269 2ND AVENUE
DUNMORE, AB
T1B 0K3

Distribution List:

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File #: 15-04-28

November 14, 2015

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GEM TESTING LTD.
Geotechnical, Environmental, Materials

2-2269 2nd Ave.
Dunmore, AB., T1B-0K3
Ph: (403) 580-1813

November 12, 2015 15-04-28

Scheffer Andrew Ltd.
Unit 102 – 505 1st Street SE
Medicine Hat, Alberta
T1A 0A9

Attention: Mr. James Johansen, P. Eng.

RE: Geotechnical Assessment Report
Proposed Lake Newell Head Gate Subdivision
County of Newel, Alberta

1.0 Introduction

As requested by Mr. James Johansen, P. Eng. of Scheffer Andrew Ltd., GEM Testing Ltd. completed a geotechnical assessment at the above noted subject site, on November 5, 2015. The objective of this investigation was to determine the apparent subsurface soil and groundwater conditions present, in order to provide geotechnical design and construction recommendations for the development of the subject site. It is our understanding that the project is planned to a residential subdivision utilizing septic fields for the disposal of sanitary sewage effluent.

The scope of this investigation, when authorized to commence, included the following:

- Test Hole Drilling (Advance 6 test holes throughout the subject site to a depth of 7.5m and shallow test holes throughout the proposed subdivision)
- Field and laboratory investigation program, with supplementary field and laboratory testing as required. The report shall include:

- Site stratigraphy;
- Soil moisture contents at a minimum of 1.0 m intervals;
- Atterberg limits, in-situ relative densities and consistency, septic field suitability, soil bearing capacities, and groundwater elevations;
- Classification of each predominant soil type;
- Soil Sulphate test results representative of the soils in contact with Portland Cement concrete;
- Recommendations for site grading, pavement structure and materials design for roadways, foundation design criteria for buildings (National Building Code) including weeping tile and septic fields, deep utility installation and backfill;

2.0 Site Description

The site is located within the County of Newell along the Northeast shore of Lake Newell. The site is located east of Lake Newell, north of TWP Rd 180, West of a small lagoon, and south of the EID Canal. The site currently consists of multiple residential buildings and storage areas. The site is gently undulating overland drainage generally directed east to Lake Newell and West to a wet low lying area.

3.0 Details of the Investigation

During the investigation a total of six (6) test holes were advanced throughout the subject site on November 5, 2015, using a truck mounted auger drill rig supplied by Sub Organic Investigations Ltd. (SOIL) from Dunmore, Alberta. All of the test holes were advanced to a minimum depth of 7.5 m throughout the subject site.

Standard Penetration Tests (SPT) were conducted at selected intervals within each of the test holes advanced at the subject site. The soil conditions encountered were logged and samples were obtained from the auger flights for laboratory testing. The samples from the field were visually classified in the laboratory and natural moisture contents (MC), were performed on each. Selected

Samples were tested for water-soluble sulphate contents, Atterberg Limit Index Properties, and grain size distributions. The field and laboratory test results are presented on the test hole logs attached.

4.0 Subsurface Conditions

The subsoil conditions observed at the subject site (excluding the surficial concrete, gravel structure and topsoil/browns horizon) consisted of two main stratigraphic units: 1) Silty Clay Till and 2) Clay.

In all of the test holes advanced was a 0.3m to 0.5m thick seam of topsoil/browns material. The material was generally silty, damp to moist and of a compact consistency. No moisture contents or lab testing was performed on this material.

Isolated surficial layers of Silty Sand were encountered in test holes 1 and 5 that was encountered to a depth of 1.4m below grade. The sand contained variable amounts of silt and clay, ranged from a dry to moist condition and ranged from a loose to compact consistency. Natural Moisture Contents performed on the silt ranged from 13.17 % to 19.96 %.

Isolated layers of Silt were also encountered in test holes 1 and 5 at depth and contained abundant amounts of coal ranged from a damp to moist condition and was of a loose to compact consistency.

Silty Clay Till was encountered in all of the test holes advanced at the subject site. The till generally contained a trace to some sand, a trace of sulphates, variable amounts of coal, oxide staining and a trace of pebbles. The clay ranged from damp to wet and ranged from a stiff to hard consistency at depth. Natural Moisture Contents ranged from 17.54 % to 58.78 %. It should be noted that the high moisture content of this material can be attributed to the abundant amount of coal in the soil. Atterberg Limit index property tests performed on the till classify the silty clay as CI (Medium to High plastic clay).

CLAY was encountered below in four (4) of the test holes advanced at the subject site. The clay was contained a trace to some silt, a trace of pebbles, a trace of coal, sulphates and oxide staining. The clay was generally damp to moist and was of a stiff to very stiff consistency. Natural Moisture Contents performed on the gravel ranged from 12.62 % to 31.77 %. Atterberg Limit index property tests performed on the till classify the silty clay as CH (High plastic clay).

Table 1 is a summary of the stratigraphic soil depths observed and reported on the test hole logs presented in Appendix "B".

TABLE 1
STRATIGRAPHY TABLE
Depth below existing ground surface (m)

Test Hole No.	Topsoil/Browns	Sand	Silty Clay Till	Clay	Silt	Coal
1	0 – 0.2	0.2 – 1.4	1.4 – 5.8	--	5.8 – 6.6	6.6 – 7.5
2	0 – 0.3	--	4.0 – 7.5	0.3 – 4.0	--	--
3	0 – 0.2	--	4.0 – 7.5	0.2 – 4.0	--	--
4	0 – 0.2	--	3.8 – 7.5	0.2 – 3.8	--	--
5	0 – 0.3	0.3 – 1.3	1.3 – 5.7	--	5.7 – 7.5	--
6	0 – 0.2	--	4.1 – 7.5	0.2 – 4.1	--	--

5.0 Groundwater Conditions

Groundwater was encountered in test hole 1 during and at completion of the drilling operations at a depth of 5.5m below existing grade. Slotted standpipes were installed in all of the test holes advanced and the groundwater elevation was monitored one weeks subsequent to installation. The groundwater elevations encountered during drilling operation and when monitored 1 weeks subsequent to installation are indicated on Table 2.

TABLE 2

GROUNDWATER CONDITIONS

Depth Below Existing Ground Surface (m)

Test Hole #	Depth of Standpipe	At Completion November 5, 2015	1 Weeks Subsequent November 11, 2015	
			Depth (m)	Elevation
1	7.2	5.5	6.25	762.2
2	7.3	Dry	4.63	765.18
3	7.3	Dry	6.84	761.73
4	7.1	Dry	3.0	766.21
5	7.3	Dry	Dry	
6	7.2	Dry	5.54	763.58

It must be recognized that groundwater levels are subject to seasonal and annual fluctuations which are dependent on many factors such as precipitation and site surface and subsurface drainage.

Based on the groundwater elevations it is apparent that the groundwater is flowing away from Lake Newell towards the wet low lying area located East of the subject site.

6.0 Comments and Recommendations

Comments and recommendation presented are based on the interpretation of the subsoil conditions present in the six (6) test holes advanced throughout the proposed subdivision at subject site on November 5, 2015.

6.1 Optional Foundation Systems

6.1.1 Shallow Spread Footings

Shallow concrete continuous spread footing foundation, with a minimum soil cover of 1.2m, can be

used for the proposed residential buildings at the subject site. The footings may be proportioned using an allowable soil bearing pressure of 110 kPa at a depth between 1.2 and 1.5m below existing grade. It is recommended that all foundations at the subject include the installation of a weeping tile and sump pump system due to the soil conditions present at or below the footing elevation.

It is recommended that all bearing surfaces be inspected and approved by qualified geotechnical personnel prior to pouring concrete in order to confirm soil conditions and allowable bearing pressures due to the nature of the sub-soil conditions present throughout the site.

6.2 Site Preparation

Wet and/or soft soils encountered are to be removed and replaced, as required, using a compacted suitable soil. The engineered fill placed within the subject subdivision, should be compacted to a minimum of 98 % of standard proctor maximum dry density within 3.0 % of optimum moisture content. It is apparent that the on-site sub-soils are suitable for use as engineered fill required to bring the site to the required design grades. However the on-site soil will require moisture conditioning in order to be used as suitable engineered fill.

6.3 Flatwork Concrete

It is recommended that any flatwork concrete be underlain with a minimum 100mm of 25 mm crushed gravel base and or equivalent, compacted to 98% of Standard Proctor Max. Dry Density (MDD) within 2% of optimum moisture content.

6.4 Foundation Concrete

Water Soluble Sulphate tests performed on the sub-grade soils indicated moderate concentrations up to 0.72 %. Based on the CSA standard specifications it is recommended that Sulphate Resistant Type 50 cement, with a maximum water to cementing materials ratio of 0.50, a minimum 56-day

compressive strength of 32 MPA, and with the addition of +5 % air entrainment be used for all foundation concrete in contact with the soil.

6.5 Excavations

It is our understanding trench excavations up to 4.0 m may be required for the installation of the sanitary and water utilities at the subject site. Based on the information obtained during this investigation, excavation to this depth will primarily encounter variable depths of sand, clay and silty clay till. The site sub-soils are readily excavated with typical track hoes and other construction equipment in the Medicine Hat area. It should be noted that areas of sands are prone to sloughing especially when saturated. Therefore careful planning and execution of the deep utilities is recommended by a contractor experienced with these potentially difficult soils. Side slopes for temporary excavations which are more than 1.5 m in depth should be sloped back at angles no steeper than 1.5 horizontal to 1 vertical for stability purposes due to the high sloughing nature of the sand material present at the subject site. It is apparent that Dewatering of the trenches might be necessary throughout the subject site based on the depth of groundwater encountered during the investigation.

It is anticipated that excavated material from the utility trenches will be suitable for backfilling. However, due to the dry subsoil conditions present at the subject site moisture conditioning of the excavated material will be required in order to achieve $\pm$ 3% of optimum moisture content.

6.6 Backfill and Compaction of Fill

It is recommended that all engineered fill placed at the subject site be compacted to a minimum of 98 % of standard proctor density at a moisture content within 3 % of optimum However the on-site soil will require moisture conditioning in order to be used as suitable engineered fill.

6.7 Septic Field Recommendations

During the site investigation the sub-soils throughout the subject site were analyzed for the suitability for septic fields. This analysis consisted of in-situ field tests as well as hydrometer grain size analysis in order to determine the soil suitability. Based on the field and laboratory results, the "Alberta Private Sewage Systems Standard of Practice 2009" classifies the soil as a Moderate Platy Clay Loam which is not are suitable to be used for septic fields. Any septic fields located at the subject site will have to be engineered with imported material or will require septic tanks.

6.8 Pavement Design

The subgrade soil conditions within the proposed roadway primarily consist of a mixture of stiff to very stiff, damp to moist silty clay till that contains variable amounts of silty clay till, sand, and clay. Based on the expected vehicle loadings and traffic the following pavement structure is recommended.

Structural Pavement Design

Material	Thickness of Material (mm)
25mm Crushed Gravel	50
Sub-Base Gravel (50mm or 75mm)	300

Soft and/or wet soils are to be removed from the roadways prior to backfill with suitable material. The sub-grade may require scarification to a minimum depth of 150mm and re-compacted to at least 98% of Standard Proctor Maximum Dry Density within 2% of optimum moisture content.

All prepared sub-grade areas must be proof rolled with a heavily loaded vehicle, prior to approval to commence the gravel sub-base construction. Soft, wet and/or flexing areas may require sub-cuts and replacement with geotextile fabric and additional base gravel or asphalt. The sub-cut areas must maintain positive sub-grade drainage in order to limit areas where water is allowed to pond and create frost susceptible zones.

Long-term durability of this pavement sections is extended by maintaining subgrade drainage. Therefore, should areas of isolated shallow groundwater be encountered, within or directly below the pavement structure, a sub-grade drain system such as weeping tile, connected to the manholes and/or catch basins, may be required.

7.0 Closing

This Geotechnical Investigation was performed to evaluate the subsurface soil and groundwater conditions, in order to provide design and construction recommendations for the proposed commercial development at the subject site.

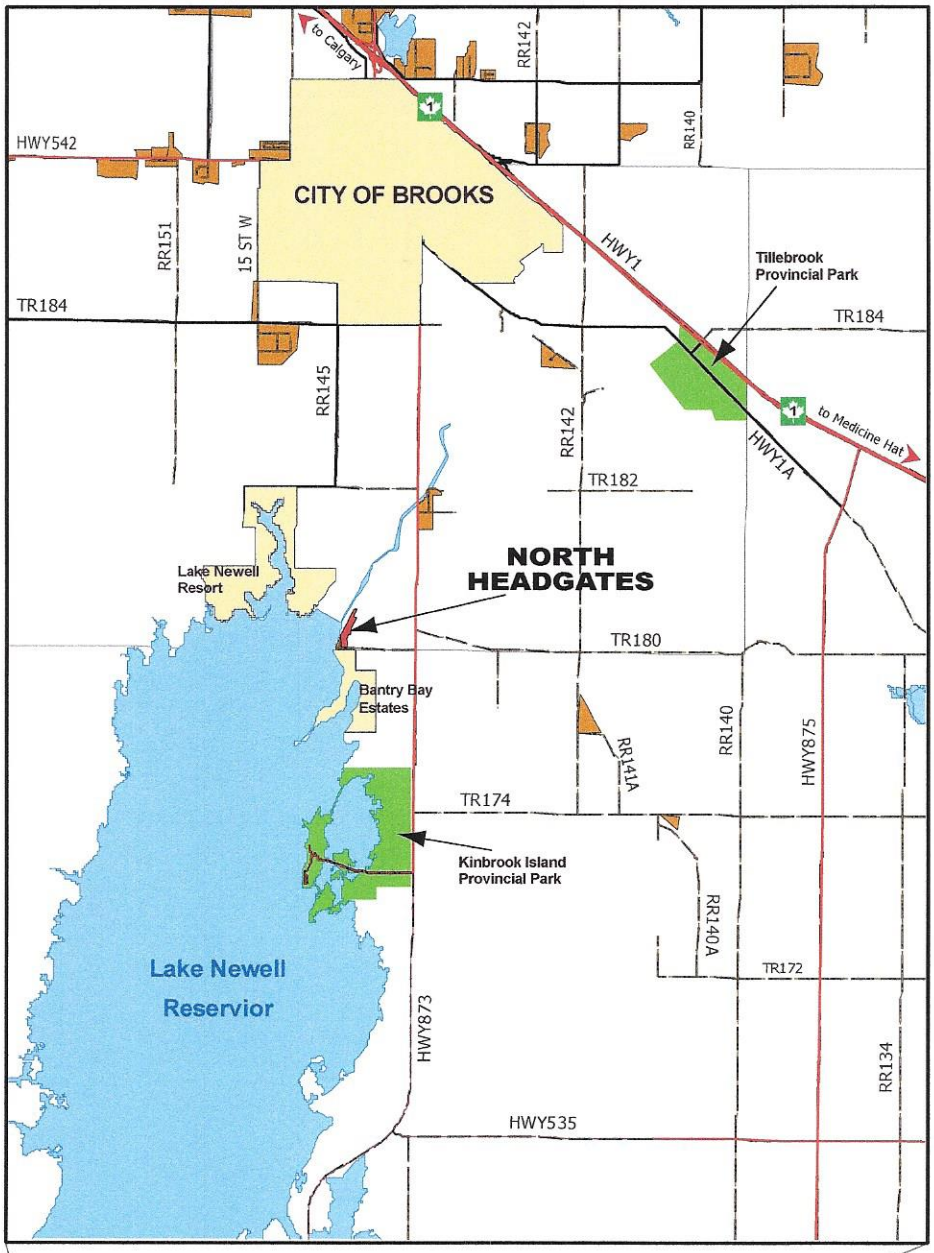
The geotechnical recommendations presented in this report are based on the subsurface soil and groundwater conditions observed in the six (6) test holes advanced at the subject site on November 5, 2015. It should be noted that soil conditions throughout the subject site could be variable, especially with variable fine grained soil conditions. Transitions between the stratigraphy units of the site subsoils are gradual rather than distinct as indicated on the test hole logs.

Should subsoil conditions other than those presented be encountered during construction, our office should be notified in order to review and revise our recommendations, if necessary. This investigation was performed for the development of this specific subject site.

Respectfully Submitted

GEM TESTING LTD. **APEGA Permit No. P-09733**

Scott Dooher, P. Eng.
CEO/Sr. Engineer



LEGEND

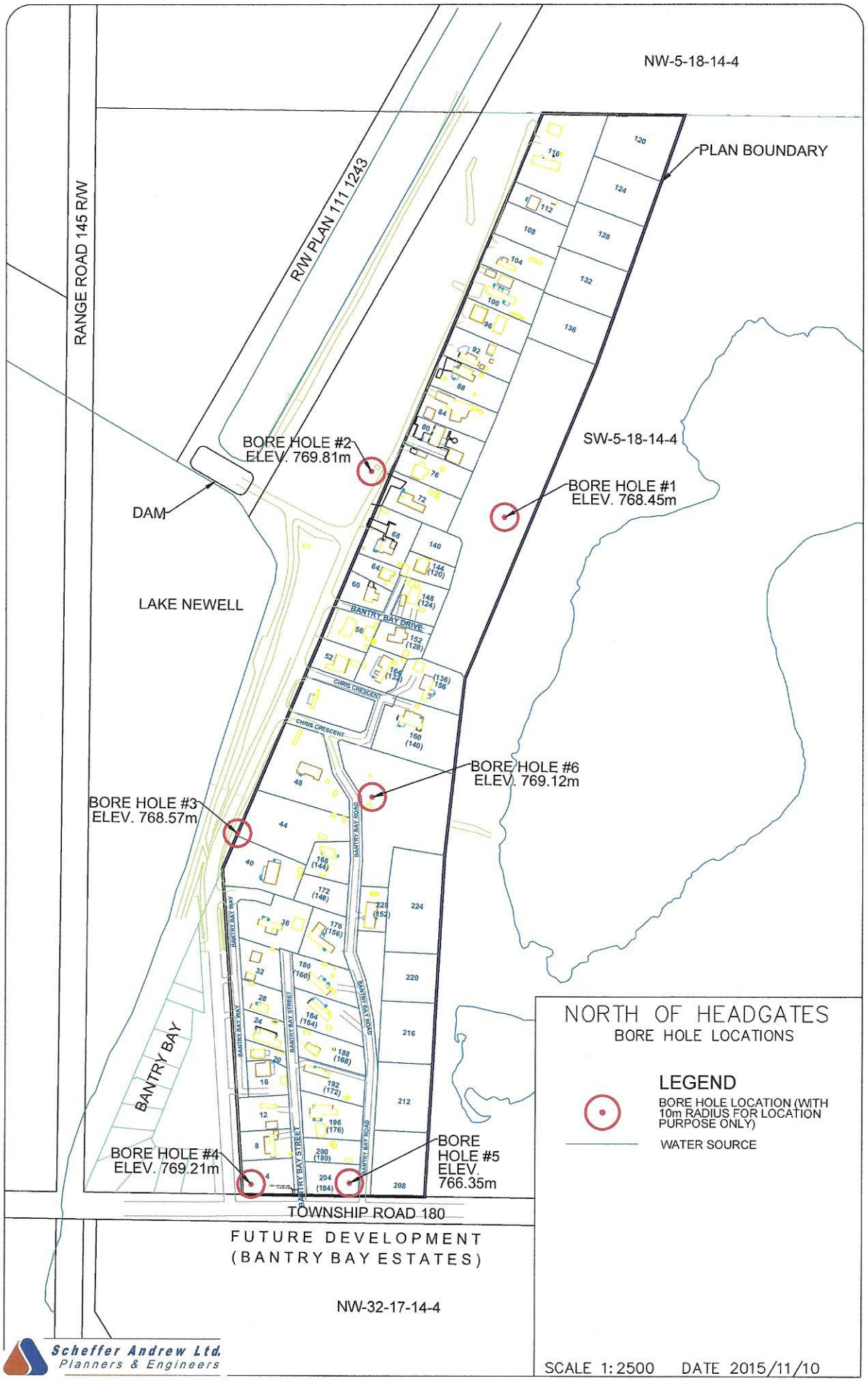
- Provincial Paved Highway
- Provincial Gravel Highway
- Paved Road
- Gravel Road
- Subdivision
- Provincial Park

FIGURE 1

LOCATION

NORTH HEADGATES
COUNTY OF NEWELL SW-5-18-14-4
Scale as shown
November 2013

Scheffer Andrew Ltd.
Planners & Engineers


NW-5-18-14-4
PLAN BOUNDARY
RANGE ROAD 145 R/W
R/W PLAN 111 1243
SW-5-18-14-4
BORE HOLE #2
ELEV. 769.81m
BORE HOLE #1
ELEV. 768.45m
DAM
LAKE NEWELL
BANTRY BAY DRIVE
CHRIS CRESCENT
BORE HOLE #6
ELEV. 769.12m
BORE HOLE #3
ELEV. 768.57m
BANTRY BAY ROAD
BANTRY BAY WAY
BANTRY BAY STREET
BANTRY BAY
BORE HOLE #4
ELEV. 769.21m
BORE
HOLE #5
ELEV.
766.35m
TOWNSHIP ROAD 180
FUTURE DEVELOPMENT
(BANTRY BAY ESTATES)
NW-32-17-14-4
NORTH OF HEADGATES
BORE HOLE LOCATIONS
LEGEND
BORE HOLE LOCATION (WITH 10m RADIUS FOR LOCATION PURPOSE ONLY)
WATER SOURCE
Scheffer Andrew Ltd.
Planners & Engineers
SCALE 1:2500 DATE 2015/11/10

GEM Testing Ltd.

2-2269 2nd Avenue, Dunmore, Alberta - T1B 0K3
Ph: 580-1813

Bore Hole Log Report

Client	Scheffer Andrew Ltd.	Report Date	12-Nov-15
Address	Unit 102 - 505 1st Street SE	Project No.	15-04-28
	Medicine Hat, AB	Report No.	1
	T1A 0A9		
Attention	Mr. James Johansen, P. Eng.	Bore Hole #	1
Project	Lake Newel Headgate Project	Bore Hole Depth	7.5
Date Advanced	5-Nov-15 By. SD	Bore Hole Elevation	768.45
Drill Method	Solid Stem Auger		

Depth (m)	Depth (ft)	Soil Type	SPT N	Sample Type	Soil Description	Comments/Lab Test Results
					Topsoil/Browns, Silt, some sand, trace of clay, moist, brown	
1				B	Sand, trace of silt, compact, moist, brown	
	5		15	SPT		
					Silty Clay Till, trace of sand, trace of pebbles, trace of coal, oxide staining, some sulphates,	
2				B	damp, olive, very stiff, medium to high plastic	
3	10		12	SPT		
4				B	- abundant Oxide Staining	
	15					
5				B	- trace to some coal	
					Silt, abundant coal, trace to some sand, trace of	
6	20		13	SPT	clay, moist to wet, compact, light olive	- groundwater on 11/11/15
					Coal, weak, weathered, silty, some sand, black	
7				B		
	25				End of Test Hole - 7.5m	
8					Groundwater at 5.5m upon Completion	
9						
	30					
10						

Moisture Content: 0.00 10.00 20.00 30.00 40.00 50.00 60.00

GEM Testing Ltd.

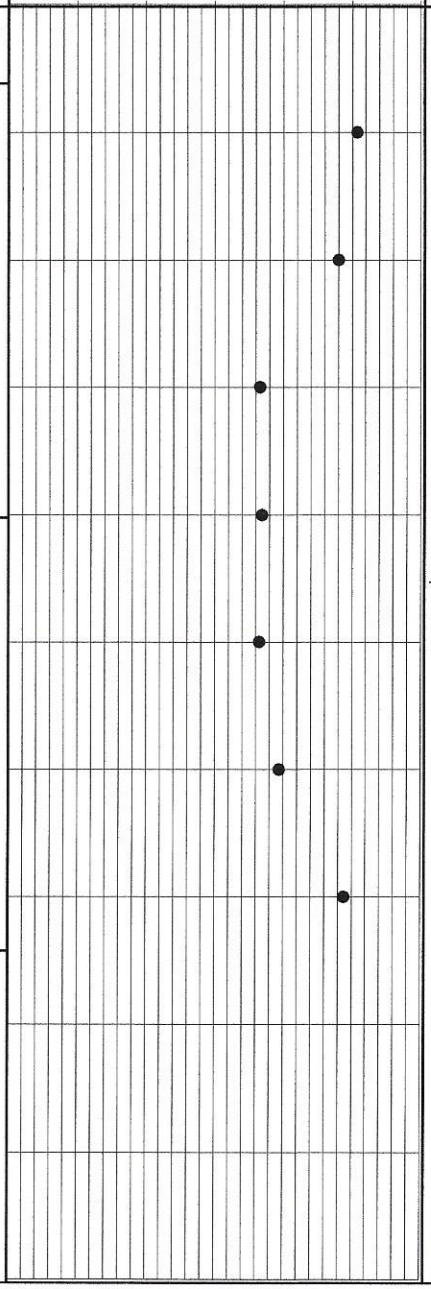
2-2269 2nd Avenue, Dunmore, Alberta - T1B 0K3
Ph: 580-1813

Bore Hole Log Report

Client	Scheffer Andrew Ltd.	Report Date	12-Nov-15
Address	Unit 102 - 505 1st Street SE	Project No.	15-04-28
	Medicine Hat, AB	Report No.	2
	T1A 0A9		
Attention	Mr. James Johansen, P. Eng.	Bore Hole #	2
Project	Lake Newel Headgate Project	Bore Hole Depth	7.5
Date Advanced	5-Nov-15 By. SD	Bore Hole Elevation	769.81
Drill Method	Solid Stem Auger		

Depth (m)	Depth (ft)	Soil Type	SPT N	Sample Type	Soil Description	Comments/Lab Test Results
					Topsoil/Browns, Silt, some sand, trace of clay, moist, brown	
1				B	Clay, trace of silt, mottled olive grey, damp to moist, stiff, high plastic	
	5		12	SPT		
2				B		
3	10		15	SPT		
4				B		
	15				Silty Clay Till, trace of sand, trace of pebbles, trace of coal, oxide staining, some sulphates, damp, olive, very stiff, medium to high plastic	- groundwater on 11/11/15
5				B		
6	20		18	SPT		
7				B		
	25				End of Test Hole - 7.5m Test Hole Dry upon Completion	
8						
9						
	30					
10						

Moisture Content: 0.00 5.00 10.00 15.00 20.00 25.00 30.00



GEM Testing Ltd.

2-2269 2nd Avenue, Dunmore, Alberta - T1B 0K3
Ph: 580-1813

Bore Hole Log Report

Client	Scheffer Andrew Ltd.	Report Date	12-Nov-15
Address	Unit 102 - 505 1st Street SE	Project No.	15-04-28
	Medicine Hat, AB	Report No.	3
	T1A 0A9		
Attention	Mr. James Johansen, P. Eng.	Bore Hole #	3
Project	Lake Newel Headgate Project	Bore Hole Depth	7.5
Date Advanced	5-Nov-15 By. SD	Bore Hole Elevation	768.57
Drill Method	Solid Stem Auger		

Depth (m)	Depth (ft)	Soil Type	SPT N	Sample Type	Soil Description	Comments/Lab Test Results
					Topsoil/Browns, Silt, some sand, trace of clay, moist, brown	
1				B	Clay, trace of silt, mottled olive grey, damp to moist, stiff, high plastic	
	5		11	SPT		
2				B		
3	10		10	SPT		
4				B	- interbedded wet sand seam	
	15				Silty Clay Till, trace of sand, trace of pebbles, trace of coal, oxide staining, some sulphates, dry to damp, dark olive, very stiff, medium to high plastic	
5				B		
					- Abundant coal	
6	20		8	SPT		
7				B		- groundwater on 11/11/15
	25				End of Test Hole - 7.5m	
8					Test Hole Dry upon Completion	
9						
	30					
10						

Moisture Content: 0.00 10.00 20.00 30.00 40.00 50.00 60.00

GEM Testing Ltd.

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Ph: 580-1813

Bore Hole Log Report

Client	Scheffer Andrew Ltd.	Report Date	12-Nov-15
Address	Unit 102 - 505 1st Street SE	Project No.	15-04-28
	Medicine Hat, AB	Report No.	4
	T1A 0A9		
Attention	Mr. James Johansen, P. Eng.	Bore Hole #	4
Project	Lake Newel Headgate Project	Bore Hole Depth	7.5
Date Advanced	5-Nov-15 By. SD	Bore Hole Elevation	769.21
Drill Method	Solid Stem Auger		

Depth (m)	Depth (ft)	Soil Type	SPT N	Sample Type	Soil Description	Moisture Content (0.00 10.00 20.00 30.00 40.00 50.00 60.00)	Comments/Lab Test Results
					Topsoil/Browns, Silt, some sand, trace of clay, moist, brown		
1				B	Clay, trace of silt, mottled olive grey, damp to moist, stiff, high plastic		
	5		12	SPT			
2				B			
3	10		13	SPT	- interbedded wet sand seam		- groundwater on 11/11/15
4				B			
	15				Silty Clay Till, trace of sand, trace of pebbles, some coal, oxide staining, some sulphates, dry to damp, dark olive, very stiff, medium to high plastic		
5				B	- Abundant coal		
6	20		10	SPT			
7				B			
	25				End of Test Hole - 7.5m Test Hole Dry upon Completion		
8							
9							
	30						
10							

GEM Testing Ltd.

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Ph: 580-1813

Bore Hole Log Report

Client	Scheffer Andrew Ltd.	Report Date	12-Nov-15
Address	Unit 102 - 505 1st Street SE	Project No.	15-04-28
	Medicine Hat, AB	Report No.	5
	T1A 0A9		
Attention	Mr. James Johansen, P. Eng.	Bore Hole #	5
Project	Lake Newel Headgate Project	Bore Hole Depth	7.5
Date Advanced	5-Nov-15 By. SD	Bore Hole Elevation	766.35
Drill Method	Solid Stem Auger		

Depth (m)	Depth (ft)	Soil Type	SPT N	Sample Type	Soil Description	Comments/Lab Test Results
					Topsoil/Browns, Silt, some sand, trace of clay, moist, brown	
1				B	Sand, trace of silt, compact, moist, brown	
	5		11	SPT		
2				B	Silty Clay Till, trace of sand, trace of pebbles, trace of coal, oxide staining, some sulphates, damp, olive, very stiff, medium to high plastic	
3	10		15	SPT		
4				B	- abundant Oxide Staining	
	15				- some coal	
5				B		
6	20		9	SPT	Silt, abundant coal, trace to some sand, some clay, moist to wet, compact, light olive	
7				B		
	25				End of Test Hole - 7.5m Test Hole Dry upon Completion	
8						
9						
	30					
10						

Moisture Content: 0.00 10.00 20.00 30.00 40.00 50.00

GEM Testing Ltd.

2-2269 2nd Avenue, Dunmore, Alberta - T1B 0K3
Ph: 580-1813

Bore Hole Log Report

Client	Scheffer Andrew Ltd.	Report Date	12-Nov-15
Address	Unit 102 - 505 1st Street SE	Project No.	15-04-28
	Medicine Hat, AB	Report No.	6
	T1A 0A9		
Attention	Mr. James Johansen, P. Eng.	Bore Hole #	6
Project	Lake Newel Headgate Project	Bore Hole Depth	7.5
Date Advanced	5-Nov-15 By. SD	Bore Hole Elevation	769.12
Drill Method	Solid Stem Auger		

Depth (m)	Depth (ft)	Soil Type	SPT N	Sample Type	Soil Description	Comments/Lab Test Results
					Topsoil/Browns, Silt, some sand, trace of clay, moist, brown	
1				B	Clay, trace of silt, mottled olive grey, damp to moist, stiff, high plastic	
	5		12	SPT		
2				B		
3	10		13	SPT	- interbedded wet sand seam	
4				B		
	15				Silty Clay Till, trace of sand, trace of pebbles, some coal, oxide staining, some sulphates, dry to damp, dark olive, very stiff, medium to high plastic	
5				B	- Abundant coal	- groundwater on 11/11/15
6	20		10	SPT		
7				B		
	25				End of Test Hole - 7.5m Test Hole Dry upon Completion	
8						
9						
	30					
10						

Moisture Content: 0.00 10.00 20.00 30.00 40.00 50.00 60.00 70.00

SCHEDULE F

Phase 1 Environmental Site Assessment

GEM TESTING LTD.

GEM TESTING LTD.
Geotechnical, Environmental, Materials

2-2269 2nd Ave.
Dunmore, AB., T1B-0K3
Ph: (403) 580-1813

November 15, 2015 15-04-28

Scheffer Andrew Ltd.
Unit 102 – 505 1st Street SE
Medicine Hat, Alberta
T1A 0A9

Attention: Mr. James Johansen, P. Eng.

RE: Environmental Site Assessment – Phase I
Proposed Lake Newell Head Gate Subdivision
Newell County, Alberta

GEM Testing Ltd. has completed an assessment of the above-noted property in accordance with CSA Standard Z768, *Phase I Environmental Site Assessment* (Phase I ESA).

Representative from GEM Testing visited the subject site on November 5 and 11, 2015 to identify visual evidence of actual and/or potential site contamination. Furthermore site conditions such as topography, water features or presence of bulk storage containers were assessed during the site visit. The Phase I ESA also included a review of historical records, aerial photographs and interviews. No examinations of the buildings was performed during the site inspection, therefore contamination that may be present in the existing structures is not covered in this report.

The review of the information collected in this assessment indicated that there were isolated evidence of surficial or potential contamination at the subject site. It is recommended that these areas be removed and disposed of during the development of the subject site

Should you require further information please do not hesitate to contact the undersigned.

Respectfully submitted,
GEM TESTING LTD.

APEGGA PERMIT #P09733

Scott Dooher, P.Eng.

EXECUTIVE SUMMARY

This report presents the results of a Phase I Environmental Site Assessment (Phase I ESA), conducted for Scheffer Andrew Ltd. on behalf of Ron Redelback. GEM Testing completed the assessment of the above-noted property in accordance with CSA Standard Z768, Phase I Environmental Site Assessment.

Representatives from GEM Testing visited the subject site on November 5 and 11, 2015, to identify visual evidence of actual or potential site contamination. Furthermore site conditions such as topography, vegetation, water features or presence of bulk storage containers were assessed during the site visit. The Phase I ESA also included a review of historical records and aerial photographs. No examinations of the buildings was performed during the site inspection, therefore contamination that may be present in the existing structures is not covered in this report.

The assessment of information collected in this Phase I ESA indicated the following:

- Through extensive dialog with the relevant agencies, it's apparent that there are currently no underground storage facilities on or within close proximity of the subject site.
- The review of land title records in conjunction with other information collected in this study does not reveal any ownership of property of any environmental concern on or within close proximity of the subject site.
- The review of aerial photographs showed nothing developed on or near the site in the past or present that would contribute to any environmental concern.
- Geotechnical Test Holes advanced throughout the subject site indicated no evidence of environmental concern.
- Observations made throughout the subject site did indicate signs of minor surficial staining and contamination, however these areas are isolated and limited to the surficial 200mm based on observations and site soil conditions

The review of the information collected in this assessment indicated that there were isolated evidence of surficial or potential contamination at the subject site. It is recommended that these areas be removed and disposed of during the development of the subject site.

TABLE OF CONTENTS

1.0 INTRODUCTION

In October of 2015, GEM Testing was retained by Scheffer Andrew Ltd. to conduct a Phase I Environmental Site Assessment (ESA) on the property located along the NE corner shore of Lake Newell. The legal land description is as follows:

Legal: SW¼ Sec. 5-18-14-W4

This property is subsequently referred to as the subject site.

The purpose of the site assessment is to identify actual and/or potential site contamination. It may be used to reduce uncertainty about potential liabilities caused by environmental conditions, and may be the basis for further investigation of the property. No examinations of the buildings was performed during the site inspection, therefore contamination that may be present in the existing structures is not covered in this report.

The Phase I ESA includes a review of historical records including land titles, aerial photos and other information supplied by a variety of agencies and individuals. It also includes a site inspection, and the evaluation of findings.

This report does not involve the selection or implementation of any measuring, sampling, analytical or remediation activities. The findings contained in this report are based solely on historical information and observed site and shallow subsoil conditions at the time of the inspection. The conclusions contained in this report are not intended to document the extent of contamination or to qualify the acceptability of risks associated with possible or probable occurrences of contamination. This report is however, intended to provide the reader with a detailed understanding of the site in relation to environmental conditions.

2.0 SITE DESCRIPTION

2.1 Subject Site

The subject site is located along the NW shore of Lake Newell in the County of Newell in an area known as the North Headgates. The subject site is developed with residential properties and is proposed to be upgraded with the installation of site services including septic fields. The subject site primarily consists of residential buildings, landscaped and native grasses and vegetation.

3.0 ADJACENT PROPERTIES

The adjacent properties around the subject site were observed for anything that may have or will contribute to environmental concern. Upon observation of the adjacent properties, there is an indication of potential environmental concern from the property located to the south of the subject site.

3.1 Adjacent Property to the North

The property located to the north of the subject site consists of a grazing land and an EID irrigation canal. There was no evidence of environmental concern observed at the time of the inspection.

3.2 Adjacent Property to the South

The property located to the south of the subject site consists of agricultural land and prairie grasses and is the proposed future development of Bantry Bay Estates). There was no evidence of environmental concern observed during the site inspection.

3.3 Adjacent Property to the East

The property located to the east of the subject site is consists of a wet low lying area that contained water at the time of inspection. There was no evidence of environmental concern observed during the site inspection.

3.4 Adjacent Property to the West

The property located to the west of the subject site consists of Lake Newell. There was no evidence of environmental concern observed during the site inspection.

4.0 RECORDS REVIEW

4.1 Historical Records

Historical records have been reviewed to indicate the site's past owners along with any history of environmental hazards for the site of interest. The review consists of historical aerial photographs, land titles and dangerous goods or incidents reported within or adjacent to the subject site.

4.2 Aerial Photos

A review of historical aerial photographs was performed to visually identify any developments that have occurred at the subject site or on adjacent properties that may pose any environmental concern. Features that are looked for in photographs include site usage, structures and improvements. The presence of tanks, pits and sumps or disturbed soil is also examined. During the review of the photos, no observations were made that would lead to any concern of contamination.

4.3 Land Titles

A land titles search was initiated and records dating to 1924 were obtained. There is no evidence of the subject site having been owned or operated by proprietors whom would contribute to environmental contaminations or hazards, based on the land titles review.

4.4 County of Newell Fire Services

The City of Medicine Hat Fire Inspector indicated there are no records of any underground storage tanks for flammable or combustible liquids on the subject site. Also, there are no recorded fuel/chemical spills on the subject site.

4.5 Alberta Infrastructure Dangerous Goods Control Branch

Alberta Infrastructure's Dangerous Goods Control Branch indicated no previous dangerous goods incidents at or near the location of the subject site.

4.6 Petroleum Tank Management Association of Alberta

The records of the Petroleum Tank Management Association of Alberta reveal no past or present active or abandoned tank sites on the subject site.

5.0 Site Visit

On November 5 and 11, 2015, representatives of GEM Testing visited the subject site and conducted an inspection of the subject site. The inspection noted the condition of the subject site as well as the lands and buildings of adjacent properties. These observations are summarized as follows.

5.1 Investigation Conditions

At the time of the site visit weather conditions were favourable.

5.1.1 Topography

The topography of the subject site was and gently undulating sloping towards the low lying area to the East of the subject site.

5.1.2 Groundwater

Groundwater conditions at the time of the investigation were known and were not investigated during a congruent Geotechnical Assessment. Groundwater was encountered at depths ranging from 3.0m to 6.4m below the exiting grade.

5.1.3 Surface Water

The surface water conditions of the site consisted of a general well-drained area with overland drainage directed towards the low area to the east.

5.1.4 Artificial Water Features

There were no artificial water features observed at the subject site.

5.1.5 Natural Water Features

Lake Newell is located to the West of the site and a low lying wet area is present to the east of the subject site.

5.1.6 Water Wells

No known water wells observed at the subject site during the inspection.

5.1.7 Slumps or Depressions

With the exception of the low lands to the east and Lake Newell to the west there were no noticeable slumps or depressions observed at the subject site at the time of the investigation.

5.1.8 Pits or Lagoons

No pits or lagoons were located on the subject site at the time of the investigation.

5.1.9 Stains or Odours

Minor surface staining was observed in and around the current residential buildings, However these areas are isolated and are limited to the surface of the

site sub-soils. These areas are to be removed during the construction of the subject site.

5.1.10 Bulk Storage

Isolated residential storage containers were observed during the site inspection and were the source of the surficial staining observed.

5.1.11 Stressed Vegetation

The vegetation on the subject site showed no indications of any stress.

5.1.12 Dump Sites or Landfills

There was no evidence of dump Sites or landfills were observed during the site assessment

5.1.13 Wastewater or Effluent

The current wastewater and/or effluent from the residential buildings is being discharged into individual or group septic fields that are located throughout the subject site. It is our understanding that these areas are to being reviewed with respect to the "Alberta Private Sewage Systems Standard of Practice 2009" and will either be brought up to the standards or removed during further development at the subject site.

5.1.14 Electrical Transformers

There were electrical transformers located at the subject site, however they were in good condition and indicated no signs of environmental concern.

5.1.15 Housekeeping

The subject site was generally well kept from an environmental contamination point of view

5.2 Accessibility

The entire subject site including all of the residential properties were accessible for the site visit.

5.3 Interviews

Individuals that were involved in the development of the adjacent sites were interviewed with regards to the subject site and to the best of their recollection nothing of environmental concern has occurred at the subject site.

6.0 RESULTS

The assessment of information collected in this Phase I ESA indicated the following:

- Through extensive dialog with the relevant agencies, it's apparent that there are currently no underground storage facilities on or within close proximity of the subject site.
- The review of land title records in conjunction with other information collected in this study does not reveal any ownership of property of any environmental concern on or within close proximity of the subject site.
- The review of aerial photographs showed nothing developed on or near the site in the past or present that would contribute to any environmental concern.
- Geotechnical Test Holes advanced throughout the subject site indicated no evidence of environmental concern.
- Observations made throughout the subject site did indicate signs of minor surficial staining and contamination, however these areas are isolated and limited to the surficial 200mm based on observations and site soil conditions

The review of the information collected in this assessment indicated that there were isolated evidence of surficial or potential contamination at the subject site. It is recommended that these areas be removed and disposed of during the development of the subject site.

7.0 CONCLUSIONS

The information gathered during the course of this investigation indicates that there were isolated surficial areas of contamination or staining that are of an environmental concern on the subject site. It is recommended that these areas be removed and properly disposed of during the further development of the subject site

8.0 QUALIFICATIONS OF ASSESSORS

GEM Testing is a licensed member of the Association of Professional Engineers, Geologists and Geophysicists of Alberta.

The site investigation was supervised by Mr. Scott Dooher, P. Eng. along with the retrieval and interpretation of the material in the assessment.

The warranty for the quality of the information presented in the assessment is limited to that which can be inferred from the visual observations of the site conditions and the quality of information supplied by the various sources used in this investigation. GEM Testing cannot be held responsible for the conditions or consequences arising from relevant information that was withheld, incorrect, not fully disclosed, or was not contained in records reviewed at the time the assessment was performed.

9.0 SUPPORTING DOCUMENTATION

Additional site photographs and aerial photographs are on file in the office of GEM Testing in Medicine Hat, Alberta.

10.0 LIMITATIONS AND CLOSURE

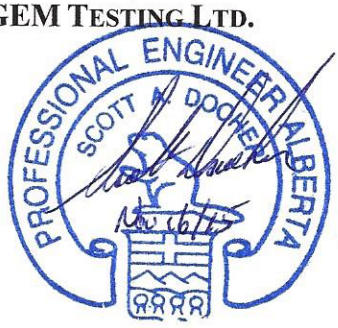
This report has been prepared for and is intended for the exclusive use by Scheffer Andrew Ltd. The findings are relevant for the dates of our site visits and should not be relied upon to represent conditions at later dates. Any use which a third party makes of this report, or any reliance on or decisions to be made based on it, are the responsibility of such third parties. GEM Testing accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or of actions taken based on this report.

Conclusions regarding the condition of the site do not represent a warranty that all areas within the subject site are of the same quality as those identified. The possible existence of contaminants other than those addressed in this investigation has not been addressed in this *Environmental Site Assessment*. If additional information becomes available concerning this site, such information should be provided to GEM Testing so that our recommendations may be reviewed and modified as necessary.

Should you have any questions or require further information, please do not hesitate to contact the undersigned.

Respectfully Submitted,
GEM TESTING LTD.

APEGGA PERMIT #P09733



Scott Dooher, P.Eng.