



GOLDER

2019 Operations Report, Appendix H - 2019 Leachate Collection System, Purge Well Gravity Drain and Groundwater Gallery Cleaning and Inspection Report

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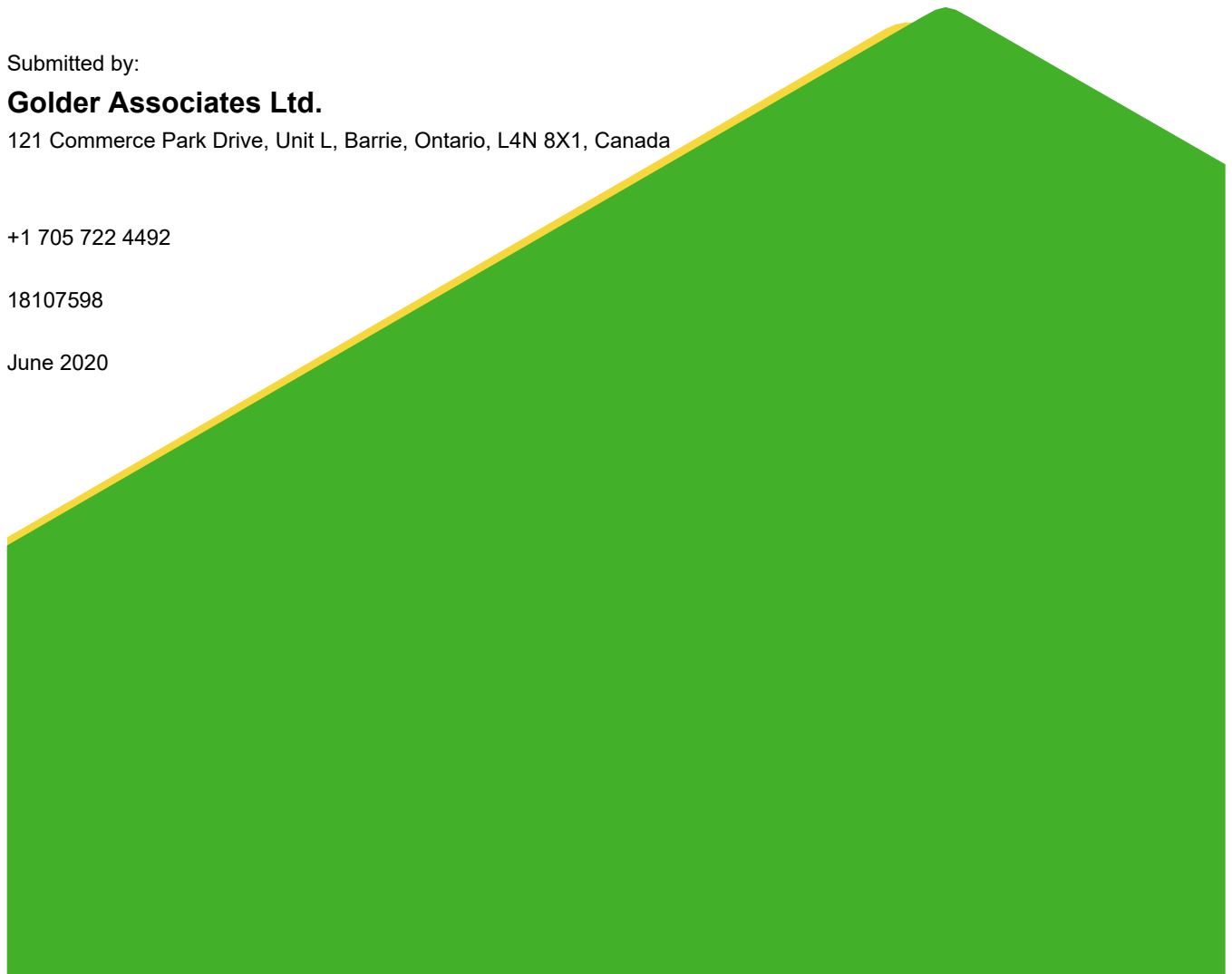
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1.0 INTRODUCTION

1.1 Background

The City of Barrie (City) owns and operates the Barrie Landfill (Site) located within the limits of the City (see Figure H-1) under Environmental Compliance Approval No. A250101 (ECA), most recently amended on March 8, 2017. The total approved design footprint of the landfill is 18.6 Ha.

The City is required to complete annual cleaning and video inspections of the Leachate Collection System, including all leachate collection system piping, as outlined in Conditions 5.21 and 5.25 of the ECA. This report has been prepared on behalf of the City by Golder Associates Ltd. (Golder) to document the 2019 cleaning and video inspection of the Leachate Collection System (LCS), Groundwater Collection Gallery (Gallery) and the Purge Well (PW) conveyance piping at the Site.

The design of the landfill includes a liner and LCS under the western portion (i.e., Cells 2 and 3), which was completed as part of the landfill reclamation project described in the Design and Operations Plan (Golder, 2019). The eastern portion of the landfill (i.e., Cell 1) is unlined, and environmental controls for this area consist of the groundwater collection gallery and toe-drain (Gallery) and purge well system (see Figures H-3 and H-4). The detailed designs of these systems are contained in the documents referred to in the current ECA.

The LCS collects leachate draining from the waste placed over the lined portions of the landfill. The purge wells (PW) capture leachate impacted groundwater immediately downgradient of the west and central portions of the landfill. The Gallery captures the impacted groundwater on the south-eastern side of the landfill (i.e., largely from the area under Cells 1 and eastern part of Cell 2) that is not captured by the purge wells.

Inspection of all perforated collection and solid conveyance lines of the LCS is undertaken annually to determine if the perforations are draining as designed and to confirm that the piping is not blocked with precipitate or damaged. The 2019 LCS, Gallery and PW gravity drainage cleaning program involved cleaning and inspection of the entire LCS, PW Gravity Drain and Gallery.

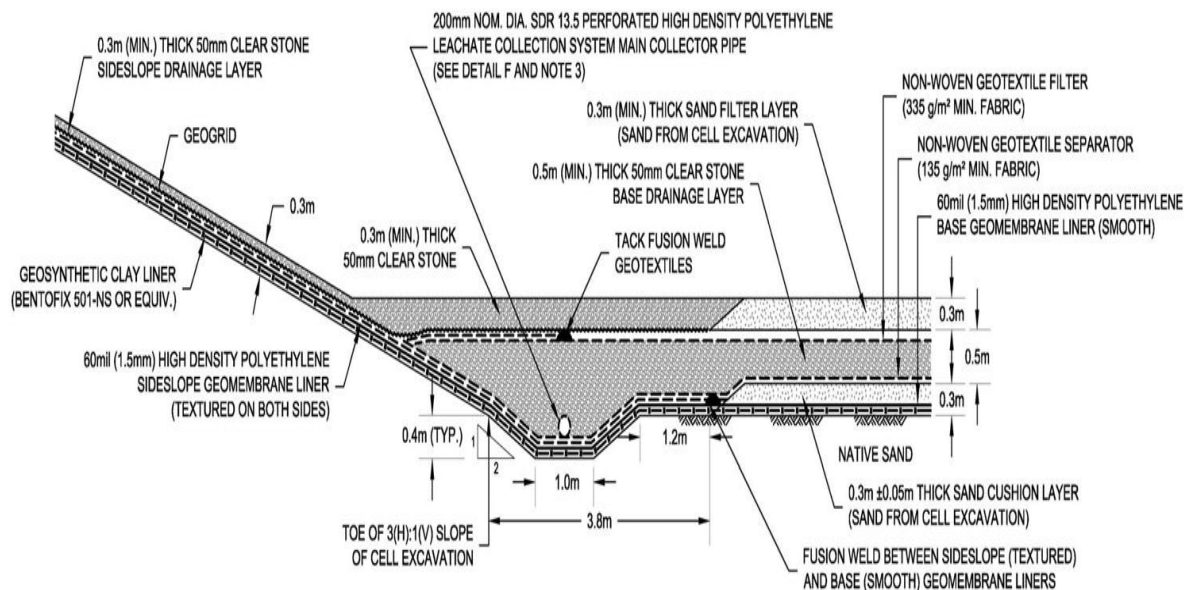
2.0 LEACHATE AND GROUNDWATER COLLECTION SYSTEMS OVERVIEW

2.1 Leachate Collection System

The overall LCS layout shown on Figure H-3, which includes the gravity drain connection from MH4 to the sanitary sewer line. A detailed description of the LCS and PW systems can be found in the main body of the 2019 City of Barrie Solid Waste Report (Golder, 2020).

The engineered landfill cells consist include a LCS underlain by a single composite geosynthetic liner, generally installed as shown in the figure below (depicted design for the southern 1/3 of Cells 2 and 3). The leachate collection systems consist of a series of 200 mm diameter collection pipes within a 0.5 m thick, 50 mm clear stone drainage layer over the base area of the landfill cells. The cell sideslopes consist of a 0.3 m thick, 50 mm diameter stone drainage layer. The single composite liner is comprised of a 1.5 mm (60 mil) thick HDPE geomembrane liner and an underlying geosynthetic clay liner (GCL). The LCS in the northern part of the landfill differs slightly from those of Cells 2A and 3A, as the leachate collection pipes in the northern area of the cells are not placed in “trenches” but are instead placed along the low point of the liner.

Barrie Landfill LCS Design



The Waste Reclamation and Re-engineering project was completed between 2009 and 2015 and included the re-engineering and construction of Cell 2C and 3C including the LCS. The leachate collection systems in Cell 2A and Cell 3A are connected by a header pipeline along the southern limits of the cells, leading to a manhole on the southwest corner of Cell 3A. Discharge from this manhole is directed to drop manhole MH4, which also receives flow from the Purge Well System. This drop manhole discharges to the City's sanitary sewer located on Edgehill Drive. Similar to Cells 2A and 3A, the leachate collection systems in Cells 2B and 3B are connected by a single header pipeline along the southern limits of the cells, which flows to a maintenance hole located within the south-west corner of Cell 3B. This maintenance chamber is in turn connected to a second external chamber

located outside the landfill and west of the western landfill perimeter road. The LCS in Cells 2C and 3C is connected by a single header pipeline along the southern limits of the cells, which flows to a maintenance hole located within the north-west corner of Cell 3B. This maintenance hole is in turn connected to the maintenance hole located within the south-west corner of Cell 3B. Leachate from Cells 2B, 3B, 2C and 3C flows through these structures along a conveyance pipeline located parallel to the western perimeter road and connects to the existing external drop manhole (MH4) and gravity drain, which also connects the PW System to the City sanitary sewer along Edgehill Drive.

Access to the leachate collection system is possible at maintenance holes in Cells 3A, 3B and 3C, the exterior leachate maintenance hole adjacent to Cell 3A, and at MH4. Six cleanouts are located along the south edge of Cells 3A and 2A, and one cleanout access on the west side of Cell 3A.

2.2 Purge Well System

The PW system was commissioned at the Site in October 2007. The first purge well (PW1) was installed in late 2004, whereas the second and third purge wells (PW2 and PW3) were installed in late 2005. PW4 was constructed in 2014 and construction of the associated infrastructure was completed in 2015. PW4 has been operational since July 2016, as allowed under Permit to Take Water (PTTW) No. 1315-6W3QAS.

The conveyance piping (gravity drain) between the southern edge of Cell 3A and Edgehill Drive was installed in December 2006. Under a covering letter dated January 26, 2007, a Permit to Take Water (Number 1315-6W3QAS) was granted by the Ministry (i.e., MECP or precursors) to allow installation and operation of gravity drainage sewers from the purge wells to the City sewer system along Edgehill Drive. A new PTTW, No. 4785-AJTNQ2, was issued on March 16, 2017 and expires on February 28, 2027.

Each purge well discharges through a valve chamber, connected to a common gravity drain commencing at PW4 and extending to MH4. This gravity drain runs for a total distance of approximately 360 metres, discharging to MH4, which in turn discharges to a gravity drain leading to the sanitary sewer at Edgehill Drive. The City flushes the gravity drain from MH4 to the south property boundary on a quarterly basis.

Access to the PW gravity drain is through manholes located south of each PW location, downstream of the valve chambers. Access to the LCS/PW gravity drain downstream of MH4 is through three manholes (MHA, MHB and MHC) located south of MH4 and leading to the City sewer at Edgehill Drive. The LCS/PW gravity drain is comprised of three intervals of conveyance pipe, accessible at each interval through a manhole.

2.3 Groundwater Collection Gallery

A groundwater collection gallery and an associated toe drain (Gallery) are located east and south-east of Cell 1 (Figures H-2 and H-4). These systems were installed during the summer/fall of 2002 to intercept leachate-impacted groundwater migrating in a south-east direction towards Dymont's Creek. The systems replaced an older Gallery that had operated since 1977. The portion from GC7 to GC4 was reconstructed in 2009; the portion from GC4 to GC2, including the toe drain, was reconstructed in 2017; it is noted that there has been minimal flow from the Toe Drain GC2 since reconstruction in 2017. Approximately 150 m of the southern portion of the gallery, between GC2 and GC4, including the toe drain, was replaced in 2017 to address partial clogging of the system and reduced performance. The replacement of the Gallery pipe also included the installation of two new manholes (GC-4N and GC-3N).

Gallery flow is monitored at a Parshall Flume at GC1. The City cleans the flume at GC1 on an as needed basis, as the iron contained within the intercepted water deposits on the measurement structure, affecting flow readings.

The Gallery consists of a nominal 200 mm to 300 mm diameter HDPE pipe within a granular filled trench. The depth of the trench ranges from about 2.5 m to 6.0 m below ground surface. The Gallery extends in an approximately north-south direction (immediately west of Dymont's Creek) over a total distance of about 450 m and includes six maintenance-hole access points (i.e., GC1 through GC-5N, and GC-7N). The invert elevation of the perforated pipe is, at a minimum, 0.5 m below the invert elevation of the adjacent creek. The terminus of the Gallery is connected to a sanitary sewer leading to Edgehill Drive.

The Toe Drain is located along the toe of the natural slope immediately west of the Gallery and intercepts leachate impacted seepage along the toe of the slope, which would otherwise flow overland to Dymont's Creek. It has a total length of about 160 m, has two (2) access maintenance holes (i.e., TDMH-1 and TDMH-2) and consists of a nominal 300 mm diameter perforated HDPE drainpipe within a granular filled trench. The depth of the trench ranges from about 1.5 m to 2.5 m below ground surface. The Toe Drain can also be accessed where it connects to the Gallery at GC-2.

3.0 2019 CLEANING PROGRAM

The 2019 annual cleaning and video inspection was carried out between September 16 and 20, 2019. The work was completed by Sewer Technologies Inc., who were retained by the City. Golder provided full-time oversight during the cleaning and inspection program and documented the extent of the work completed.

Sewer Technologies used the following equipment:

- Vacuum and flusher truck equipped with various sizes and types of flushing heads
- A mobile video inspection unit equipped with truck-mounted video cameras

The cleaning procedure is performed by inserting the cleaning head into the downstream access point of the pipe. If possible, the mobile video camera unit is inserted at the upstream end of the pipe to allow the camera to inspect the pipe soon after cleaning. If no upstream access point is available, the flushing head and hose are removed, and the camera is inserted at the downstream location. This procedure is not ideal since the camera is required to travel up a positive grade, which limits the travel distance due to the weight of the camera cable.

A summary of flushing and video inspection distances in the leachate collection system, purge well gravity drain Cells 2A and 3A is provided in Tables 3.1 through 3.5. Unless noted in the comments, all sections of pipe were flushed and inspected to their full length. Sections of pipe where the 2019 inspected length listed in the tables differ by 1 m to 2 m from the as-built length were inspected to the full length; these small differences are considered largely due to discrepancies with the camera distance tracking.

3.1 Cells 2A and 3A Leachate Collection System

The 2019 Cell 2A and 3A LCS cleaning consisted of flushing all headers and laterals to the capability of the flusher truck. Several locations could not be inspected, due to either the difficulty in entering access points within the system (i.e., sharp bends creating a retrieval risk) or the camera losing traction. A summary of flushing and inspection in Cells 2A and 3A is provided in Table 3.1.

Flushing was typically started at the most upstream location and progressed downstream such that sediment, precipitate and blockages could be continually flushed downstream and ultimately out of the system. The starting point within Cells 2A and 3A was at 2A Lateral 1, thereafter progressing downstream to the south and west.

Flushing of the Cell 2A LCS was successful - all were flushed to their full extent, as shown in Table 3.1. Flushing of the Cell 3A LCS was also successful - all were flushed to their full extent. In 2011, 3A Lateral 1 could not be flushed beyond approximately 30 m due to a sediment blockage caused by sumping. Sumping refers to a low-point in the LCS lines where sediment is likely to build up. In subsequent years, a full flusher tank of water was jetted into the 3A western cleanout, which removed this blockage. This procedure was repeated in 2019 and flushing of 3A Lateral 1 to the full length of approximately 171 m was successful.

Table 3.1: 2019 Flushing and Inspection Summary for Cells 2A and 3A

Cell 2A	Length (m)	Flushed Length (m)	Inspected Length (m)	Comment
2A Lateral 4	78	78	34	Camera could not pass cleanout joint
2A Lateral 3	82	82	37	Camera could not pass cleanout joint
2A Lateral 1 & 2	180	180	36	Camera could not pass cleanout joint
2A South Header	165	165	34	Camera could not pass cleanout joint
Cell 3A	Length (m)	Flushed Length (m)	Inspected Length (m)	Comment
3A Lateral 4	84	84	31	Camera could not pass cleanout joint
3A Lateral 3	86	86	30	Camera could not pass cleanout joint
3A Lateral 2	88	88	28	Camera could not pass cleanout joint
3A Lateral 1	171	171	171	
3A West Header	61	61	59	Sumping at end of line at junction of 3A Lateral 1
3A South Header	175	175	157	Camera lost traction
3AMH to MH4	61	61	60	

3.2 Cells 2B and 3B Leachate Collection System

Access to the LCS in Cell 3B was through the maintenance hole located in the south-west corner of Cell 3B. A maximum methane concentration of 0.5% (v/v) methane (CH₄) by volume (i.e., 10% of the Lower Explosive Limit “LEL” of 5% v/v) was required for works in and around the Cell 3B Maintenance Chamber to be allowed to proceed.

The 3B / 3C West Header and the solid leachate conveyance line between the Cell 3B Maintenance Chamber and the 3B External Maintenance Hole were successfully cleaned from the Cell 3B Maintenance Chamber to their constructed extents, as indicated in Table 3.2 and visible on Figure H-3. Approximately 179 m of the 2B / 3B Lateral was successfully cleaned, which was limited by the length of the hose.

The leachate conveyance pipeline between the Cell 3B external maintenance-hole and MH4 was successfully cleaned from MH4. A summary of flushing and inspection in Cells 2B and 3B is provided in Table 3.2.

Table 3.2: 2019 Flushing and Inspection Summary for Cells 2B and 3B

Cell 2B / 3B	Length (m)	Flushed Length (m)	Inspected Length (m)	Comment
2B / 3B Lateral	265	179	229	Maximum flushing hose length was 179 m; the camera lost traction at 229 m
3B / 3C West Header	79	79	79	
3B MH to 3B EXT	88	88	86	
3B EXT to MH4	120	120	117	

3.3 Cells 2C and 3C Leachate Collection System

The western portion of the Cell 2C / 3C LCS system includes the 2C / 3C Lateral 1 (274 m), 2C / 3C Lateral 2 (256 m) and 2C / 3C Lateral 3 (233 m). Two cleanouts, NCleanout 1 and NCleanout 2, were also flushed and inspected in 2019. A summary of flushing and inspection in Cells 2C and 3C is provided in Table 3.3.

Table 3.3: 2019 Flushing and Inspection Summary for Cells 2C and 3C

Cell 3C	Length (m)	Flushed Length (m)	Inspected Length (m)	Comment
2C3C Lateral 1	274	170	269	Maximum hose length was 186 m
2C3C Lateral 2	256	148	193	Hose unable to continue; camera lost traction at 172 m
2C3C Lateral 3	233	148	221	Hose unable to continue; camera could not pass small rock in LCS
NCleanout 1	76	76	76	
NCleanout 2	75	75	74	

3.4 Purge Well Gravity Drain

The PW gravity drain was cleaned sequentially from the most upstream PW4 to the LCS/PW gravity drain at MH4. Access points are provided adjacent to each of the purge wells, allowing cleaning and inspection in four separate intervals. Cleaning was completed successfully, and a large amount of iron and magnesium precipitate was washed out during the cleaning. This is consistent with past conditions observed during the cleaning of the purge well gravity drain.

The LCS/PW gravity drain was cleaned sequentially from MH4 to the southernmost manhole access (MHC) located upstream of the connection to the sanitary sewer on Edgehill Drive, and within landfill property. A summary of flushing and inspection in the purge well system LCS/PW gravity drain is provided in Table 3.4.

Table 3.4: 2019 Flushing and Inspection Summary for the Purge Well Gravity Drain and LCS/PW Gravity Drain

Drain Section	Length (m)	Flushed Length (m)	Inspected Length (m)	Comment
PW4 to PW3	88	88	87	
PW3 to PW2	85	85	85	
PW2 to PW1	75	75	75	
PW1 to MH4	126	126	126	
MH4 to MHA	27	27	25	
MHA to MHB	20	20	18	
MHB to MHC	85	85	83	

Notes:

MHA to MHC are referred as MH3 to MH1, respectively in the inspection records provided in Appendix H-2

3.5 Groundwater Gallery

On September 19 and 20, 2019, the Gallery and Toe-Drain were cleaned sequentially from the northernmost upstream access at manhole GC7N to the sanitary sewer connection at manhole GC1. The entirety of the Gallery and Toe-Drain was able to be flushed. A summary of flushing and inspection in the Groundwater Gallery is provided in Table 3.5.

Table 3.5: 2019 Flushing and Inspection Summary for the Groundwater Gallery

	Length (m)	Flushed Length (m)	Inspected Length (m)	Comment
GC7N to GC5N	118	118	118	
GC5N to GC4	100	100	100	
GC4 to GC4N	10	10	9	
GC4N to GC3N	80	80	79	
GC3N to GC2	58	58	57	
GC2 to GC1	79	79	79	
TDMH2 – TDMH1	82	82	81	
TDMH1 – GC2	80	80	78	

4.0 2019 VIDEO INSPECTION PROGRAM

Video inspections were carried out on each pipe segment following completion of the flushing in two directions. In some cases, the video inspection revealed remaining sediment deposits or other obstructions and, as a result, flushing and video inspection was conducted a second time to confirm the pipe sections had been satisfactorily cleaned. Records of all inspections (date, length of inspected interval, conditions, etc.) are included in Appendix H-2 of this report.

4.1 Cells 2A and 3A

Inspection of the LCS in Cells 2A and 3A was carried out between September 16, 17 and 19, 2019. Video inspection was only partially completed in Cells 2A and 3A as a result of the alignment of the connections between the southern cleanout accesses and the associated laterals. This connection joins the solid cleanout access to the perforated lateral from above, resulting in a drop-off that would make the camera potentially irretrievable, should it pass the joint. As a result, inspections originating from the cleanout access points could only inspect up to this joint. Photo 1 shows a typical connection between the south cleanout accesses and the associated laterals. The following section summarizes the notable findings of these inspections.



Photo 1: Typical cleanout connection to LCS laterals in Cells 2A and 3A.

Photo 2 shows the condition within the west cleanout access to 3A Lateral 1 at approximately 47 m from the cleanout entrance. Sumping observed in this area is further supported by the video inspection of the 3A West Header, which also indicates a sump condition, as shown in Photo 3. During the inspection, the camera was able to navigate beyond the sump in the 3A Lateral 1 pipe and the entire length of the lateral was inspected. The inspection indicates that the 3A Lateral 1 is not plugged and is draining towards the maintenance chamber in Cell 3A; typical 3A Lateral 1 conditions are shown in Photo 4.

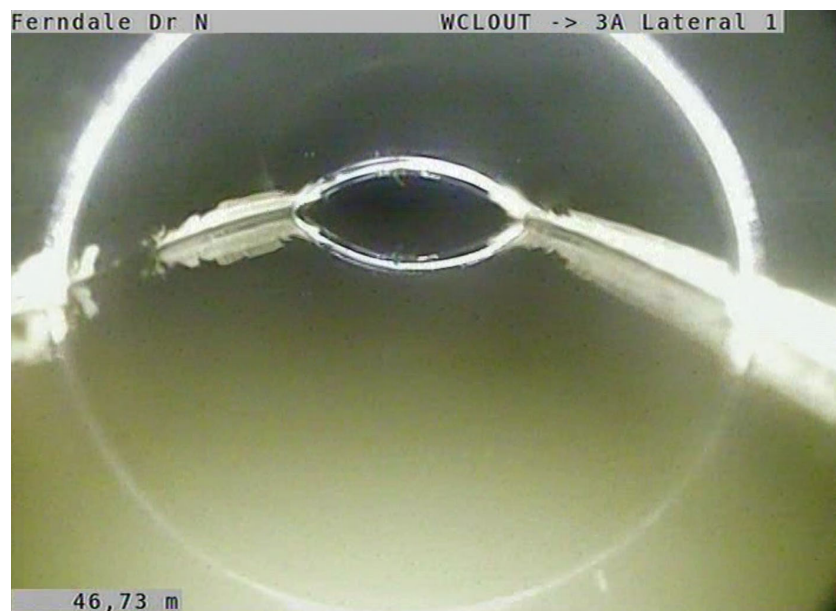


Photo 2: Sumping (as observed in 2019) within west cleanout access to 3A Lateral 1 at approximately 47 m.



Photo 3: Sumping (as observed in 2019) within 3A West Header at approximately 59 m.



Photo 4: Typical conditions within the 3A Lateral 1.

Inspection of the leachate conveyance line between the 3A Maintenance Chamber and MH4 identified small amounts of accumulated sediment / precipitate, which was similarly noted in previous inspection programs (Photo 5).



Photo 5: Leachate conveyance line between 3A Maintenance Chamber and MH4.

4.2 Cell 2B and 3B

Following cleaning of the 2B / 3B Lateral from the Cell 3B internal maintenance hole, video inspection was conducted. The lateral was inspected to a length of 229 m, short of the 265 m length of this lateral, as the camera was not able to pass a pipe joint. Inspection of the lateral indicated that it was in good condition, as shown in Photo 6.

The 3B / 3C West Header was also video inspected and the inspection indicated that the pipe was in good condition (Photo 7). The leachate conveyance pipeline between the Cell 3B internal maintenance chamber and the 3B exterior maintenance chamber was inspected starting at the Cell 3B location and indicated that the LCS was in good condition.



Photo 6: Typical conditions within the 2B3B Lateral.



Photo 7: Typical conditions within the 3B / 3C West Header.

4.3 Cell 2C and 3C

Following cleaning of the 2C / 3C Lateral 1, 2C / 3C Lateral 2 and 2C / 3C Lateral 3, video inspection was conducted. Inspection of the laterals revealed good conditions, as shown in Photo 8. During the video inspection, it was noted there was a piece of concrete debris within the 3C maintenance hole; similar to observations in previous years. The piece of concrete debris was removed by a Sewer Technologies Confined Space Entry Team on December 13, 2019.



Photo 8: Typical conditions within 2C / 3C Lateral 3

Following cleaning of two cleanouts, NCleanout 1 and NCleanout 2, video inspection was conducted. Inspection of the cleanouts revealed good conditions, as shown in Photo 9.

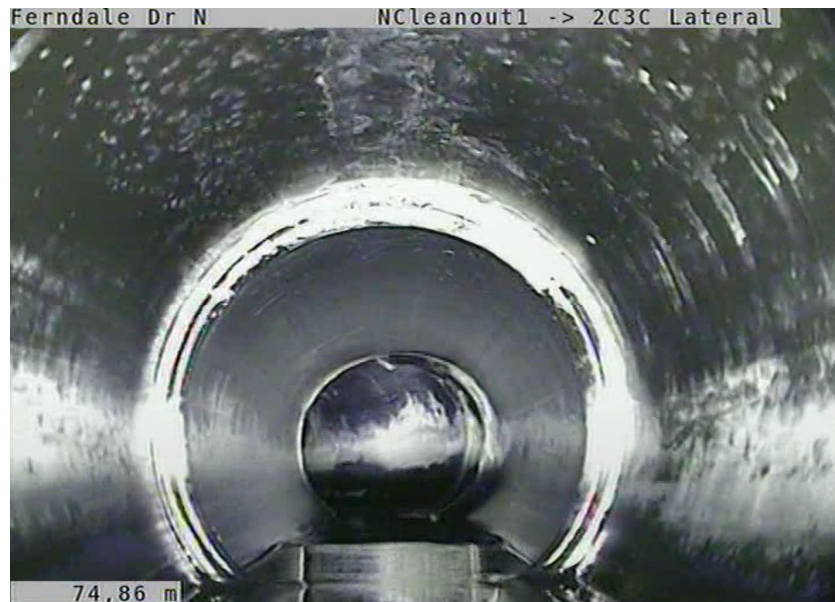


Photo 9: Typical conditions within NCleanout 1.

4.4 Purge Well Gravity Drain and LCS/PW Gravity Drain

The purge well gravity drain was inspected following the flushing of the pipeline from PW4 to MH4. The PW pumps were stopped during inspection of the PW gravity drain. Each section exhibited sidewall staining consistent with high water levels in the pipe during operation. The flushing operation successfully cleaned the pipes of accumulated silt and precipitate. Typical conditions in the purge well gravity drain can be seen in Photo 10.

The LCS/PW gravity drain was video inspected sequentially, from MH4 through to MHA, MHB and MHC, and indicated that the pipe was in good condition (Photo 11).



Photo 10: Purge well main condition, approximately 15 m downstream of PW2.



Photo 11: LCS/PW gravity drain condition, approximately 30 m downstream of MHB.

4.5 Groundwater Collection Gallery and Toe Drain

In 2019, the Gallery was inspected following flushing of the Gallery from GC7N to GC1. Based on previous inspection programs, it was anticipated the thickest accumulation of precipitate would be observed in the section between GC7N and GC5N. Although the precipitation in this section was thick, it was soft and appeared to have been completely removed following flushing, as shown in Photo 12.



Photo 12: Typical conditions within Gallery between manholes GC7N and GC5N following flushing.

The Gallery section between GC5N and GC4 was inspected following flushing and indicated that this pipe section was in good condition. A video still of a perforation in the Gallery collection pipe is shown in Photo 13. This photo indicates that there was no visible clogging. This condition is considered to represent typical conditions in the Gallery between manhole GC4 and GC5N.



Photo 13: Perforations in the sidewall of the Gallery collector pipe between GC5N and GC4.

Inspection of the southern half of the groundwater collection gallery between GC4 and GC2 indicated that the pipe is in good condition and no deficiencies; typical conditions were observed, as indicated in Photo 14.

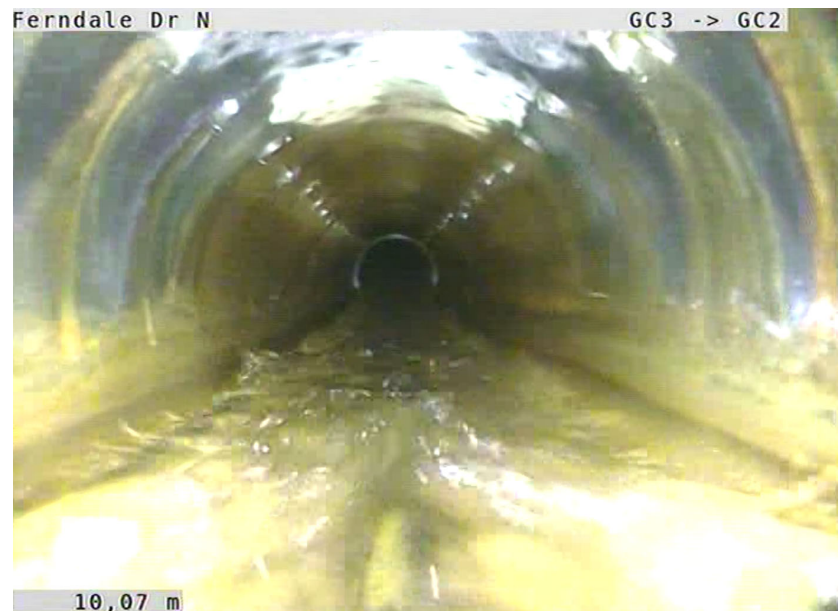


Photo 14: Typical conditions within Gallery between manholes GC3N and GC2.

Gallery sections between GC2 and GC1 represent the older section of the Gallery that was constructed in 2002. The inspection along these pipe sections indicates unobstructed flows within the pipe. Clogged perforations at several locations within the first 12 m of this section are observed as shown in Photo 15, similar to the clogging observed between GC4 and GC2 prior to reconstruction. Minimal clogging was observed for the remaining section of the Gallery between GC2 and GC1; typical conditions are represented in Photo 16. This section of the Gallery is furthest from the landfill and progressive clogging is expected have minimal effect on the operation of the Gallery. Future replacement of the Gallery section between GC2 and GC1 is not anticipated. Furthermore it is noted that reconstruction of this part of the Gallery would be problematic as a result of the proximity to the adjacent creek and building.



Photo 15: Typical conditions within Gallery approximately 12m downgradient of GC2 showing clogged perforations



Photo 16: Typical conditions within Gallery between manholes TDMH1 and GC2 following flushing.

The Gallery Toe Drain section between TDMH2 and GC2 was inspected prior to and following flushing. Inspection of the Toe Drain connection to the Gallery indicated no visible clogging, and typical conditions are represented in Photo 18. Following reconstruction of the Gallery in 2017, minimal flow is observed in the Toe Drain due to the increased effectiveness of the Gallery.



Photo 17: Typical conditions within Gallery between manholes TDMH1 and GC2 following flushing.

5.0 SUMMARY AND CONCLUSIONS

The following summary and conclusions are provided based on observations from the 2019 video inspection:


- The portion of Cell 2A and 3A LCS that can be inspected appears to be in a good condition. Leachate flows appear unobstructed, with the exception of the northern extent of the 3A West Header where some sumping (a low point in the pipe) is observed, causing locally high leachate levels within the LCS;
- The Cell 2B and 3B LCS appeared to be in a good condition and leachate flows appear to be unobstructed;
- The Cell 2C and 3C LCS appeared to be in a good condition and leachate flows appear to be unobstructed. A piece of concrete debris within the 3C maintenance hole was removed by the contractor in December 2019;
- Cleaning of the PW Gravity Drain removed most of the accumulated deposits. All conveyance piping and manhole access points were observed to be in good condition;
- The entire length of the Gallery was cleaned and inspected. The Gallery was noted to be good condition and unobstructed flows are observed;
- Clogged perforations are observed at several locations within the first 12 m of the Gallery immediately downstream of GC2; this is not expected to materially affect the performance of the Gallery;
- Minimal clogging was observed for the remaining section of the Gallery between GC2 and GC1; and
- The Gallery Toe Drain section between TDMH2 and GC2 appeared to be in good condition. Following reconstruction of the Gallery in 2017, minimal flow is observed in the Toe Drain due to the increased effectiveness of the Gallery.

6.0 RECOMMENDATIONS

- Continued annual flushing and inspection of the LCS, Gallery, PW Gravity drain and landfill Gravity drain should be conducted.

Signature Page

Golder Associates Ltd.

A handwritten signature in black ink, appearing to read 'Jamie Bonany', with a dotted rectangular box around it.

Jamie Bonany, MA.Sc.
Project Scientist

A handwritten signature in black ink, appearing to read 'Paul Dewaele', with a dotted rectangular box around it.

Paul Dewaele, M.Sc., P.Eng.
Principal

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LIMITATIONS

This report was prepared by Golder Associates Ltd. (Golder) for the exclusive use of The City of Barrie (City) in accordance with the scope and conditions agreed upon between these parties, acknowledging that this report is intended for submission to applicable regulatory agencies for their review.

The report is based on data and information collected in the current monitoring year referred to in the report, as well as historical information and data obtained by Golder and that provided to Golder by the City. Golder Associates has relied in good faith on all information provided by others and does not accept responsibility for any deficiency, misstatements, or inaccuracies contained in these reports as a result of omissions, misinterpretation, or fraudulent acts of the persons contacted or errors or omissions in the reviewed documentation.

The services performed as described in this report were conducted in a manner consistent with that level of care and skill normally exercised by other members of the engineering and science professions currently practicing under similar conditions, subject to the time limits and financial and physical constraints applicable to the services.

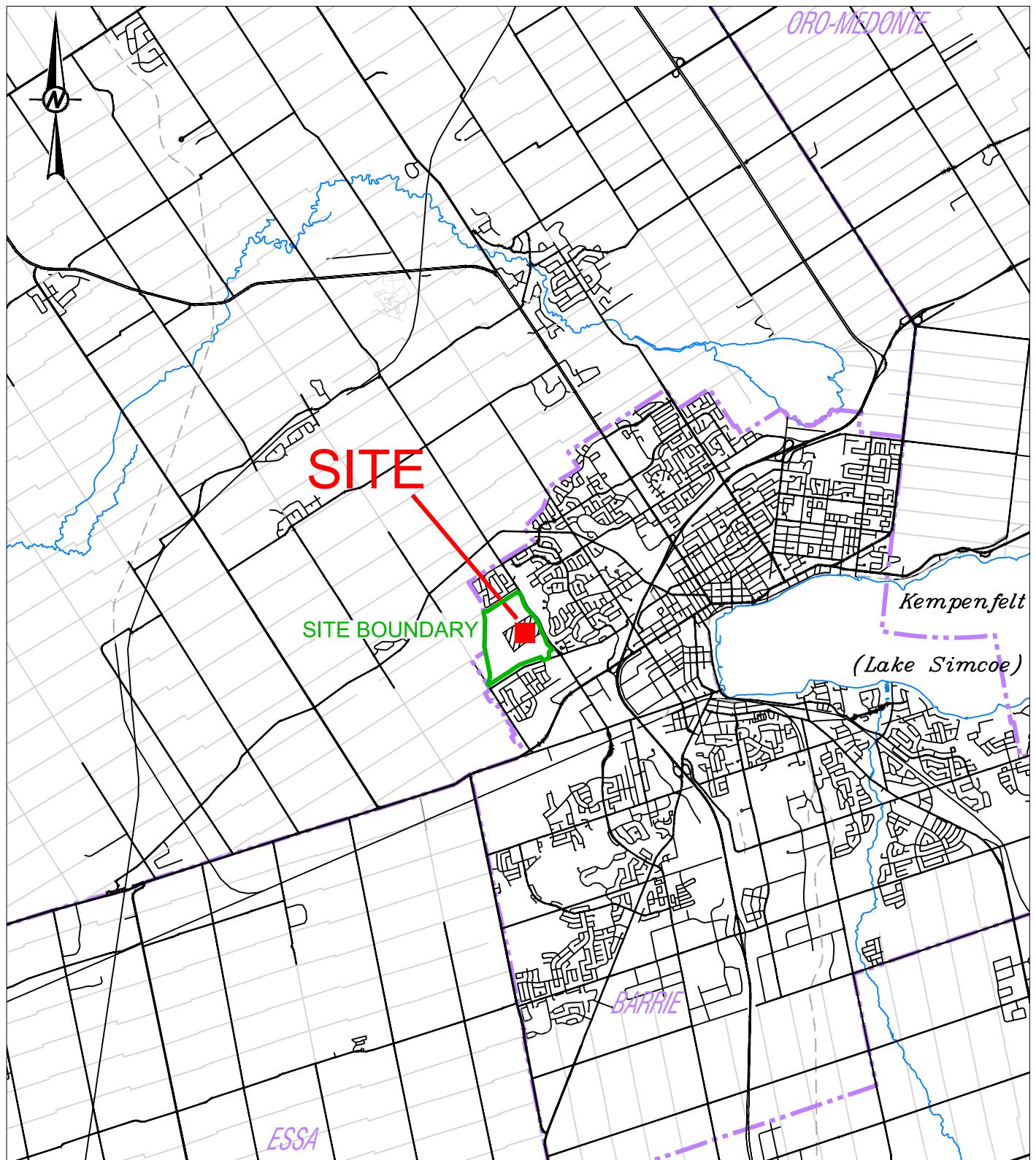
Any use which a third party makes of this report, or any reliance on, or decisions to be made based on it, are the responsibilities of such third parties. Golder Associates Ltd. accepts no responsibility for damages, if any, suffered by any third party (other than as noted above) as a result of decisions made or actions based on this report. The findings and conclusions of this report are valid only as of the date of this report. If new information is discovered in future work, including excavations, borings, or other studies, Golder Associates should be requested to re-evaluate the conclusions of this report, and to provide amendments as required.

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APPENDIX A1

Report Figures

Last Edited By: showman Date: 2020-05-19 Time: 10:40:55 AM | Printed By: Showman Date: 2020-05-02 Time: 2:29:02 PM
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CLIENT
THE CITY OF BARRIE

CONSULTANT



YYYY-MM-DD 2020-05-19

DESIGNED

PREPARED STB

REVIEWED JEB

APPROVED PJD

PROJECT
2019 LEACHATE COLLECTION SYSTEM, PURGE WELL GRAVITY
DRAIN AND GROUNDWATER GALLERY CLEANING AND INSPECTION
REPORT, BARRIE LANDFILL, BARRIE, ONTARIO

TITLE
REGIONAL LOCATION PLAN

PROJECT NO.
18107598

CONTROL
0001

REV.
A

FIGURE
H-1

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI A
25 mm

Path: \\golder.com\projects\18107598_LeachateCollectionSystem\GIS\Map\SiteLocationPlan.mxd | File Name: 18107598_0001_CW-0002.dwg | Last Edited By: shawman | Date: 2020-05-02 | Time: 2:25:14 PM



LEGEND

- LANDFILL SITE PROPERTY LIMIT
- LANDFILL COMPLIANCE BOUNDARY
- APPROXIMATE LIMIT OF LANDFILL
- GROUNDWATER COLLECTION GALLERY & MANHOLE
- LINED LANDFILL CELL AREA
- PURGE WELL / LEACHATE GRAVITY MAIN
- LEACHATE COLLECTION PIPE
- LEACHATE COLLECTION PIPE CLEANOUT
- TOE-DRAIN & MANHOLE
- SHEET PILE CUT-OFF WALL
- STREAM (DASHED WHERE INTERMITTENT)
- LANDFILL GRADE CONTOUR masl (1m INTERVAL)
- CONTAMINANT ATTENUATION ZONE (CAZ)

REFERENCES

- CITY OF BARRIE MUNICIPAL MAPPING
- LEGAL SURVEY RUDY MAK S-6510-C (2003); UPDATED ANNUALLY VARIOUS
- TOPOGRAPHY SURVEY PLAN DATED NOVEMBER 26, 2019 BY SMC GEOMATICS INC.

CLIENT

THE CITY OF BARRIE

PROJECT

2019 LEACHATE COLLECTION SYSTEM, PURGE WELL GRAVITY DRAIN AND GROUNDWATER GALLERY CLEANING AND INSPECTION REPORT, BARRIE LANDFILL, BARRIE, ONTARIO

TITLE

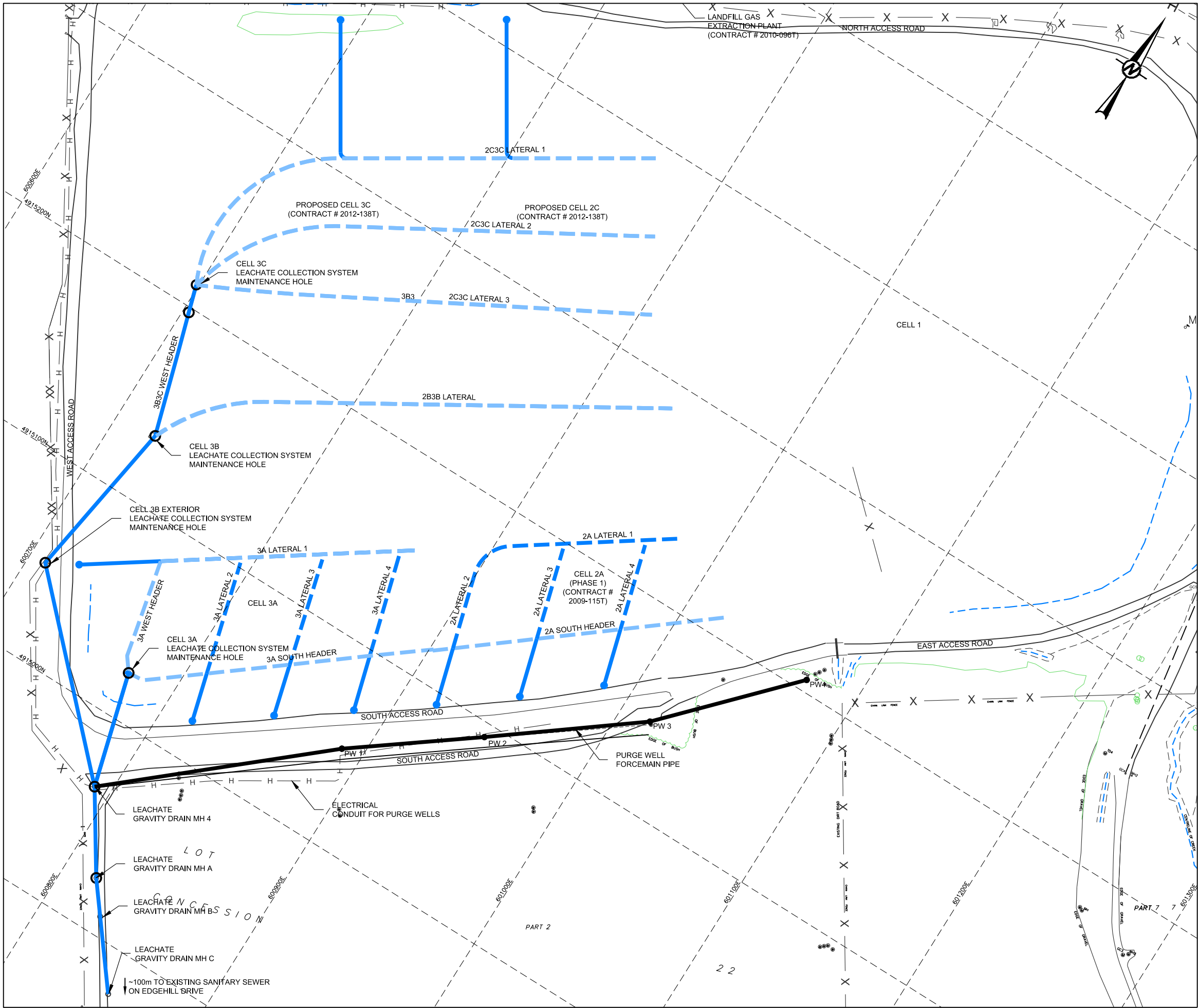
SITE LOCATION PLAN

CONSULTANT	YYYY-MM-DD	2020-05-19
DESIGNED		
PREPARED	STB	
REVIEWED	JEB	
APPROVED	PJD	

PROJECT NO.	CONTROL	REV.	FIGURE
18107598	0001	A	H-2

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM A3S18

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LEGEND

- ACCESS ROAD
- FENCE LINE
- LEACHATE GRAVITY DRAIN PIPELINE
- ELECTRICAL CONDUIT FOR PURGE WELLS
- 200mm NOM. DIA. SDR 13.5 PERFORATED HDPE LEACHATE COLLECTOR PIPE
- 200mm NOM. DIA. SDR 13.5 NON-PERFORATED HDPE LEACHATE COLLECTOR PIPE
- 200mm NOM. DIA. SDR 13.5 NON-PERFORATED HDPE CLEAN-OUT RISER PIPE

NOTE(S)

- PROJECTION IS UTM NAD83-17.

REFERENCE(S)

- EXISTING TOPOGRAPHIC CONTOURS WITHIN LANDFILL AREA ARE BASED ON TOPOGRAPHIC SURVEY DATED MARCH 9, 2011 BY J.D. BARNES LIMITED.
- LANDFILL BASE GRADE CONTOURS AND LEACHATE COLLECTION SYSTEM LAYOUT ARE BASED ON DESIGN DRAWINGS FOR PHASES 0 TO 3, BY GOLDER ASSOCIATES LTD.

CLIENT

THE CITY OF BARRIE

PROJECT

2019 LEACHATE COLLECTION SYSTEM, PURGE WELL GRAVITY DRAIN AND GROUNDWATER GALLERY CLEANING AND INSPECTION REPORT, BARRIE LANDFILL, BARRIE, ONTARIO

TITLE

LEACHATE COLLECTION SYSTEM LAYOUT

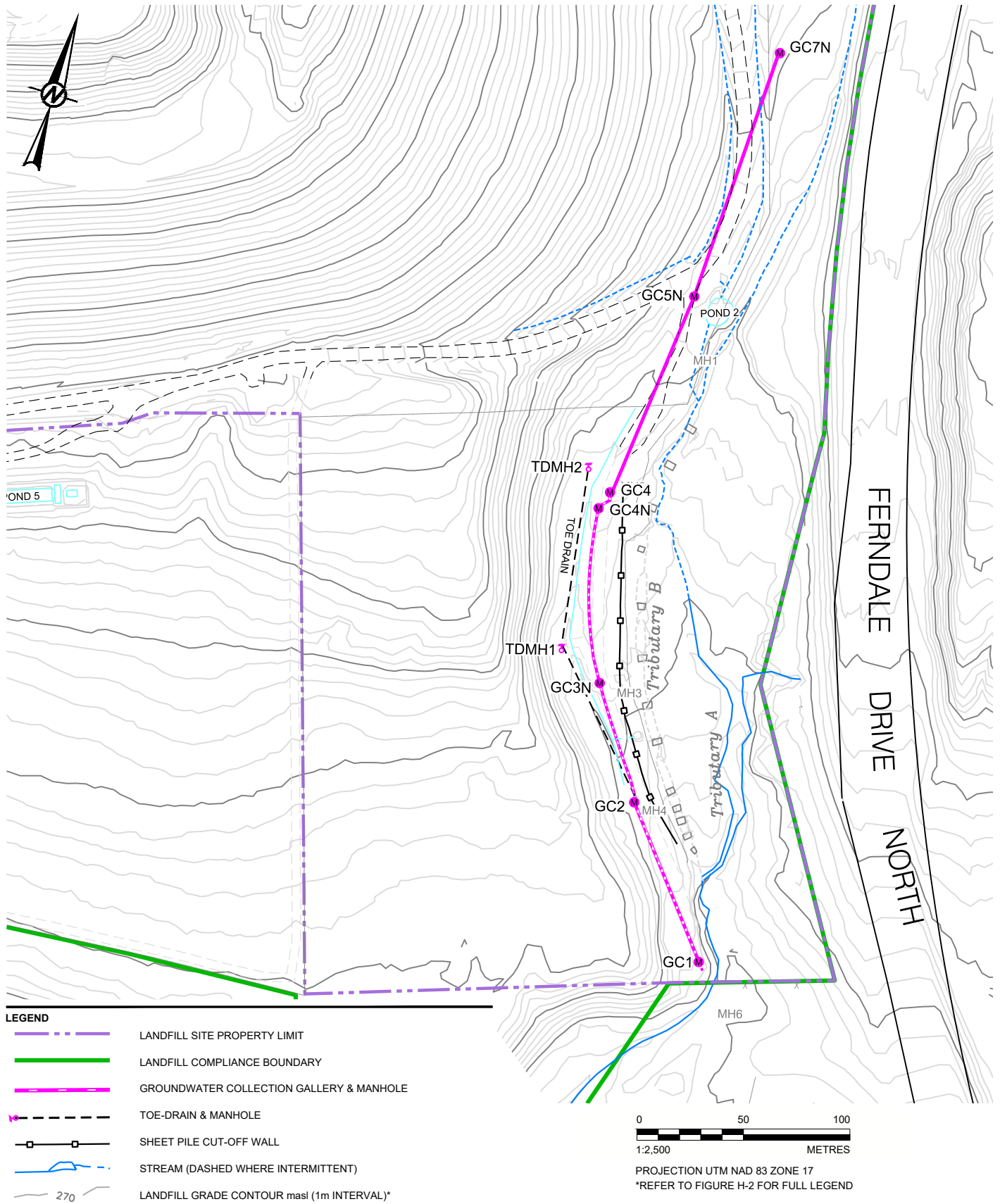
CONSULTANT	YYYY-MM-DD	2020-05-19
DESIGNED		
PREPARED	STB	
REVIEWED	JEB	
APPROVED	PJD	

PROJECT NO.	CONTROL	REV.	FIGURE
18107598	0001	A	H-3

GOLDER

25 mm

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LEGEND

- LANDFILL SITE PROPERTY LIMIT
- LANDFILL COMPLIANCE BOUNDARY
- GROUNDWATER COLLECTION GALLERY & MANHOLE
- TOE-DRAIN & MANHOLE
- SHEET PILE CUT-OFF WALL
- STREAM (DASHED WHERE INTERMITTENT)
- 270 --- LANDFILL GRADE CONTOUR masl (1m INTERVAL)*

CLIENT
THE CITY OF BARRIE

CONSULTANT



YYYY-MM-DD 2020-05-19

DESIGNED

PREPARED STB

REVIEWED JEB

APPROVED PJD

PROJECT
2019 LEACHATE COLLECTION SYSTEM, PURGE WELL GRAVITY
DRAIN AND GROUNDWATER GALLERY CLEANING AND INSPECTION
REPORT, BARRIE LANDFILL, BARRIE, ONTARIO

TITLE
GROUNDWATER COLLECTION GALLERY

PROJECT NO.
18107598

CONTROL
0001

REV.
A

FIGURE
H-4

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI A

APPENDIX B2

Inspection Records

Section Profile

Project
City of Barrie Environmental Operations - Landfill Sept 2019

2019-09-16

Nr.	Upstream MH	Downstream MH	Date	Street	Media Label	Material	Total Length	Length Surveyed
1	NCleanout2	2C3C Lateral	2019-09-16	Ferndale Dr N	01	Polyethylene	73.58	73.58
2	NCleanout1	2C3C Lateral	2019-09-16	Ferndale Dr N	01	Polyethylene	75.77	75.77
3	SCLOUT6	2A South Header	2019-09-16	Ferndale Dr N	01	Polyethylene	34.09	34.09
4	SCLOUT5	2A South Header	2019-09-16	Ferndale Dr N	01	Polyethylene	37.21	37.21
5	SCLOUT4	2A South Header	2019-09-16	Ferndale Dr N	01	Polyethylene	33.94	33.94
6	SCLOUT	2A South Header	2019-09-16	Ferndale Dr N	01	Polyethylene	35.85	35.85
7	SCLOUT3	3A South Header	2019-09-16	Ferndale-Dr-N	01	Polyethylene	31.28	31.28
8	SCLOUT2	3A South Header	2019-09-16	Ferndale Dr N	01	Polyethylene	29.77	29.77
9	SCLOUT1	3A South Header	2019-09-16	Ferndale Dr N	01	Polyethylene	27.63	27.63
10	WCLOUT	3A Lateral 1	2019-09-17	Ferndale Dr N	02	Polyethylene	179.58	179.58
11	2C3C Lateral 2	MH3C	2019-09-17	Ferndale Dr N	02	Polyethylene	193.41	193.41
12	2C3C Lateral 1	MH3C	2019-09-18	Ferndale Dr N	03	Polyethylene	269.08	269.08
13	2C3C Lateral 3	MH3C	2019-09-18	Ferndale Dr N	03	Polyethylene	221.19	221.19
14	MH3C	MH3B	2019-09-18	Ferndale Dr N	03	Polyethylene	78.64	78.64
15	2B3B Lateral	MH3B	2019-09-18	Ferndale Dr N	03	Polyethylene	228.74	228.74
16	MH3B	MH3B EXT	2019-09-18	Ferndale Dr N	03	Polyethylene	85.50	85.50
17	3A South Header	3AMH	2019-09-18	Ferndale Dr N	03	Polyethylene	156.98	156.98
18	3A West Header	3AMH	2019-09-18	Ferndale Dr N	03	Polyethylene	59.31	59.31
19	PW4	PW3	2019-09-19	Ferndale Dr N	04	Polyethylene	87.22	87.22
20	PW3	PW2	2019-09-19	Ferndale Dr N	04	Polyethylene	84.75	84.75
21	PW2	PW1	2019-09-19	Ferndale Dr N	04	Polyethylene	75.56	75.56
22	PW1	MH4	2019-09-19	Ferndale Dr N	04	Polyethylene	128.07	128.07
23	MH3B EXT	MH4	2019-09-19	Ferndale Dr N	04	Polyethylene	116.67	116.67
24	MH3A	MH4	2019-09-19	Ferndale Dr N	04	Polyethylene	59.75	59.75
25	MH4	MHA	2019-09-19	Ferndale Dr N	04	Polyethylene	24.71	24.71
26	MHA	MHB	2019-09-19	Ferndale Dr N	04	Polyethylene	17.94	17.94
27	MHB	MHC	2019-09-19	Ferndale Dr N	04	Polyethylene	83.28	83.28

27 x Circular 150 = 2529.48 Total Length (2529.48 Length Surveyed)

Nr.	Upstream MH	Downstream MH	Date	Street	Media Label	Material	Total Length	Length Surveyed
28	GC7N	GC5N	2019-09-19	Ferndale Dr N	04	Polyethylene	118.66	118.66
29	GC5N	GC4	2019-09-20	Ferndale Dr N	05	Polyethylene	101.46	101.46
30	GC4	GC4N	2019-09-20	Ferndale Dr N	05	Polyethylene	9.36	9.36
31	GC4N	GC3	2019-09-20	Ferndale Dr N	05	Polyethylene	79.37	79.37
34	GC3	GC2	2019-09-20	Ferndale Dr N	05	Polyethylene	57.34	57.34

5 x Circular 200 = 366.19 Total Length (366.19 Length Surveyed)

Section Profile

Project
City of Barrie Environmental Operations - Landfill Sept 2019

2019-09-16

Nr.	Upstream MH	Downstream MH	Date	Street	Media Label	Material	Total Length	Length Surveyed
32	TDMH2	TDMH1	2019-09-20	Ferndale Dr N	05	Polyethylene	81.07	81.07
33	TDMH1	GC2	2019-09-20	Ferndale Dr N	05	Polyethylene	78.07	78.07
35	GC2	GC1	2019-09-20	Ferndale Dr N	05	Polyethylene	79.84	79.84

3 x Circular 300 = 238.98 Total Length (238.98 Length Surveyed)

Total: 35 = 3134.64 Total Length (3134.64 Length Surveyed)

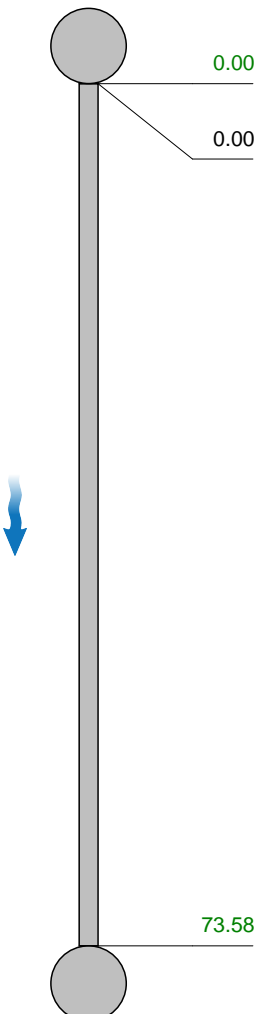
Inspection report

Date : 2019-09-16	Work Order : 57462	Weather : Dry	Surveyed By : Sewertech_DH	Certificate Number : U-513-17791	Pipe Segment Ref. : NCleanout2-2C3CLateral
Year laid :	Pre-cleaning : Jetting	Direction : Downstream	Pipe Joint Length : 4.0	Total Length : 73.6	Length Surveyed : 73.6

City : Barrie	Drainage Area :	Upstream MH : NCleanout2
Street : Ferndale Dr N	Media Label : 01	Up Rim to Invert : 0.0
Location Code : Other	Flow Control :	Downstream MH : 2C3C Lateral
Location Details :	Sheet Number :	Down Rim to Invert : 0.0

Pipe shape: Circular	Sewer Use: Other
Pipe size: 150	Sewer Category : SEC
Pipe material: Polyethylene	Purpose: Routine Assessment
Lining Method :	Owner :

Additional Info :

1:643	Distance	Code	Observation	Counter	Photo	Grade
NCleanout2						
	0.00	ACOM	Cleanout Mainline / NCleanout2	00:00:07		
	0.00	MWL	Water Level, 0% of cross sectional area	00:00:10		
	73.58	AEP	End of Pipe / 2C3C Lateral 2	00:06:11		
2C3C Lateral						

QSR	QMR	SPR	MPR	OPR	SPRI	MPRI	OPRI
0000	0000	0.0	0.0	0.0	0.0	0.0	0.0

Inspection report

Date : 2019-09-16	Work Order : 57462	Weather : Dry	Surveyed By : Sewertech_DH	Certificate Number : U-513-17791	Pipe Segment Ref. : NCleanout1-2C3CLateral1
Year laid :	Pre-cleaning : Jetting	Direction : Downstream	Pipe Joint Length : 4.0	Total Length : 75.8	Length Surveyed : 75.8

City :	Barrie	Drainage Area :		Upstream MH :	NCleanout1
Street :	Ferndale Dr N	Media Label :	01	Up Rim to Invert :	0.0
Location Code :	Other	Flow Control :		Downstream MH :	2C3C Lateral
Location Details :		Sheet Number :		Down Rim to Invert :	0.0
Pipe shape:	Circular	Sewer Use:	Other		
Pipe size:	150	Sewer Category :	SEC		
Pipe material:	Polyethylene	Purpose:	Routine Assessment		
Lining Method :		Owner :			

Additional Info :

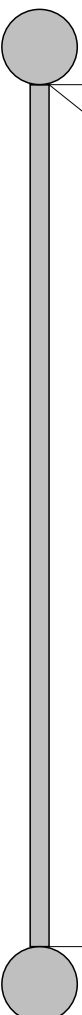
1:662	Distance	Code	Observation	Counter	Photo	Grade
	0.00	ACOM	Cleanout Mainline / NCleanout1	00:00:00		
	0.00	MWL	Water Level, 0% of cross sectional area	00:00:14		
	75.77	AEP	End of Pipe / 2C3C Lateral 1	00:05:50		

QSR	QMR	SPR	MPR	OPR	SPRI	MPRI	OPRI
0000	0000	0.0	0.0	0.0	0.0	0.0	0.0

Inspection report

Date : 2019-09-16	Work Order : 57462	Weather : Dry	Surveyed By : Sewertech_DH	Certificate Number : U-513-17791	Pipe Segment Ref. : SCLOUT6-2ASouthheader
Year laid :	Pre-cleaning : Jetting	Direction : Downstream	Pipe Joint Length : 4.0	Total Length : 34.1	Length Surveyed : 34.1

City : Barrie	Drainage Area :	Upstream MH : SCLOUT6
Street : Ferndale Dr N	Media Label : 01	Up Rim to Invert : 0.0
Location Code : Other	Flow Control :	Downstream MH : 2A South Header
Location Details :	Sheet Number :	Down Rim to Invert : 0.0
Pipe shape: Circular	Sewer Use: Other	
Pipe size: 150	Sewer Category : SEC	
Pipe material: Polyethylene	Purpose: Routine Assessment	
Lining Method :	Owner :	
Additional Info : MH Id's incorrect on video corrected on reports(approved onsite)		

1:298	Distance	Code	Observation	Counter	Photo	Grade
SCLOUT6						
	0.00	ACOM	Cleanout Mainline / 2A lateral 4	00:00:13		
	0.00	MWL	Water Level, 0% of cross sectional area	00:00:16		
	34.09	AEP	End of Pipe	00:03:09		
2A South Header						
QSR	QMR	SPR	MPR	OPR	SPRI	MPRI
0000	0000	0.0	0.0	0.0	0.0	0.0

Inspection report

Date : 2019-09-16	Work Order : 57462	Weather : Dry	Surveyed By : Sewertech_DH	Certificate Number : U-513-17791	Pipe Segment Ref. : SCLOUT5-2ASouthheader
Year laid :	Pre-cleaning : Jetting	Direction : Downstream	Pipe Joint Length : 4.0	Total Length : 37.2	Length Surveyed : 37.2

City : Barrie	Drainage Area :	Upstream MH : SCLOUT5
Street : Ferndale Dr N	Media Label : 01	Up Rim to Invert : 0.0
Location Code : Other	Flow Control :	Downstream MH : 2A South Header
Location Details :	Sheet Number :	Down Rim to Invert : 0.0

Pipe shape: Circular	Sewer Use: Other
Pipe size: 150	Sewer Category : SEC
Pipe material: Polyethylene	Purpose: Routine Assessment
Lining Method :	Owner :

Additional Info :

1:325	Distance	Code	Observation	Counter	Photo	Grade
SCLOUT5						
	0.00	ACOM	Cleanout Mainline / SCLOUT5	00:00:16		
	0.00	MWL	Water Level, 0% of cross sectional area	00:00:20		
	37.21	AEP	End of Pipe / 2A South Header	00:02:55		
2A South Header						
QSR	QMR	SPR	MPR	OPR	SPRI	MPRI
0000	0000	0.0	0.0	0.0	0.0	0.0

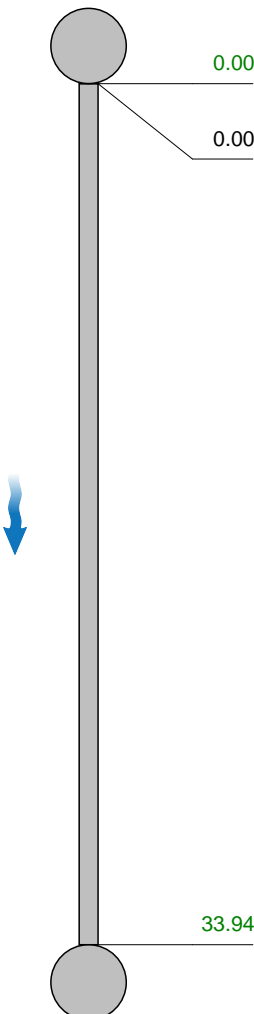
Inspection report

Date : 2019-09-16	Work Order : 57462	Weather : Dry	Surveyed By : Sewertech_DH	Certificate Number : U-513-17791	Pipe Segment Ref. : SCLOUT4-2ASouthHeader
Year laid :	Pre-cleaning : Jetting	Direction : Downstream	Pipe Joint Length : 4.0	Total Length : 33.9	Length Surveyed : 33.9

City : Barrie	Drainage Area :	Upstream MH : SCLOUT4
Street : Ferndale Dr N	Media Label : 01	Up Rim to Invert : 0.0
Location Code : Other	Flow Control :	Downstream MH : 2A South Header
Location Details :	Sheet Number :	Down Rim to Invert : 0.0

Pipe shape: Circular	Sewer Use: Other
Pipe size: 150	Sewer Category : SEC
Pipe material: Polyethylene	Purpose: Routine Assessment
Lining Method :	Owner :

Additional Info :

1:297	Distance	Code	Observation	Counter	Photo	Grade
SCLOUT4						
	0.00	ACOM	Cleanout Mainline / SCLOUT4	00:00:19		
	0.00	MWL	Water Level, 0% of cross sectional area	00:00:31		
	33.94	AEP	End of Pipe / 2A South header	00:02:45		
2A South Header						

QSR	QMR	SPR	MPR	OPR	SPRI	MPRI	OPRI
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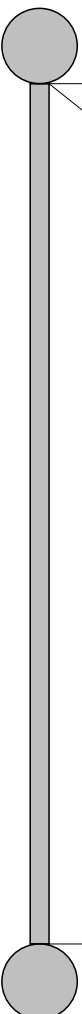
Inspection report

Date : 2019-09-16	Work Order : 57462	Weather : Dry	Surveyed By : Sewertech_DH	Certificate Number : U-513-17791	Pipe Segment Ref. : SCLOUT-2ASouthHeader
Year laid :	Pre-cleaning : Jetting	Direction : Downstream	Pipe Joint Length : 4.0	Total Length : 35.9	Length Surveyed : 35.9

City : Barrie	Drainage Area :	Upstream MH : SCLOUT
Street : Ferndale Dr N	Media Label : 01	Up Rim to Invert : 0.0
Location Code : Other	Flow Control :	Downstream MH : 2A South Header
Location Details :	Sheet Number :	Down Rim to Invert : 0.0

Pipe shape: Circular	Sewer Use: Other
Pipe size: 150	Sewer Category : SEC
Pipe material: Polyethylene	Purpose: Routine Assessment
Lining Method :	Owner :

Additional Info :

1:314	Distance	Code	Observation	Counter	Photo	Grade
SCLOUT						
	0.00	ACOM	Cleanout Mainline / SCLOUT	00:00:12		
	0.00	MWL	Water Level, 0% of cross sectional area	00:00:14		
	35.85	AEP	End of Pipe / SCLOUT	00:02:41		
2A South Header						

QSR	QMR	SPR	MPR	OPR	SPRI	MPRI	OPRI
0000	0000	0.0	0.0	0.0	0.0	0.0	0.0

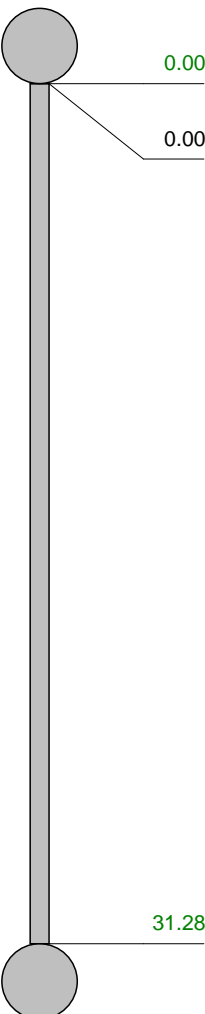
Inspection report

Date : 2019-09-16	Work Order : 57462	Weather : Dry	Surveyed By : Sewertech_DH	Certificate Number : U-513-17791	Pipe Segment Ref. : SCLOUT3-3ASouthHeader
Year laid :	Pre-cleaning : Jetting	Direction : Downstream	Pipe Joint Length : 4.0	Total Length : 31.3	Length Surveyed : 31.3

City : Barrie	Drainage Area :	Upstream MH : SCLOUT3
Street : Ferndale-Dr-N	Media Label : 01	Up Rim to Invert : 0.0
Location Code : Other	Flow Control :	Downstream MH : 3A South Header
Location Details :	Sheet Number :	Down Rim to Invert : 0.0

Pipe shape: Circular	Sewer Use: Other
Pipe size: 150	Sewer Category : SEC
Pipe material: Polyethylene	Purpose: Routine Assessment
Lining Method :	Owner :

Additional Info :

1:274	Distance	Code	Observation	Counter	Photo	Grade
SCLOUT3						
	0.00	ACOM	Cleanout Mainline / SCLOUT3	00:00:12		
	0.00	MWL	Water Level, 0% of cross sectional area	00:00:16		
	31.28	AEP	End of Pipe / 3A South header	00:02:27		
3A South Header						

QSR	QMR	SPR	MPR	OPR	SPRI	MPRI	OPRI
0000	0000	0.0	0.0	0.0	0.0	0.0	0.0

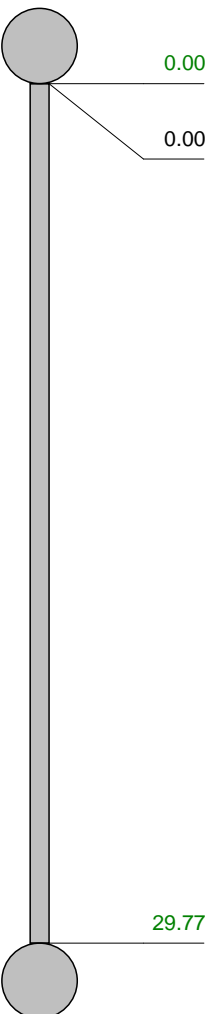
Inspection report

Date : 2019-09-16	Work Order : 57462	Weather : Dry	Surveyed By : Sewertech_DH	Certificate Number : U-513-17791	Pipe Segment Ref. : SCLOUT2-3ASouthHeader
Year laid :	Pre-cleaning : Jetting	Direction : Downstream	Pipe Joint Length : 4.0	Total Length : 29.8	Length Surveyed : 29.8

City : Barrie	Drainage Area :	Upstream MH : SCLOUT2
Street : Ferndale Dr N	Media Label : 01	Up Rim to Invert : 0.0
Location Code : Other	Flow Control :	Downstream MH : 3A South Header
Location Details :	Sheet Number :	Down Rim to Invert : 0.0

Pipe shape: Circular	Sewer Use: Other
Pipe size: 150	Sewer Category : SEC
Pipe material: Polyethylene	Purpose: Routine Assessment
Lining Method :	Owner :

Additional Info :

1:261	Distance	Code	Observation	Counter	Photo	Grade
SCLOUT2						
	0.00	ACOM	Cleanout Mainline / SCLOUT2	00:00:09		
	0.00	MWL	Water Level, 0% of cross sectional area	00:00:12		
	29.77	AEP	End of Pipe / 3A South Header	00:02:14		
3A South Header						

QSR	QMR	SPR	MPR	OPR	SPRI	MPRI	OPRI
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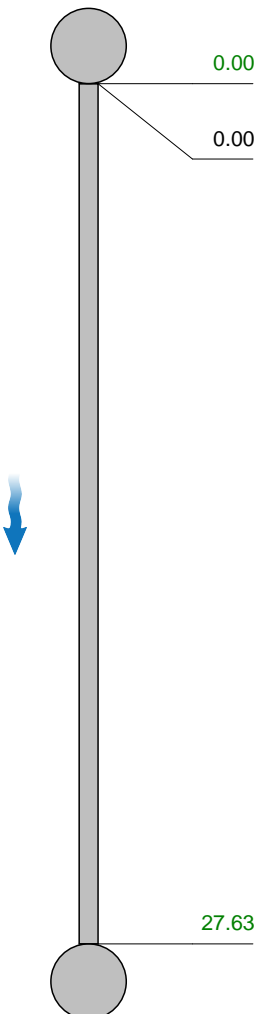
Inspection report

Date : 2019-09-16	Work Order : 57462	Weather : Dry	Surveyed By : Sewertech_DH	Certificate Number : U-513-17791	Pipe Segment Ref. : SCLOUT1-3ASouthHeader
Year laid :	Pre-cleaning : Jetting	Direction : Downstream	Pipe Joint Length : 4.0	Total Length : 27.6	Length Surveyed : 27.6

City : Barrie	Drainage Area :	Upstream MH : SCLOUT1
Street : Ferndale Dr N	Media Label : 01	Up Rim to Invert : 0.0
Location Code : Other	Flow Control :	Downstream MH : 3A South Header
Location Details :	Sheet Number :	Down Rim to Invert : 0.0

Pipe shape: Circular	Sewer Use: Other
Pipe size: 150	Sewer Category : SEC
Pipe material: Polyethylene	Purpose: Routine Assessment
Lining Method :	Owner :

Additional Info :

1:242	Distance	Code	Observation	Counter	Photo	Grade
SCLOUT1						
	0.00	ACOM	Cleanout Mainline / SCLOUT1	00:00:14		
	0.00	MWL	Water Level, 0% of cross sectional area	00:00:20		
	27.63	AEP	End of Pipe / 3A South Header	00:02:12		
3A South Header						

QSR	QMR	SPR	MPR	OPR	SPRI	MPRI	OPRI
0000	0000	0.0	0.0	0.0	0.0	0.0	0.0

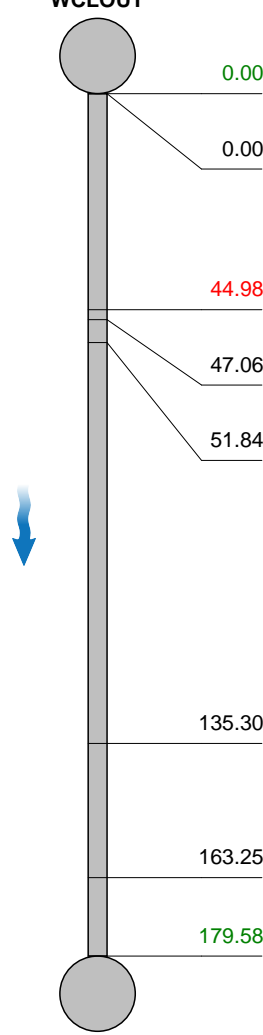
Inspection report

Date : 2019-09-17	Work Order : 57463	Weather : Dry	Surveyed By : Sewertech_DH	Certificate Number : U-513-17791	Pipe Segment Ref. : WCLOUT-3ALateral1
Year laid :	Pre-cleaning : Jetting	Direction : Downstream	Pipe Joint Length : 4.0	Total Length : 179.6	Length Surveyed : 179.6

City : Barrie	Drainage Area :	Upstream MH : WCLOUT
Street : Ferndale Dr N	Media Label : 02	Up Rim to Invert : 0.0
Location Code : Other	Flow Control :	Downstream MH : 3A Lateral 1
Location Details :	Sheet Number :	Down Rim to Invert : 0.0

Pipe shape: Circular	Sewer Use: Other
Pipe size: 150	Sewer Category : SEC
Pipe material: Polyethylene	Purpose: Routine Assessment
Lining Method :	Owner :

Additional Info :

1:1569	Distance	Code	Observation	Counter	Photo	Grade
WCLOUT						
	0.00	ACOM	Cleanout Mainline / WCLOUT	00:00:00		
	0.00	MWL	Water Level, 0% of cross sectional area	00:00:25		
	44.98	D	Deformed, 5% changed	00:03:28		S4
	47.06	MWL	Water Level, 95% of cross sectional area	00:03:44		
	51.84	MWL	Water Level, 50% of cross sectional area	00:04:17		
	135.30	MGP	General Photograph	00:09:34		
	163.25	MGP	General Photograph	00:11:53		
	179.58	AEP	End of Pipe / Capped	00:12:34		
3A Lateral 1						

QSR	QMR	SPR	MPR	OPR	SPRI	MPRI	OPRI
4100	0000	4.0	0.0	4.0	4.0	0.0	4.0

Section Pictures

City Barrie	Street Ferndale Dr N	Date 2019-09-17	Pipe Segment WCLOUT-3ALateral1	Nr. 10
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, 00:09:34, 135.30
General Photograph



, 00:09:34, 135.30
General Photograph



, 00:11:53, 163.25
General Photograph

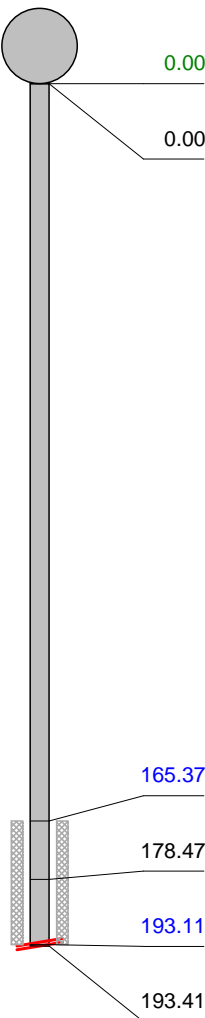
Inspection report

Date : 2019-09-17	Work Order : 57463	Weather : Dry	Surveyed By : Sewertech_DH	Certificate Number : U-513-17791	Pipe Segment Ref. : MH3C-2C3CLateral2
Year laid :	Pre-cleaning : Jetting	Direction : Upstream	Pipe Joint Length : 4.0	Total Length : 193.4	Length Surveyed : 193.4

City : Barrie	Drainage Area :	Upstream MH : 2C3C Lateral 2
Street : Ferndale Dr N	Media Label : 02	Up Rim to Invert : 0.0
Location Code : Other	Flow Control :	Downstream MH : MH3C
Location Details :	Sheet Number :	Down Rim to Invert : 0.0

Pipe shape: Circular	Sewer Use: Other
Pipe size: 150	Sewer Category : SEC
Pipe material: Polyethylene	Purpose: Routine Assessment
Lining Method :	Owner :

Additional Info :

1:1690	Distance	Code	Observation	Counter	Photo	Grade
MH3C						
	0.00	AMH	Manhole / MH3C	00:00:00		
	0.00	MWL	Water Level, 20% of cross sectional area	00:00:24		
	165.37	S01	DSF	Deposits Settled Fine, 10% of cross sectional area from 5 o'clock to 7 o'clock, Start	00:11:39	
	178.47	MGP	General Photograph	00:12:51		
	193.11	F01	DSF	Deposits Settled Fine, 10% of cross sectional area from 5 o'clock to 7 o'clock, Finish	00:18:00	M2
	193.41	MSA	Survey Abandoned / Unable to pass DSF	00:18:02		

QSR	QMR	SPR	MPR	OPR	SPRI	MPRI	OPRI
0000	2600	0.0	12.0	12.0	0.0	2.0	2.0

Section Pictures

City Barrie	Street Ferndale Dr N	Date 2019-09-17	Pipe Segment MH3C-2C3CLateral2	Nr. 11
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, 00:12:51, 178.47
General Photograph



, 00:12:51, 178.47
General Photograph

Inspection report

Date : 2019-09-18	Work Order : 57464	Weather : Dry	Surveyed By : Sewertech_DH	Certificate Number : U-513-17791	Pipe Segment Ref. : MH3C-2C3CLateral1
Year laid :	Pre-cleaning : Jetting	Direction : Upstream	Pipe Joint Length : 4.0	Total Length : 269.1	Length Surveyed : 269.1

City : Barrie	Drainage Area :	Upstream MH : 2C3C Lateral 1
Street : Ferndale Dr N	Media Label : 03	Up Rim to Invert : 0.0
Location Code : Other	Flow Control :	Downstream MH : MH3C
Location Details :	Sheet Number :	Down Rim to Invert : 0.0

Pipe shape: Circular	Sewer Use: Other
Pipe size: 150	Sewer Category : SEC
Pipe material: Polyethylene	Purpose: Routine Assessment
Lining Method :	Owner :

Additional Info :

1:2351	Distance	Code	Observation	Counter	Photo	Grade
MH3C						
	0.00	AMH	Manhole / MH3C	00:00:21		
	0.00	MWL	Water Level, 15% of cross sectional area	00:00:25		
	8.36	MGP	General Photograph	00:01:21		
	13.07	MWL	Water Level, 5% of cross sectional area	00:01:54		
	30.04	MGP	General Photograph	00:03:10		
	53.86	MWL	Water Level, 15% of cross sectional area	00:04:57		
	78.83	MWL	Water Level, 5% of cross sectional area	00:06:45		
	111.63	TF	Tap Factory Made at 9 o'clock, 150mm dim	00:09:10		
	195.11	TF	Tap Factory Made at 9 o'clock, 150mm dim, within 200 mm	00:15:30		
	264.99	S01 DSF	Deposits Settled Fine, 5% of cross sectional area from 5 o'clock to 7 o'clock, within 200 mm, Start	00:21:09		
	269.08	F01 DSF	Deposits Settled Fine, 5% of cross sectional area from 5 o'clock to 7 o'clock, within 200 mm, Finish	00:21:34		M2
	269.08	AEP	End of Pipe	00:21:34		
2C3C Lateral 1						

QSR	QMR	SPR	MPR	OPR	SPRI	MPRI	OPRI
0000	2100	0.0	2.0	2.0	0.0	2.0	2.0

Section Pictures

City Barrie	Street Ferndale Dr N	Date 2019-09-18	Pipe Segment MH3C-2C3CLateral1	Nr. 12
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, 00:01:21, 8.36
General Photograph



, 00:01:21, 8.36
General Photograph



, 00:03:10, 30.04
General Photograph



, 00:03:10, 30.04
General Photograph

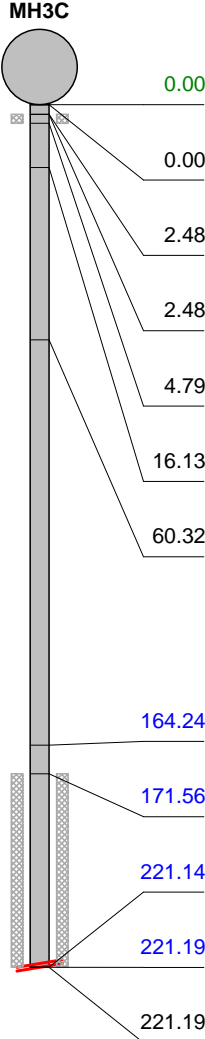
Inspection report

Date : 2019-09-18	Work Order : 57464	Weather : Dry	Surveyed By : Sewertech_DH	Certificate Number : U-513-17791	Pipe Segment Ref. : MH3C-2C3CLateral3
Year laid :	Pre-cleaning : Jetting	Direction : Upstream	Pipe Joint Length : 4.0	Total Length : 221.2	Length Surveyed : 221.2

City : Barrie	Drainage Area :	Upstream MH : 2C3C Lateral 3
Street : Ferndale Dr N	Media Label : 03	Up Rim to Invert : 0.0
Location Code : Other	Flow Control :	Downstream MH : MH3C
Location Details :	Sheet Number :	Down Rim to Invert : 0.0

Pipe shape: Circular	Sewer Use: Other
Pipe size: 150	Sewer Category : SEC
Pipe material: Polyethylene	Purpose: Routine Assessment
Lining Method :	Owner :

Additional Info :

1:1932	Distance	Code	Observation	Counter	Photo	Grade
						
	0.00	AMH	Manhole / MH3C	00:00:21		
	0.00	MWL	Water Level, 10% of cross sectional area	00:00:25		
	2.48 S01	MCU	Camera Underwater, Start	00:00:53		
	2.48	MWL	Water Level, 60% of cross sectional area	00:00:50		
	4.79 F01	MCU	Camera Underwater, Finish	00:01:04		M4
	16.13	MWL	Water Level, 5% of cross sectional area	00:01:57		
	60.32	MGP	General Photograph	00:05:04		
	164.24	DSF	Deposits Settled Fine, 5% of cross sectional area from 5 o'clock to 7 o'clock, within 200 mm	00:12:39		M2
	171.56 S02	DSF	Deposits Settled Fine, 5% of cross sectional area from 5 o'clock to 7 o'clock, within 200 mm, Start	00:13:11		
	221.14 F02	DSF	Deposits Settled Fine, 5% of cross sectional area from 5 o'clock to 7 o'clock, within 200 mm, Finish	00:22:52		M2
	221.19	OBR	Obstacles Rocks, 10% of cross sectional area at 6 o'clock	00:22:52		M2
	221.19	MSA	Survey Abandoned / Unable to pass Rock	00:22:53		

QSR	QMR	SPR	MPR	OPR	SPRI	MPRI	OPRI
0000	2A00	0.0	24.0	24.0	0.0	2.0	2.0

Section Pictures

City Barrie	Street Ferndale Dr N	Date 2019-09-18	Pipe Segment MH3C-2C3CLateral3	Nr. 13
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, 00:05:04, 60.32
General Photograph



, 00:05:04, 60.32
General Photograph

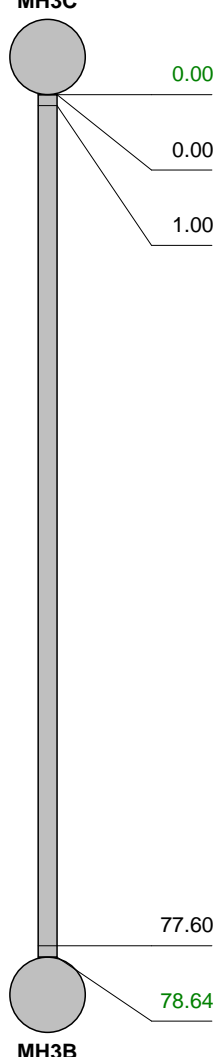
Inspection report

Date : 2019-09-18	Work Order : 57464	Weather : Dry	Surveyed By : Sewertech_DH	Certificate Number : U-513-17791	Pipe Segment Ref. : 3B3CWestheader
Year laid :	Pre-cleaning : Jetting	Direction : Downstream	Pipe Joint Length : 4.0	Total Length : 78.6	Length Surveyed : 78.6

City : Barrie	Drainage Area :	Upstream MH : MH3C
Street : Ferndale Dr N	Media Label : 03	Up Rim to Invert : 0.0
Location Code : Other	Flow Control :	Downstream MH : MH3B
Location Details :	Sheet Number :	Down Rim to Invert : 0.0

Pipe shape: Circular	Sewer Use: Other
Pipe size: 150	Sewer Category : SEC
Pipe material: Polyethylene	Purpose: Routine Assessment
Lining Method :	Owner :

Additional Info :

1:687	Distance	Code	Observation	Counter	Photo	Grade
						
	0.00	AMH	Manhole / MH3C	00:00:20		
	0.00	MWL	Water Level, 5% of cross sectional area	00:00:24		
	1.00	MGP	General Photograph / Inlet offset	00:00:42		
	77.60	MWL	Water Level, 25% of cross sectional area	00:06:16		
	78.64	AMH	Manhole / MH3B	00:06:33		
QSR	QMR	SPR	MPR	OPR	SPRI	MPRI
0000	0000	0.0	0.0	0.0	0.0	0.0

Section Pictures

City Barrie	Street Ferndale Dr N	Date 2019-09-18	Pipe Segment 3B3CWestheader	Nr. 14
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, 00:00:42, 1.00
General Photograph / Inlet offset

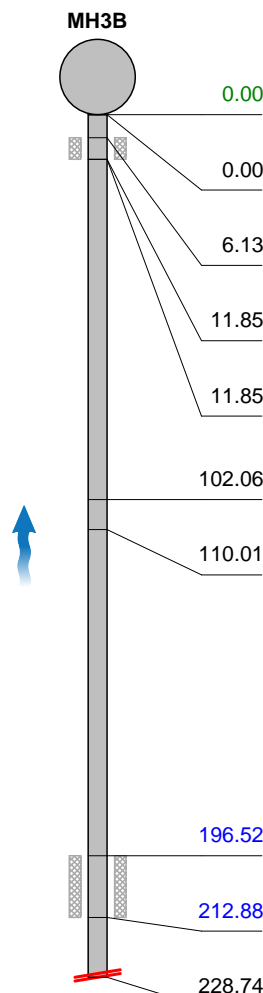
Inspection report

Date : 2019-09-18	Work Order : 57464	Weather : Dry	Surveyed By : Sewertech_DH	Certificate Number : U-513-17791	Pipe Segment Ref. : 2B3BLateral
Year laid :	Pre-cleaning : Jetting	Direction : Upstream	Pipe Joint Length : 4.0	Total Length : 228.7	Length Surveyed : 228.7

City : Barrie	Drainage Area :	Upstream MH : 2B3B Lateral
Street : Ferndale Dr N	Media Label : 03	Up Rim to Invert : 0.0
Location Code : Other	Flow Control :	Downstream MH : MH3B
Location Details :	Sheet Number :	Down Rim to Invert : 0.0

Pipe shape: Circular	Sewer Use: Other
Pipe size: 150	Sewer Category : SEC
Pipe material: Polyethylene	Purpose: Routine Assessment
Lining Method :	Owner :

Additional Info :

1:1998	Distance	Code	Observation	Counter	Photo	Grade
						
	0.00	AMH	Manhole / MH3B	00:00:27		
	0.00	MWL	Water Level, 25% of cross sectional area	00:00:31		
	6.13 S01	MCU	Camera Underwater, Start	00:01:12		
	11.85 F01	MCU	Camera Underwater, Finish	00:01:34		M4
	11.85	MWL	Water Level, 15% of cross sectional area	00:01:35		
	102.06	MWL	Water Level, 50% of cross sectional area	00:10:27		
	110.01	MWL	Water Level, 5% of cross sectional area	00:11:17		
	196.52 S02	DSF	Deposits Settled Fine, 5% of cross sectional area from 5 o'clock to 7 o'clock, within 200 mm, Start	00:22:09		
	212.88 F02	DSF	Deposits Settled Fine, 5% of cross sectional area from 5 o'clock to 7 o'clock, within 200 mm, Finish	00:26:28		M2
	228.74	MSA	Survey Abandoned / Unable to pass joint	00:33:36		

QSR	QMR	SPR	MPR	OPR	SPRI	MPRI	OPRI
0000	4123	0.0	10.0	10.0	0.0	2.5	2.5

Inspection report

Date : 2019-09-18	Work Order : 57464	Weather : Dry	Surveyed By : Sewertech_DH	Certificate Number : U-513-17791	Pipe Segment Ref. : MH3B-MH3BEXT
Year laid :	Pre-cleaning : Jetting	Direction : Downstream	Pipe Joint Length : 4.0	Total Length : 85.5	Length Surveyed : 85.5

City : Barrie	Drainage Area :	Upstream MH : MH3B
Street : Ferndale Dr N	Media Label : 03	Up Rim to Invert : 0.0
Location Code : Other	Flow Control :	Downstream MH : MH3B EXT
Location Details :	Sheet Number :	Down Rim to Invert : 0.0

Pipe shape: Circular	Sewer Use: Other
Pipe size: 150	Sewer Category : SEC
Pipe material: Polyethylene	Purpose: Routine Assessment
Lining Method :	Owner :

Additional Info :

1:747	Distance	Code	Observation	Counter	Photo	Grade
	0.00	AMH	Manhole / MH3B	00:00:27		
	0.00	MWL	Water Level, 5% of cross sectional area	00:00:30		
	85.50	AMH	Manhole / MH3BEXT	00:06:56		

QSR	QMR	SPR	MPR	OPR	SPRI	MPRI	OPRI
0000	0000	0.0	0.0	0.0	0.0	0.0	0.0

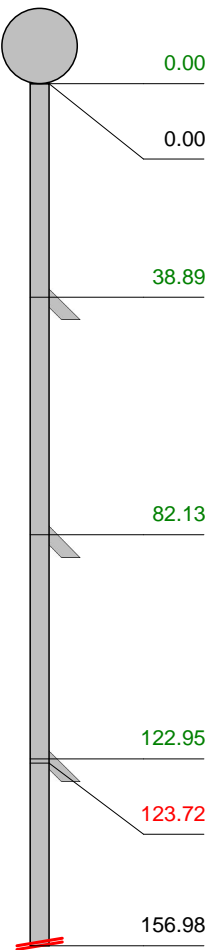
Inspection report

Date : 2019-09-18	Work Order : 57464	Weather : Dry	Surveyed By : Sewertech_DH	Certificate Number : U-513-17791	Pipe Segment Ref. : 3AMH-3ASouthHeader
Year laid :	Pre-cleaning : Jetting	Direction : Upstream	Pipe Joint Length : 4.0	Total Length : 157.0	Length Surveyed : 157.0

City : Barrie	Drainage Area :	Upstream MH : 3A South Header
Street : Ferndale Dr N	Media Label : 03	Up Rim to Invert : 0.0
Location Code : Other	Flow Control :	Downstream MH : 3AMH
Location Details :	Sheet Number :	Down Rim to Invert : 0.0

Pipe shape: Circular	Sewer Use: Other
Pipe size: 150	Sewer Category : SEC
Pipe material: Polyethylene	Purpose: Routine Assessment
Lining Method :	Owner :

Additional Info :

1:1372	Distance	Code	Observation	Counter	Photo	Grade
	0.00	AMH	Manhole / 3AMH	00:00:13		
	0.00	MWL	Water Level, 10% of cross sectional area	00:00:18		
	38.89	TF	Tap Factory Made at 9 o'clock, 150mm dim, within 200 mm / 3A Lateral2	00:03:24		
	82.13	TF	Tap Factory Made at 9 o'clock, 150mm dim / 3A Lateral 3	00:06:49		
	122.95	TF	Tap Factory Made at 9 o'clock, 150mm dim, within 200 mm / 3A Lateral 4	00:09:54		
	123.72	D	Deformed, 5% changed	00:10:54		S4
	156.98	MSA	Survey Abandoned / Unable to pass Electrofusion Coupling	00:13:51		

QSR	QMR	SPR	MPR	OPR	SPRI	MPRI	OPRI
4100	0000	4.0	0.0	4.0	4.0	0.0	4.0

Section Pictures

City	Street	Date	Pipe Segment	Nr.
Barrie	Ferndale Dr N	2019-09-18	3AMH-3ASouthHeader	17



, 00:10:54, 123.72
Deformed, 5% changed

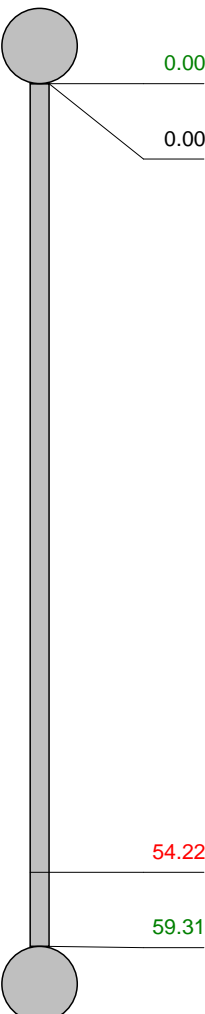
Inspection report

Date : 2019-09-18	Work Order : 57464	Weather : Dry	Surveyed By : Sewertech_DH	Certificate Number : U-513-17791	Pipe Segment Ref. : 3AMH-3AWestHeader
Year laid :	Pre-cleaning : Jetting	Direction : Downstream	Pipe Joint Length : 4.0	Total Length : 59.3	Length Surveyed : 59.3

City : Barrie	Drainage Area :	Upstream MH : 3A West Header
Street : Ferndale Dr N	Media Label : 03	Up Rim to Invert : 0.0
Location Code : Other	Flow Control :	Downstream MH : 3AMH
Location Details :	Sheet Number :	Down Rim to Invert : 0.0

Pipe shape: Circular	Sewer Use: Other
Pipe size: 150	Sewer Category : SEC
Pipe material: Polyethylene	Purpose: Routine Assessment
Lining Method :	Owner :

Additional Info :

1:518	Distance	Code	Observation	Counter	Photo	Grade
3A West Header						
	0.00	AMH	Manhole / 3AMH	00:00:15		
	0.00	MWL	Water Level, 5% of cross sectional area	00:00:23		
	54.22	D	Deformed, 5% changed	00:05:13		S4
	59.31	AEP	End of Pipe / 3A Lateral 1	00:05:43		
3AMH						

QSR	QMR	SPR	MPR	OPR	SPRI	MPRI	OPRI
4100	0000	4.0	0.0	4.0	4.0	0.0	4.0

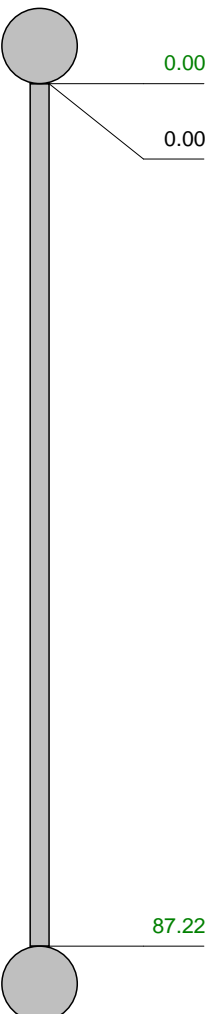
Inspection report

Date : 2019-09-19	Work Order : 57465	Weather : Dry	Surveyed By : Sewertech_DH	Certificate Number : U-513-17791	Pipe Segment Ref. : PW3-PW4
Year laid :	Pre-cleaning : Jetting	Direction : Upstream	Pipe Joint Length : 4.0	Total Length : 87.2	Length Surveyed : 87.2

City : Barrie	Drainage Area :	Upstream MH : PW4
Street : Ferndale Dr N	Media Label : 04	Up Rim to Invert : 0.0
Location Code : Other	Flow Control :	Downstream MH : PW3
Location Details :	Sheet Number :	Down Rim to Invert : 0.0

Pipe shape: Circular	Sewer Use: Other
Pipe size: 150	Sewer Category : SEC
Pipe material: Polyethylene	Purpose: Routine Assessment
Lining Method :	Owner :

Additional Info :

1:762	Distance	Code	Observation	Counter	Photo	Grade
	0.00	AMH	Manhole / PW3	00:00:11		
	0.00	MWL	Water Level, 0% of cross sectional area	00:00:18		
	87.22	AMH	Manhole / PW4	00:07:46		

QSR	QMR	SPR	MPR	OPR	SPRI	MPRI	OPRI
0000	0000	0.0	0.0	0.0	0.0	0.0	0.0

Inspection report

Date : 2019-09-19	Work Order : 57465	Weather : Dry	Surveyed By : Sewertech_DH	Certificate Number : U-513-17791	Pipe Segment Ref. : PW3-PW2
Year laid :	Pre-cleaning : Jetting	Direction : Downstream	Pipe Joint Length : 4.0	Total Length : 84.8	Length Surveyed : 84.8

City :	Barrie	Drainage Area :		Upstream MH :	PW3
Street :	Ferndale Dr N	Media Label :	04	Up Rim to Invert :	0.0
Location Code :	Other	Flow Control :		Downstream MH :	PW2
Location Details :		Sheet Number :		Down Rim to Invert :	0.0

Pipe shape:	Circular	Sewer Use:	Other
Pipe size:	150	Sewer Category :	SEC
Pipe material:	Polyethylene	Purpose:	Routine Assessment
Lining Method :		Owner :	

Additional Info :

1:741	Distance	Code	Observation	Counter	Photo	Grade
	0.00	AMH	Manhole / PW3	00:00:14		
	0.00	MWL	Water Level, 0% of cross sectional area	00:00:17		
	84.75	AMH	Manhole / PW2	00:06:29		

QSR	QMR	SPR	MPR	OPR	SPRI	MPRI	OPRI
0000	0000	0.0	0.0	0.0	0.0	0.0	0.0

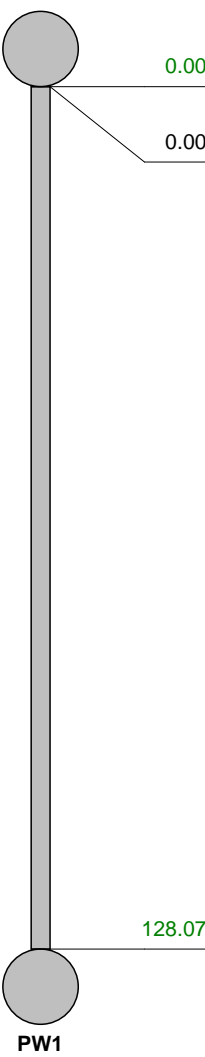
Inspection report

Date : 2019-09-19	Work Order : 57465	Weather : Dry	Surveyed By : Sewertech_DH	Certificate Number : U-513-17791	Pipe Segment Ref. : MH4-PW1
Year laid :	Pre-cleaning : Jetting	Direction : Upstream	Pipe Joint Length : 4.0	Total Length : 128.1	Length Surveyed : 128.1

City : Barrie	Drainage Area :	Upstream MH : PW1
Street : Ferndale Dr N	Media Label : 04	Up Rim to Invert : 0.0
Location Code : Other	Flow Control :	Downstream MH : MH4
Location Details :	Sheet Number :	Down Rim to Invert : 0.0

Pipe shape: Circular	Sewer Use: Other
Pipe size: 150	Sewer Category : SEC
Pipe material: Polyethylene	Purpose: Routine Assessment
Lining Method :	Owner :

Additional Info :

1:1119	Distance	Code	Observation	Counter	Photo	Grade	
	0.00	AMH	Manhole / MH4	00:00:12			
	0.00	MWL	Water Level, 0% of cross sectional area	00:00:14			
	128.07	AMH	Manhole / PW1	00:09:46			
QSR	QMR	SPR	MPR	OPR	SPRI	MPRI	OPRI
0000	0000	0.0	0.0	0.0	0.0	0.0	0.0

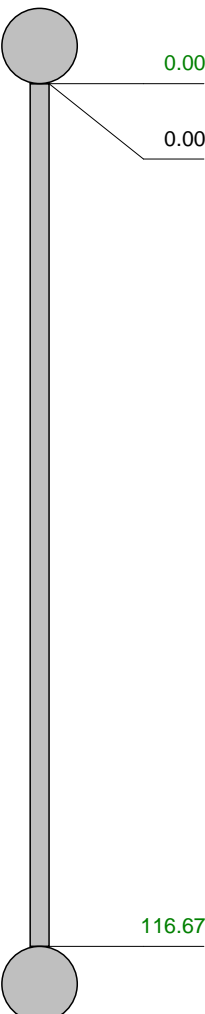
Inspection report

Date : 2019-09-19	Work Order : 57465	Weather : Dry	Surveyed By : Sewertech_DH	Certificate Number : U-513-17791	Pipe Segment Ref. : MH4-MH3BEXT
Year laid :	Pre-cleaning : Jetting	Direction : Upstream	Pipe Joint Length : 4.0	Total Length : 116.7	Length Surveyed : 116.7

City : Barrie	Drainage Area :	Upstream MH : MH3B EXT
Street : Ferndale Dr N	Media Label : 04	Up Rim to Invert : 0.0
Location Code : Other	Flow Control :	Downstream MH : MH4
Location Details :	Sheet Number :	Down Rim to Invert : 0.0

Pipe shape: Circular	Sewer Use: Other
Pipe size: 150	Sewer Category : SEC
Pipe material: Polyethylene	Purpose: Routine Assessment
Lining Method :	Owner :

Additional Info :

1:1019	Distance	Code	Observation	Counter	Photo	Grade
	0.00	AMH	Manhole / MH4	00:00:08		
	0.00	MWL	Water Level, 0% of cross sectional area	00:00:12		
	116.67	AMH	Manhole / MH3BEXT	00:12:46		

QSR	QMR	SPR	MPR	OPR	SPRI	MPRI	OPRI
0000	0000	0.0	0.0	0.0	0.0	0.0	0.0

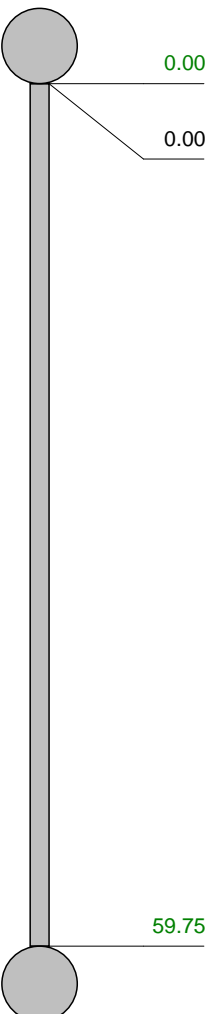
Inspection report

Date : 2019-09-19	Work Order : 57465	Weather : Dry	Surveyed By : Sewertech_DH	Certificate Number : U-513-17791	Pipe Segment Ref. : MH4-MH3A
Year laid :	Pre-cleaning : Jetting	Direction : Upstream	Pipe Joint Length : 4.0	Total Length : 59.8	Length Surveyed : 59.8

City : Barrie	Drainage Area :	Upstream MH : MH3A
Street : Ferndale Dr N	Media Label : 04	Up Rim to Invert : 0.0
Location Code : Other	Flow Control :	Downstream MH : MH4
Location Details :	Sheet Number :	Down Rim to Invert : 0.0

Pipe shape: Circular	Sewer Use: Other
Pipe size: 150	Sewer Category : SEC
Pipe material: Polyethylene	Purpose: Routine Assessment
Lining Method :	Owner :

Additional Info :

1:522	Distance	Code	Observation	Counter	Photo	Grade
MH4						
	0.00	AMH	Manhole / MH4	00:00:13		
	0.00	MWL	Water Level, 10% of cross sectional area	00:00:16		
	59.75	AMH	Manhole / MH3A	00:04:40		
MH3A						

QSR	QMR	SPR	MPR	OPR	SPRI	MPRI	OPRI
0000	0000	0.0	0.0	0.0	0.0	0.0	0.0

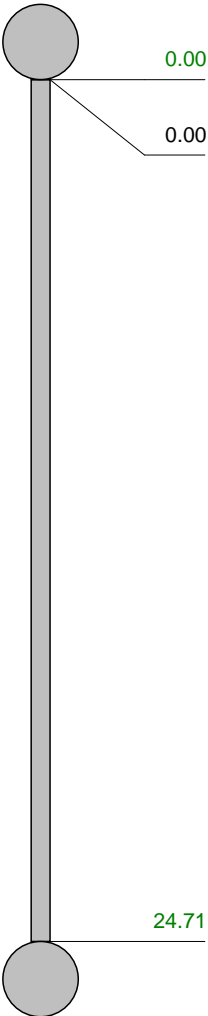
Inspection report

Date : 2019-09-19	Work Order : 57465	Weather : Dry	Surveyed By : Sewertech_DH	Certificate Number : U-513-17791	Pipe Segment Ref. : MH4-MHA
Year laid :	Pre-cleaning : Jetting	Direction : Downstream	Pipe Joint Length : 4.0	Total Length : 24.7	Length Surveyed : 24.7

City :	Barrie	Drainage Area :		Upstream MH :	MH4
Street :	Ferndale Dr N	Media Label :	04	Up Rim to Invert :	0.0
Location Code :	Other	Flow Control :		Downstream MH :	MHA
Location Details :		Sheet Number :		Down Rim to Invert :	0.0

Pipe shape:	Circular	Sewer Use:	Other
Pipe size:	150	Sewer Category :	SEC
Pipe material:	Polyethylene	Purpose:	Routine Assessment
Lining Method :		Owner :	

Additional Info :

1:216	Distance	Code	Observation	Counter	Photo	Grade
	0.00	AMH	Manhole / MH4	00:00:12		
	0.00	MWL	Water Level, 5% of cross sectional area	00:00:14		
	24.71	AMH	Manhole / MHA	00:02:02		

QSR	QMR	SPR	MPR	OPR	SPRI	MPRI	OPRI
0000	0000	0.0	0.0	0.0	0.0	0.0	0.0

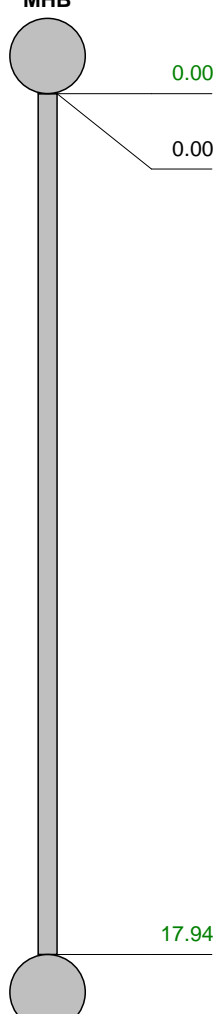
Inspection report

Date : 2019-09-19	Work Order : 57465	Weather : Dry	Surveyed By : Sewertech_DH	Certificate Number : U-513-17791	Pipe Segment Ref. : MHB-MHA
Year laid :	Pre-cleaning : Jetting	Direction : Upstream	Pipe Joint Length : 4.0	Total Length : 17.9	Length Surveyed : 17.9

City : Barrie	Drainage Area :	Upstream MH : MHA
Street : Ferndale Dr N	Media Label : 04	Up Rim to Invert : 0.0
Location Code : Other	Flow Control :	Downstream MH : MHB
Location Details :	Sheet Number :	Down Rim to Invert : 0.0

Pipe shape: Circular	Sewer Use: Other
Pipe size: 150	Sewer Category : SEC
Pipe material: Polyethylene	Purpose: Routine Assessment
Lining Method :	Owner :

Additional Info :

1:157	Distance	Code	Observation	Counter	Photo	Grade																					
<div style="display: flex; align-items: center;"> <div style="margin-right: 10px;">  </div> <table> <tr> <td></td><td>0.00</td><td>AMH</td><td>Manhole / MH4</td><td>00:00:11</td><td></td><td></td></tr> <tr> <td></td><td>0.00</td><td>MWL</td><td>Water Level, 5% of cross sectional area</td><td>00:00:14</td><td></td><td></td></tr> <tr> <td></td><td>17.94</td><td>AMH</td><td>Manhole / MHA</td><td>00:01:35</td><td></td><td></td></tr> </table> </div>								0.00	AMH	Manhole / MH4	00:00:11				0.00	MWL	Water Level, 5% of cross sectional area	00:00:14				17.94	AMH	Manhole / MHA	00:01:35		
	0.00	AMH	Manhole / MH4	00:00:11																							
	0.00	MWL	Water Level, 5% of cross sectional area	00:00:14																							
	17.94	AMH	Manhole / MHA	00:01:35																							
<div style="display: flex; justify-content: space-between;"> MHB </div>																											
<div style="display: flex; justify-content: space-between;"> MHA </div>																											

QSR	QMR	SPR	MPR	OPR	SPRI	MPRI	OPRI
0000	0000	0.0	0.0	0.0	0.0	0.0	0.0

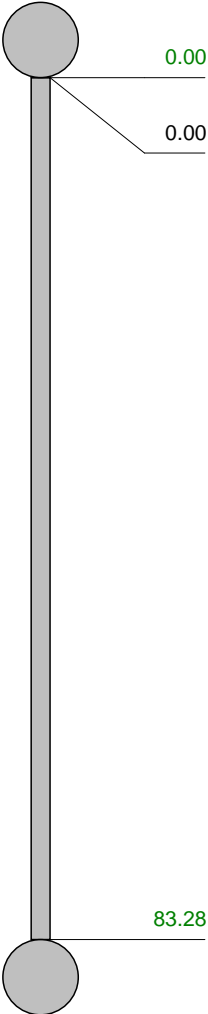
Inspection report

Date : 2019-09-19	Work Order : 57465	Weather : Dry	Surveyed By : Sewertech_DH	Certificate Number : U-513-17791	Pipe Segment Ref. : MHB-MHC
Year laid :	Pre-cleaning : Jetting	Direction : Downstream	Pipe Joint Length : 4.0	Total Length : 83.3	Length Surveyed : 83.3

City :	Barrie	Drainage Area :		Upstream MH :	MHB
Street :	Ferndale Dr N	Media Label :	04	Up Rim to Invert :	0.0
Location Code :	Other	Flow Control :		Downstream MH :	MHC
Location Details :		Sheet Number :		Down Rim to Invert :	0.0

Pipe shape:	Circular	Sewer Use:	Other
Pipe size:	150	Sewer Category :	SEC
Pipe material:	Polyethylene	Purpose:	Routine Assessment
Lining Method :		Owner :	

Additional Info :

1:728	Distance	Code	Observation	Counter	Photo	Grade
	0.00	AMH	Manhole / mhb	00:00:13		
	0.00	MWL	Water Level, 5% of cross sectional area	00:00:17		
	83.28	AMH	Manhole / MHC	00:05:59		

QSR	QMR	SPR	MPR	OPR	SPRI	MPRI	OPRI
0000	0000	0.0	0.0	0.0	0.0	0.0	0.0

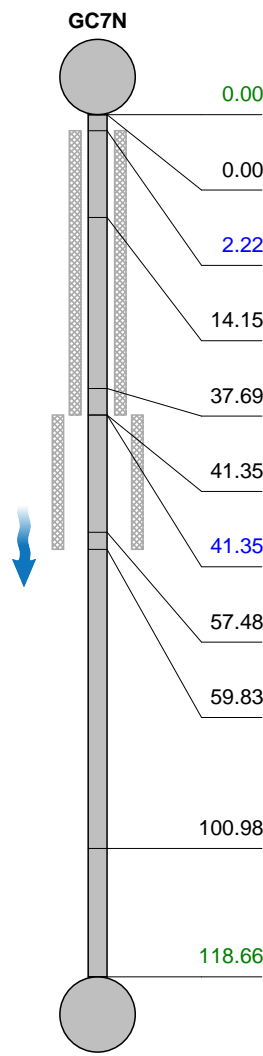
Inspection report

Date : 2019-09-19	Work Order : 57465	Weather : Dry	Surveyed By : Sewertech_DH	Certificate Number : U-513-17791	Pipe Segment Ref. : GC7N-GC5N
Year laid :	Pre-cleaning : Jetting	Direction : Downstream	Pipe Joint Length : 4.0	Total Length : 118.7	Length Surveyed : 118.7

City : Barrie	Drainage Area :	Upstream MH : GC7N
Street : Ferndale Dr N	Media Label : 04	Up Rim to Invert : 0.0
Location Code : Other	Flow Control :	Downstream MH : GC5N
Location Details :	Sheet Number :	Down Rim to Invert : 0.0

Pipe shape: Circular	Sewer Use: Other
Pipe size: 200	Sewer Category : SEC
Pipe material: Polyethylene	Purpose: Routine Assessment
Lining Method :	Owner :

Additional Info :

1:1037	Distance	Code	Observation	Counter	Photo	Grade
						
	0.00	AMH	Manhole / GC7	00:00:00		
	0.00	MWL	Water Level, 10% of cross sectional area	00:00:00		
	2.22 S01	DAE	Deposits Attached Encrustation, 5% of cross sectional area from 7 o'clock to 5 o'clock, within 200 mm, Start	00:00:51		
	14.15	MWL	Water Level, 20% of cross sectional area	00:01:56		
	37.69	MWL	Water Level, 40% of cross sectional area	00:04:03		
	41.35 S02	MCU	Camera Underwater, Start	00:04:21		
	41.35 F01	DAE	Deposits Attached Encrustation, 5% of cross sectional area from 7 o'clock to 5 o'clock, within 200 mm, Finish	00:04:23		M2
	57.48	MWL	Water Level, 10% of cross sectional area	00:05:34		
	59.83 F02	MCU	Camera Underwater, Finish	00:05:57		M4
	100.98	MWL	Water Level, 30% of cross sectional area	00:09:48		
	118.66	AMH	Manhole / GC5	00:11:31		

QSR	QMR	SPR	MPR	OPR	SPRI	MPRI	OPRI
0000	4428	0.0	32.0	32.0	0.0	2.7	2.7

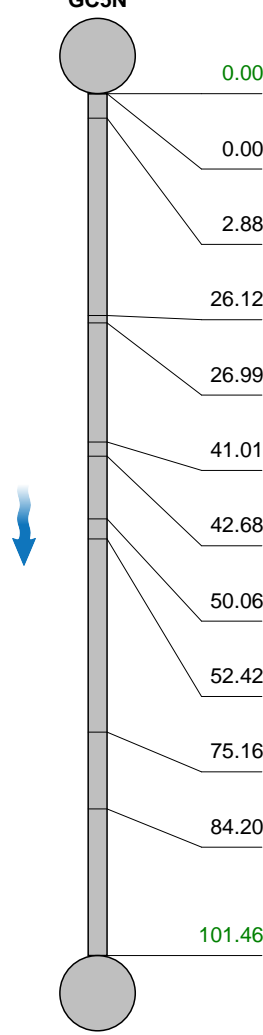
Inspection report

Date : 2019-09-20	Work Order : 57466	Weather : Dry	Surveyed By : Sewertech_DH	Certificate Number : U-513-17791	Pipe Segment Ref. : GC5N-GC4
Year laid :	Pre-cleaning : Jetting	Direction : Downstream	Pipe Joint Length : 4.0	Total Length : 101.5	Length Surveyed : 101.5

City : Barrie	Drainage Area :	Upstream MH : GC5N
Street : Ferndale Dr N	Media Label : 05	Up Rim to Invert : 0.0
Location Code : Other	Flow Control :	Downstream MH : GC4
Location Details :	Sheet Number :	Down Rim to Invert : 0.0

Pipe shape: Circular	Sewer Use: Other
Pipe size: 200	Sewer Category : SEC
Pipe material: Polyethylene	Purpose: Routine Assessment
Lining Method :	Owner :

Additional Info :

1:887	Distance	Code	Observation	Counter	Photo	Grade
GC5N						
	0.00	AMH	Manhole / GC5N	00:00:23		
	0.00	MWL	Water Level, 30% of cross sectional area	00:00:26		
	2.88	MWL	Water Level, 10% of cross sectional area	00:00:52		
	26.12	MWL	Water Level, 45% of cross sectional area	00:02:50		
	26.99	MWL	Water Level, 15% of cross sectional area	00:02:54		
	41.01	MWLS	Water Level, Sag in pipe, 40% of cross sectional area	00:04:01		S3
	42.68	MWL	Water Level, 15% of cross sectional area	00:04:09		
	50.06	MWL	Water Level, 45% of cross sectional area	00:04:44		
	52.42	MWL	Water Level, 15% of cross sectional area	00:04:57		
	75.16	MWL	Water Level, 30% of cross sectional area	00:06:50		
	84.20	MWL	Water Level, 10% of cross sectional area	00:08:02		
	101.46	AMH	Manhole / GC4	00:09:23		
GC4						

QSR	QMR	SPR	MPR	OPR	SPRI	MPRI	OPRI
3100	0000	3.0	0.0	3.0	3.0	0.0	3.0

Inspection report

Date : 2019-09-20	Work Order : 57466	Weather : Dry	Surveyed By : Sewertech_DH	Certificate Number : U-513-17791	Pipe Segment Ref. : G4C-GC4N
Year laid :	Pre-cleaning : Jetting	Direction : Downstream	Pipe Joint Length : 4.0	Total Length : 9.4	Length Surveyed : 9.4

City :	Barrie	Drainage Area :		Upstream MH :	GC4
Street :	Ferndale Dr N	Media Label :	05	Up Rim to Invert :	0.0
Location Code :	Other	Flow Control :		Downstream MH :	GC4N
Location Details :		Sheet Number :		Down Rim to Invert :	0.0

Pipe shape:	Circular	Sewer Use:	Other
Pipe size:	200	Sewer Category :	SEC
Pipe material:	Polyethylene	Purpose:	Routine Assessment
Lining Method :		Owner :	

Additional Info :

1:82	Distance	Code	Observation	Counter	Photo	Grade
	0.00	AMH	Manhole / GC4	00:00:11		
	0.00	MWL	Water Level, 10% of cross sectional area	00:00:19		
	9.36	AMH	Manhole / GC4N	00:01:25		

QSR	QMR	SPR	MPR	OPR	SPRI	MPRI	OPRI
0000	0000	0.0	0.0	0.0	0.0	0.0	0.0

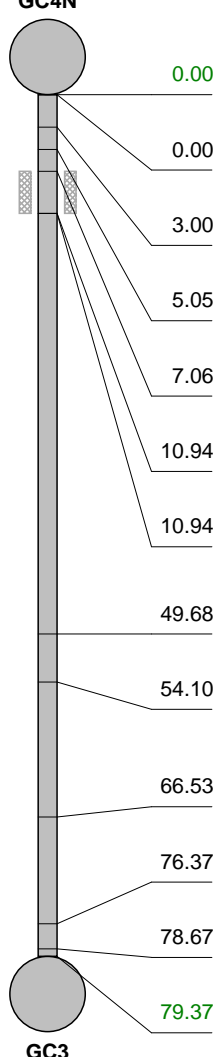
Inspection report

Date : 2019-09-20	Work Order : 57466	Weather : Dry	Surveyed By : Sewertech_DH	Certificate Number : U-513-17791	Pipe Segment Ref. : GC4N-GC3
Year laid :	Pre-cleaning : Jetting	Direction : Downstream	Pipe Joint Length : 4.0	Total Length : 79.4	Length Surveyed : 79.4

City : Barrie	Drainage Area :	Upstream MH : GC4N
Street : Ferndale Dr N	Media Label : 05	Up Rim to Invert : 0.0
Location Code : Other	Flow Control :	Downstream MH : GC3
Location Details :	Sheet Number :	Down Rim to Invert : 0.0

Pipe shape: Circular	Sewer Use: Other
Pipe size: 200	Sewer Category : SEC
Pipe material: Polyethylene	Purpose: Routine Assessment
Lining Method :	Owner :

Additional Info :

1:694	Distance	Code	Observation	Counter	Photo	Grade
						
	0.00	AMH	Manhole / GC4N	00:00:09		
	0.00	MWL	Water Level, 10% of cross sectional area	00:00:18		
	3.00	MWL	Water Level, 35% of cross sectional area	00:00:46		
	5.05	MWL	Water Level, 90% of cross sectional area	00:00:58		
	7.06	S01 MCU	Camera Underwater, Start	00:01:11		
	10.94	F01 MCU	Camera Underwater, Finish	00:01:31		M4
	10.94	MWL	Water Level, 20% of cross sectional area	00:01:34		
	49.68	MWL	Water Level, 60% of cross sectional area	00:04:11		
	54.10	MCU	Camera Underwater	00:04:50		M4
	66.53	MWL	Water Level, 15% of cross sectional area	00:06:12		
	76.37	MWL	Water Level, 50% of cross sectional area	00:07:07		
	78.67	MWL	Water Level, 10% of cross sectional area	00:07:27		
	79.37	AMH	Manhole / GC3	00:07:34		
QSR	QMR	SPR	MPR	OPR	SPRI	MPRI
0000	4200	0.0	8.0	8.0	0.0	4.0

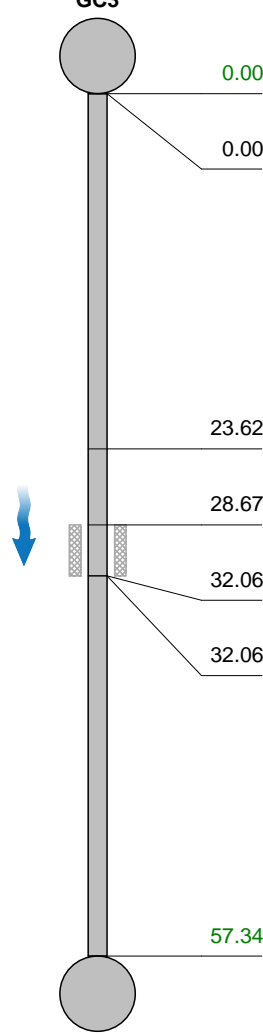
Inspection report

Date : 2019-09-20	Work Order : 57466	Weather : Dry	Surveyed By : Sewertech_DH	Certificate Number : U-513-17791	Pipe Segment Ref. : GC3-GC2
Year laid :	Pre-cleaning : Jetting	Direction : Downstream	Pipe Joint Length : 4.0	Total Length : 57.3	Length Surveyed : 57.3

City : Barrie	Drainage Area :	Upstream MH : GC3
Street : Ferndale Dr N	Media Label : 05	Up Rim to Invert : 0.0
Location Code : Other	Flow Control :	Downstream MH : GC2
Location Details :	Sheet Number :	Down Rim to Invert : 0.0

Pipe shape: Circular	Sewer Use: Other
Pipe size: 200	Sewer Category : SEC
Pipe material: Polyethylene	Purpose: Routine Assessment
Lining Method :	Owner :

Additional Info :

1:501	Distance	Code	Observation	Counter	Photo	Grade
	0.00	AMH	Manhole / GC3	00:00:00		
	0.00	MWL	Water Level, 15% of cross sectional area	00:00:17		
	23.62	MWL	Water Level, 80% of cross sectional area	00:02:04		
	28.67	S01	MCU	Camera Underwater, Start	00:02:12	
	32.06	F01	MCU	Camera Underwater, Finish	00:02:29	M4
	32.06	MWL	Water Level, 25% of cross sectional area	00:02:31		
	57.34	AMH	Manhole / GC2	00:04:26		

QSR	QMR	SPR	MPR	OPR	SPRI	MPRI	OPRI
0000	4100	0.0	4.0	4.0	0.0	4.0	4.0

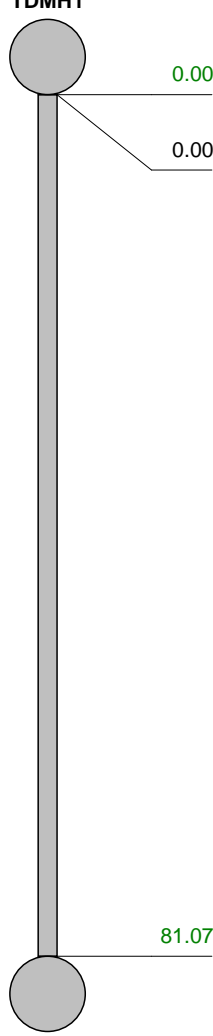
Inspection report

Date : 2019-09-20	Work Order : 57466	Weather : Dry	Surveyed By : Sewertech_DH	Certificate Number : U-513-17791	Pipe Segment Ref. : TDMH1-TDMH2
Year laid :	Pre-cleaning : Jetting	Direction : Upstream	Pipe Joint Length : 4.0	Total Length : 81.1	Length Surveyed : 81.1

City : Barrie	Drainage Area :	Upstream MH : TDMH2
Street : Ferndale Dr N	Media Label : 05	Up Rim to Invert : 0.0
Location Code : Other	Flow Control :	Downstream MH : TDMH1
Location Details :	Sheet Number :	Down Rim to Invert : 0.0

Pipe shape: Circular	Sewer Use: Other
Pipe size: 300	Sewer Category : SEC
Pipe material: Polyethylene	Purpose: Routine Assessment
Lining Method :	Owner :

Additional Info :

1:709	Distance	Code	Observation	Counter	Photo	Grade																												
<div style="display: flex; align-items: center;"> <div style="margin-right: 10px;">  </div> <table> <tr> <td>TDMH1</td><td>0.00</td><td>AMH</td><td>Manhole / TDMH1</td><td>00:00:09</td><td></td><td></td></tr> <tr> <td></td><td>0.00</td><td>MWL</td><td>Water Level, 5% of cross sectional area</td><td>00:00:12</td><td></td><td></td></tr> <tr> <td></td><td>81.07</td><td>AMH</td><td>Manhole / TDMH2</td><td>00:06:04</td><td></td><td></td></tr> <tr> <td>TDMH2</td><td></td><td></td><td></td><td></td><td></td><td></td></tr> </table> </div>							TDMH1	0.00	AMH	Manhole / TDMH1	00:00:09				0.00	MWL	Water Level, 5% of cross sectional area	00:00:12				81.07	AMH	Manhole / TDMH2	00:06:04			TDMH2						
TDMH1	0.00	AMH	Manhole / TDMH1	00:00:09																														
	0.00	MWL	Water Level, 5% of cross sectional area	00:00:12																														
	81.07	AMH	Manhole / TDMH2	00:06:04																														
TDMH2																																		
QSR	QMR	SPR	MPR	OPR	SPRI	MPRI																												
0000	0000	0.0	0.0	0.0	0.0	0.0																												

Inspection report

Date : 2019-09-20	Work Order : 57466	Weather : Dry	Surveyed By : Sewertech_DH	Certificate Number : U-513-17791	Pipe Segment Ref. : TDMH1-GC2
Year laid :	Pre-cleaning : Jetting	Direction : Downstream	Pipe Joint Length : 4.0	Total Length : 78.1	Length Surveyed : 78.1

City : Barrie	Drainage Area :	Upstream MH : TDMH1
Street : Ferndale Dr N	Media Label : 05	Up Rim to Invert : 0.0
Location Code : Other	Flow Control :	Downstream MH : GC2
Location Details :	Sheet Number :	Down Rim to Invert : 0.0

Pipe shape: Circular	Sewer Use: Other
Pipe size: 300	Sewer Category : SEC
Pipe material: Polyethylene	Purpose: Routine Assessment
Lining Method :	Owner :

Additional Info :

1:682	Distance	Code	Observation	Counter	Photo	Grade
<div><div><div><div><div><div></div><div>TDMH1</div></div><div><div></div><div>0.00</div></div><div><div></div><div>0.00</div></div><div><div></div><div>78.07</div></div></div><div><div></div><div>GC2</div></div></div><div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><di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Inspection report

Date : 2019-09-20	Work Order : 57466	Weather : Dry	Surveyed By : Sewertech_DH	Certificate Number : U-513-17791	Pipe Segment Ref. : GC2-GC1
Year laid :	Pre-cleaning : Jetting	Direction : Downstream	Pipe Joint Length : 4.0	Total Length : 79.8	Length Surveyed : 79.8

City : Barrie	Drainage Area :	Upstream MH : GC2
Street : Ferndale Dr N	Media Label : 05	Up Rim to Invert : 0.0
Location Code : Other	Flow Control :	Downstream MH : GC1
Location Details :	Sheet Number :	Down Rim to Invert : 0.0

Pipe shape: Circular	Sewer Use: Other
Pipe size: 300	Sewer Category : SEC
Pipe material: Polyethylene	Purpose: Routine Assessment
Lining Method :	Owner :

Additional Info :

1:698	Distance	Code	Observation	Counter	Photo	Grade	
							
	0.00	AMH	Manhole / GC2	00:00:24			
	0.00	MWL	Water Level, 5% of cross sectional area	00:00:30			
	79.84	AMH	Manhole / GC1	00:05:21			
QSR	QMR	SPR	MPR	OPR	SPRI	MPRI	OPRI
0000	0000	0.0	0.0	0.0	0.0	0.0	0.0



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