



Water and Waste Department • Service des eaux et des déchets

Summit Landfill Soil Fabrication Pilot Project

Year Two Phase Two Interim Report

January 2020

Prepared For:

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Introduction

On May 7, 2018 the City of Winnipeg, Solid Waste Services (SWS) received approval from Manitoba Sustainable Development (MSD), now Manitoba Conservation and Climate (MCC) for the three year Summit Soil Fabrication pilot project, 2018-2020, examining the viability of fabricating soil with biosolids to complete the cap system at Summit Landfill. This interim report covers the activities of Year Two Phase Two (Y2P2). The main goals for Y2P2 were to test doubling the timeframe of biosolids managed to two months and test operations in wet weather conditions.

The main findings from Y2P2 are:

- Soil fabrication can successfully manage two months' worth of biosolids; and
- Soil fabrication is possible in wet weather conditions; and
- Fabricated soil windrows can be effectively mixed and spread using a dozer.

Activities since Year Two Phase One (Y2P1)

Wood and Wood chips

Wood chipping operations continued at Summit Landfill. All wood chips from this operation were directed to the soil fabrication pilot project. City crews and contractors also dumped wood chips at Summit in designated areas. Wood chip volumes on site were reviewed prior to the start of Y2P2 and it was determined there was enough to meet the needs of the first month of operations at approximately 8,000m³. Woodchips continued to be brought to site throughout the operational phase, and chipping operations continued through the operational phase.

Seeding and Vegetation Monitoring of Y1P1 Plot

Approximately 2.5 ha of spread soil from Y1P1 were seeded with oats the week of April 22nd, 2019. It was intended to use a tractor and broadcast seeder to seed the area but the soil was too soft and spongy to drive on with the machine. Consequently the plot was hand seeded and an ATV was used to harrow and pack the site. The plot was mowed multiple times through the season to minimize self-seeding in anticipation of overseeding with native grasses and forbes for the 2020 growing season.

Mixing and Spreading of Y1P2, Y2P1 Windrows

Windrowed soil in Y1P1 and Y2P1 were prepared in order to be mixed with a windrow turner, and spread with a dozer before seeding. It was determined that the number of large rocks in the material was too high a risk of damaging a windrow turner. Six windrows were pushed and spread with a dozer to



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assess the resulting soil. An agriculture disc was used to further turn the top 15-30 cm of soil. After further review and a site inspection by SYLVIS Environmental in the fall of 2019, initial observations indicate that a dozer is an adequate tool to mix, spread and prepare fabricated soil. Assessment of vegetation establishment in 2020 and soil sampling results will provide further information regarding the effectiveness of this method.

Environmental Monitoring

Wood chip stockpiles and fabricated soil windrow temperatures continue to be taken on an as needed basis. Due to winter weather conditions, most windrows were frozen. No odour was detected from the windrows.

Biosolids Emergency Receiving Operation

On September 11, 2019, SWS received approval from MCC to accept biosolids at Summit Landfill for inclusion in Y2P2, for a maximum of 960 wet tonnes. Due to a historically wet September and the resulting issues with accessibility, biosolids could not be received at the land application location, or at the Brady Road Resource Management Facility. Biosolids were received at Summit and preliminary mixed over four days, September 11-15th, for a total of 706.52 tonnes.

October Snow Storm Response

From October 11 to 14, Winnipeg received over 23cm of snow. Due to the heavy, wet nature of the snow, and trees still having all their leaves, there was a large volume of tree debris. As part of the response to this storm, Summit Landfill was designated as one of the end points for wood waste. A 3.8 hectare granular pad was built to receive, grind and manage wood waste. A residential drop off area was set up, which was managed by a City traffic director. Summit Safety and Emergency Response Guidelines were updated to reflect the changes on site. Summit also received woodchips from other storm wood waste management sites. All wood waste received at Summit from the storm is being used on site for soil fabrication.

Operations

The biosolids receiving operation phase started on September 26th, 2019 and was completed November 29th, 2019. Over the course of this operational phase, 8,919.32 tonnes of biosolids were received at Summit Landfill and mixed into an initial soil blend. With the 706.52 tonnes from the September emergency operation, a total of 9,625.84 tonnes of biosolids were managed at Summit Landfill in Y2P2. All biosolids produced during the operational phase were accepted in the soil fabrication process. Site layout from the operation can be found in Appendix A.



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The soil blend of 1(biosolids):2(wood chips):3(sweepings) was continued in this phase. At this ratio, Y2P2 operations produced, in theory 57,755.04 m³ of top soil. However, due to the nature of the material the mixed volume is lower. With mixing, spreading and settlement, it is anticipated that the total volume also reduces over time. Volumes are tracked with regular drone scans to gain more information on end soil volumes.

Operations were possible in wet weather conditions. This included a total of 125.3 mm of precipitation in September and a total of 56.4mm during the biosolids accepting phase. Operations moved to different areas depending on the surface conditions. Main impacts to operations included:

- Wet conditions caused windrow building locations to become very rutted, and difficult for the loader operator to traverse. Moving the location every week gave the ground time to harden.
- A bulldozer was used to clean up the ruts and remove loose mud on top of the cap around feedstocks, so that the loaders could continue to move in and around these areas.
- Certain low lying areas of the site were inaccessible until temperatures dropped and remained below 0 °C.

Next Steps

Windrows, including Y2P1 and Y2P2, will continue to be spread with the dozer. The spread soil will be seeded by Naturalist Services Branch. Depending on conditions, some areas of spread soil will be seeded in late winter, with the rest seeded in spring.

Soil samples will be taken in spring. Environmental monitoring, including surface water sampling and vegetation monitoring will proceed over the spring and summer months.

Environmental Results

Odour

Biosolids odour was detected in the biosolids dumping area while biosolids were being dumped. Odours were observed to be reduced after mixing biosolids with woodchips and street sweepings. No odours were detected offsite during the biosolids receiving operations.

Soil

Due to a delay in spreading, only Y1P1 was ready to be sampled in the spring of 2019 prior to seeding. Samples were taken in April of 2019, and compared to the Canadian Council of Ministers of the Environment Industrial criteria. Grab samples of soil mixed with the dozer and the discer were also taken to visually determine how well the equipment incorporated all the feedstocks into the mix.



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Spreading on the Y1P2 and Y2P2 plots will be completed in 2020, and will be sampled before seeding.

Surface Water

The project is located within the boundaries of the Summit Road Landfill leachate and surface water collection and containment system.

Surface water samples were taken in April of 2019 after the spring runoff. Monthly scheduled checks and observations after major rainfall events were done to observe if any surface water was present and none was detected. Surface water will be sampled in spring of 2020, and continuous observation will be done through the year. Results are presented in the Year Two Annual Report.

Vectors

No vectors were observed during the operational phase.

Dust, Noise, Nuisance

There were no dust, noise or nuisance concerns during operations.

Site Security and Safety

Safe Work Procedures were reviewed every week with staff and followed at Summit. Job Safety Planning Forms were completed daily, where all local hazards were identified and addressed. All personnel onsite were required to wear appropriate PPE, this included safety glasses and High Visibility rain jackets when appropriate to mitigate any weather hazards. No safety or emergency incidents occurred during Y2P2.

Year Three Phase One (Y3P1)

Y3P1 will start January 20th, 2020 and proceed for three months.

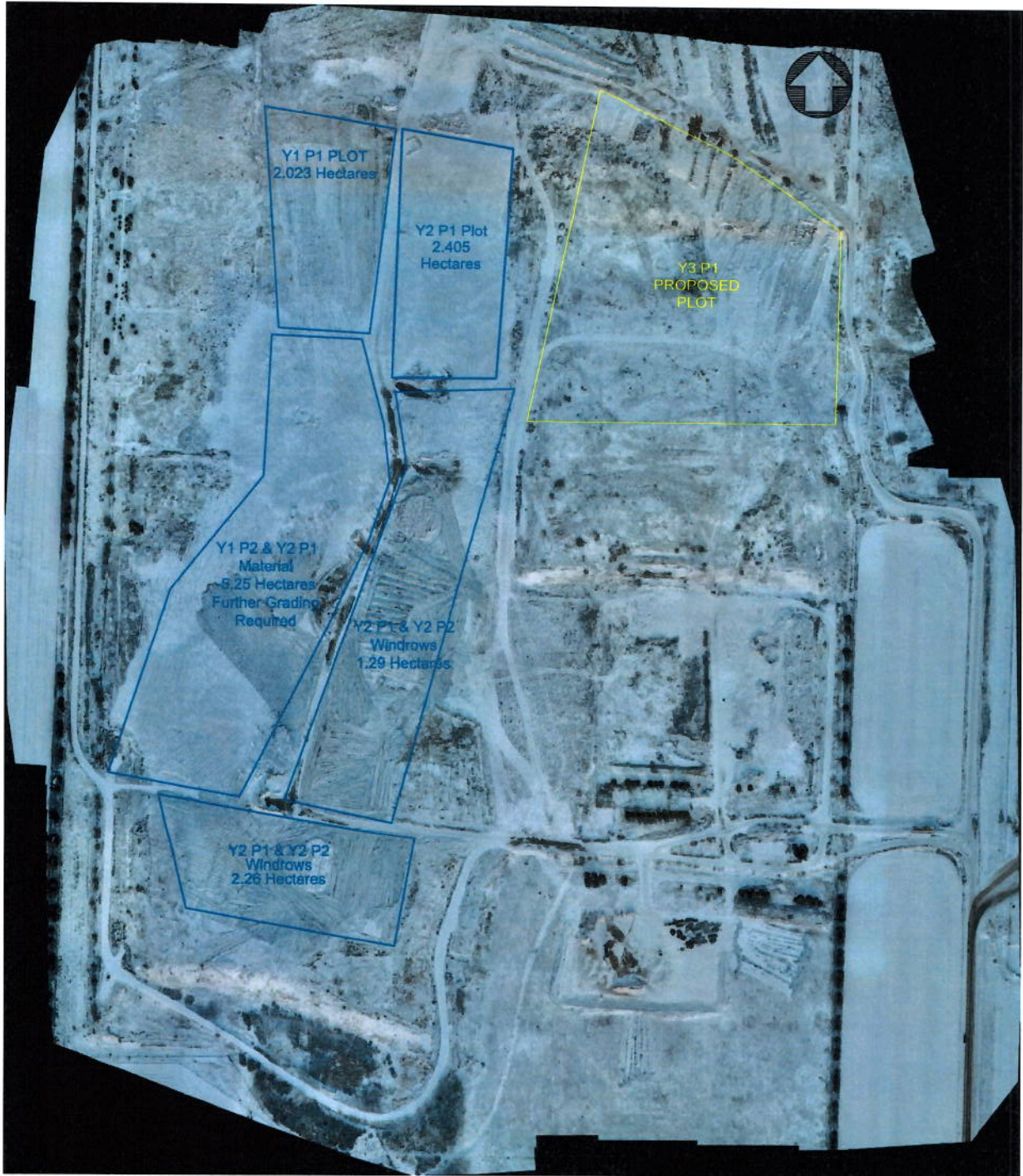
Regulatory Approval

Approval to proceed with the Summit Soil Fabrication Pilot Project under the Exemption Clause (6) of the *Classes of Development Regulation* was received on May 7, 2018. Y2P1 proceeded according to the Summit Soil Fabrication Pilot Year Two Phase One (Y2P1) Project Plan.

Appendix A
Soil Fabrication Plots - Summit Landfill
Aerial Taken May 8th, 2019



Appendix A
Soil Fabrication Plots - Summit Landfill
Aerial Taken December 6th, 2019



Appendix A
Soil Fabrication Plots - Summit Landfill
Aerial Taken October 25th, 2019

