



OUR FILE: 9100-51

YOUR FILE:

25 February 1982

Regional Municipality of Halton
1151 Bronte Road
Oakville, Ontario
L6G 6E1

Attention: D.J. Corbett, P. Eng.
Manager of Construction

Burlington and Oakville Landfill
Sites-Capacity Updates

Dear Sirs:

As requested in your letter of 11 December 1981 we have carried out site capacity updates and volume utilization calculations for the Burlington and Oakville landfill sites. Base data, derived from 25 September 1980 and 7 November 1981 photography, were prepared by Northway-Gestalt and reviewed by Dillon.

The results obtained from this study are summarized below and reflect your comments made during our meeting of 24 February 1982.

A. Burlington - Phase I

Refuse density achieved	742 kg/m ³
Refuse to cover ratio	3.3:1
Remaining operating life	6.9 months
Estimated site closure	June 1982
Future fill required	44,543 m ³

B. Burlington - Phase II

Expected operating life	19.8 months
Estimated site life	July/82 - February/84

C. Oakville

Refuse density achieved	695 kg/m ³
Refuse to cover ratio	3.1:1
Remaining operating life	11.3 months
Estimated site closure	October 1982
Future fill required	28,820 m ³

...continued

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Detailed outlines of the calculations undertaken at each site are attached for your perusal.

The above refuse densities are greater than anticipated and may be due to an over estimation of the quantities of fill being used on-site. At the moment however, these densities are the best available estimate based on data received. Should the densities be lower than calculated revised site lives are provided.

The somewhat higher than expected refuse to cover ratios indicate more fill is being used than theoretically required. While on-site conditions may necessitate the use of this extra material this situation should be brought to the attention of the operating contractor. The use of extra fill will deplete sources of cover material more rapidly than needed while consuming valuable refuse capacity.

We trust the above is satisfactory. Should you have any questions please do not hesitate to contact the undersigned.

Yours truly,

M.M. DILLON LIMITED

JWR/wl
Encl.

for 
J.A. Hiraishi, P.Eng.
Project Manager

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A. BURLINGTON LANDFILL - PHASE I

A.1 Volume Utilization

Total volume used between photos..... 178,515m³

Net fill used;

i) fill excavated in Phase II 62,158m³
(including 15% bulking factor)

ii) fill trucked in (less 50% for 14,882m³
on-site compaction)

iii) less Phase II topsoil stock- (7,670m³)
pile

iv) less Phase I stockpiles (7,492m³)

v) less fill used for berm on (3,200m³)
south and east boundary

Gross fill used 58,678m³

Less 20% for losses (11,736m³)
(infilling refuse voids,
slopes improvements, ramp
construction etc.)

Total net fill used 46,942m³ (46,942m³)

Refuse volume 131,573m³

Waste received at site 97,674 tonnes
(after subtracting waste sent to S.W. area)

Density achieved = 742 kg/m³

A.2 Refuse: Cover Ratio

from above; Net fill used 46,942m³

less; Final cover where (7,380m³)
in place

Fill used for intermediate 39,562m³
and daily cover

Therefore; 131,573m³ refuse: 39,562m³ fill

or 3.3:1 refuse to cover

- use 3:1 refuse to cover ratio for future calculations

A.3 Remaining Capacity

Volume remaining to final contours	123,541m ³
Less 0.6m final cover	<u>(28,200m³)</u>
Refuse, intermediate and daily cover	95,341m ³
Less cover at 3:1 refuse to cover ratio	(23,835m ³)
Refuse volume available	71,506m ³
Refuse tonnage capacity (assuming 742 kg/m ³ density)	53,057 tonnes
Rate of fill in 1982 (assuming 1981 average increases by 2.5%)	7,692 tonnes/ month
<u>Remaining operating life</u>	6.9 months
<u>Estimated site closure</u>	June 1982

If the refuse: cover ratio is reduced to 4:1 the remaining operating life will increase to 7.4 months.

If the refuse density of 765 kg/m³ is incorrect and is actually closer to the 600 kg/m³ originally assumed the estimated operating life would be 5.6 months..

A.4 Future Fill Required

Final cover at 0.6m	28,200m ³
Intermediate and daily cover (3:1 refuse to cover ratio)	<u>23,835m³</u>
Less fill available in current stockpiles (not including Phase II's topsoil stockpile)	(7,492m ³)
<u>Total Fill required</u>	44,543m ³

Over the entire Phase II area this represents an average cut of 0.56m. If a 4:1 refuse to cover ratio is achieved the total fill required will be reduced to 39,778m³.

B. BURLINGTON LANDFILL - PHASE II

B.1 Remaining Capacity

No new data was generated for the Phase II area with regards to future capacity. The total volume available was taken from our November 1980 analyses.

Total volume available	574,056m ³
Less 0.6m final cover	<u>(47,700m³)</u>
Refuse, intermediate and daily cover	526,356m ³
Less cover at 3:1 refuse to cover ratio	<u>(131,589m³)</u>
Refuse volume available	394,767m ³
Refuse tonnage capacity (assuming 742 kg/m ³ density)	292,917 tonnes
Average rate of fill* (1982 - 1984)	14,890 tonnes/ month
<u>Expected operating life</u> <u>Estimated site closure</u>	19.8 months February 1984

IF the refuse: cover ratio is reduced to 4:1 the estimated site closure would be March 1984.

IF the refuse density of 765 kg/m³ is incorrect and is actually 600 kg/m³ the site closure date would be November 1983.

* assumptions: Phase II will start in July 1982. Oakville waste will be redirected to Phase II in November 1982. Waste quantities based on projecting 1981 data by 2.5%/year.

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C. OAKVILLE LANDFILL

C.1 Volume Utilization

Total volume used between photos		149,041m ³
Plus interim excavations		81,191m ³
Net fill used;		
i) fill excavated at site (including 15% bulking factor)	93,370m ³	
ii) less fill in stockpiles	<u>(8,218m³)</u>	
Gross fill used	85,152m ³	
Less 15% for losses (infilling of refuse voids etc.)	<u>(12,772m³)</u>	
Total net fill used	72,380m ³	<u>(72,380m³)</u>
Refuse volume		157,852m ³
Waste received at site		109,702 tonnes

Density achieved = 695 kg/m³

C.2 Refuse: Cover Ratio

from above; Net fill used	72,380m ³
less; Final cover where in place	<u>(21,240m³)</u>
Fill used for intermediate and daily cover	51,140m ³

Therefore;
157,852m³ refuse: 51,140m³ fill

or 3.1:1 refuse to cover

- use 3:1 refuse to cover ratio for future calculations

C.3 Remaining Capacity

Volume remaining to Final contours	180,070m ³
Plus proposed excavation	37,266m ³
Less 0.6m final cover	<u>(34,080m³)</u>
Refuse, Intermediate and daily cover	183,256m ³
Less cover at 3:1 refuse to cover ratio	<u>(45,814m³)</u>
Refuse volume available	137,442m ³
Refuse tonnage capacity (assuming 695 kg/m ³ density)	95,522 tonnes
Rate of fill in 1982 (assuming 1981 average increases by 2.5%)	8,461 tonnes/ month

<u>Remaining operating life</u>	11.3 months
<u>Estimated site closure</u>	October 1982

IF the refuse: cover ratio is reduced to 4:1 the remaining operating life will be 12 months.

IF the refuse density of 695 kg/m³ is incorrect and is actually 600 kg/m³ the remaining operating life is decreased to 10.4 months.

C.4 Future Fill Required

Final cover at 0.6m	34,080
Intermediate and daily cover (3:1 refuse to cover ratio)	45,814m ³
Less fill available in stockpiles	(8,218m ³)
Less future excavation (includes 15% bulking factor)	<u>(42,856m³)</u>
<u>Total Fill required</u>	28,820m ³

If a 4:1 refuse to cover ratio is achieved the total fill required will be reduced to 19,656m³.