Exhibit A: Report by Michael R. Baye, Ph. D.

October 11, 2000

I. Qualifications

1. I am the Bert Elwert Professor of Business Economics and Public Policy at Indiana University. I received my B.S. degree in economics from Texas A&M University in 1980 and a Ph. D. in economics from Purdue University in 1983. I received a Fulbright award during 1985-1986 to conduct research and to present lectures on spatial pricing at Erasmus University Rotterdam.

2. I have taught Ph. D. level courses in industrial organization at Texas A&M University, Penn State University, Indiana University, and the New Economic School in Moscow. My fields of specialization within economics include industrial organization, microeconomic theory, and game theory.

3. My research has been published in the *American Economic Review*, *Journal of Political Economy*, *Econometrica* and other leading economics journals. I am the editor of *Advances in Applied Microeconomics*, and in that capacity have edited volumes on *Industrial Organization* (2000), *Oligopoly* (1999) and *Auctions* (1996). I am also on the editorial board of the *Economics of Governance*.

4. From 1988 to the present, I have served intermittently as a consultant to the Antitrust Division of the United States Department of Justice on a variety of mergers within the waste industry.

II. Scope

5. On or about 30 September 1999, I was contacted by the Canadian Competition Bureau and asked to examine the competitive effects of the acquisition by Canadian Waste Services Inc. (CWS) of Browning-Ferris Industries Ltd. (BFIL).

6. The Bureau has asked me to limit the scope of this Report to the competitive effects of CWS's acquisition of BFIL's Ridge Landfill, and in particular the likely impact on the markets for waste generated in (a) the Greater Toronto Area (GTA) and (b) the Chatham-Kent Area (CKA).

7. In conducting this analysis, I have drawn on the relevant economics literature and my knowledge of the structure and conduct of firms in the waste industry. I have also reviewed numerous documents pertaining to this specific case, including, but not limited to, information provided by (a) CWS and BFIL in their responses to the Competition Bureau's requests, (b) various governments and/or government agencies, (c) independent haulers, landfills, and transfer stations, and (d) opinions provided by experts and attorneys hired by CWS and BFIL.

III. Summary of Opinions

8. My analysis, and more generally the evidence in this case, indicates that disposal prices for commercial, institutional, and industrial (ICI) waste generated in the GTA and CKA critically depend on the ownership of the Ridge landfill. Placing the Ridge landfill in the hands of CWS would likely result in a substantial lessening or prevention of competition in GTA and CKA service areas for ICI waste disposal, thereby enabling CWS to charge

materially higher tipping fees than it could if the Ridge landfill was under the control of an independent party. Furthermore, the ability of independent ICI haulers and transfer stations to compete with CWS critically depends on their ability to secure waste disposal at competitive prices. The higher disposal fees that would result from CWS's control of the Ridge landfill, coupled with vertical links between the collection, transfer, and final disposal of commercial and industrial waste and CSW's ability to internalize its own waste stream, is likely to lead to a substantial lessening or prevention of competition in these related markets.

9. The economic analysis underlying these conclusions is presented below.

V. Analysis

10. My analysis contains three main parts: (A) A general overview of the waste industry, (B) an analysis of the GTA service area, and (C) an analysis of the CKA service area. The analysis under parts (B) and (C) are broken into two main parts: (i) market definition, and (ii) the competitive effects of losing the Ridge landfill as an independent player in the relevant markets.

A. Overview of the Waste Industry

11. The collection and disposal of solid waste involve several stages that are economically linked. Any analysis of the competitive effects of CWS's acquisition and control of the Ridge landfill must take these links into account.

12. Commercial and industrial customers typically generate waste in larger volumes than residential customers.

13. Commercial customers (such as restaurants, office buildings, and wholesale stores) typically place their waste in containers that hold from 2 to 8 cubic yards of waste. These containers are collected mechanically, typically with front-end loading trucks which have a hydraulic lift on the front to hoist the container and dump its contents into the truck. Once the contents are deposited into the truck, the empty container is left on the customer's premises.

14. Industrial customers, such as factories and construction sites, typically deposit their waste into larger containers that hold up to 40 cubic yards of waste. These customers are often called "roll-off" customers, since the containers have small metal wheels that are used to help load them onto a truck. After being loaded on a truck, the roll-off container is transported to a disposal site where the single container is emptied and then typically transported back to the customer's premises.

15. Residential customers typically generate small quantities of waste that are placed in trash cans or plastic bags and left at curbside. Two-to three person crews empty these cans or place the bags into a vehicle, typically a rear-end loader or side-loader.

16. Once a truck is full or completes its route, the collected waste is transported to a disposal site where it must be emptied before additional waste is collected. Transportation costs are typically substantial, and in my experience can account for between 30 and 50 percent of collection revenues. Collecting waste from customers that are close to one another permits a hauler to more efficiently accumulate waste from customers before driving to the disposal site. This permits haulers to spread transport costs over more customers and

to thus enjoy economies of scale.

17. To fully exploit economies of scale, a hauler must establish routes with a dense base of consumers and use disposal sites that are relatively close to its routes. Consequently, collection and hauling markets tend to be localized. The density may be achieved by establishing routes at densely populated points (e.g. city neighborhoods) or along densely populated segments (roads or highways) in geographic space. Route density is especially important for residential and commercial waste, since it typically takes many of these customers to fill a truck to capacity. Typically, firms that collect and haul waste set up garages and related facilities within the local areas served.

18. Disposal sites include transfer stations, landfills, and incinerators.

19. Transfer stations are temporary depositories for waste. When a hauler brings its truck to a transfer station, the truck is weighed and then the waste is deposited with the waste from other haulers. Heavy equipment is used to load the waste onto large trailers that then transport the waste to a landfill or incinerator. The capacity of a transfer station therefore refers to the amount of waste it can accept from haulers and transport to a landfill or incinerator.

20. The primary economic function of a transfer station is to provide a convenient location for haulers to empty trucks, thus enabling haulers to more quickly deposit waste and return to their collection routes. Since transfer stations combine the waste from several haulers into a single load before transporting it, they are able to transport waste to distant landfills or incinerators at a lower cost per tonne than individual haulers.

21. Landfills and incinerators are permanent depositories for waste. They may accept waste directly from haulers or from transfer stations. Landfills consist of cells where waste is deposited and covered. Typically, dirt, sand, and in some instances special types of industrial waste (such as construction debris) is used as cover. Obviously, incinerators are unable to accept construction debris and other forms of non-combustible waste. The capacity of a landfill or incinerator refers to the amount of waste from haulers and transfer stations that can be permanently disposed at the site.

22. Commercial and industrial waste haulers charge fees for removing waste from their customer's premises at specified time intervals. The prices for these collection services tend to vary across different types of customers and also among customers of a same type. To remain in business, a hauler must collect fees sufficient to cover the costs required to collect, transport, and dispose the waste at a disposal site.

23. Transfer stations typically charge haulers for dumping waste at the site on a per-tonne basis, and these prices also tend to vary depending on the identity of the hauler and the type of waste. To remain in business, a transfer station must collect fees sufficient to cover the costs of loading waste onto transfer trailers, transporting the waste to a landfill or incinerator, and paying the final disposal site a "tipping fee" for right to unload the waste.

24. The tipping fees that landfills charge are usually quoted on a per-tonne basis, and vary depending on the identity of the hauler or transfer station and the nature of the type of waste. Prices are typically lower for dense waste (such as construction debris) because it

takes up less space and can also be used for cover. Unlike haulers and transfer stations, landfills do not pay transport costs. The costs of developing a landfill are substantial, and are discussed in more detail below.

B. The GTA Service Area

(i) Market Definition

25. In examining whether the acquisition of the Ridge landfill by CWS is likely to substantially lessen or prevent competition in the GTA service area, I considered the characteristics of waste generated in the GTA, the structure and conduct of firms that provide collection and/or disposal services, and the role that governments, geography, and transportation costs play in defining geographic boundaries for these services. For the purposes of this case, the relevant market includes those products or services for which the merged entity is likely to be able to exert market power as well as the geographic area in which this power is likely to be exercised.

26. Based on a complete analysis of these and other economic issues, I conclude that

(a) The relevant product is the permanent disposal of ICI waste generated in the Greater Toronto Area (GTA), and the relevant geographic market is Southern Ontario.

(b) Due to vertical links between the collection and disposal of ICI waste, a substantial lessening or prevention of competition in the relevant market defined in (a) will likely result in a substantial lessening or prevention of competition in the following relevant markets:

1. The collection of ICI waste in the GTA.

2. The transfer of ICI waste from the GTA to permanent disposal sites.

27. The analysis underlying these conclusions follows.

Product Definition

28. About 3 million tonnes of GTA solid non-hazardous waste (SNHW) is disposed of each year. Approximately 2 million tonnes of this is ICI waste and 1 million tonnes is residential waste.

29. The City of Toronto's Keele Valley Landfill is the only permanent disposal site in the GTA which receives ICI waste from the entire GTA, and is scheduled to close in 2002. Its closure will result in an annual loss of about 1.4 million tonnes of permanent disposal capacity. About 40 percent of this lost capacity is currently being used to permanently dispose of ICI waste from the GTA.

30. The City of Toronto is in the final stages of negotiating a 20 year contract with Rail Cycle North Ltd. (a wholly owned subsidiary of CWS) for the permanent disposal of up to 1.3 million tonnes of GTA residential waste each year at the Adams Mine Landfill. This landfill has an annual capacity of 1.3 million tonnes per year, and is expected to be operational on or before January 1, 2003.

31. The City of Toronto is in the final stages of negotiating a 20 year contract with Republic Services of Canada for the annual disposal of between 100,000 and 500,000 tonnes of ICI waste at the Carleton Farms landfill in Michigan. If it is profitable for the City of

Toronto to do so, it will charge independent ICI haulers a tipping fee to dispose of waste at GTA transfer stations which will transport the waste to the Carleton Farms landfill.

32. Market forces will determine where the remaining annual volume of ICI waste from the GTA will be permanently disposed. Disposal prices will critically depend on the conduct of firms owning permanent disposal facilities.

33. The Ridge landfill is permitted to receive commercial and industrial waste from the GTA, and in fact received 106,224 tonnes of ICI waste from transfer stations in the GTA in 1999. In 1999, the Ridge was operating at full capacity, and could not accept additional ICI Waste. However, during 2000, an additional 460,000 tonnes of annual capacity for ICI waste will be available at the Ridge landfill due to a recently approved expansion.

34. The Ridge landfill is about 292 kilometers from the GTA, which makes it impractical for most independent haulers in the GTA to drive to the Ridge landfill to empty their collection trucks. In addition to fuel, labor, and depreciation on the vehicle, each hour a hauler spends driving to a distant disposal site keeps the truck off of the collection route for two hours (including the round trip). The economically correct measure of a hauler's transport costs includes not only the explicit costs of fuel, labor and vehicle depreciation, but also any collection revenues lost while the truck is in transit to and from the disposal site. The distance from the GTA to the Ridge landfill makes it economically unprofitable for most collectors to directly dispose of ICI waste at the Ridge landfill.

35. Instead, individual haulers in the GTA area must either dispose of their waste at a permanent disposal site that is closer to their route (such as the Keele Valley landfill), or

otherwise dispose of waste at a transfer station in the GTA that combines waste from individual haulers and then transfers waste to a permanent disposal site. The Ridge landfill directly competes against other permanent disposal sites for the opportunity to accept waste from these transfer stations. For this reason, the relevant market for ICI waste generated in the GTA includes permanent disposal sites but not transfer stations.

36. There are no viable substitutes for the final disposal of GTA generated ICI waste to which customers could turn if a hypothetical monopolist unilaterally increased the price of permanent disposal by a small but significant amount. More generally, the only available substitutes for customers seeking permanent disposal are to either dispose of the waste illegally (creating environmental hazards) or, in some cases, to bear the cost of attempting to reduce the amount of permanent disposal space needed through diversion or by processing the waste to remove recoverable materials such as wood or concrete. Even in the latter case, however, the ability of a hypothetical monopolist to charge different disposal fees for different types of ICI waste would permit it to profitably charge higher tipping fees for waste that is not recoverable, while maintaining lower tipping fees for other types of waste in order to continue to attract waste that might otherwise be diverted. As noted in the Agreed Statement of Facts, disposal sites do in fact charge different prices for different types of waste.

37. While landfills and incinerators both provide permanent disposal facilities, landfills are generally a superior method of disposing of ICI waste because landfills accept both combustible and noncombustible waste. In contrast, incinerators accept only combustible

waste, and the residue from incinerators must ultimately be disposed of at landfills.

38. For these reasons, I conclude that the relevant product is the permanent disposal of approximately 2 million tonnes of ICI waste generated in the GTA each year.

Geographic Market

39. Permanent disposal sites in the United States are poor substitutes for the permanent disposal of GTA ICI waste within Southern Ontario. As such, permanent disposal sites outside of Southern Ontario do not provide sufficient discipline to prevent a hypothetical monopolist in Southern Ontario from charging higher tipping fees for ICI waste generated in the GTA. The reasons for this conclusion are discussed below.

40. Transportation costs are an important component of the total cost of permanent disposal services. Since transportation costs to the Ridge and other disposal sites are borne by customers (transfer stations) and not the disposal sites, the economic theory of spatial competition indicates that disposal sites closer to the GTA will be able to charge higher tipping fees than more distant rivals and still attract waste. The additional distance a customer would have to transport waste in order to utilize an alternative site gives market power to disposal sites that are closer to the GTA than other sites. This permits them to charge higher tipping fees than more distant sites. For this reason, the hypothetical monopolization of landfills close to GTA would eliminate local competition, thereby forcing customers (transfer stations) to travel longer distances to reach alternative disposal sites. A hypothetical monopolist could profitably exploit this by increasing tipping fees. The amount by which tipping fees could be increased depends, of course, on

the proximity of the distant landfills: the farther away, the greater the cost to the customer of reaching that substitute, and the greater the increase in the tipping fee charged by the hypothetical local monopolist.

41. As shown in Table 1, the evidence in this case is consistent with economic theory: Permanent disposal sites closer to the GTA charge higher tipping fees than more distant sites.

42. This pattern of tipping fees indicates that disposal sites in Michigan and other U. S. states that are farther from the GTA are imperfect substitutes for Southern Ontario landfills that are closer to the GTA.

43. In addition to their distance from the GTA, there are a number of other factors which make disposal sites in the U. S. poor substitutes for permanent disposal sites in Southern Ontario.

44. First, in the Ridge Landfill Expansion Proposal (1/8/97, p. 71), BFIL noted that, in addition to the added transport costs stemming from the distance required to transport waste to Michigan, other factors make U. S. disposal sites poor substitutes for Southern Ontario sites such as the Ridge landfill:

> "Export is not the least-cost solution for the disposal of a large portion of the waste to be managed. In addition, export has the added problem of requiring a reliance on other governments...The export of this waste is affected by Canadian, Ontario, various State and U.S. Federal governments. There have been a number of

attempts to reduce the export/import of waste. Recently a bill was passed by the U.S. Senate which could have that effect. Given the time required for approval of waste disposal facilities in Ontario, BFI is concerned that its waste management activities could be jeopardized if it relied entirely on waste export for its business."

45. Thus, even a large vertically integrated firm like BFIL recognized that political factors and uncertainties, such as potential border closures or restrictions, made it desirable to expend about 20 million dollars expanding capacity at the Ridge Landfill rather than relying on capacity at existing U.S. disposal sites that its parent or affiliates owned.

46. Potential border closures or restrictions are even more problematic for unintegrated firms, and for this reason rational independent transfer stations in the GTA are willing to pay a substantial premium to utilize Southern Ontario disposal sites. Absent a relationship with Southern Ontario sites, they risk being denied capacity at Ontario sites in the event that the U.S. border closes to GTA waste, or imports of waste are otherwise restricted. Good business practice dictates maintaining a relationship with Southern Ontario disposal sites to ensure favorable treatment should the political landscape change.

47. There are a number of other explicit and implicit costs which make disposal sites in Michigan and New York poor substitutes for Southern Ontario sites. The extra distance involved in transporting waste to Michigan means that the typical transfer station can make only one haul to a Michigan site per day, whereas more trips can be made each day to Southern Ontario sites such as the Ridge landfill.

48. It can take several hours for transfer trailers to cross the border, and this raises the cost of using U. S. sites. More specifically, in order to cross the border, drivers must either show the proper paper work to customs (which can take up to several hours), or alternatively provide a bond of $450,000 to obtain a “line release” in order to be able to automatically clear customs.

49. Some states (such as Michigan) more strictly enforce weight limits on transfer trailers, which means that additional time and money is lost dealing with law enforcement officers, paying fines, and hiring attorneys.

50. Finally, the reliance on U. S. sites exposes transfer stations to additional risk, as the viability of these options critically depends on movements in exchange rates and (for distant U. S. sites) fuel prices.

51. To summarize, there are a number of implicit costs associated with utilizing U. S. disposal sites which, when added to the explicit costs of transporting waste longer distances, make U. S. sites poor substitutes for permanent disposal sites in Southern Ontario. Rational transfer stations will be willing to pay a premium to use Southern Ontario sites in order to avoid these implicit costs.

52. In order to quantify the magnitude and significance of these implicit costs, I used data from the Agreed Statement of Facts to examine the relationship between the tipping fees that permanent disposal sites charge different transfer stations and (1) the distance between the permanent disposal site and transfer station; (2) the location of the permanent disposal site. Economic theory indicates that, for the reasons discussed above,

there should be a negative and statistically significant relationship between the tipping fee charged and distance required to travel to a given site. Furthermore, the higher implicit costs of using U. S. disposal sites should result in higher tipping fees in Southern Ontario even after controlling for other factors such as distance.

53. The statistical evidence overwhelmingly confirms economic theory as well as common sense. Based on accepted econometric techniques and criteria for determining the statistical significance of the estimated relationship, the data indicate that disposal sites in the U. S. are poor substitutes for Southern Ontario disposal sites.

54. More specifically, the statistical analysis summarized in Table 2 indicates that

(a) transfer stations in the GTA are willing to pay a tipping-fee premium of about 5 cents per tonne for each kilometer a disposal site is closer to the transfer station; and

(b) transfer stations in the GTA are willing to pay an additional tipping-fee premium of about $5.00 per tonne to dispose of waste at Southern Ontario sites instead of disposal sites in the U. S.

55. The fact that a transfer station is willing to pay a five cent premium per tonne for each kilometer a permanent disposal site is closer to their station reflects the market power that distance creates in a spatial market. Furthermore, the additional $5.00 premium that transfer stations are willing to pay to avoid U.S. disposal sites indicates that there are indeed significant costs associated with using U.S. sites. This $5.00 premium per tonne amounts to well over 20 percent of the average tipping fees that GTA transfer stations

pay for disposing of ICI waste in Michigan and New York, and would not exist if disposal sites in Michigan and New York were close substitutes for Southern Ontario disposal sites.

56. These conclusions follow from the Ordinary Least Squares regressions reported in Table 2, and are based on data from the Agreed Statement of Facts regarding ICI waste transported in 1999 by independent transfer stations from the GTA to permanent disposal sites in both the United States and Canada. A variety of specifications are reported to illustrate that the results are robust. For instance, Regression 1 uses the distance from transfer station to permanent disposal sites (d), as well as a variable (S_Ont) which indicates whether the disposal site used was in the U.S., to explain the observed difference in tipping fees. Since one might speculate that lower tipping fees might be due to volume discounts, Regression 2 includes volume (q) as an additional explanatory variable. Since one might reason that tipping fees vary depending on whether the waste flowing to a particular site was directed or being internalized by BFIL or CWS, Regression 3 includes another explanatory variable (direct) in the regression to account for this potential effect.

57. In all of the specifications, the data indicate that GTA transfer stations are willing to pay a premium of about $5 per tonne to use Southern Ontario disposal sites. This premium would not exist if permanent disposal sites in the U. S. did not entail the implicit costs and risks noted above. Furthermore, in all specifications, transfer stations are willing to pay a premium of about 5 cents per tonne for each kilometer closer the permanent

disposal site is to the transfer station.

58. To summarize, the statistical evidence indicates that disposal sites in Southern Ontario enjoy market power, and that disposal sites outside of this geographic boundary are poor substitutes.

59. In addition to these findings, the effective capacities available at those U.S. permanent disposal sites close enough to attract ICI waste from the GTA, coupled with ownership, control, and contractual relationships with customers and other disposal sites, significantly limit the ability of U. S. disposal sites to discipline the tipping fees charged by permanent disposal sites in Southern Ontario. These issues will be discussed in more detail below.

60. I conclude that the relevant geographic market is Southern Ontario.

(ii) Competitive Effects

61. For the above reasons, the relevant market is permanent disposal sites in Southern Ontario that are permitted to accept ICI waste from the GTA.

62. Table 3 shows the permanent disposal sites used to dispose of 1,806,028 tonnes of ICI waste generated in the GTA in 1999. As the Table reveals, 78.9 percent of the waste was disposed in Southern Ontario, 17.3 percent in Michigan, and 3.9 percent in New York.

63. The waste flows in Table 3 might lead one to erroneously conclude that Michigan and New York disposal sites are in the relevant market. For several reasons, the utilization of U. S. disposal sites in 1999 does not imply that they are in the relevant market for considering the competitive effects of the acquisition by CWS of the Ridge landfill.

64. First, a significant percentage of the waste flows to Michigan and New York stem from the fact that, in 1999, BFIL was a vertically integrated firm controlling (based on 1998 revenue data) about 20% of the Western Toronto market for commercial collection and about 10% of the Eastern Toronto commercial collection market. In addition, BFIL owned the Ridge landfill, which was operating at full capacity. For this reason, BFIL found it profitable to internalize the waste by shipping some of the waste collected in its commercial collection operations to disposal sites that were owned by its parent or affiliates in Michigan and New York. By adopting such a strategy, BFIL freed up landfill space at the Ridge site which could then be sold at higher tipping fees than would have been received had it used the space itself and sold U. S. disposal space to independent transfer stations. Expressed differently, the fact that disposal sites in Southern Ontario have market power, as discussed above, provided an incentive for vertically integrated BFIL to direct waste to Michigan and New York. Unintegrated firms are unable to internalize waste flows.

65. Table 4 shows that, for the ICI waste from the GTA that was not directed or internalized by BFIL and CWS, 81.7 percent went to disposal sites in Southern Ontario, 15.3 percent to disposal sites in Michigan, and 3 percent to New York. Unintegrated commercial haulers and transfer stations in the GTA heavily rely on Southern Ontario disposal sites.

66. Second, the incentives and ability of the disposal sites in Michigan and New York to discipline the tipping fees charged by CWS sites in Southern Ontario are limited.

67. Arbor Hills is subject to a local host agreement which restricts the amount of out-of-state

waste it can accept to an average of [Confidential] per year over any five year period. Since its current contract with the City of Toronto is for about 450,000 tonnes per year, it does not have the ability to absorb any significant volumes of ICI waste from the GTA should tipping fees in Southern Ontario increase.

68. The disposal sites owned by Allied in Michigan and New York are subject to non-solicitation agreements which restrict them from actively seeking out ICI waste from the GTA.

69. WMI is the parent of CWS, and the landfills owned by WMI in Michigan do not discipline the CWS owned landfills in Southern Ontario.

70. The contract the City of Toronto is finalizing with Republic includes a most-favored nation clause wherein if Republic offers a lower price to another ICI customer from the GTA, Republic would have to reduce its contracted price with the City. It is well-known in the economics literature that these types of clauses significantly reduce the incentive for Republic landfills to actively compete for additional ICI waste from the GTA. Furthermore, under the terms of the contract, the City is obliged to purchase only 100,000 tonnes of airspace, but has the option of purchasing up to 500,000 tonnes disposal space. Republic must therefore reserve 500,000 tonnes per year of its disposal space for the City, even if the City chooses not to exercise the option for the extra 400,000 tonnes.

71. Third, the flow data in Tables 3 and 4 do not reveal the capacity available in Southern Ontario for disposing of ICI from the GTA. As shown in Table 5, the most important

Southern Ontario landfills listed in Tables 3 and 4 were operating at full capacity during 1999, so only 45.6 percent of the capacity at those sites was available for ICI waste from the GTA. The result was a 434,028 tonne shortage of landfill space at these Southern Ontario sites, and most of this was ultimately sent to Michigan and New York. The fact that independent GTA transfer stations were willing to pay the implicit costs of $5 per tonne associated with crossing the U.S. border indicates that there were no other viable disposal options in Ontario.

72. Fourth, the landscape will change dramatically by the year 2002. The Sarnia landfills (Lasalle and Blackwell) are expected to close, resulting in a loss of 675,000 tonnes of total annual capacity. The Keele Valley landfill is also scheduled to close, resulting in an additional loss of 1.4 million tonnes of annual capacity. Based on 1999 ICI waste flows, these landfill closures mean that [Confidential] tonnes of ICI waste from the GTA that is currently disposed at Southern Ontario sites will have to find another home. This loss of ICI capacity is shown in the 5th column of Table 6.

73. Where will this waste go? The City of Toronto is in the process of negotiating a contract with the Republic's Carleton Farms landfill to dispose of up to 500,000 tonnes of ICI waste from the GTA. Furthermore, the City of Toronto's residential disposal needs will likely be met through an anticipated contract for 1.3 million tonnes of annual capacity at the Adams Mine landfill.

74. An additional 1,319,000 tonnes of capacity for ICI waste from the GTA is likely to be available by 2002, due to proposed expansions at the Warwick and Richmond landfills

which would permit them to accept ICI waste from the GTA.

75. Finally, during 2000, an additional 460,000 tonnes of annual ICI disposal capacity will be available at the Ridge landfill, as their proposal to expand capacity from 220,000 tonnes per year to 680,000 tonnes per year was recently approved.

76. As shown in Table 6, there will likely be excess capacity of disposal space at Southern Ontario landfills by 2002. Indeed, the Ridge, Warwick, and Richmond landfills are likely to have more than enough capacity to handle the [Confidential] tonnes of ICI waste displaced as a result of landfill closures between 2000 and 2002. Including the available capacity at the EWSWA landfill (which presently receives no ICI waste from the GTA) and the Greenlane landfill (which only received [Confidential] of ICI waste from the GTA in 1999 but could receive up to an additional [Confidential] tonnes per year), there is likely to be 1,197,923 tonnes of unused disposal space in Southern Ontario after absorbing the [Confidential] tonnes of ICI capacity lost due to anticipated closures. This does not include the additional capacity available if the City of Toronto finalizes its contract with Republic to dispose of between 100,000 and 500,000 tonnes of ICI waste.

77. The impact of the anticipated excess capacity for ICI waste in 2002 on tipping fees in Southern Ontario critically depends on who controls the Ridge landfill. As shown in Table 7, if the Ridge is independent, CWS will control 47.5 percent of the total 2002 permitted annual capacity for ICI waste from the GTA, compared with 69 percent if it controls the Ridge landfill. More importantly, controlling the Ridge increases CWS's share of the excess capacity available for handling ICI waste from the GTA from 63.6

percent to 85.8 percent. Based on the anticipated annual capacity for ICI waste from the GTA, CWS's acquisition of the Ridge landfill increases the Herfindahl index from 3,178 to 5,221. The Herfindahl index based on the control of anticipated excess capacity in the relevant market increases from 4,650 to 7,472 if CWS gains control of the Ridge landfill. Both the levels and changes in these Herfindahl indices are well above the thresholds used in the U.S. to gauge whether a merger is anticompetitive.

78. If CWS is allowed to control the Ridge, it would control 85.8 percent of the 2,073,500 metric tonnes of excess capacity that is likely to be available to handle the [Confidential] tonnes of capacity lost due to anticipated landfill closures. For the following reasons, it is likely that this would prevent competition in the relevant market.

79. If the Ridge is independent, economic theory indicates that strong price competition for ICI waste from the GTA would result between the Ridge landfill and the CWS (Warwick and Richmond) landfills. In particular, since all three of these landfills are similar distances from the GTA, none of the landfills would have a significant location advantage over the others. As a result, the Ridge and CWS landfills would lower prices in an attempt to attract waste to their sites. This downward pressure on prices would continue until tipping fees were within a few dollars of marginal costs.

80. Competition between the Ridge and CWS sites, in turn, would put downward pressure on the tipping fees charged by the Walker landfill, which is closer to the GTA. However, since the Walker landfill enjoys a location advantage over the Ridge and CWS landfills (it is closer to the GTA), the Walker landfill would not have to lower its tipping fees as

close to its marginal cost in order to attract waste.

81. In contrast, if CWS is given control of the Ridge, the competition between the Ridge and the CWS (Richmond and Warwick) landfills vanishes. CWS could then maintain its current pricing structure and attract waste that is currently going to U.S. disposal sites. Transfer stations would be willing to switch to, for example, the Ridge site, since doing so would eliminate the implicit costs of $5 associated with crossing the border. U.S. disposal sites could not profitably respond by lowering prices in an attempt to retain the waste. In particular, since U.S. disposal sites had the option in 1999 of dropping prices to attract more waste, but chose not to, economic theory indicates that the tipping fees charged at the U.S. sites that accept ICI waste from the GTA are operating close to relevant marginal cost.

82. Relevant marginal costs include not only the explicit (variable) costs of handling a tonne of ICI waste from the GTA, but also the implicit costs. The implicit cost of accepting a tonne of waste from the GTA is the lost opportunity to use that capacity to accept waste from a local customer (who will be willing to pay a higher tipping fee due the location advantage), either today or in the future. Landfill space is an exhaustible resource, and rational landfills will take these implicit costs into account when deciding whether to lower tipping fees to attract distant waste. Rational disposal sites will not price below relevant marginal costs.

83. For these reasons, I conclude that the acquisition of the Ridge landfill by CWS would be likely to substantially prevent competition: The merger would eliminate competition

between the Ridge and CWS (Richmond and Warwick) landfills, thereby preventing competitive forces from lowering tipping fees for ICI waste from the GTA.

84. Furthermore, it is my opinion that CWS's acquisition of the Ridge landfill would likely result in a substantial lessening of competition. The reasons for this opinion are as follows.

85. In light of the findings reported earlier which indicate that U. S. disposal sites are poor substitutes for ICI waste from the GTA, the merger would give CWS the ability to raise its tipping fees without losing significant volumes to U. S. disposal facilities.

86. Therefore, CWS's ability to increase its price depends on whether such an action induces transfer stations to substitute towards other Southern Ontario disposal sites.

87. Total disposal costs (tipping plus transport costs) from the GTA to the Ridge landfill are about [Confidential]. Total disposal costs (tipping plus transport costs) under the City's proposed contract with Carleton Farms are $52.09 in 2002. If CWS owned the Ridge, it could easily raise tipping fees by [Confidential] percent and still beat out Carleton Farms.

88. Furthermore, the Walker landfill was operating at full capacity in 1999 and is likely to be in 2002. In this case, any price increase at the Ridge could not result in a net increase in the waste going to the Walker landfill.

89. The only potential risk to CWS of raising prices as a result of the merger would be that transfer stations might substitute towards the EWSWA or Greenlane landfills. This is highly unlikely.

90. First, faced with a shortage of landfill space in 1999, transfer stations preferred to bear

the $5 in implicit costs to use U.S. disposal sites rather than substantially relying on the Greenlane or EWSWA landfills for their disposal needs. This indicates that the Greenlane and EWSWA landfills are even poorer substitutes than the U.S. disposal sites.

91. Second, the Greenlane landfill only has the capacity to accept about 262,000 tonnes of ICI waste from the GTA, and about twenty five percent of this capacity is being used for other purposes. Under its operating arrangements and internal plans, the EWSWA landfill can only accept [Confidential] tonnes of ICI waste from the GTA. For these reasons, these two landfills would only be able to accept about [Confidential] tonnes of ICI waste from the GTA.

92. Third, the Greenlane landfill operates at a significant cost disadvantage relative to other landfills in the area. For instance, its explicit marginal cost is [Confidential], compared with explicit marginal costs for [Confidential] at the Walker landfill and [Confidential] at the Ridge Landfill. This significantly limits its ability to discipline other landfills in Southern Ontario.

93. For these reasons, it is not surprising that insignificant volumes of ICI waste from the GTA went to the Greenlane or EWSWA landfills in 1999, and it is unlikely that their presence in the market plays a significant role in disciplining the tipping fees charged by CWS in the relevant market.

Barriers to Entry

94. It is my opinion that barriers to entry are sufficiently high to permit CWS to increase tipping fees in the relevant market without inducing entry.

95. Numerous economic and political factors create barriers to entry by new landfills. As clearly indicated in the Agreed Statement of Facts, the cost of locating a suitable site and purchasing the land is expensive, and it takes years and millions of dollars to obtain approval for the site from governmental authorities.

96. Except for the cost of purchasing the land, these costs are sunk costs and cannot be recouped if approval is not gained. Furthermore, once a landfill begins accepting waste, a large portion of the land costs are sunk, as the use of the land as a landfill significantly reduces its value for other uses.

97. The nature of the product also entails environmental, legal, and political risks which are both costly to guard against and difficult to overcome. Small, inexperienced entrants are unlikely to have the economic and political capital needed to overcome these barriers.

98. Economic theory indicates that the sunk costs associated with entering the market, coupled with the length of time needed to get the site approved and operational, makes it unlikely that the threat of entry would successfully keep the merged entity from substantially raising prices.

99. In particular, the excess capacity controlled by CWS would serve as a barrier to entry. Rational entrants would know that CWS could easily lower price and attract additional waste if entry occured. Ultimately, the heightened competition for disposal customers would prevent the potential entrant from recouping the sunk entry costs, and therefore a rational entrant would not choose to enter in the first place if it observed CWS charging high tipping fees.

100. For the above reasons, it is my opinion that entry or the threat of entry is unlikely to discipline the prices charged by the merged entity.

Impact on Vertically Linked Markets

101. The higher tipping fees that are likely to result in the disposal market, coupled with the fact that CWS is the only vertically integrated ICI collector in the GTA collection market, would be likely to substantially lessen or prevent competition in vertically related markets.

102. As a result of the recent merger of the CWS and BFIL collection assets in Toronto, CWS's share (based on 1998 data) of the Western Toronto commercial collection market about [Confidential], and its share of the Eastern Toronto market is about [Confidential]. Overall, both of these markets are highly concentrated, with the top three firms in each market accounting for more than 75% of the commercial waste collected.

103. CWS is the only firm in the GTA commercial collection market that is vertically integrated into disposal sites.

104. The ability of nonintegrated commercial haulers and transfer stations in the GTA to successfully compete against CWS hinges on their ability to secure competitive tipping fees at transfer stations close to their commercial routes (for the haulers) and at permanent disposal sites (for transfer stations).

105. By controlling 85 percent of the excess capacity of landfill space in Southern Ontario that could be used for ICI waste from the GTA, CWS would be in a position to exercise market power in vertically related markets. By raising the cost of its rivals (both haulers

and transfer stations), CWS could raise the prices it charges for collection and/or transfer station services.

106. In particular, CWS could raise its rivals' costs by either raising the tipping fees charged for disposal or by using local space itself and forcing transfer stations to use more distant disposal sites in the U.S.

107. The ability of CWS to profitably exploit such a strategy stems from the nature of the oligopolistic rivalry it faces in disposal and hauling markets, as well as its ability to price discriminate. By refusing to provide disposal space or otherwise charging high tipping fees to unintegrated haulers and transfer stations with whom it directly competes, CWS gains a cost advantage over these rivals and therefore could charge higher prices for its own services in these related markets.

108. In examining the anti-competitive effects on vertically related markets, I considered two factors that sometimes mitigate the incentive of a firm to pursue such a tactic. First, by charging prices so high that it drives the unintegrated firm out of the market, the vertically integrated firm loses disposal revenues, which offset to some extent the higher revenues earned in vertically related markets due to the increased market power. Second, when the integrated firm cannot price discriminate, increasing disposal fees to all customers by a like amount results in lost disposal revenues from customers that collect waste in markets where the integrated firm does not compete. I conclude that these arguments against vertical foreclosure are not relevant in this case, as CWS's ability to price discriminate in both disposal and collection markets permits it to "target" price

increases to particular haulers, transfer stations, and commercial customers. This permits it to raise tipping fees (and hence costs) for those competitors that pose the most serious threat in vertically related markets, and at the same time, charge sufficiently low tipping fees to other parties to maximize disposal profits earned from them.

109. Furthermore, the threat of entry into commercial collection and hauling markets is unlikely to limit CSW's ability to raise prices vertically related markets.

110. To be successful in entering the collection market, an entrant would have to achieve economically efficient route densities and obtain airspace at a disposal site at a price that would make it competitive with the large, vertically integrated hauler. In the Toronto market, this is unlikely.

111. Even ignoring the entrant's problem of finding competitive disposal prices, economic theory suggests that a large player in a market can effectively prevent competition in a market by threatening to undercut rivals who attempt to enter the market, or more generally, who do not agree to certain market-sharing arrangements. Furthermore, it is well-documented that these tactics can be highly successful in highly concentrated markets where price discrimination is possible. In the absence of price discrimination, it is more costly for a firm to undercut an entrant's price to forestall entry or to force a rival to a particular market-sharing arrangement: by lowering price in an attempt to punish a rival or to otherwise keep a customer from switching to the rival, a non discriminating firm must lower its price for all of its customers. In contrast, if the firm can price discriminate, it need only cut price for the subset of the consumers that would inflict the

most damage to the rival or potential entrant. While it is costly to establish a reputation for punishing firms that don't play along, these costs are more than offset by the higher future profits that result from such a reputation.

112. This tactic is especially feasible in commercial hauling markets, where firms know the name and address of their existing customers. If a customer calls to cancel service, it is a trivial matter to contact the customer to offer a more favorable price and furthermore, to determine who attempted to steal the customer and "punish" the offender by stealing five or ten of its customers.

113. This tactic has, in fact, been used by haulers in North America to discipline independent haulers or to induce them to sell out to the vertically integrated firm at bargain prices (See Michael R. Baye, *Managerial Economics and Business Strategy*, 3rd Edition, McGraw Hill, 2000, p. 377). More importantly, economic theory indicates that even the implicit threat of such an action by a large firm in a highly concentrated market is sufficient to thwart entry or induce existing firms to go along with a market sharing arrangement.

114. For these reasons, I conclude that placing the Ridge landfill in the hands of CWS would likely prevent or lessen competition substantially for the disposal of ICI waste from the GTA, and that this would likely lead to a substantial lessening or prevention of competition in related vertical markets, such as commercial collection.

C. The Chatham-Kent Service Area

115. In examining whether the acquisition of the Ridge landfill by CWS is likely to

substantially lessen or prevent competition in the CKA, I considered the characteristics of waste generated in the CKA, the structure and conduct of firms that provide collection and/or disposal services, and the role that governments, geography, and transportation costs play in defining geographic boundaries for these services. For the purposes of this CKA area, the relevant market includes those products or services for which the merged entity is likely to be able to exert market power as well as the geographic area in which this power is likely to be exercised.

116. I conclude that

(a) The relevant product is the permanent disposal of ICI waste generated in the CKA, and the relevant geographic market is the CKA.

(b) Due to vertical links between the collection and disposal of ICI waste, a likely substantial lessening or prevention of competition in the relevant market defined in (a) will also result in a likely substantial lessening or prevention of competition in the collection of ICI waste from the CKA.

117. The reasons underlying these conclusions is similar to those for the GTA service area, and are briefly summarized below.

(i) Product Definition and Geographic Market

118. The Municipality of Chatham-Kent manages residential waste collection in the CKA. Under the Ridge Host Community Agreement, it pays a guaranteed tipping fee for all residential waste (up to 35,000 tonnes) that it or private haulers under Municipal contract dispose at the Ridge landfill.

119. Tipping fees paid by private ICI waste generators and haulers in the CKA are determined by market forces, as the guaranteed rate for residential waste does not apply to ICI Waste.

120. In 1999, about 40,000 tonnes of ICI waste was generated in the CKA.

121. The Ridge landfill is permitted to accept ICI waste from the CKA, and in fact about one-third of the ICI waste from the CKA waste was permanently disposed at the Ridge landfill.

122. For reasons similar to those given in Paragraphs 16, 17 and 22, it is generally impractical for ICI customers in the CKA to leave the CKA area to dispose of their waste.

123. Furthermore, for reasons similar to those given in Paragraph 36, there are no viable substitutes for the permanent disposal of CKA waste at CKA disposal sites.

124. There are 7 municipal transfer depots in the CKA. All of these transfer depots permanently dispose of their waste at either the Ridge landfill or the Gore landfill.

125. The Ridge and Gore landfills are the only two privately owned landfills in the CKA.

126. While there are two municipal landfills in the CKA (the Camden and Romney landfills), neither accepts ICI waste. Furthermore, both of these municipal landfills are expected to close between 2001 and 2002.

127. For these reasons, I conclude that the permanent disposal of ICI waste from the CKA is the relevant product, and the geographic market is the CKA.

(ii) Competitive Effects

128. Table 8 shows the permanent disposal sites used to dispose of the ICI waste generated in the CKA in 1999. Over 95 percent of this waste was disposed at the Ridge and Gore

landfills. Virtually all of the remaining waste was disposed at the Sarnia landfills, which are owned by CWS.

129. Table 9 shows that the acquisition of the Ridge landfill would make it a virtual monopolist in the relevant market. In 1999, CWS controlled [Confidential] percent of the ICI waste from the CKA. If CWS gains control of the Ridge, it would control 99.7 percent of the ICI waste from the CKA. As a result of the acquisition, the Herfindahl index would increase from 5,452 to 9,943.

130. As noted in paragraph 33, an additional 460,000 tonnes of annual ICI disposal capacity will be available at the Ridge landfill by the end of this year.

131. If the Ridge landfill remains independent, economic theory indicates that this increase in capacity would lead an independent Ridge landfill to lower its tipping fees in order to attract waste from the Gore landfill.

132. In contrast, if CWS is given control of the Ridge landfill, the competition between the Ridge and Gore landfills is eliminated.

133. For reasons similar to those articulated in Paragraphs 94-99, entry or the threat of entry is unlikely to discipline the price charged by the merged entity.

134. Thus, I conclude that the CWS acquisition of the Ridge landfill would likely result in a substantial lessening or prevention of competition in the permanent disposal of ICI waste generated in the CKA.

Impact on Vertically Linked Markets

135. Due to the vertical links between disposal and ICI collection, a likely substantial

lessening or prevention of competition in the disposal market would likely result in a substantial lessening or prevention of competition in the collection market for ICI waste in the CKA.

136. In particular, CWS would have the power to drive independent collectors of ICI waste from the CKA out of the market by raising tipping fees or otherwise precluding independents from utilizing its sites.

137. The only option for independents would be to drive over 50 kilometers to a distant landfill or transfer station operated by the EWSWA.

138. Transport costs to either of these facilities is about [Confidential] per tonne, which when added to the current tipping fee of [Confidential] per tonne, would make independent haulers unable to effectively compete with CWS in the ICI collection market.

139. Furthermore, the threat of entry is unlikely to discipline CWS in this regard, for reasons similar to those articulated in Paragraphs 110-113.

140. Moreover, the Municipality of Chathem-Kent receives a host fee for each tonne of waste that goes to the Ridge landfill. It would therefore lose revenue by granting approval to a transfer station that would take ICI waste out of the CKA.

141. For these reasons, I conclude that the acquisition of the Ridge landfill by CWS would likely prevent or lessen competition substantially for ICI disposal and collection in the CKA.

Table 1: Average Distance From Permanent Disposal Sites Accepting ICI Waste From the GTA to Transfer Stations and Average Tipping Fees Paid, 1999

Landfill	Distance (KM)	Tipping Fee
Sauk Trails (MI)	432	[Confidential]
Rep- Carleton Fs. (MI)	412	[Confidential]
BFI-Vienna Jct (MI)	445	[Confidential]
Brent-Run (MI)	404	[Confidential]
Tri-City (MI)	343	[Confidential]
Riverview (MI)	396	[Confidential]
Venice Park (MI)	463	[Confidential]
Pinetree (MI)	350	[Confidential]
Arbor Hills (MI)	432	[Confidential]
Woodland Mead. (MI)	442	[Confidential]
Citizens (MI)	422	[Confidential]
CWS-Sarnia	315	[Confidential]
BFI- Ridge	292	[Confidential]
Niagara Recy. (NY)	190	[Confidential]
BFI- Ref-Fuel (NY)	138	[Confidential]
Walker Bros	144	[Confidential]
Keele Valley	30	[Confidential]

Table 2: Statistical Analysis of the Impact of Distance, Location, and Other Variables on the Tipping Fees that Permanent Disposal Sites charge GTA Transfer Stations.

Regression 1: Tipping fees as a linear function of distance (d) in kilometers from transfer station to permanent disposal site, a dummy variable (S_Ont) which equals 1 if the permanent disposal site used is in Southern Ontario and 0 otherwise, and a constant (_cons).

```
                                                Number of obs =      79
                                                F(  2,    76) =   67.92
                                                Prob > F      =  0.0000
                                                R-squared     =  0.7825
                                                Root MSE      =  3.9507

------------------------------------------------------------------------------
             |             Huber-White
      tipfee |      Coef.   Std. Err.       t     P>|t|       [95% Conf. Interval]
-------------+----------------------------------------------------------------
           d |  -.0499037   .0071396     -6.990   0.000      -.0641234    -.035684
     S_Ont |   4.836988   1.117222      4.329   0.000       2.611846    7.062129
     _cons |   38.17254   2.805765     13.605   0.000       32.58438    43.76071
------------------------------------------------------------------------------
```

Regression 2: Tipping fees as a linear function of transfer station volume (q), distance (d) in kilometers from transfer station to permanent disposal site, a dummy variable (S_Ont) which equals 1 if the permanent disposal site is in Southern Ontario and 0 otherwise), and a constant (_cons).

```
                                                Number of obs =      79
                                                F(  3,    75) =   73.62
                                                Prob > F      =  0.0000
                                                R-squared     =  0.7874
                                                Root MSE      =  3.9315

------------------------------------------------------------------------------
             |             Huber-White
      tipfee |      Coef.   Std. Err.       t     P>|t|       [95% Conf. Interval]
-------------+----------------------------------------------------------------
           q |  -.0000702   .0000613     -1.144   0.256      -.0001924    .0000521
           d |  -.0511315   .0076997     -6.641   0.000      -.0664701   -.0357928
     S_Ont |   5.300043   1.275362      4.156   0.000       2.759391    7.840694
     _cons |   38.97418    3.21361     12.128   0.000       32.57234    45.37602
------------------------------------------------------------------------------
```

Regression 3: Tipping fees as a linear function of transfer station volume (q), distance (d) in kilometers from transfer station to permanent disposal site, a dummy variable (S_Ont) which equals 1 if the permanent disposal site is in Southern Ontario and 0 otherwise), a variable (direct) which represents the fraction of each transfer station's volume that is directed or internalized by BFIL and CWS, and a constant (_cons).

```
                                                Number of obs =      72
                                                F(  4,    67) =   50.46
                                                Prob > F      =  0.0000
                                                R-squared     =  0.7930
                                                Root MSE      =  3.8801
------------------------------------------------------------------------------
             |             Huber-White
      tipfee |      Coef.   Std. Err.       t     P>|t|       [95% Conf. Interval]
-------------+----------------------------------------------------------------
           q |  -.0000767   .0000666     -1.151   0.254      -.0002096    .0000563
           d |   -.051135   .0080682     -6.338   0.000      -.0672391   -.0350308
      direct |   3.953561   1.848182      2.139   0.036       .2645738    7.642548
     S_Ont |   5.289116   1.321867      4.001   0.000       2.650659    7.927574
     _cons |   37.66098   3.181202     11.839   0.000       31.31127    44.01068
------------------------------------------------------------------------------
```

Report by Michael R. Baye

Table 3: Where ICI Waste from the GTA was Permanently Disposed, 1999

Landfill	1999 Control	Current Control	Location	Total Volume (Tonnes) of ICI Waste from the GTA, 1999
Ridge	BFIL	Ridge	SO	[Confidential]
Greenlane	Greenlane	Greenlane	SO	[Confidential]
Keele V	Keele V	Keele V	SO	[Confidential]
Walker Bros	Walker Bros	Walker Bros	SO	[Confidential]
Sarnia (Lasalle/Blackwell)	CWS	CWS	SO	[Confidential]
Richmond	CWS	CWS	SO	[Confidential]
Other	Other	Other	SO	[Confidential]
Ref-Fuel	BFI/Allied	Allied	NY	[Confidential]
Niagara Recycling	BFI/Allied	Allied	NY	[Confidential]
Vienna Jct	BFI/Allied	Allied	MI	[Confidential]
Sauk Trails	BFI/Allied	Allied	MI	[Confidential]
Citizens	BFI/Allied	Allied	MI	[Confidential]
Arbor Hills	BFI/Allied	Onyx	MI	[Confidential]
Brent Run	Republic	Republic	MI	[Confidential]
Carleton F	Republic	Republic	MI	[Confidential]
Riverview	Riverview	Riverview	MI	[Confidential]
Venice	WMI	WMI	MI	[Confidential]
Woodland	WMI	WMI	MI	[Confidential]
Pinetree	WMI	WMI	MI	[Confidential]
Tri City	WMI	WMI	MI	[Confidential]
Total				[Confidential]

Breakdown of Volume by Location of Disposal Site		
Location	**Tonnes**	**Percentage**
Southern Ontario	0	[Confidential]
Michigan	0	[Confidential]
New York	0	[Confidential]

Report by Michael R. Baye

Table 4: Where ICI Waste from the GTA that BFIL and CWS did not Direct or Internalize was Permanently Disposed, 1999

Landfill	1999 Control	Current Control	Location	Total Volume (Tonnes) of ICI Waste from the GTA, 1999
Ridge	BFIL	Ridge	SO	[Confidential]
Greenlane	Greenlane	Greenlane	SO	[Confidential]
Keele V.	Keele V.	Keele V.	SO	[Confidential]
Walker Bros.	Walker Bros.	Walker Bros.	SO	[Confidential]
Sarnia (Lasalle/Blackwell)	CWS	CWS	SO	[Confidential]
Richmond	CWS	CWS	SO	[Confidential]
Other	Other	Other	SO	[Confidential]
Ref-Fuel	BFI/Allied	Allied	NY	[Confidential]
Niagara Recycling	BFI/Allied	Allied	NY	[Confidential]
Vienna Jct	BFI/Allied	Allied	MI	[Confidential]
Sauk Trails	BFI/Allied	Allied	MI	[Confidential]
Citizens	BFI/Allied	Allied	MI	[Confidential]
Arbor Hills	BFI/Allied	Onyx	MI	[Confidential]
Brent Run	Republic	Republic	MI	[Confidential]
Carleton Farms	Republic	Republic	MI	[Confidential]
Riverview	Riverview	Riverview	MI	[Confidential]
Venice	WMI	WMI	MI	[Confidential]
Woodland	WMI	WMI	MI	[Confidential]
Pinetree	WMI	WMI	MI	[Confidential]
Tri City	WMI	WMI	MI	[Confidential]
Total				**0**

Breakdown of Volume by Location of Disposal Site		
Location	**Volume**	**Percentage**
Southern Ontario	0	[Confidential]
Michigan	0	[Confidential]
New York	0	[Confidential]

Report by Michael R. Baye

Table 5: Capacity Utilization of Southern Ontario Landfills Receiving Significant Volumes of ICI Waste from the GTA, 1999

Landfill	1999 Control	Current Control	Tonnes of ICI Waste Received from GTA, 1999	Annual Capacity (Tonnes)
Walker Bros	Walker	Walker	[Confidential]	617,000
Ridge	BFIL	Ridge	[Confidential]	220,000
Keele V.	Keele V.	Keele V.	[Confidential]	1,497,400
Sarnia (Lasalle/Blackwell)	CWS	CWS	[Confidential]	675,000
Total			1,372,000	3,009,400

Percentage of Capacitity Used for:	
ICI Waste from GTA	45.6%
Other Waste	54.4%
Excess Capacity	0%

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Table 6: Anticipated Southern Ontario Excess Capacity for ICI Waste from the GTA in 2002

Landfill	2002 Control	1999 Annual Capacity (Tonnes)	2002 Permitted Annual Capacity (Tonnes)	Lost Capacity*	Unutilized Capacity Potentially Available in 2002**	New Capacity Available in 2002
Sarnia (Lasalle/Blackwell)	CWS	675,000	0	[Confidential]	0	0
Warwick	CWS	56,000	750,000	0	0	694,000
EWSWA	EWSWA	320,000	320,000	0	[Confidential]	0
Richmond	CWS	125,000	750,000	0	0	625,000
Greenlane	Greenlane	262,500	262,500	0	[Confidential]	0
Walker Bros.	Walker	617,000	617,000	0	0	0
Ridge	Ridge	220,000	680,000	0	0	460,000
Keele V.	Keel V.	1,497,400	0	[Confidential]	0	0
Total				[Confidential]	[Confidential]	**1,779,000**

Represents the ICI Waste going into a landfill that is anticipated to close by 2002.

Greenlane: 2002 capacity less the total volume of SNHW received in 1998.

EWSWA: Amount of out-of-county waste permitted under its operating plan.

Summary of Anticipated Change in Net Excess Capacity by 2002	
Unutilized Capacity	[Confidential]
+ **New Capacity**	**1,779,000**
= **Total Excess Capacity in 2002**	[Confidential]
- **Lost Capacity**	[Confidential]
= **Net Excess Capacity for ICI Waste From GTA in 2002**	1,197,923

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Table 7: Control of Southern Ontario Excess Capacity for ICI Waste from the GTA in 2002 and Herfindahl Indices

Control of Southern Ontario Capacity for GTA: Independent Ridge Landfill

Control	Total 2002 Permitted Annual Capacity for ICI From GTA		Total Excess Capacity for ICI Waste From GTA	
	Metric Tonnes	Percent of Total Annual Capacity	Volume (Tonnes)	Percent of Total Excess Capacity
CWS	1,500,000	[Confidential]	1,319,000	[Confidential]
EWSWA	[Confidential]	[Confidential]	[Confidential]	[Confidential]
Greenlane	262,500	[Confidential]	[Confidential]	[Confidential]
Walker Bros	617,000	[Confidential]	0	0.0%
Ridge	[Confidential]	[Confidential]	460,000	[Confidential]
Total	**2,379,500**		**1,779,000**	
Herfindahl Index		**3,178**		**4,650**

Control of Southern Ontario Capacity for GTA: CWS Controlled Ridge Landfill

Control	Total 2002 Permitted Annual Capacity for ICI From GTA		Total Excess Capacity for ICI Waste From GTA	
	Metric Tonnes	Percent of Total Annual Capacity	Volume (Tonnes)	Percent of Total Excess Capacity
CWS	2,180,000	[Confidential]	[Confidential]	[Confidential]
EWSWA	[Confidential]	[Confidential]	[Confidential]	[Confidential]
Greenlane	262,500	[Confidential]	[Confidential]	[Confidential]
Walker Bros	617,000	[Confidential]	0	[Confidential]
Total	**[Confidential]**		[Confidential]	
Herfindahl Index		**5,221**		**7,472**

Report by Michael R. Baye

Table 8: Where ICI Waste from the CKA was Permanently Disposed, 1999

Landfill	1999 Control	Current Control	Location	Total Volume (Tonnes) of ICI Waste from the CKA, 1999
Ridge	BFIL	Ridge	CKA	[Confidential]
Gore	CWS	CWS	CKA	[Confidential]
Sarnia	CWS	CWS	SO	[Confidential]
EWSWA	EWSWA	EWSWA	SO	[Confidential]
Total				39,425

Percentage Of ICI Waste from the CKA Disposed in	
CKA	[Confidential]
CWS Sites Outside of the CKA	[Confidential]
Other Sites Outside of the CKA	[Confidential]

Table 9: Impact of CWS Control of the Ridge Landfill on the Stucture of the Market for ICI Waste from the CKA (Based on Waste Flows for 1999)

Market Shares and Herfindahl Index with CWS Controlled Ridge		
Control	**Volume**	**Market Share**
CWS	[Confidential]	[Confidential]
EWSWA	[Confidential]	[Confidential]
Total	[Confidential]	
HHI	**9,943**	

Market Shares and Herfindahl Index with Independent Ridge		
Control	**Volume**	**Market Share**
CWS	[Confidential]	[Confidential]
Ridge	[Confidential]	[Confidential]
EWSWA	[Confidential]	[Confidential]
Total	[Confidential]	
HHI	**5,452**	

Exhibit B: Curriculum Vitae of MICHAEL R. BAYE

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DEGREES

Ph.D. (Economics), Purdue University, August 1983
M.S. (Economics), Purdue University, December 1981
B.S. (Economics), Texas A&M University, May 1980

FIELDS OF INTEREST

Industrial Organization, Microeconomic Theory, Game Theory

PROFESSIONAL EXPERIENCE

Academic Positions:

Bert Elwert Professor of Business, Kelley School of Business, Indiana University, 1997 - present
Associate and Full Professor of Economics, Penn State University, 1991-1997
Assistant and Associate Professor of Economics, Texas A&M University, 1985-1991
Assistant Professor of Economics, University of Kentucky, 1983 - 1985

Administrative, Visiting, and Other Positions:

Interim Head, Department of Economics, Penn State University, 1994-1995
Advisory Committee, Institute for Policy Research and Evaluation, 1994 - 1995
Visiting Professor, New Economic School, Moscow, Russia, 1995
Fellow, CentER for Economic Research, 1990 - Present
Fulbright Professor, Erasmus University Rotterdam, 1985 - 1986

BOOKS

Michael R. Baye, *Managerial Economics and Business Strategy, 3rd Edition.* McGraw-Hill, 2000.

Michael R. Baye, *Student Workbook for Managerial Economics and Business Strategy, 3rd Edition*. McGraw-Hill, 2000.

Michael R. Baye (ed.), *Advances in Applied Microeconomics: Industrial Organization*. Greenwich: JAI Press, forthcoming, 2000.

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Paul M. Anglin and Michael R. Baye, "Information, Multiprice Search, and Cost-of-Living Index Theory," *Journal of Political Economy*, Vol. 95 (December 1987), pp. 1179-1195.

Michael R. Baye and Thomas F. Cosimano, "Erratic Monetary Policy and the Dispersion of Commodity Prices," *Journal of Macroeconomics*, Vol 8 (Spring 1986), pp. 201-259

Michael R. Baye, "Population Intervals and the True Cost-of-living Index with Known Price Distributions," *Economics Letters*, Vol. 17 (1985), pp. 257-259.

Michael R. Baye, "A Note on Price Stability and Consumers' Welfare," *Econometrica*, Vol. 53 (January 1985), pp. 213-217.

Michael R. Baye, "Price Dispersion and Functional Price Indices," *Econometrica*, Vol. 53 (January 1985), pp. 217-223.

Michael R. Baye and Darrell F. Parker, "Combining Ridge and Principal Component Regression: A Money Demand Illustration," *Communications in Statistics (Theory and Methods)*, Vol. 13 (1984), pp. 197-205.

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Michael R. Baye, "Optimal Adjustments to Changes in the Price of Advertising," *Journal of Industrial Economics*, Vol. 30 (September 1981), pp. 95-103.

Michael R. Baye and Darrell F. Parker, "The Consumption Tax and Supply Side Economics: Some Short-Term Revenue Effects," *The Cato Journal*, Vol. 1 (Fall 1981), pp. 629-632.

RECENT WORKING PAPERS

Michael R. Baye and John Morgan, "Bounded Rationality in Homogeneous Product Pricing Games."

Michael R. Baye, Dan Kovenock, and Casper G. de Vries, "A General Model of Contests and Auctions."

Michael R. Baye, Dan Kovenock, and Casper G. de Vries, "Comparative Analysis of Litigation Systems: An Auction-Theoretic Approach."

TEACHING EXPERIENCE

Courses Taught:

Undergraduate:	Microeconomics, Industrial Organization, Managerial Economics, Principles of Economics, Global Strategy.
MBA:	Managerial Economics and Strategy.
Ph.D.:	Industrial Organization, Microeconomic Theory

Recent Awards:

Teaching Excellence Award, Kelley School of Business, 1999-2000
Teaching Excellence Award, Kelley School of Business, 1998-1999
Teaching Excellence Recognition Award, Kelley School of Business, 1997-1998

NATIONAL GRANTS AND AWARDS

Listed in *Who's Who in Finance and Industry* (since 1992).

Fulbright Lecturer/Research Scholar Grant, Erasmus University, Rotterdam, The Netherlands, December 1985 - August 1986.

National Science Foundation Grant (SES-8410190), Adjusting Data for Distortions in the Measurement of the Cost of Living, October 1984 - March 1986.

EDITORIAL BOARDS AND SERVICE

Editor, *Advances in Applied Microeconomics*, JAI Press.

Editorial Board, *Journal of Economics & Governance*, Springer-Verlag.

Editorial Board, *Lecture Notes in Economics and Mathematical Systems*, Springer-Verlag

Referee for *American Economic Review, Econometrica, Rand Journal of Economics, Journal of Economics and Management Strategy, Journal of Economic Theory, European Journal of Political Economy, Journal of Economic Behavior and Organization, International Economic Review, Journal of Public Economics, Journal of Econometrics, Annals of the Institute of Statistical Mathematics, Economic Inquiry, Economics Letters, Applied Economics, Economic Theory, Economica, International Journal of Game Theory, Journal of Industrial Economics, International Journal of Industrial Organization, Journal of International Economics, Journal of Institutional and Theoretical Economics, Quarterly Journal of Business and Economics,* National Science Foundation

INVITED LECTURES

Harvard, Michigan, Cornell, Texas, North Carolina, Federal Trade Commission, U.S. Department of Justice, Florida, VPI, General Motors Research Laboratories, Georgetown, Bureau of Labor Statistics, Indiana, Iowa State, Katholieke Universiteit Leuven, Econometric Institute, Louis Pasteur University, Penn State, Free University of Amsterdam, Southern Methodist University, State University of New York at Buffalo, Syracuse, Tilburg, Netherlands Central Bureau of Statistics, Erasmus University Rotterdam, Texas A&M, University of Amsterdam, Illinois, Karlsruhe, Winthrop, Kentucky, Notre Dame, Western Ontario, West Virginia, Missouri, Wisconsin, Michigan State

SELECTED INTERNATIONAL MEETINGS

World Congress of the Econometric Society, Seattle, Washington, August 2000. Paper presented: Information Gatekeepers on the Internet and the Competitiveness of Homogeneous Product Markets.

Economic Theory Meetings, Rhodes, Greece, July 1-July 10, 1999. Paper presented: "Information Gatekeepers and the Competitiveness of Homogeneous Product Markets."

Econometric Society, Toulouse France, August 27-August 30, 1997. Paper presented: "Information Transmission, Information Acquisition, and Price Dispersion in 'Thin' Homogeneous Product Markets."

Tinbergen Institute Conference on Contests, Rotterdam, The Netherlands, August 22-23, 1997. Paper presented, "Fee Allocation of Lawyer Services in Litigation."

Econometric Society Summer Meetings, Pasadena California, June 26-June 29, 1997. Paper presented: "Necessary and Sufficient Conditions for Bertrand's Paradox."

American Economic Association Annual Meetings, San Francisco, CA, January 5-7 1996. Paper Discussed: "The Effects of Price Dispersion on Cost-of-Living Indices."

Econometric Society, Boston, MA, January 3-5, 1993. Paper presented: "The Solution to the Tullock Rent-Seeking Game when R > 2."

Econometric Society, Brussels, Belgium, August 24-28, 1992. Paper Presented: "Efficient Rent Seeking."

World Congress of the Econometric Society, August 22-29, 1990, Barcelona, Spain. Paper presented: "The All-Pay Auction with Complete Information."

Econometric Society, September 4-9, 1989, Munich, West Germany. Paper presented: "Asymmetric Information and the Formation of Asset Prices."

European Economic Association, September 2-4, 1989, Augsburg, West Germany. Paper presented: "It Takes Two to Tango: Equilibria in a Model of Sales."

European Economic Association, August 29-September 1, 1988, Bologna Italy. Paper presented: "Mixed-Strategy Trade Equilibria."

European Economic Association, August 29-September 1, 1988, Bologna Italy. Paper presented: "The Poverty Concept when Prices are Income-Dependent."

American Economic Association, December 28-30, 1987, Chicago. Paper presented: "Stochastic Bertrand Trade Equilibria."

Econometric Society, December 28-30, 1986, New Orleans. Paper presented: "Search and Matching Equilibria When the Side of the Match is Endogenous."

Canadian Economic Association, May 26-30, 1985, Montreal. Paper presented: "Multiprice Search and the Cost of Living."

Econometric Society, December 28-30, 1982, New York. Paper presented: "A Stochastic Price Index."

Joint Council on Economic Education, June 20-25, 1982, Harvard University, Boston.

SELECTED CONSULTING CLIENTS

Ackerson Group, Washington D. C.
California Franchise Tax Board
Canadian Department of Justice – Competition and Consumer Law Division
John Wiley and Sons, Inc.
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