4. EXISTING CONDITIONS

4.1 Physical

4.1.1. Engineering

Since the late 1950's, the Toronto Harbour Commissioners (THC) have been responsible for the design and construction of the landmass at the foot of Leslie Street. Through the process of dumping earth, brick, and large rubble into Lake Ontario, the THC have refined the technique of deep water harbour mole creation. The THC followed a three phased design in the creation of Tommy Thompson Park; the Eastern Headland was formed first, the peninsulas on the north side of the spine were developed in 1973-74, while the Endikement was initiated in 1979. Figure 4.1 represents the yearly progression of the lakefill operations for the Park.

Table 4.1 - Fill Progress Report for the Outer Harbour East Headland and Endikement provides a summary of the material volumes in the creation of Tommy Thompson Park. As of the end of 1991 over 4.3 million truckloads or 23 million cubic meters of material and over 6.4 million cubic meters of dredgeate from the harbour channel dredging has been deposited. Timing to complete the configuration is subject to the availability of fill material.

4.1.2 Dredgeate Disposal

The three cells contained within the endikement area have been designed as a Confined Disposal Facility (CDF) for the disposal of dredged material. Cell #1 covers 8.2 ha of water area. In 1987, it was filled to 1.5 m below Chart Datum with a total of 365,441 m^3 (scow measure) of dredgeate.

The disposal operations in Cell #2 commenced in 1987. This cell covers 9.3 ha of water area. As of September 1992, a total of 723,017 m^3 (scow measure) of material was deposited within this cell. This cell has an estimated capacity of 530,000 m^3 when filled to 1.5 m below Chart Datum.

Cell #3 is the largest of the three cells, covering 32.1 ha of water area. Its estimated capacity is 2.2 million cubic meters for disposal operations.

Cell #1 Capping Proposal

At its meeting #4/91, June 14, 1991, the Authority adopted the following resolution regarding the Cell 1 Capping Proposal:

Res. #133
THAT the preferred option of a clean fill cap with the creation of a wetland

Figure 4.1: Tommy Thompson Park Proposed Landfill Program

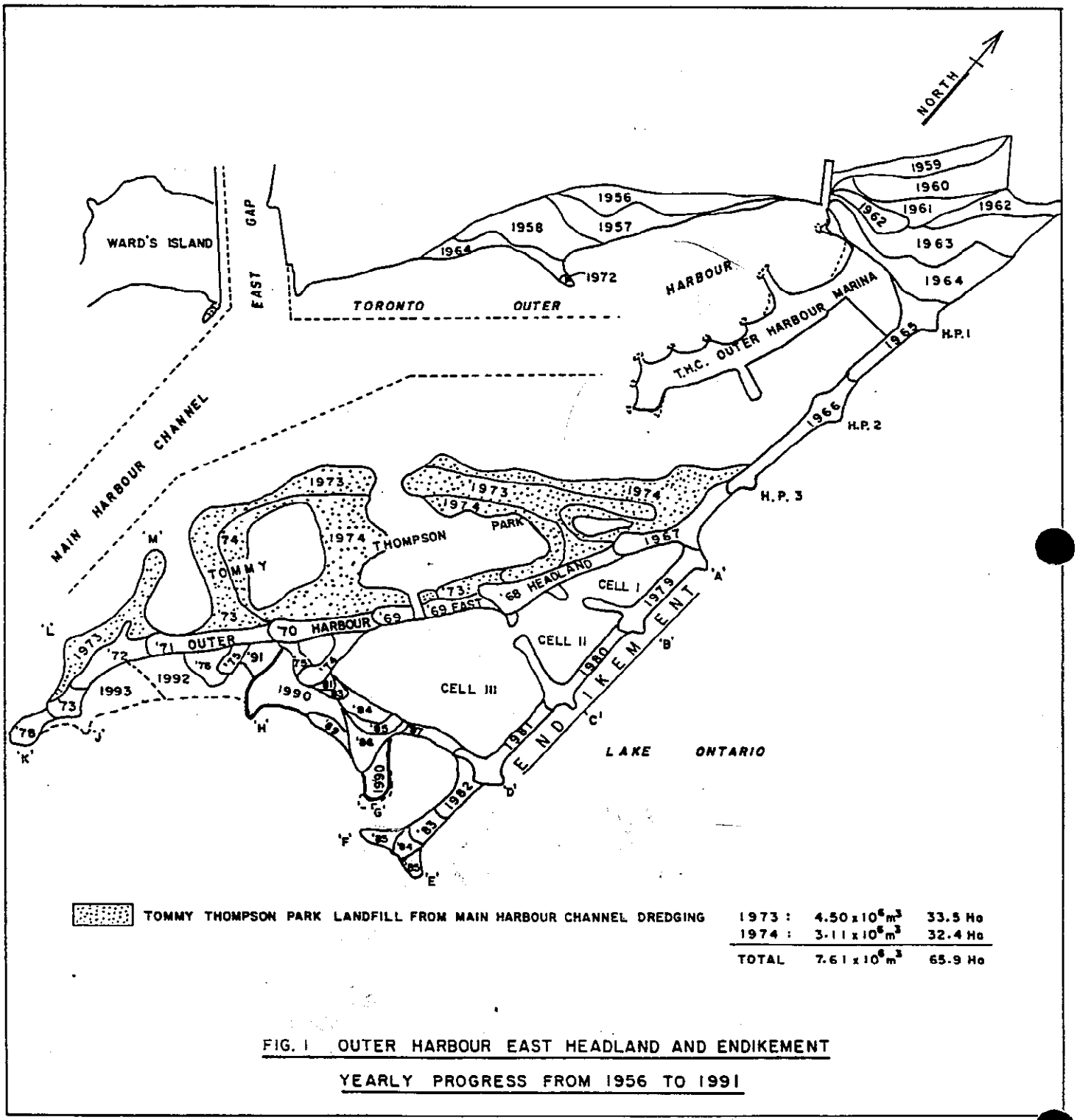


FIG. 1 OUTER HARBOUR EAST HEADLAND AND ENDIKEMENT

YEARLY PROGRESS FROM 1956 TO 1991

Table 4.1: Fill Progress for the Outer Harbour East Headland and Endikement 1956 - 1991

YEAR	TRUCK LOADS	CUBIC METRES	DREDGE SPOIL m³	TOTAL m³	ha
1956	26,000	99,385	-	99,385	5.50
1957	38,000	149,078	-	149,078	7.00
1958	13,894	58,867	-	58,867	6.68
1959	78,901	283,630	-	283,630	4.90
1960	107,880	347,542	-	347,542	9.35
1961	123,704	390,277	-	390,277	4.90
1962	114,725	408,702	416,653	825,355	6.47
1963	156,820	522,536	-	522,536	10.12
1964	266,826	1,034,904	-	1,034,904	15.78
1965	173,912	705,834	-	705,834	3.64
1966	180,561	757,620	252,285	1,009,905	4.86
1967	180,700	779,790	99,385	879,175	3.92
1968	238,918	1,110,482	77,054	1,187,536	3.72
1969	178,451	902,822	143,126	1,045,948	2.27
1970	184,600	893,067	82,310	975,377	2.55
1971	199,501	910,514	66,397	976,911	3.44
1972	157,921	690,835	51,650	742,485	1.78
1973	169,850	768,490	74,002	842,492	0.81*
1974	98,797	458,321	22,505	480,826	3.52**
1975	106,514	610,725	44,100	654,825	2.31
1976	78,817	451,917	-	451,917	2.75
1977	64,402	369,265	3,662	372,927	1.86
1978	16,496	94,584	13,341	107,925	0.16□
1979	76,254	437,224	3,392	440,616	2.29⁎
1980	182,797	1,040,719	43,045	1,083,764	4.30
1981	182,616	1,438,131	102,875	1,541,006	3.50
1982	157,065	1,216,345	73,010	1,289,355	2.88
1983	113,702	895,430	29,760	925,190	1.62
1984	100,636	779,303	83,335	862,638	1.78
1985	98,067	689,565	83,214	772,779	1.91
1986	91,967	744,303	62,445	806,758	1.70
1987	53,352	431,769	93,591	525,360	1.55
1988	55,405	444,011	120,903	564,914	0.32
1989	89,374	721,265	107,724	828,989	3.30
1990	153,419	1,236,725	97,538	1,334,263	5.19
1991	55,625	446,858	95,329	542,187	1.70
Total	4,366,469	23,320,835	2,342,641	25,663,476	140.80
*'73			3,825,558		33.55●
**'74			2,640,562		32.34●

□ Rubble Only 78/1/19
⁎ Endikement 79/4/2
● Main Harbour Channel Dredging

ecosystem for disposal Cell 1 at Tommy Thompson Park, in accordance with the Keating Channel Environmental Assessment (September 17, 1986), be approved;

AND FURTHER THAT staff be directed to submit the proposal to the Regional Director of the Ministry of the Environment for review and approval.

Following the Authority approval of the Cell 1 Capping Proposal, it was submitted to the Toronto Harbour Commissioners for approval. Authority staff submitted the proposal to the Ministry of the Environment in July, 1991, as part of the annual operating plan approved through the Keating Channel Environmental Assessment. The Ministry of the Environment then coordinated a review of the proposal with agencies involved with the Toronto Harbour Commissioners' annual operating plan review.

Background

For several years, Tommy Thompson Park has been repository for sediments dredged from the Keating Channel and other locations in the vicinity of the Toronto Harbour. These operations were approved under Section 14 of the Environmental Assessment Act by the Provincial Minister of the Environment on September 17, 1986, subject to a number of terms and conditions. Condition number five states:

Cell 1 shall be topped off and capped no later than December 31, 1992, in a manner which restricts biological uptake and mobility of contaminants.

Disposal of dredgeate in Cell 1 at Tommy Thompson Park was completed in 1987; and as required by the Environmental Assessment decision, capping options have been developed by the MTRCA. The three capping alternatives evaluated by the MTRCA are: a dry clean-fill cap; a wetland cap established directly on dredgeate; and the placement of clean-fill cap over the dredgeate, followed by the creation of a wetland ecosystem on the clean fill. After extensive studies of the existing environment at Cell 1 and after evaluation of the economic and engineering considerations of the project, MTRCA is proposing the use of a clean-fill cap and subsequent establishment of a wetland at the site.

The preferred capping alternative will be completed in phases to facilitate de-watering operations and to improve the management and control of construction. A minimum of 0.5 meters of clean fill will be placed over the dredgeate, and the quality of all fill will meet open-water disposal criteria. An estimated 203,754 m^3 of fill will be required for the capping.

Construction will begin immediately upon project approval. The length of the construction period will depend on the availability of fill, but at an expected average of 120 truck loads per day, the capping will be completed in approximately 11 months. At this rate of construction, the project is estimated to cost $493,000.

After the placement of clean-fill cap over the dredgeate in Cell 1, a wetland ecosystem will be established at the site. The wetland will provide fish and wildlife habitat as well as recreational and interpretive opportunities. In addition, the wetland ecosystem will satisfy the policy objectives of various regulatory agencies.

For more information regarding the Cell 1 Capping Proposal, refer to Appendix B in the Addendum document. The Keating Channel Dredging Environmental Assessment can be found in the Original Master Plan/Environmental Assessment document, in Appendix B.

4.1.3 Fill Quality

The Improved Lakefill Quality Control Program

The Improved Lakefill Quality Control Program (ILQCP) is designed to protect the present and future environment of lakefill locations from environmentally unsuitable soil or fill material. The decision making process of the ILQCP takes into account the end use of lakefill sites and the surrounding aquatic environment in assessing the suitability of fill for placement.

The ILQCP enforces environmental controls on the material to be deposited at lakefill locations. In addition, pre-disposal inspection of sites undergoing development requires the developer or owner to document the site history and the chemical nature of excavated material prior to acceptance at a lakefill location. This information is used by the MTRCA to assess the acceptability of material and appropriate placement location of fill (See Figure 4.2).

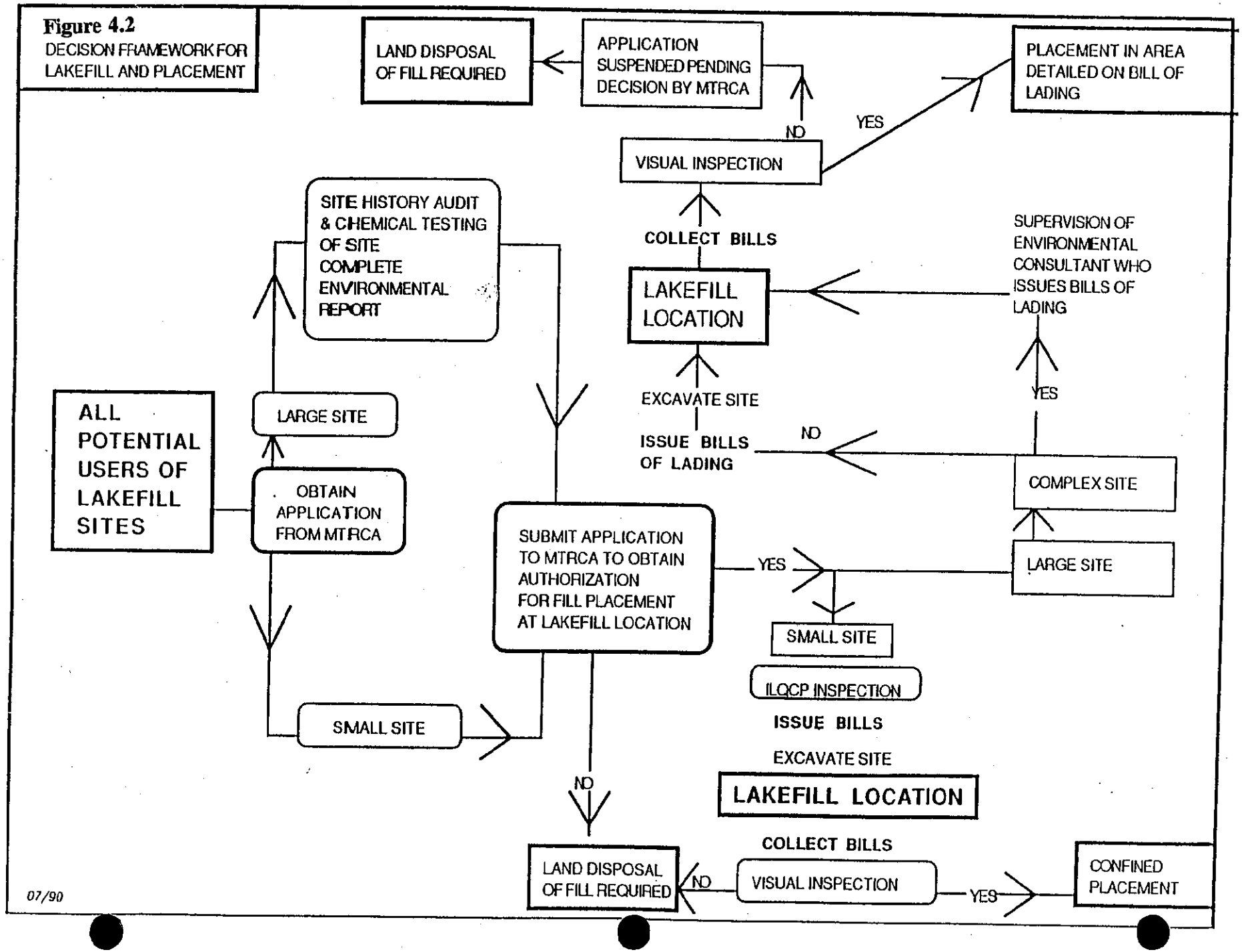
The ILQCP is designed as a tool to be used in conjunction with good judgement and past practical experience in the handling and disposal of material at lakefill locations.

The ILQCP requires that developers with sites producing potential lakefill material, complete an application which includes a site history audit and a series of chemical tests prior to initiation of site excavation activities. All completed applications are to be presented to the MTRCA prior to the initiation of the excavation so that the MTRCA can identify an environmentally safe disposal option at a lakefill location for the excavated material without causing unnecessary project delays.

At the lakefill location, trucks arriving from all sites are subject to a visual inspection before access is granted to the facility. The vehicles will have Bills of Lading which show the Gate Inspector that the material has been inspected and is conditionally suitable for lakefill placement.

All material proposed for lakefill must meet the regulatory standards and policies set forth by the governing agencies which have jurisdiction at the lakefill facility. It is expected that the Program Guidelines will change through time and the regulatory standards and policies which are to be used will be those that are current. Consequently, the developer should be aware of all updated policies and regulations. Currently, only open water quality material, as defined in the Lakefill manual, is accepted at Tommy Thompson Park. The decision of the MTRCA will be final as to the application of the regulations and policies of the lakefill

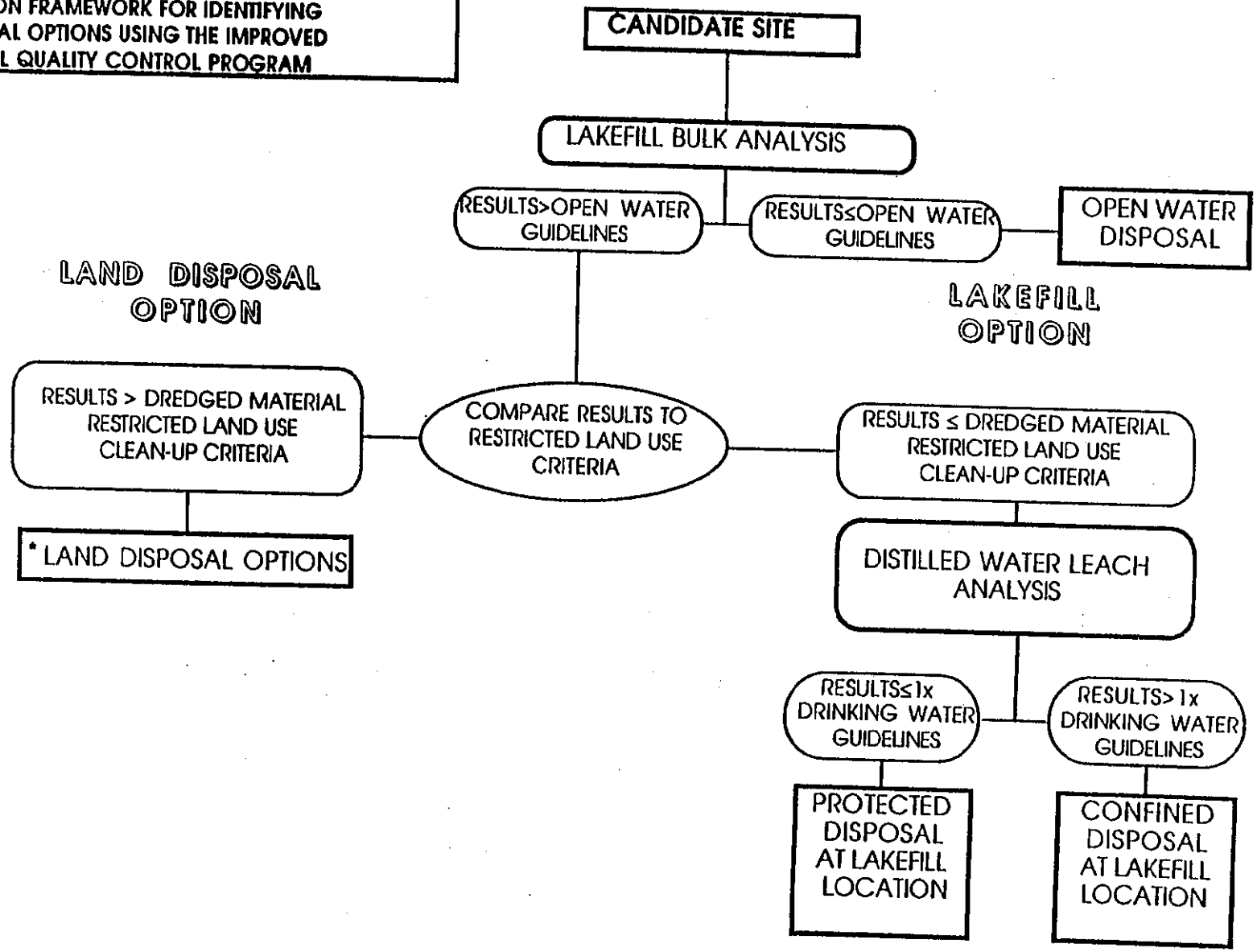
Figure 4.2
DECISION FRAMEWORK FOR LAKEFILL AND PLACEMENT



07/90

Figure 4.3

DECISION FRAMEWORK FOR IDENTIFYING DISPOSAL OPTIONS USING THE IMPROVED LAKEFILL QUALITY CONTROL PROGRAM



* Subject to Ontario Regulation 309 and/or M.O.E. Decommissioning Guidelines

December, 1988

program and are not restricted to the limitations imposed by the ILQCP. Once granted access to a lakefill location, all excavated material proposed for placement will be directed to an appropriate location, on the basis of the results of the required tests and inspections. Subject to availability, the following classifications are a list of potential lakefill location disposal options or areas: Open water, Protected lakefill, Confined lakefill and Land disposal (See Figure 4.3).

The MTRCA audits all aspects of the ILQCP daily. The audit procedures include site visits, inspection of trucks, random chemical testing and Application reviews. Developers are not given any information as to the time or location of an audit and may not be informed that one has been completed.

Audits will supply the MTRCA with a quality control summary of the activities of developers and sites. Sites which are considered complex in nature will be subject to increased supervision due to site conditions.

If an audit or standard inspection identifies a situation which is in violation of the ILQCP, then access to the lakefill location is denied and the Ministry of the Environment is notified immediately and the prosecution of violating developers is initiated under all applicable Acts and Codes.

In addition to the rejected load reports, the MTRCA submits a summary of activities to the Ministry of the Environment every month. A year end report which summarizes the monthly reports is also forwarded to the Director of the Central Region of the Ministry of the Environment.

4.2 Biophysical

4.2.1 Ornithological Summary

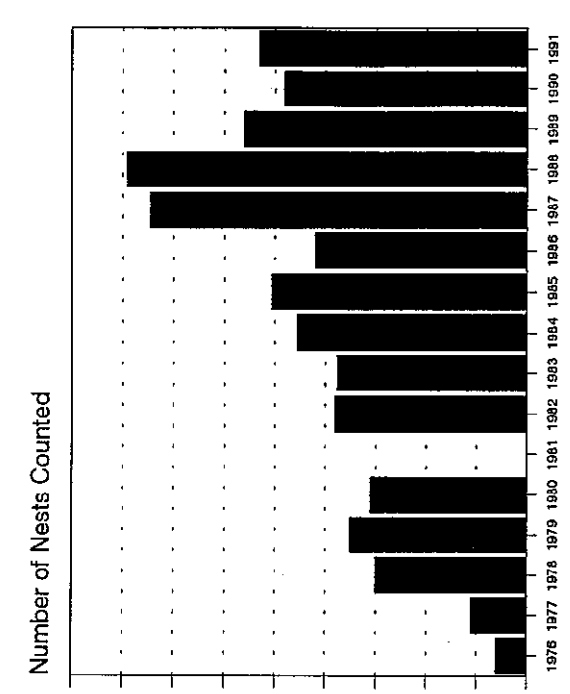
The use of the site by a wide range of avifauna has been well documented through various studies by the MTRCA, the Canadian Wildlife Service, local naturalists and interest groups. In this respect the site has become well known as a significant nesting and staging area and is an important component of one of the major migrational corridors through the metro region.

At the present time there are 5 species of colonial waterbirds that nest at Tommy Thompson Park in significant numbers. These include; ring-billed gull, herring gull, common tern, black-crowned night heron and double-crested cormorant (see Figure 4.4).

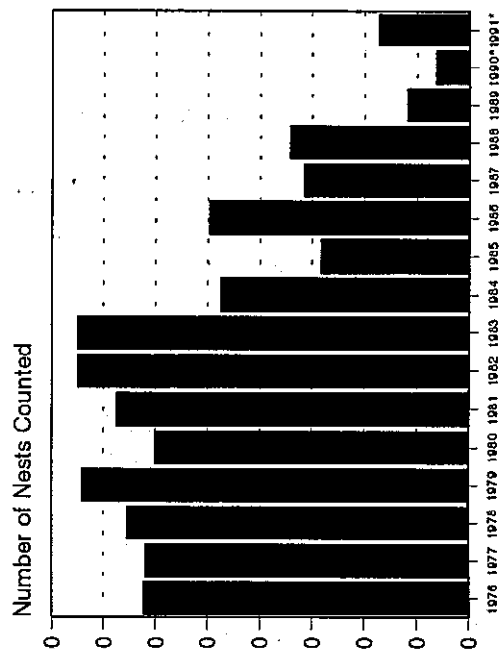
In 1988 the colony of caspian terns abandoned their former nesting area on peninsula B due to changes in habitat and competition from ring-billed gulls. Although these birds have not nested at Tommy Thompson Park since 1987, adults are regularly observed feeding immature birds in various locations of the park during the summer months.

In 1991 double-crested cormorants nested in small numbers at the Park at the tip of

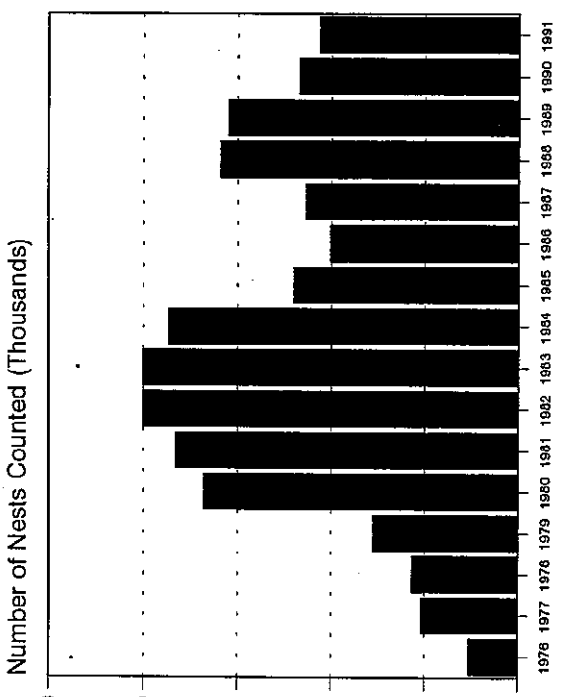
Figure 4.4 Colonial Waterbird Nesting Numbers
Tommy Thompson Park 1976-1991



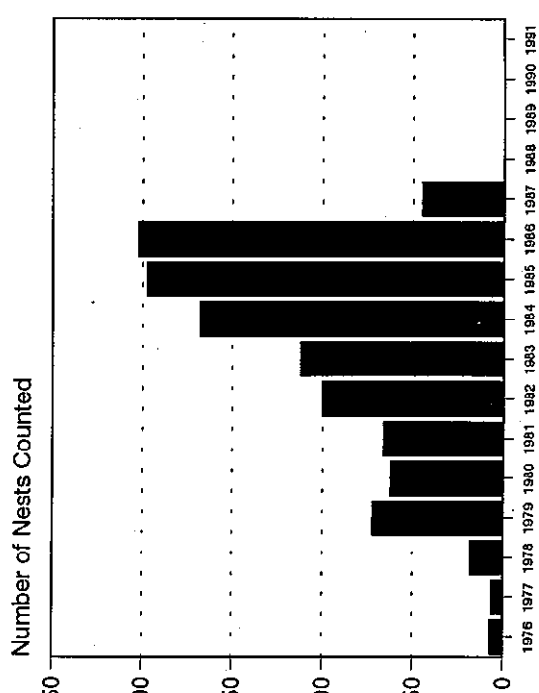
Herring Gull Nesting Numbers



Common Tern Nesting Numbers
* - nests on artificial rafts

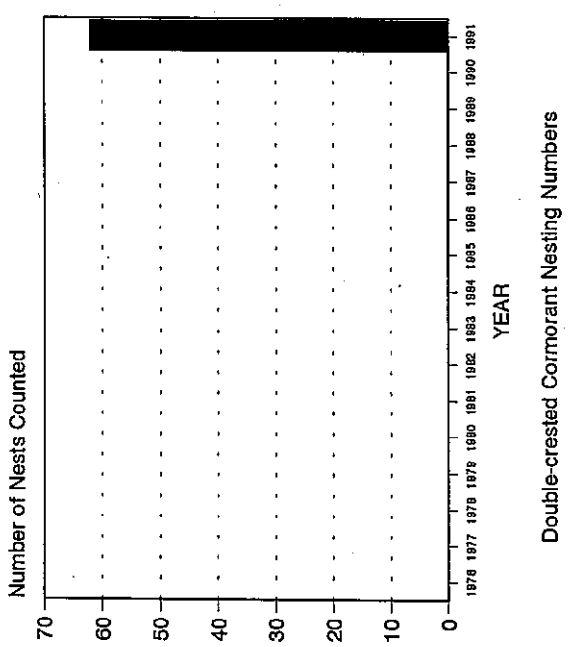


Ring-billed Gull Nesting Numbers

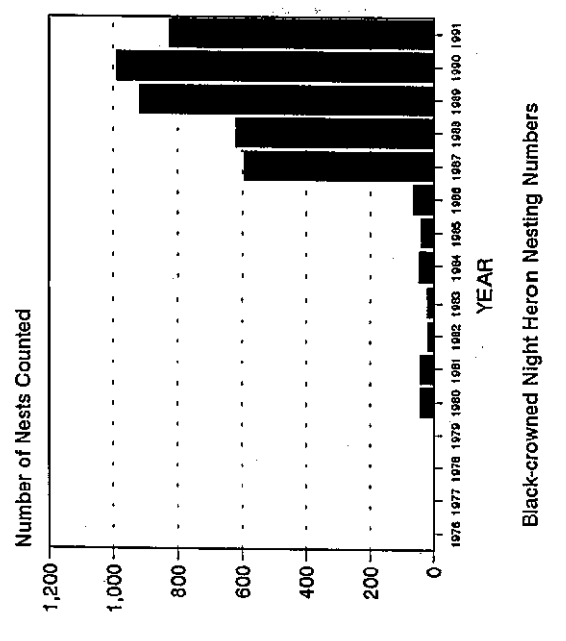


Caspian Tern Nesting Numbers

Figure 4.4 (Con't) Colonial Waterbird Nesting Numbers
Tommy Thompson Park 1976-1991



Double-crested Cormorant Nesting Numbers



Black-crowned Night Heron Nesting Numbers

peninsula B. These birds nested again in 1992 and are expected to continue colonization at this location.

The colony of black-crowned night herons at Tommy Thompson Park increased dramatically between 1987 and 1990, and, a decline in the former colony at Mugg's Island (Toronto Island's) was also observed during this time period. In this respect, the colony at Tommy Thompson Park represents the largest colony of this species in the greater metro region.

In total, 290 bird species have been observed on site, see Table 4.2. Of these species, 40 have been known to breed at the site.

4.2.2 Wildlife Features

The environmental significance of the wildlife features of the site have been determined by applying the environmentally significant areas (E.S.A.) selection criteria, and monitoring the wildlife species and habitat features that are present.

The wildlife significance of the site includes the presence of:

- Migrant bird staging areas (see page 48, 1989 Document);
- Significant nesting areas (see page 50, 1989 Document); and
- Nationally, provincially and Regionally rare plant species (see pages 49, 51 and 52, 1989 Document).

An update of the Aquatic Park Environmental Study will be undertaken in 1993 using methodologies similar to those used during the 1978-82 inventories. Studies will focus on updating the information on mammals, reptiles, amphibians, birds and fish. Staff will also endeavour to update the Authority's Environmentally Significant Area Study for the E.S.A.'s at Tommy Thompson Park.

Tommy Thompson Park provides important habitat for a variety of reptiles, amphibians, urban mammals, butterflies and skippers. Table 4.4 lists the species that have been documented at this site.

4.2.3 Vegetation Summary

One of the most significant biophysical attributes of Tommy Thompson Park has been the colonization and succession of various plant communities. The significance has been due in part to the presence of rare and unusual species, and the successional processes themselves. Over time a number of studies and inventories have documented the community types and species composition of the site, however, continuing natural succession and other disturbances have caused changes in the status of some species. Table 4.5 provides a

Table 4.2 **Birds Observed at Tommy Thompson Park**

- Red-throated Loon
- Common Loon
- Pied-billed Grebe
- Horned Grebe
- Red-necked Grebe
- Eared Grebe
- Northern Gannet
- American White Pelican
- Great Cormorant
- Double-crested Cormorant
- American Bittern
- Least Bittern
- Great Blue Heron
- Great Egret
- Snowy Egret
- Cattle Egret
- Green-backed Heron
- Black-crowned Night Heron
- Yellow-crowned Night Heron
- Glossy Ibis
- Tundra Swan
- Trumpeter Swan
- Mute Swan
- Greater White-fronted Goose
- Snow Goose
- Brant
- Canada Goose
- Wood Duck
- Green-winged Teal
- American Black Duck
- Mallard
- Northern Pintail
- Blue-winged Teal
- Northern Shoveler
- Gadwall
- Eurasian Wigeon
- American Wigeon
- Canvasback
- Redhead
- Ring-necked Duck
- Greater Scaup
- Lesser Scaup
- King Eider
- Harlequin Duck
- Oldsquaw
- Black Scoter
- Surf Scoter
- White-winged Scoter
- Common Goldeneye
- Barrow's Goldeneye
- Bufflehead
- Hooded Merganser
- Common Merganser
- Red-breasted Merganser
- Ruddy Duck
- TurkeyVulture
- Osprey
- Bald Eagle
- Northern Harrier
- Sharp-shinned Hawk
- Cooper's Hawk
- Northern Goshawk
- Red-shouldered Hawk
- Broad-winged Hawk
- Red-tailed Hawk
- Rough-legged Hawk
- Golden Eagle
- American Kestrel
- Merlin
- Peregrine Falcon
- Gyrfalcon
- Ring-necked Pheasant
- Northern Bobwhite
- Yellow Rail
- Virginia Rail
- Sora
- Common Moorhen
- American Coot
- Sandhill Crane
- Black-bellied Plover
- Lesser Golden Plover
- Semipalmated Plover
- Piping Plover
- Killdeer
- American Avocet
- Greater Yellowlegs
- Lesser Yellowlegs
- Solitary Sandpiper
- Willet
- Spotted Sandpiper
- Upland Sandpiper
- Whimbrel
- Hudsonian Godwit
- Marbled Godwit
- Ruddy Turnstone
- Red Knot
- Sanderling
- Semipalmated Sandpiper
- Western Sandpiper
- Least Sandpiper
- White-rumped Sandpiper
- Baird's Sandpiper
- Pectoral Sandpiper
- Purple Sandpiper
- Dunlin
- Stilt Sandpiper
- Buff-breasted Sandpiper
- Short-billed Dowitcher
- Long-billed Dowitcher
- Common Snipe
- American Woodcock
- Wilson's Phalarope
- Red-necked Phalarope
- Red Phalarope
- Pomarine Jaeger
- Parasitic Jaeger
- Laughing Gull
- Franklin's Gull
- Little Gull
- Common Black-headed Gull
- Bonaparte's Gull
- Ring-billed Gull
- California Gull
- Herring Gull
- Thayer's Gull
- Iceland Gull
- Lesser Black-backed Gull
- Glaucous Gull
- Great Black-backed Gull
- Black-legged Kittiwake
- Caspian Tern
- Common Tern
- Forster's Tern
- Black Tern
- Rock Dove
- Mourning Dove
- Black-billed Cuckoo
- Yellow-billed Cuckoo
- Eastern Screech Owl
- Great Horned Owl
- Snowy Owl
- Barred Owl
- Long-eared Owl
- Short-eared Owl
- Northern Saw-whet Owl
- Common Nighthawk
- Whip-poor-will
- Chimney Swift
- Ruby-throated Hummingbird
- Belted Kingfisher
- Red-headed Woodpecker
- Red-bellied Woodpecker
- Yellow-bellied Sapsucker
- Downy Woodpecker
- Hairy Woodpecker
- Northern Flicker
- Olive-sided Flycatcher
- Eastern Wood-peewee
- Yellow-bellied Flycatcher
- Acadian Flycatcher
- Alder Flycatcher
- Willow Flycatcher
- Least Flycatcher
- Eastern Phoebe
- Great Crested Flycatcher
- Western Kingbird
- Eastern Kingbird
- Horned Lark
- Purple Martin
- Tree Swallow

- Northern Rough-winged Swallow
- Bank Swallow
- Cliff Swallow
- Barn Swallow
- Blue Jay
- Black-billed Magpie
- American Crow
- Common Raven
- Black-capped Chickadee
- Boreal Chickadee
- Red-breasted Nuthatch
- White-breasted Nuthatch
- Brown Creeper
- Carolina Wren
- House Wren
- Winter Wren
- Sedge Wren
- Marsh Wren
- Golden-crowned Kinglet
- Ruby-crowned Kinglet
- Blue-gray Gnatcatcher
- Eastern Bluebird
- Veery
- Gray-cheeked Thrush
- Swainson's Thrush
- Hermit Thrush
- Wood Thrush
- American Robin
- Gray Catbird
- Northern Mockingbird
- Brown Thrasher
- Water Pipit
- Cedar Waxwing
- Northern Shrike
- Loggerhead Shrike
- European Starling
- White-eyed Vireo
- Solitary Vireo
- Yellow-throated Vireo
- Warbling Vireo
- Philadelphia Vireo
- Red-eyed Vireo
- Blue-winged Warbler
- Golden-winged Warbler
- Tennessee Warbler
- Orange-crowned Warbler
- Nashville Warbler
- Northern Parula
- Yellow Warbler
- Chestnut-sided Warbler
- Magnolia Warbler
- Cape May Warbler
- Black-throated Blue Warbler
- Yellow-rumped Warbler
- Black-throated Green Warbler
- Blackburnian Warbler
- Pine Warbler
- Kirtland's Warbler
- Prairie Warbler
- Palm Warbler
- Bay-breasted Warbler
- Blackpoll Warbler
- Cerulean Warbler
- Black-and-white Warbler
- American Redstart
- Ovenbird
- Northern Waterthrush
- Louisiana Waterthrush
- Kentucky Warbler
- Connecticut Warbler
- Mourning Warbler
- Common Yellowthroat
- Hooded Warbler
- Wilson's Warbler
- Canada Warbler
- Yellow-breasted Chat
- Scarlet Tanager
- Northern Cardinal
- Rose-breasted Grosbeak
- Indigo Bunting
- Dickcissel
- Rufous-sided Towhee
- American Tree Sparrow
- Chipping Sparrow
- Clay-colored Sparrow
- Field Sparrow
- Vesper Sparrow
- Lark Sparrow
- Lark Bunting
- Savannah Sparrow
- Grasshopper Sparrow
- Le Conte's Sparrow
- Sharp-tailed Sparrow
- Fox Sparrow
- Song Sparrow
- Lincoln's Sparrow
- Swamp Sparrow
- White-throated Sparrow
- White-crowned Sparrow
- Dark-eyed Junco
- Lapland Longspur
- Snow Bunting
- Bobolink
- Red-winged Blackbird
- Eastern Meadowlark
- Yellow-headed Blackbird
- Rusty Blackbird
- Common Grackle
- Brown-headed Cowbird
- Northern Oriole
- Purple Finch
- House Finch
- Red Crossbill
- Common Redpoll
- Hoary Redpoll
- Pine Siskin
- Lesser Goldfinch
- American Goldfinch
- Evening Grosbeak
- House Sparrow

Table 4.4 Herptiles, Mammals, Butterflies and Skippers Found on Tommy Thompson Park

Herptiles

- Midland Painted Turtle
- Blanding's Turtle
- Snapping Turtle
- Eastern Garter Snake
- Northern Brown Snake
- Eastern Milk Snake
- American Toad
- Northern Leopard Frog

Mammals

- Star-nosed Mole
- Eastern Cottontail
- European Hare
- Woodchuck
- Eastern Grey Squirrel
- Deer Mouse
- White-footed Mouse
- Muskrat
- Beaver
- Meadow Vole
- Norway Rat
- House Mouse
- Domestic Dog
- Red Fox
- Raccoon
- Striped Skunk
- Mink
- Domestic Cat

Butterflies and Skippers

-Silver-spotted Skipper
-Common Sooty Wing
-Least Skipper
-European Skipper
-Eastern Black Swallowtail
-Tiger Swallowtail
-Cabbage White
-Common Sulphur
-Orange Sulphur
-Hybrid Sulphur
-American Copper
-Bronze Copper
-Acadian Hairstreak
-Spring Azure
-Variegated Fritillary
-Great Spangled Fritillary
-Silvery Checkerspot
-Question Mark
-Mourning Cloak
-Milbert's Tortoiseshell
-American Painted Lady
-Painted Lady
-Red Admiral
-Buckeye
-White Admiral
-Red-spotted Purple
-Viceroy
-Inornate Ringlet
-Large Wood Nymph
-Monarch

listing of the plants previously recorded at the Leslie Street Spit, and Figure 4.5 indicates the plant community structure of the park.

4.2.4 Sediment Quality Assessment

The quality of sediment within Tommy Thompson Park has been determined through investigations conducted under the Keating Channel Environmental Monitoring Program. See Figure 4.6 for the monitoring locations.

The investigations focused on the following monitoring methods:

- Ponar Sediment Samples

  Ponar sediment samples were collected and analyzed to determine the difference in grain size distribution, and sediment quality between the Disposal Cells and the Outer Harbour/Embayment "C".

- Sediment Trap

  Sediment traps were placed in the study area to monitor the deposition rate, quality, and composition of deposits within the Disposal Cells and the Outer Harbour/Embayment "C". Deposition rates, sediment quality, and composition were determined for the dredgeate disposal and non-disposal period.

- Dredgeate Quality Sampling

  Sediment samples from the dredging operation at the Keating Channel were collected to determine the sediment composition and chemical characteristics of the material destined for the confined disposal facility at Tommy Thompson Park.

The results of the ponar sediment samples indicate that sediments within the disposal cells are dissimilar to other areas within Tommy Thompson Park. Although violations of the Open Water Disposal Guidelines (OWDG) were frequent within the disposal cells sediments, no concentrations of parameters exceeded the Severe Effect Level (SEL). The quality of in situ sediments, especially the difference of concentration from the disposal cells to other sample collection areas indicates that the disposal operation is confined within the disposal cells. The sediment chemistry of Embayment A is elevated in comparison to similar areas within Tommy Thompson Park. The reason for the elevated levels in Embayment A has not been determined during the course of this monitoring program.

The sediment traps deployed in the study area collected settled material that was typically composed of silts and clays within the disposal Cell and coarser material outside of the disposal cells. This difference in sediment composition indicates that sediment deposited

Table 4.5 Vegetation found on Tommy Thompson Park

	Common Name
¤ Abutilon theophrasti Medic. - UC; S-1 (A)	Velvet leaf
¤ Acalypha rhomboidea Raf. - UC; S-1 (N)	Three-seeded Mercury
▲ Acer negundo L. - C; S-1, CG (N)	Manitoba Maple
▲ Acer platanoides L. - R, S-1 (E)	Norway Maple
▲ Acer saccharinum L. - (seedlings) C; MS (N)	Silver Maple
▲ Acer rubrum L. - R, CG	Red Maple
¤ Achillea millefolium L. - C; CG (E)	Yarrow
¤ Agropyron repens (L.) Beauv. - C; CG (E)	Quack grass
¤ Agrostis gigantea Roth - A, CG (E)	Redtop
¤ Agrostis hyemalis (Walter) BSP - C; CG (N)	Redtop
¤ Agrostis stolonifera L. - A, CG	Creeping Bent Grass
▲ Ailanthus altissima (Mill.) Swingle - UC, S-1 (A)	Tree of Heaven
¤ Ajuga reptans L. - R; DS (E)	Bugle
¤ Alisma plantago-aquatica L. - UC; WD, base (N)	Water Plantain
¤ Alliaria officinalis Andrz.	Garlic Mustard
¤ Allium stellatum Ker.	Wild Onion
¤ Alnus glutinosa L. Gaertn.	Black Alder
¤ Althaea rosea Cav. - UC; CG (GE)	Holly Hock
¤ Amaranthus albus L. - C; CG, DS (N)	Tumbling Pigweed
¤ Amaranthus graecizans L. - C; S-1, CG (WNA)	Tumbleweed
¤ Amaranthus retroflexus L. - C; S-1, DS (N)	Green Amaranth
¤ Amaranthus retroflexus var. powellei (Wats) Boivin - UC; DS (WNA)	Redroot Pigweed
¤ Ambrosia artemisiifolia L. - C; CG, S-1 (N)	Common Ragweed
¤ Ambrosia trifida L. - UC; S-2 (N)	Great Ragweed
¤ Anacharis canadensis (Michx.) Rich. - A, MS	Elodea
¤ Anaphalis margaritacea (L.) Clarke - UC; DS (N)	Pearly Everlasting
¤ Anemone canadensis L.	Canada Anemone
¤ Anthemis arvensis L. - UC; CG, S-1 (E)	Corn Chamomile
¤ Anthemis cotula L. - UC; CG, S-1 (E)	Mayweed
¤ Antirrhinum majus L. - R, CG (GE)	Snapdragon
¤ Apocynum androsaemiifolium L. - R; CG, base (N)	Spreading Dogbane
¤ Apocynum cannabinum L. var. glaberrimum DC	Indian Hemp
¤ Arctium minus (Hill) Bernh. - C; CG, S-1 (E)	Common Burdock
¤ Arenaria serpyllifolia L.	Thyme-leaved Sandwort
¤ Armoracia rusticana (Lam.) G., M.S. - R; CG (E)	Horseradish
¤ Artemisia biennis Willd. - C; DS, CG (WNA)	Biennial Wormwood
¤ Artemisia campestris spp. caudata (Michx.) Hall and Clem. - UC, DS (N)	Tall Wormwood
¤ Asclepias incarnata L.	Swamp Milkweed
¤ Asclepias syriaca L. - UC, CG (N)	Common Milkweed
¤ Asparagus officinalis L.	Asparagus
¤ Aster X amethystinus Nutt. - UC; CG, base (N)	Amethyst Aster
¤ Aster brachyactis Blake - A, CG	Ravless Aster
¤ Aster ericoides L. - A, CG (N)	Heath Aster
¤ Aster laurentianus Fern. - A; CG, S-1, MS (N)	Aster
¤ Aster novae-angliae L. - A; CG (N)	New England Aster
¤ Aster simplex Willd. - UC; CG (N)	Panicled Aster
¤ Atriplex patula L. - UC; S-1 (N)	Orache
¤ Atriplex patula var. hastata (L). Grav - A; CG, base (N)	Halberd-leaved Atriplex
¤ Avena sativa L. - R; CG (E)	Oats
¤ Barbarea vulgaris R. Br. - UC; CG (E)	Winter Cress

		Common Name
¤	Berteroa incana (L.) DC.	Hoary Alyssum
▲	Betula papyrifera Marsh.	White Birch
▲	Betula pendula Roth	European White Birch
¤	Bidens cernua L. - C; MS, along high water line (N)	Tickseed Sunflowers
¤	Bidens tripartita var. comosa Gray - R; S-2 (N)	European Beggar Ticks
¤	Bidens frondosa L. - C; MS, WD (N)	Beggar Ticks
¤	Brassica kaber (DC) L.C. Wheeler - R; S-2 (E)	Charlock
¤	Brassica juncea (L.) Czern. - UC; S-1, CG (E)	Indian Mustard
¤	Brassica rapa L.	Field Mustard
¤	Bromus commutatus Schrader - UC; CG, base (E)	Hairy Chess
¤	Bromus inermis leyss - UC; CG, base (E)	Smooth Brome
¤	Bromus tectorum L. - C, CG, in cinders and other sterile soil (E)	Downy Brome
¤	Cakile edentula (Bigel.) Hook. (var. lacustris Fern) - C; DS, and loose gravelly shores (N)	Sea Rocket
¤	Calamagrostis canadensis (Michx.) Beauv. - R; MS, in willow thicket (N)	Canada Blue-joint
¤	Calendula officinalis L. - R; S-1 (GE)	Pot Marigold
¤	Calystegia sepium L. - UC; CG, near shorelines (N)	Hedge Bindweed
¤	Camelina microcarpa Andrz. - UC; S-1 (E)	Small-seeded False Flax
¤	Campanula rapunculoides L. - UC; S-1 (E)	Creeping Bellflower
¤	Capsella bursa-pastoralis (L.) Medic. - UC; CG (E)	Shepard's Purse
¤	Carduus nutans L. - R; CG, near CWS trailer (E)	Nodding Thistle
¤	Carex annectens (Bickn.) Bickn. - UC; WD, base; rare in Ontario (N)	Sedge
¤	Carex aquatilis Wahlenb.	Sedge
¤	Carex aurea Nutt.	Sedge
¤	Carex cristatella Britton - UC; edge of WD base (N)	Sedge
¤	Carex garberi Fern.	Sedge
¤	Carex hystericina Muhl.	Sedge
¤	Carex lanuginosa Michx.	Sedge
¤	Carex molesta Mackenz.	Sedge
¤	Carex pseudo-cyperus L. - UC; WD, and in cottonwood thickets, base (N)	Sedge
¤	Carex retrorsa Schw. - UC; edge of WD, base (N)	Sedge
¤	Carex vulpinoidea Michx. - UC; edge of WD, base (N)	Sedge
¤	Celosia crista L. (GE)	Cocks-comb
¤	Cenchrus longispinus (Hack.) Fern - R; CG, base (N)	Long-spined Sandbur
¤	Cerastium vulgatum L. - C; S-1 (E)	Mouse-ear Chickweed
¤	Chaenorrhinum minus (L.) Lange - UC; CG loose gravel at tip (E)	Dwarf Snapdragon
¤	Chenopodium album L. - C; CG (E)	Lamb's Quarters
¤	Chenopodium glaucum L. - C; CG, S-1 (E)	Oak-leaved Goosefoot
¤	Chenopodium hybridum L. - C; S-1 (N)	Maple-leaved Goosefoot
¤	Chenopodium rubrum L.- R; CG;damp willow thicket (E)	Coast Blite
¤	Chrysanthemum leucanthemum L. - UC; CG, loose shale near tip (E)	Oxeye Daisy
¤	Chrysanthemum parthenium (L.) Bernh. - R; CG, near tip (E)	Feverfew
¤	Cichorium intybus L. - C; CG (E)	Chicory
¤	Cirsium arvense (L.) Scop. - A; CG (E)	Canada Thistle
¤	Cirsium arvense forma albiflorum (Rand and Redf.) Hoff. - R; CG (E)	Canada Thistle

		Common Name
¤	Cirsium vulgare (Savi) Tenore - UC; CG (E)	Bull Thistle
¤	Citrullus vulgaris Schrad. - R; S-2 (GE)	Watermelon
¤	Cleome spinosa Jacq. - C; S-2 (GE)	Spider Thistle
¤	Commelina communis L. - UC; S-1 (A)	Asiatic Dayflower
¤	Convolvulus arvensis L. - UC; S-1 (E)	Field Bindweed
¤	Conyza canadensis (L) Crong. var. canadensis - A, CG	Horse-weed
∩	Cornus rugosa Lam.	Round-leaved Dogwood
∩	Cornus stolonifera Michx. - UC; edges of WD (N)	Red Osier Dogwood
¤	Crepis tectorum L. - C; CG, DS, S-1 (E)	Narrow Hawk's Beard
¤	Cucumis sativus L. - R; S-2 (GE)	Cucumber
¤	Cuscuta gronovii Willd. - UC;CG, on Salix exigua (N)	Dodder
¤	Cycloloma atriplicifolium (Spreng.) Coult. - C; DS, S-1 (WNA)	Winged Pigweed
¤	Cyperus engelmanii Steud. - R, MS	Umbrella Sedge
¤	Cyperus rivularis Kunth - A; MS, along shorelines(N)	Nut Grass
¤	Cyperus odoratus L. - C; MS, along shorelines (N)	Nut Grass
¤	Cypripedium reginae Walt.	Showy Lady's Slipper
¤	Dactylis glomerata L. - UC; CG, base (E)	Orchid Grass
¤	Daucus carota L. - C; CG (E)	Wild Carrot
¤	Descurainia sophia (L.) Webb - UC; CG loose gravel at tip (E)	Flixweed
¤	Digitaria ischaemum (Schreb.) Muhl. - UC; CG (EA)	Smooth Crabgrass
¤	Diplotaxis tenuifolia (L.) DC - C; S-1, CG (E)	Wall-rocket
¤	Dipsacus sylvestris Huds.	Teasel
¤	Echinochloa crusgalli (L.) Beauv. - C; CG, MS (E)	Barnyard Grass
¤	Echinochloa muricata (Beauv.) Fern. - C; WD, base(N)	Barnyard Grass
¤	Echinochloa microstachya (Weig.) Rydb. - M, CG	Barnyard Grass
¤	Echinocystis lobata (Michx.) T. and G. - US; S-1; S-2 (N)	Wild Cucumber
¤	Echium vulgare L. - C; CG (E)	Viper's Bugloss
∩	Elaeagnus angustifolia L. - R; CG, one shrub, along road (EA)	Russian Olive
¤	Eleocharis acicularis (L.) R. and S. - C; MS, along retreating shorelines (N)	Spike-rush
¤	Eleocharis erythropoda Steud. - M, MS	Spike-rush
¤	Elodea canadensis Michx. - C; washed ashore (N)	Water Weed
¤	Elymus canadensis L. - C; CG, base (N)	Nodding Wild Rye
¤	Epilobium ciliatum Raf. - R, WS	Sticky Willowherb
¤	Epilobium glandulosum Lehm. - UC; WD, at base; MS along shorelines (N)	Northern Willow Herb
¤	Epilobium hirsutum L. - UC; WD, base, MS, along shorelines (E)	Hairy Willow Herb
¤	Epipactis helleborine (L.) Crantz.	Helleborine
¤	Equisetum arvense L. - C; CG, MS, DS, S-1 (N)	Field Horsetail
¤	Equisetum hyemale L.	Scouring Rush
¤	Equisetum laevigatum A. Br.	Smooth Scouring Rush
¤	Equisetum variegatum Schleich.	Variegated Scouring Rush
¤	Eragrostis poaeoides R. and S. - UC; CG, MS, along shorelines (E)	Little Love Grass
¤	Erigeron annuus (L.) Pers. - C; CG, base (N)	Daisy Fleabane
¤	Erigeron philadelphicus L. - UC; MS, near tip (N)	Common Fleabane
¤	Erigeron strigosus Muhl. - UC; DS (N)	Lesser Daisy Fleabane
¤	Erucastrum gallicum (Willd.) O.E. Schultz - R; CG(E)	Dog Mustard

	Common Name
¤ Erysimum cheiranthoides L. - C; S-2 (E)	Wormseed Mustard
¤ Eupatorium maculatum L.	Spotted Joe-Pye Weed
¤ Eupatorium perfoliatum L. - UC; MS, along shorelines (N)	Boneset
¤ Euphorbia helioscopia L. - UC; S-1 (E)	Sun Spurge
¤ Euphorbia marginata Pursh - UC; S-1 (GE)	Snow-on-the-mountain
¤ Euphorbia polygonifolia L. - UC; loose gravel at tip (N)	Seaside Spurge
¤ Euphorbia vermiculata Raf.	Hairy-stemmed Spurge
¤ Fagopyrum esculentum Moench. - R, CG	Buckwheat
¤ Festuca rubra L. - UC; CG (E)	Red Fescue
¤ Filago germanica (L.) Huds. - R; DS, first report for Ontario (Catling, Pers. Comm., specimen in TRT, 1979) (E)	Cudweed
∩ Forsythia viridissima Lindl - R; CG, tip (GE)	Forsythia
¤ Fragaria virginiana Duch.	Common Strawberry
▲ Fraxinus americana L.	White Ash
▲ Fraxinus pennsylvania Marsh. var. subintegerrima (Vahl) Fern. - R; one tree 2.5 m CG at base (N)	Green Ash
¤ Gaillardia aristata Parsh. (GE)	Blanket Flower
¤ Gaillardia pulchella Foug. - R; S-1 (GE)	Blanket Flower
¤ Galinsoga ciliata (Raf.) Blake - UC; S-1 (TA)	Galinsoga
¤ Galinsoga parviflora Cav. - R, CG	Small-flowered Galinsoga
¤ Galium cf. palustre L. - R, WS	Marsh Bedstraw
¤ Gerardia tenuifolia Vahl. - UC; CG, WD, base (N)	Slender Gerardia
¤ Glechoma hederacea L. - R; MS, along shoreline (E)	Ground Ivy
¤ Geum aleppicum Jacq.	Yellow Avens
¤ Gnaphalium uliginosum L. - C; MS, along retreating shorelines (N)	Low Cudweed
¤ Habenaria hyperborea (L.) R. Br.	Northern Green Orchis
¤ Helianthus annuus L. - UC; CG (WNA)	Common Sunflower
¤ Helianthus tuberosus L. - UC; one colony,CG,base (N)	Jerusalem Artichoke
¤ Hemerocallis fulva (L.) L. - R; CG at tip (E)	Day Lily
¤ Hesperis matronalis L. - UC; S-1 (E)	Dame's Rocket
¤ Hibiscus trionum L. - R; S-1 (E)	Flower-of-an-hour
¤ Hieracium aurantiacum L.	Orange Hawkweed
¤ Hieracium florentinum all. - UC; CG near tip (E)	Smooth Hawkweed
¤ Hieracium pratense Tausch	Field Hawkweed
¤ Hordeum jubatum L. - A; CG (N)	Foxtail Barley
¤ Humulus japonicus Sieb. and Zucc. - UC; S-1, S-2 (A)	Japanese Hop
¤ Hypericum perforatum L. - UC; CG, base (E)	Common St. John's Wort
¤ Impatiens capensis Meerb. - C; rocky shoreline at base, MS (N)	Jewelweed
¤ Inula helenium L. (E)	Elecampane
¤ Ipomoea purpurea (L.) Roth. - R; S-1 (GE)	Common Morning-Glory
¤ Iris germanica L.	Garden Iris
¤ Iris versicolor L.	Larger Blue Flag
¤ Juncus alpinus Vill. - UC; S-2 (N)	Rush
¤ Juncus articulatus L.	Rush
¤ Juncus balticus Willd. - C; MS, WD on base (N)	Rush
¤ Juncus bufonius L. - UC; MS along shorelines (N)	Toad Rush
¤ Juncus compressus Jacq. - UC; edges of WD, damp CG base (N)	Rush
¤ Juncus dudleyi Weig. - A, WS	Rush

	Common Name
¤ Juncus effusus L. - C; WD on base, MS (N)	Rush
¤ Juncus nodosus L. - M, WS	Rush
¤ Juncus secundus Beauv.	Rush
¤ Kochia scoparia (L.) Schrad. - C; damp CG, base (EA)	Summer Cypress
¤ Lactuca scariola L. - C; dry CG (E)	Prickly Lettuce
¤ Lathyrus odoratus L. - R, CG	Sweet Pea
¤ Leersia oryzoides (L.) SW. (forma inclusa (Wiesb.) Dorfler) - UC; MS, along shores (N)	Cut Grass
¤ Leonurus cardiaca L. - UC; S-1, loose gravel at tip (E)	Motherwort
¤ Lepidium campestre (L.) R. Br.	Field Peppergrass
¤ Lepidium densiflorum Schrad. - C; dry CG (E)	Common Peppergrass
¤ Lepidium ruderale L. - R, CG	Roadside Peppergrass
¤ Lepidium virginicum L. - A, CG	Wild Peppergrass
¤ Lindernia dubia (L.) Pennell - R; MS, on exposed shoreline (N)	False Pimpernel
¤ Linaria vulgaris Hill - C; dry CG (E)	Butter-and-eggs
¤ Liparis loeselii (L.) Rich.	Bog Twayblade
¤ Lobularia maritima Desv. - R, CG	Sweet Alyssum
¤ Lolium perenne L. - UC; damp CG, base (E)	Perennial Rye-grass
∩ Lonicera tatarica L. - R; 1 shrub, 1 m tall, damp CG, near tip (EA)	Tartarian Honeysuckle
¤ Lotus corniculatus L. - R; loose CG, near tip (E)	Birdsfoot Trefoil
¤ Lychnis alba Mill. - C; CG (EA)	White Campion
¤ Lysimachia thyrsiflora L.	Tufted Loosestrife
¤ Lycopersicum esculentum Mill. - UC; S-2 (GE)	Tomato
¤ Lycopus americanus Muhl. - C; rocky shorelines and MS (N)	Water Horehound
¤ Lycopus europaeus L. - UC; MA. along high water line (E)	European Water Horehound
¤ Lythrum salicaria L. - UC; MS, along shorelines (E)	Purple Loosestrife
¤ Malva neglecta Wallr. - UC; S-1, CG (E)	Common Mallow
¤ Malva rotundifolia L. - UC; S-1, loose gravel at tip (E)	Round-leaved Mallow
¤ Matricaria matricarioides (Less.) Porter. - C; S-1, scattered on CG (WNA)	Pineapple Weed
¤ Matteucia struthiopteris (L.) Todaro - R; S-1 (N)	American Ostrich Fern
¤ Medicago lupulina L. - C; dry CG and S-1 (E)	Black Medick
¤ Medicago sativa L. - R; damp CG at tip (E)	Alfalfa
¤ Melilotus alba Desr. - A; CG, forming dense strands (E)	White Sweet Clover
¤ Melilotus officinalis (L.) Lam. - UC; dry CG (E)	Yellow Sweet Clover
¤ Mentha arvensis L. - C; MS, along shorelines and damp CG (N)	Field Mint
¤ Mentha gentilis L.	Mint
¤ Mentha piperita L.	Peppermint
¤ Mentha verticillata (L.)	Mint
¤ Mimulus ringens L. - UC; MS, along shorelines and S-2 (N)	Square-stemmed Monkeyflower
¤ Mollugo verticillata L.	Carpetweed
¤ Myosotis scorpioides L. - UC; MS, along shorelines (E)	True Forget-me-not
¤ Myriophyllum exalbescens Fern. - A, WS	Northern Water-milfoil

		Common Name
¤	Myriophyllum spicatum L.- C,MS and washed ashore (N)	Eurasian Water-milfoil
¤	Nasturtium officinale R. Br. - R; S-2 (E)	Water Cress
¤	Nepeta cataria L. - UC; CG (E)	Catnip
¤	Nicotiana longiflora Cav. - R; S-1 (GE)	Tobacco
¤	Oenothera biennis L. - C; dry CG and S-1 (N)	Common Evening Primrose
¤	Oenothera parviflora L. - UC; dry silts, S-1 (N)	Small-flowered Evening Primrose
¤	Opuntia humifusa	Prickly Pear
¤	Oxalis stricta L. - UC; S-1 (N)	Common Wood-sorrel
¤	Panicum capillare L.- UC; dry CG and sands, base (N)	Witch Grass
¤	Panicum dichotomiflorum Michx. (var. geniculatum (Wood) Fern.) - R; S-1 (N)	Fall Panic Grass
¤	Panicum virgatum L.	Panic Grass
¤	Papaver glaucum Boiss & Haussk. - R, CG	Tulip Poppy
¤	Papaver somniferum L. - R; S-1 and CG at tip (GE)	Common Poppy
¤	Parthenocissus vitacea (Knerr.) Hitchc. - R; CG, edge of willow thicket (N)	Virginia Creeper
¤	Pastinaca sativa L.	Wild Parsnip
¤	Penstemon digitalis Nutt. - UC; CG, tip (N)	Beard-tongue
¤	Petunia hybrida Vilm. - R; S-1 (GE)	Petunia
¤	Phalaris arundinacea L. - UC; CG (N)	Reed Canary Grass
¤	Phalaris canariensis L.	Canary Grass
∩	Philadelphus X lemoinei Lemoine	Mock Orange
¤	Phleum pratense L. - UC; S-1 (E)	Timothy
¤	Phragmites australis (Cav.)	Reed
¤	Physostegia virginiana (L.) Benth.	False Dragonhead
▲	Picea glauca (Moench)Voss - 3 small tree roadside	White Spruce
▲	Pinus resinosa Ait. - 3 small trees area B	Red Pine
	Pinus strobus L.	White Pine
	Pinus sylvestris L.	Scott's Pine
¤	Plantago lanceolata L. - UC; loose gravel and CG at tip (E)	English Plantain
¤	Plantago major L. - C; CG and S-1 (E)	Broad-leaved Plantain
¤	Plantago psyllium L. - UC; S-1 (E)	Flaxseed Plantain
¤	Poa annua L. - UC; S-1 and S-2 (E)	Annual Blue Grass
¤	Poa compressa L. - UC; CG, base (EA)	Canada Blue Grass
¤	Poa cf. nemoralis L.	Wood Blue Grass
¤	Poa palustris L.	Fowl Manna Grass
¤	Poa pratensis L. - UC; CG, base (E)	Kentucky Blue Grass
¤	Polygonum aviculare L. - A; CG, S-1, MS, (highly variable) (E)	Prostrate Knotweed
¤	Polygonum cilinode Michx. - R, CG	Fringed Buckwheat
¤	Polygonum convolvulus L. - UC; rocky shorelines along base (E)	Wild Buckwheat
¤	Polygonum cuspidatum Sieb. and Zucc. - UC; CG (A)	Japanese Knotweed
¤	Polygonum erectum - UC; CG, tip (N)	Knotweed
¤	Polygonum hydropiper L. - R; S-2 (N)	Marshpepper Smartweed
¤	Polygonum lapathifolium L. - C; S-1, MS, S-2 (N)	Willow Weed
¤	Polygonum orientale L. - UC; S-1 (EA)	Prince's Feather
¤	Polygonum pensylvanicum L. (var. laevigatum Fern.) - UC; S-2 (N)	Bigseed Smartweed
¤	Polygonum persicaria L. - UC; CG, base (E)	Lady's Thumb
▲	Populus alba L. - R; damp CG, base (E)	White Poplar
▲	Populus balsamifera L. - UC; CG, base (N)	Balsam Poplar

	Common Name
▲ Populus deltoides Marsh. - A; damp to dry CG, MS, groves at tips of larger peninsulas (N)	Cottonwood
▲ Populus grandidentata Michx.	Large Toothed Aspen
▲ Populus X jackii Sarg (P.deltoides X P.balsamifera) R; a few sprouts from rocky CG, base (E)	Poplar
▲ Populus tremuloides Michx. - A; damp to dry, CG, MS, base (N)	Trembling Aspen
¤ Portulaca grandiflora Hook. - C; S-2 (many different colors) (GE)	Rose Moss
¤ Portulaca oleracea L. - UC; loose gravel, CG at base (E)	Purslane
¤ Potamogeton crispus L. - C; washed ashore (E)	Curly-leaved Pondweed
¤ Potamogeton pectinatus L. - C; washed ashore (N)	Sago Pondweed
¤ Potamogeton richardsonii (Benn.) Rydb. - UC; washed ashore (N)	Pondweed
¤ Potentilla anserina L. - C; MS, DS, shorelines (N)	Silverweed
¤ Potentilla argentea L. - R; loose gravel near tip(E)	Silvery Cinquefoil
¤ Potentilla intermedia L. - UC; damp CG, base (E)	Cinquefoil
¤ Potentilla norvegica L. - UC; DS, gravel (N)	Rough Cinquefoil
¤ Potentilla paradoxa Nutt. - A; DS, loose gravel (N)	Lower Great Lakes Cinquefoil
¤ Potentilla recta L. - C; dry CG, base (E)	Rough-fruited Cinquefoil
¤ Prunella vulgaris L. - R; S-1 (E)	Heal-all
▲ Prunus avium L. - R; one tree, CG, base (E)	Sweet Cherry
▲ Prunus virginiana L. - R; few sprouts, CG, base (N)	Choke Cherry
∩ Prunus spp. - R; 1 shrub each, CG, base; S-1	Cherries and Plums
¤ Puccinellia distans (Jacq.) Parl. - C; CG (E)	Alkali Grass
▲ Pyrus malus L. - R; scattered on CG, base (EA)	Crabapple
¤ Ranunculus acris L.	Tall Buttercup
¤ Ranunculus sceleratus L. - UC; MS, along shorelines and S-2 (N)	Cursed Crowfoot
¤ Rhus radicans L.	Poison Ivy
∩ Rhus typhina L. - C; CG, S-1, DS (N)	Staghorn Sumac
▲ Robinia pseudo-acacia L.- UC; CG, some 3 m tall(SUS)	Black Locust
¤ Rorippa islandica (Oeder) Borbas - C; MS and gravel, shorelines (N)	Marsh Yellow Cress
¤ Rorippa islandica var. hispida (Desv.) Butt and Abbe - UC; MS (N)	Marsh Yellow Cress
∩ Rubus idaeus L. var. strigosus (Michx.) Maxim - R; S-1 (N)	Red Raspberry
∩ Rubus odoratus L.	Purple-flowering Raspberry
¤ Rudbeckia hirta L. - UC; CG, tip (N)	Black-eyed Susan
¤ Rumex crispus L. - UC; S-1, CG, base (E)	Sour Dock
¤ Rumex maritimus L. - UC; edge of WD, base (uncommon in Toronto) (N)	Dock
¤ Rumex obtusifolius L. - UC; S-1 (E)	Bitter Dock
▲ Salix alba L.	White Willow
∩ Salix amygdaloides Anderss.	Peach-leaved Willow
∩▲ Salix bebbiana Sarg. - UC; WD, base (N)	Long-beaked Willow
∩ Salix cordata Michx. var. rigida (Muhl) Carey - UC; small trees in WD, base and MS near tip (N)	Heart-leaved Willow
∩ Salix discolor Muhl. - UC; WD, base and MS, along shorelines (N)	Pussy Willow

	Common Name
∩ Salix exigua Nutt. - A; CG, MS, DS, forming dense thickets (N)	Sandbar Willow
▲ Salix fragilis L. - UC; planted along main road in 1972 or 1973, and elsewhere at base (N)	Crack Willow
∩ Salix lucida Muhl. - UC; edge of WD, base (N)	Shining Willow
∩▲ Salix nigra L.	Black Willow
∩ Salix purpurea L. - R; small clumps in WD, base (E)	Basket Willow
∩ Salix rigida Muhl. - R, CG	Willow
∩ Sambucus canadensis L.	Common Elder
∩ Sambucus racemosa L. var. pubens (Michx.) Koehne - R; CG, tip (N)	Red-berried Elder
¤ Salsola kali L. var. tenuifolia Tausch - C; S-1, DS (EA)	Russian Thistle
¤ Saponaria officinalis L. - UC; CG (E)	Bouncing Bet
¤ Scirpus acutus Bigelow - C; WD, base (N)	Hard-stemmed Bulrush
¤ Scirpus americanus Pers. - C; WD, base (N)	American Bulrush
¤ Scirpus atrovirens Willd.	Black Bulrush
¤ Scirpus validus Vahl (var. creber Fern.) - UC: WD, base (N)	Softstem Bulrush
¤ Scutellaria epilobiifolia A. Ham. - UC; rocky shoreline, base (N)	Marsh Skullcap
¤ Sedum acre L.	Mossy Stonecrop
¤ Senecio viscosus L. - UC; loose gravel at tip (E)	Sticky Groundsel
¤ Senecio vulgaris L. - UC; S-1 (E)	Common Groundsel
¤ Setaria glauca (L.) Beauv. - UC; S-1, DS, CG (E)	Yellow Bristle Grass
¤ Setaria viridis (L.) Beauv. - UC; CG, base (E)	Green Bristle Grass
¤ Silene antirrhina L. - UC; damp CG, base (not observed in 1978) (N)	Sleepy Catchfly
¤ Silene cucubalis Wibel - C; CG (E)	Bladder Campion
¤ Silene noctiflora L. - UC; CG, tip (E)	Night-flowering Catchfly
¤ Sisymbrium altissimum L. - A; S-1, CG, DS (E)	Tumble Mustard
¤ Sisymbrium officinale (L.) Scop. - C; damp CG and S-1 (E)	Hedge Mustard
▲ Sorbus aucuparia L. (A)	European Mountain-ash
¤ Solanum americanum Mill. - UC; S-2 (N)	American Nightshade
¤ Solanum dulcamara L. - C; damp CG and S-1 (E)	Bittersweet Nightshade
¤ Solanum nigrum L. - UC; damp silts, S-1, S-2 and MS near tip (E)	Black Nightshade
¤ Solidago canadensis L. - A; dry CG (N)	Canada Goldenrod
¤ Solidago gigantea Ait. - UC; damp CG, base (N)	Late Goldenrod
¤ Solidago graminifolia (L.) Salsb. - UC; damp CG, base (N)	Narrow-leaf Goldenrod
¤ Sonchus arvensis L. - C; CG (E)	Perennial Sow-thistle
¤ Sonchus asper (L.) Hill. - UC; CG (E)	Spiny Annual Sow-thistle
¤ Sonchus oleraceus L. - UC; S-1 (E)	Annual Sow-thistle
¤ Sonchus uliginosus Bieb. - A; dry CG, base (E)	Smooth Perennial Sow-thistle
¤ Spergularia marina (L.) Griseb. - UC; WD, loose cinders and gravels, base (halophyte, rare in Toronto area) (N)	Spurrey
¤ Spiranthes cernua L. Rich.	Nodding Ladies Tresses
¤ Sporobolus cryptandrus (Torrey) Gray - UC; DS (N)	Sand Dropseed
¤ Stellaria media (L.) Cyrillo	Common Chickweed
¤ Symphytum officianale L.	Common Comfrey

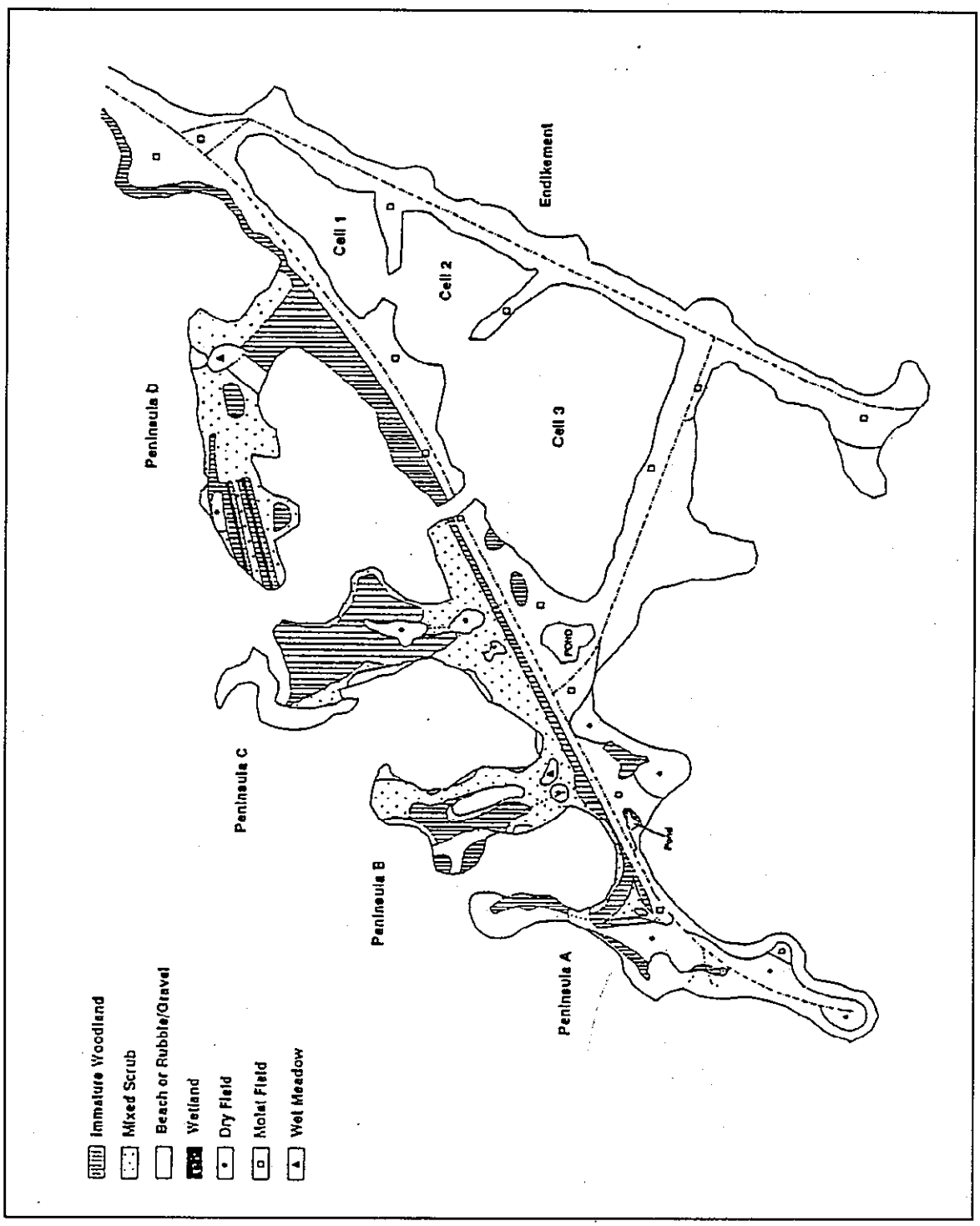
	Common Name
¤ Tanacetum vulgare L. - UC; damp CG, near storage sheds (E)	Tansy
¤ Taraxacum officinale Weber - UC; CG (E)	Dandelion
¤ Teucrium canadense L.	Woodsage
¤ Teucrium occidentale Gray - UC; one large colony, rocky shoreline, base (N)	Germander
¤ Thlaspi arvense L. - UC; S-1 and S-2 (E)	Field Pennycress
¤ Tradescantia virginiana L.	Spiderwort
¤ Tragopogon dubius Scop. - C; CG (E)	Goat's-beard
¤ Tragopogon porrifolius L. - R; CG (not observed in 1978) (E)	Common Salsify
¤ Tragopogon pratensis L. - M, CG	Meadow goat's beard
¤ Trifolium dubium Sibth.	Small Hop Clover
¤ Trifolium hybridum L. - UC; S-1 (E)	Alsike Clover
¤ Trifolium pratense L. - C; CG (E)	Red Clover
¤ Trifolium procumbens L.	Low Hop Clover
¤ Trifolium repens L. - UC; CG, S-1 (E)	White Clover
¤ Tulipa gesneriana L.- UC; CG (all yellow flower)(GE)	Tulip
¤ Tussilago farfara L. - C; wet CG and silts (E)	Sweet Coltsfoot
¤ Typha angustifolia L. - C; WD, base (N)	Narrow-leaved Cattail
¤ Typha latifolia L. - C: WD, base (N)	Common Cattail
▲ Ulmus americana L. - UC; CG and MS (N)	White Elm
▲ Ulmus pumila L. - UC; CG and MS (A)	Siberian Elm
▲ Ulmus rubra Muhl.	Red Elm
¤ Urtica dioica L. var. gracilis (Ait.) Selander - UC, S-2 (N)	American Stinging Nettle
¤ Urtica gracilis Ait.	European Stinging Nettle
¤ Urtica urens L. - R; S-2 (EA)	Annual Nettle
¤ Veratrum viride Ait.	False Hellebore
¤ Verbascum thapsus L. - C; CG (E)	Common Mullein
¤ Verbena hastata L. - UC; S-1 (N)	Blue Vervain
¤ Verbena urticifolia L. - R; dry silt, S-1 (N)	White Vervain
¤ Veronica anagallis-aquatica L. - R; S-2 (N)	Water-speedwell
¤ Viburnum trilobum Marsh.	High-bush Cranberry
¤ Vicia cracca L. - UC; CG, base (E)	Cow Vetch
¤ Viola sp (cf. septentrionalis Greene) - R; dry silts, S-1 (N)	Violet species
¤ Vitis riparia Michx. - R; CG, base (N)	Riverbank Grape
¤ Xanthium strumarium L. - C; damp CG, MS, S-1 (E)	Cocklebur
¤ Zannichellia palustris L. - R, WS	Horned Pondweed
¤ Zea mays L. - R, CG	Corn

REFERENCES USED TO COMPILE CHECKLIST

Anon. 1982. Aquatic Park Environmental Study, 1978-1982. Metropolitan Toronto and Region Conservation Authority Report.

Catling, P.M., K.L. MacIntosh and S.M. McKay. 1977. The Vascular Plants of the Leslie Street Headland. The Ontario Field Biologist 31(1): 23-39.

Figure 4.5 **Plant Communities on Tommy Thompson Park**



within the Outer Harbour and Embayment C, are distinctly separate from that of the sediment flux within disposal Cell 3. The total lead concentrations detected in sediments collected in disposal Cell 3 were consistently above the SEL concentrations. Many metals and organic compounds will bind or partition to particles in the water column and subsequently settle to the bottom. This strong binding affinity of metals to finer materials, influenced the higher concentrations of metal detections in Cell 3 and resulted in higher detections of lead. Total lead concentrations in both the Outer Harbour and the Embayment C station never exceeded the SEL concentrations. This contrast in the total lead concentrations of material collected in the sediment traps and the known association of metal contamination with fine sediments indicates that the flux of material associated with the disposal cells is contained.

Analysis of the dredgeate samples collected from the Keating Channel indicates that a wide range of sediment quality parameters frequently exceed the OWDG. The violations of the OWDG precludes the use of alternative disposal methods other than the current use of the confined disposal facility at Tommy Thompson Park. However, the frequency of OWDG violations is not an exact indication of sediment quality as much as the magnitude of the compound concentrations. The mean trace metal concentration within the Keating Channel sediments is comparable to surficial sediments found in Lake Ontario and the great lakes. Mean concentrations of total lead and zinc within the Keating Channel were above background Lake Ontario concentrations, while mean concentrations of total cadmium and mercury were within background levels. Concentrations of total lead within Keating Channel sediments have been detected in excess of the SEL. The frequency of total lead SEL violations in 1989 and 1990 have decreased since the initial years of the dredging operation. Single total phosphorus samples in 1987 and 1988 exceeded the SEL, and have not been detected at that level since.

The results of the sediment quality investigations confirm the efficiency and integrity of the disposal cells and the overall containment of the dredgeate disposal during the disposal operation.

4.2.5 Fish Community

Fish community collections were conducted during the active disposal operation during summer and autumn conditions (Figure 4.6). Fish collections were used to determine the spatial difference in community structure and composition within Tommy Thompson Park associated with the dredgeate disposal operation. A species list of fish collected within the Disposal Cells and Embayment "C" is found in Table 4.6.

The intent of the warm water summer and fall autumn fish community collections is to discerned any spatial community changes within Tommy Thompson Park that may be attributed to the dredgeate disposal operation. The sampling sessions in 1989 and 1990 were both conducted during the active dredgeate disposal operation and reflect the conditions during this operation. The fish community at Tommy Thompson Park is consistently ranked high in comparison to other locations on the Toronto waterfront. It is documented that Toronto waterfront fish communities display a high degree of seasonal variation. Index of

Biotic Integrity (IBI) scores for this collection period indicate that the apparent health of the fish community in disposal Cell 2 is similar if not greater than other areas along the Toronto waterfront. The IBI scores calculated for Disposal cell 2 do not reflect any acute impact in the health of the fish community caused by the active disposal of dredgeate.

Typically, during each collection period alewife, white sucker, and pumpkinseed dominated the catch. Alewife commonly inundate the nearshore shallow areas of Lake Ontario from April to July, during the spawning season, and during the summer months when they move inshore at night. The abundance of Young of the Year (YOY) pumpkinseed is thought to be the direct result of local reproduction within the disposal cells. Disposal Cell 1 and portions of disposal Cell 2 offer extensive shallow areas and thermal habitat conducive to optimum spawning habitat for pumpkinseed. Cyprinids were collected within the cell and although not always prolific in numbers they constitute a valuable component of the available forage fish. Adult northern pike of significant size were collected from within the study area. The presence of adult pike is indicative of the abundant forage population coupled with suitable thermal habitat.

The species assemblages present within the disposal cells reflect a well balanced fish community during the warm water summer period, this community structure is not as distinct during the cold water period in the fall. It is thought that the presence of a well balanced fish community is the result of the stable thermal habitat provided by the disposal cells. The disposal cells lack any physical structure that alone would attract and establish a stable fish community. Significant nursery habitat for YOY fish is provided for pumpkinseed and can account for the presence of this species, however, the absence of significant numbers of YOY of other species indicates that spawning and nursery habitat is not a attraction in the area. Fish collections during the major spawning period would be required to further define and delineate the extent of spawning activities.

Overall, the fish community and species assemblages associated with Tommy Thompson Park reflect a diverse and well structured community. The community of fish within Tommy Thompson Park does not display any acute impacts from the dredgeate disposal operation, and continues to provide a stable environment that produces a quality fish community.

4.2.6 Benthic Invertebrate Community Assessment

Assessment of the benthic invertebrate community within Tommy Thompson Park has been conducted under the Keating Channel Monitoring Program. Benthic invertebrate samples were collected and identified to determine the spatial difference in community structure and composition within Tommy Thompson Park associated with the dredgeate disposal operation (see Figure 4.6).

A total of 36 taxa were identified from the 1987 to 1990 benthic invertebrate collections and a further 36 species were identified to the genus level. A complete list of species identified is provided in Table 4.7.

Table 4.6 **List of the Fish Species Collected During the Summer and Fall Electroshocking Runs from Tommy Thompson Park and the Keating Channel, 1989 and 1990.**

Common Name	Scientific Name
alewife	*Alosa pseudoharengus*
gizzard shad	*Dorosoma cepedianum*
coho salmon	*Oncorhynchus kisutch*
chinook salmon	*Oncorhynchus tshawyscha*
rainbow smelt	*Osmerus mordax*
northern pike	*Esox lucius*
white sucker	*Catostomus commersoni*
common carp	*Cyprinus carpio*
golden shiner	*Notemigonus crysoleucas*
emerald shiner	*Notropis atherinoides*
common shiner	*Notropis cornutus*
spottail shiner	*Notropis hudsonius*
bluntnose minnow	*Pimephales notatus*
fathead minnow	*Pimephales promelas*
creek chub	*Semotilus atromaculatus*
brown bullhead	*Ictalurus nebulosus*
American eel	*Anguilla rostrata*
white perch	*Morone americana*
white bass	*Morone chrysops*
rock bass	*Ambloplites rupestris*
pumpkinseed	*Lepomis gibbosus*
bluegill	*Lepomis macrochirus*
largemouth bass	*Micropterus salmoides*
black crappie	*Pomoxis nigromaculatus*
yellow perch	*Perca flavescens*
johnny darter	*Etheostoma nigrum*
freshwater drum	*Aplodinotus grunniens*
mottled sculpin	*Cottus bairdi*

Previous surveys of benthic invertebrate abundance indicates that the density of benthic invertebrates within the Tommy Thompson Park monitoring stations is well below total densities previously reported for areas near Toronto. Similarly, the abundance of oligochaetes is well below reported densities for the Toronto area. The densities reported here are closer to the generalized values reported for nearshore Lake Ontario. High invertebrate densities, especially high oligochaete densities have been associated with organically enriched or eutrophic environments.

Diversity index combines information on both the number of species present in a sample and the evenness with which individual organisms are distributed among species. It is generally implied that the higher the diversity, the less impacted a community is. A major impact of pollution stress on a system is to effect a decrease in the number of surviving (tolerant) species which reduces intraspecific competition and results in an increase in numbers of fewer species. The similarity (no significant differences) between the invertebrate samples from the Tommy Thompson Park stations suggests a similarity of environmental conditions at all stations, although given the limitations of sample size and the index itself, further analyses on community composition and structure are required.

A number of schemes have been developed and widely used to relate benthos to environmental condition. The percent contribution to the total population by oligochaetes and more specifically tubificids indicates a highly polluted state if greater than 80% and good condition below 60%. According to this criteria the Cell 1 station is considered to be in good condition, Cell 2 stations, Cell 3b, and Cell 3c stations are highly polluted and the remaining stations (embayments, Outer Harbour and Cell 3a) are in questionable condition.

Pollution impacts based on oligochaete densities were "severe" at stations Cell 2b, all Cell 3 stations and embayment Cb in 1988 only. The mean densities for these stations were well below the "severe" pollution level. Embayment A and the Outer Harbour stations are classified as severely polluted by this index.

The indicator species approach utilizes the presence or absence of species typically associated with specific environmental conditions. Most of the species identified at the Keating Channel monitoring stations were oligochaetes, and mainly tolerant species. *Stylodrilus sp.* considered intolerant of pollution stresses, was only identified in one sample from the Outer Harbour station in 1988.

The predominance of tubificids in most of the samples collected is not unexpected or of particular significance since the substrates at the sampling stations are mainly composed of very fine grained materials with high organic contents preferred by this group. The exception is the Outer Harbour station which was predominantly fine sand (85%). Although tubificids were the dominant oligochaete (95%) this station also had the largest proportion of "other" oligochaetes (Lumbriculidae and Naididae) which are associated with coarser sediments than the tubificidae. The relatively high richness (number of species) at this station also suggests more diversity in microhabitats which is associated with coarser sediments. The Chironomidae contributed the second largest proportion at most stations except during two samples within Cell 1 (1987 and 1989) where chironomidae were dominant. The chironomidae are the most ubiquitous of all aquatic insects and can be found

Table 4.7 List of species identified during the Keating Channel Monitoring Program Benthic Invertebrate collections, 1987-1990.

COELENTERATA *Hydra sp.*
NEMATODA
Turbellaria *Tubellaria sp.*
Hymanella retenuova
HIRUNDINAE
Glossiphoniidae *Placobdella sp.*
OLIGOCHAETA
Lumbriculidae *Stylodrilus heringianus*
Naididae *Nais sp.*
N. bretscheri
N. variabillis
N. barbata
Styrodrilus heringianus
Arcteonais lomondi
Dero nivea
Dero sp.
Ophidonais serpentia
Unicinais uncinata
Stylaria lacustris
Tubificidae *Limnodrilus sp.*
L. cervix
L. claparedianus
L. hoffmeisteri
L. profundicola
L. udekemianus
Peloscolex sp.
Spirosperma ferox
S. nikolskyi
Potamothrix vejdovskyi
P. moldaviensis
Tubifex
T. superiorensis
Quistadrilus multisetosus
Aulodrilus pluriseta
Tubificidae (immature)
imm. with hair setae
imm. without hair setae
HEMIPTERA
Corixidae Nymph
ISOPODA
Asellidae *Asellus sp.*
AMPHIPODA
Gammaridae *Gammarus sp.*
G. fasciatus
G. pseudolimnaeus
Crangonyx sp.
Haustoriidae *Pontoporeia affinis*
Talitridae *Hyzella azteca*
ACARINA
Hygrobates sp
Lebertia sp
Limnesia sp
Unionicola sp

in any habitat. In general the assemblages of chironomid and oligochaete species in the samples discussed here are typical of organically enriched environments but not grossly polluted areas where the only species present are the most tolerant oligochaetes.

In summary, the abundance and diversity of benthic invertebrates in samples from Cell 2 stations (the active disposal cell during the sampling period) were slightly depressed (but not significantly different) from the samples from Cell 1, three Cell 3 stations and two Embayment C stations. The abundance of organisms was significantly higher at the Embayment A and outer harbour stations than in Cell 2 samples although there was no significant difference in diversity. Cell 2 samples had the lowest mean number of species but was not significantly different from all other stations excluding the outer harbour station. The mean percentage contribution of tubificidae to total population numbers was highest in the Cell 2 samples although not significantly different than the other stations excluding Cell 1 (which was predominated by chironomidae overall). Overall, Cell 2 samples ranked lowest for the measured parameters but the differences were minor, suggesting that environmental disturbances may be slightly more influential in Cell 2 than at other locations but not to a significant extent. For a list of species identified during the Keating Channel Monitoring Program Benthic Invertebrate collections for 1987 - 1990 see Table 4.7.

4.2.7 Biomonitoring Study

Freshwater clams were placed within the Disposal Cells, Outer Harbour, and Embayment "C" (see Figure 4.6), to test for the bioaccumulation of contaminants associated with the dredgeate disposal operation. The use of organisms to directly monitor toxic contaminant concentrations in water provides an indication of both short-term fluctuations in contaminated levels, and as concentrators of low contaminant levels. Because of their sedentary nature, bivalve molluscs, as filter-feeders, are particularity useful in detecting spatial variation of contaminant levels. Results showed that body burdens in clams are acquired from the aqueous phase rather than from the sediments.

The intent of the biomonitoring study is to measure the spatial and temporal trends in the availability of compounds and residual concentrations in resident biota. The trends observed through the biomonitoring study assist in determining the effectiveness of dredgeate containment and establish base line background conditions for the study area.

The bioaccumulation process is influenced by many factors including the availability of contaminants, specific conditions at the station, and the metabolism characteristic of the test organisms. Comparisons between bioaccumulation of compounds like Polychlorinated Biphenyls (PCBs) and Polynuclear Aromatic Hydrocarbons (PAHs) can give a good indication whether or not these compounds have been accumulated or metabolised, especially when they are not detected in the test medium prior to exposure. Consistently the body burdens of PCBs, PAHs, and organochlorine pesticide compounds are detected more frequently or at a higher concentration within the disposal cells. Presently the frequency of detections for these compounds are apparently declining when compared to the number of detections during the initial years of the biomonitoring study.

Figure 4.6

Keating Channel Environmental Monitoring Program

Monitoring Stations - Tommy Thompson Park

Dioxin and Furan analysis is difficult to interpret due to the collection of information from a single station, and due to analytical costs it is impractical to expand the sample size. The loss of the caged clams deployed in Cell 1 during 1990 required the analysis of clams from Cell 2. Disposal Cell 2, is a better location for observing trends because it is the area of active dredgeate disposal. There was an apparent increase in the detection of Dioxins and Furans at this location relative to Cell 1.

Spottail shiners have become a standard test medium for determining contaminant compounds within resident biota. However, within the study area it is difficult to collect the appropriate number of young of the year individuals required for analysis. The solution to this may be the analysis of a more prevalent species such as pumpkinseed (*Lepomis gibbosus*).

The marked difference in detectable compounds in caged clams and spottail shiners from within the disposal cells in comparison to areas outside, indicate that the effects of the disposal operations are confined to within the disposal cells. The concentration of detectable compounds in caged clams deployed within the disposal cells are above the concentrations observed during the same time period at Colonel Sam Smith park. The compounds detected in spottail shiners within the disposal cells are elevated in comparison to detections from other areas of the waterfront.

4.2.8 Water Temperature

Continuous water temperature recorders were deployed within Disposal Cell 3 Embayment "C", and the Outer Harbour to determine the rate of water exchange between the three locations.

In late March the nearshore temperature of surficial waters of Lake Ontario begin to rise producing a ring of warmer water adjacent to the shoreline. This early warming produces a thermal bar of warm water that is isolated from the surficial waters of the lake. Thermal stratification of Lake Ontario typically occurs during mid June. At the end of the heating season the epilimnion and thermocline in Lake Ontario can establish to a depth of fifty meters. The warmer epilimnetic water is frequently displaced from the Toronto waterfront by the upwelling of colder hypolimnetic water caused by seiche activity induced by strong North to Northwest winds. It is noted that a previous review of water temperatures collected in the raw water intake supply of Lake Ontario water filtration plants, indicated that the nearshore zone adjacent to Toronto has the highest frequency of upwelling events in Lake Ontario. Local nearshore water circulation can be greatly influenced by the effects of upwelling events. The inundation of cold water as noted in the temperature recorders deployed in Tommy Thompson Park can happen rapidly, and subsequently displaces the warmer nearshore water. The occurrence of cold water upwellings are more striking when the lake is at thermal stratification later in the heating season. Through the constant monitoring of water temperature from exposed and protected locations an indication of the extent of water circulation can be determined.

Evident in the 1989 and 1990 water temperature data, is the rapid decline in water temperatures associated with upwelling events. This infiltration of cold water on the Toronto waterfront effectively displaces the nearshore water. The rapid displacement of warm water

is apparent in the temperature data from the Outer Harbour and Embayment C and implies that there is unrestricted exchange of water between the two locations. Disposal Cell 3 is influenced by the effects of upwelling events but does not have the apparent exchange rate as the Outer Harbour and Embayment C. Cell 3 during upwelling events is slowly inundated with colder water from Embayment C. The absence of dramatic temperature changes in Cell 3, indicates that disposal Cell 3 is partially isolated from Lake Ontario.

The water temperature information recorded in Tommy Thompson Park, identifies the thermal isolation of disposal Cell 3. This supports the results of the other the sediment quality study components which demonstrate gradients in sediment chemistry within the disposal cells compared to locations outside. The water temperature data supports the evidence that the dredgeate disposal operation is effectively contained.

4.3 Interim Management Program 1992

Location

Tommy Thompson Park, also referred to as the Outer Harbour Headland, is located in the City of Toronto. It is a man-made spit of land, extending some 5 km in a southwesterly direction into Lake Ontario from the intersection of Unwin Avenue and Leslie Street.

Purpose of Site

Construction on this site was initiated in 1959 by the Toronto Harbour Commissioners, for the purpose of providing an outer breakwater for expanded port facilities. However by 1972, it was determined that much of this land was no longer required for port expansion, and alternatively a large portion of it could be made available to the public.

Approvals Overview
Ministry of Natural Resources Approval of 1972

By letter dated November 29, 1972, the Honourable Frank Miller, then Minister of Natural Resources, advised the MTRCA that Cabinet had approved of designating the Authority as the agency responsible for planning, interim management and development of Tommy Thompson Park. This approval was subject to two key conditions which are as follows:

(i) that armouring of the outer shoreline, estimated at $3.5 million must be funded by the federal Government or one of its agencies; and

(ii) that title of Tommy Thompson Park land must be transferred to the Authority for a nominal sum prior to any development occurring.

The first condition regarding armouring was resolved with the creation of the new endikement extending in southerly direction from the neck of the headland. The second condition was resolved May 17, 1984, when an area was transferred from the Ministry of Natural Resources to the Metropolitan Toronto and Region Conservation Authority.

MTRCA Executive Approval of 1984

At the Executive Meeting #7/84, the issue of interim management was considered with the following resolution adopted:

Res. #123

THAT the Metropolitan Toronto and Region Conservation Authority assume the responsibility for the Interim Use Program currently under Toronto Harbour Commissioners management when title to Tommy Thompson Park is received;

THAT the Authority request the Toronto Harbour Commissioners to act as managers of the 1984 Interim Use Program and as our agents with respect to all agreements;

THAT the Authority approve an expenditure off $5,000.00 to cover pre-development costs associated with the Authority receiving title to Tommy Thompson Park lands;

AND FURTHER THAT Authority staff be directed to enter into negotiations with the Ministry of Natural Resources, the Toronto Harbour Commissioners and the Municipality of Metropolitan Toronto with respect to management of the Interim Users Program from January 1, 1985, and subsequent years.

Interim Management Program 1992

Background

In 1973, after the Toronto Harbour Commissioners had determined that much of the area was not required for port expansion, they initiated an informal program to allow the general public access on a weekend basis. However, in 1977 this program was formalized by the Commissioners with policies for the operation of a summer program.

The basic policies for the program were:

- The length of the season for public access was determined by the bus service;
- The funding for the bus service was negotiated annually between the City of Toronto and the T.T.C.
- With the exception of emergency vehicles, no automobile access or parking on the headland was permitted during public hours;
- Outside public hours, lock and key privileges for auto access was granted to groups such as Environment Canada, Canadian Wildlife Service, MTRCA, university researchers and the Aquatic Park Sailing Club (Embayment C);
- The use of a portion of Embayment C by the Aquatic Park Sailing Club for a total of 100 berths through agreement with the Ontario Sailing Association.

At the Water and Related Land Management Advisory Board meeting #7/91, the following resolution was adopted:

THE BOARD RECOMMENDS TO THE AUTHORITY THAT the staff report on the 1991 Interim Management Program at Tommy Thompson Park be received for information.

Pursuant to this resolution, staff reviewed the program and activities of the 1991 Interim Management Program and prepared the 1992 program on a similar basis.

The 1992 Interim Management Program at Tommy Thompson Park will endeavour to maintain the basic components of the previous year's program. These basic components include:

- year round access of the park to the public;
- a nature interpretive program offered through the summer season;
- a transportation system for use by the public during the spring, summer and fall seasons;
- a wildlife management program (gull control and tern management); and
- a licence agreement with the Aquatic Park Sailing Club for sailing activities.

Public

Tommy Thompson Park will be open year round on weekends and holidays from 9:00 a.m. to 6:00 p.m. commencing January 4, 1992, excluding Christmas and Boxing Day. Staff will be on site during public hours. During the winter months the park may close periodically due to unsafe conditions created by inclement weather. Public transportation will be provided commencing April 25, 1992 and will operate until October 12, 1992. The following are the proposed types and times of service:

April 25 - May 31	-Multi-seating Passenger Bus
June 6 - September 7	-T.T.C. Special Summer Bus
September 12 - October 12	-Multi-seating Passenger Vehicles

The same level of maintenance will be provided as in the past. This includes portable washroom units, garbage receptacles, recycling containers for beverage cans and road maintenance.

A gate attendant will be on site for the duration of the open season to provide general information, ensure safety, maintain attendance records and perform park opening and closing procedures.

A nature interpreter will be on hand from June 6 to September 7 to answer any questions and conduct hikes and theme tours. The attendance for the interpretive program has increased in the past two years and has been well received by the participants. In this respect, the 1992 program will be set-up on a similar on a similar basis with one (1) nature walk scheduled on Saturdays and two (2) walks on Sundays and Holidays. During other hours the interpreter will circulate throughout the Park setting up nature viewing stations or providing informal presentations to the public using the transportation system. Staff will prepare a brochure

outlining the summer schedule of nature walks and theme hikes for distribution to the public, and will make use of news releases to announce the weekly program.

The Tommy Thompson Park Newsletter will continue on a quarterly basis and will highlight scheduled events. In addition any changes in the Interim Management Program will be announced in the newsletter.

Lessees

Staff will prepare a 1992 lease agreement with the Aquatic Park Sailing Club for sailing activities in the Park. The conditions of the lease will be the same as used in previous years. Aquatic Park Sailing Club members will be permitted parking on their leased lands and vehicle access during public hours only from April 4 - 19, inclusive, and October 17 to November 1, inclusive, for any necessary preparatory work prior to and after the sailing season. Parking during this period will be provided in a designated area to be determined by the MTRCA.

During all other public hours, the Aquatic Park Sailing Club members will be required to park in the Leslie Street parking lot and access by public transportation. During non-public hours for the time period of the 1992 lease, access to only the Aquatic Park Sailing Club leased lands will be granted upon proof of membership and key privileges. Security and adherence to MTRCA and THC site regulations will be the responsibility of the Aquatic Park Sailing Club.

Wildlife Management

Gull Control Program

In 1991 the annual Gull Control Program for Tommy Thompson Park was tendered as a two year program for the period of 1991-92. The program will utilize similar discouragement techniques as in previous years including falconry, pyrotechnical devices and scarecrows. For 1992 the control areas and timing of the control areas will be similar to 1991. The program will commence on March 23 and will continue until July 3, 1992, as follows:

Weekday Control: will be undertaken from March 26 to July 7 and will encompass the Endikement, all areas south of the main road and Peninsula D. Control techniques will include falconry, pyrotechnical devices and scarecrows.

Weekend Control: will be undertaken during the month of May (approximate) on the Endikement and all areas south of the main road. Peninsula D will not be included on weekends because of the public use in this area. Similarly, control will be restricted to falconry and scarecrows on weekends to avoid conflict with public use.

The control on weekends during the peak egg laying period proved very successful in reducing the sporadic egg laying of previous years. This component of the control program will be utilized in 1992 to minimize any egg collection.

Tern Management

The Tern Management Program for 1992 will be similar to the 1991 program and will include:

- delineation and monitoring of nesting areas;
- increased signage and patrol;
- installation and monitoring of four (4) nesting rafts in cooperation with the Canadian Wildlife Service;
- assisting the CWS with nest inventories; and
- monitoring tern nesting success.

Costs

Costs associated with the 1992 Interim Management Program have been estimated at $144,000.00. The following is a breakdown of costs associated with this program:

Table 4.8 **Interim Management Program - Tommy Thompson Park**

1.	Gull Control Program	$ 54,500.00
2.	Resource Interpreter and Facility	$ 38,000.00
3.	Transportation System	$ 28,500.00
6.	Materials, Supplies and Equipment Rentals	$ 23,000.00
	TOTAL	**$144,000.00**

The 1993 Interim Management Program will maintain the major components of the previous years program including; weekend operations, the van shuttle service, nature interpretation program, and gull control.

Falconry will not be used in the 1993 gull control program in order to evaluate the effectiveness of other control techniques on site and reduce operating costs of this program.

Costs associated with the 1993 Interim Management Program have been estimated at $144,000, representing a zero percent increase over the 1992 budget.

4.4 Metropolitan Toronto: Official Plan for the Urban Structure

From the Metropolitan Toronto perspective, the revised Plan reflects the following Metropolitan initiatives as outlined in the December 1991 document - "Metropolitan Waterfront Plan - Planning Directions for the Metropolitan Waterfront: An Overview":

> "5.2 Metropolitan Initiatives
>
> Initiatives by the regional government will result in the implementation of a significant number of the Metropolitan Waterfront Plan's policies. For example, a strategy to enhance the access and the environmental integrity of Corporate Lands through new management practices will be initiated. Other strategies will increase public access, meet recreational needs and protect natural areas (including habitats) through land acquisition, improve waterfront areas through regeneration pilot projects, and provide continuous, connected access to the waterfront with the completion of the Lakeside Trail."

In September 1992, the Municipality of Metropolitan Toronto released a Draft Official Plan - "The Liveable Metropolis". Under Section 4.2, Principal Elements of the Metropolitan Green Space System the following key objective is stated:

> "To promote the planning and management of the Principal Elements of the Metropolitan Green Space System and adjacent lands in a manner that protects and enhances the natural features and processes of the system, while allowing for compatible recreational and leisure activities."

The Revised Master Plan appears to exemplify the draft policy direction of Council as outlined in the following:

> "4. that Metropolitan Toronto parks, except in Principal Recreational Activity Areas, be restricted to those low-intensity recreational uses that require limited permanent structures; have low impact on flood control, water conservation practices, and flora and fauna; and are in keeping with the retention of the area in its natural state. In this regard, park planning should limit the extent of intensively groomed and structured landscapes and consider the use of natural surfaces when appropriate.
>
> 5. that Metropolitan Toronto and other appropriate authorities be encouraged to undertake planting programs and other initiatives aimed at:
>
> a) re-establishing a natural landscape, including the re-introduction of native plant species;
>
> b) improving soil permeability and the potential for groundwater recharge;

c) controlling erosion and improving water quality;

d) enhancing core habitats and connecting links between them, particularly east-west links and links between the waterfront and valley corridors;

e) controlling where necessary public access to or use of sensitive natural areas."

4.5 City of Toronto: Central Waterfront Plan

The revised Concept Plan could receive favourable comment from the City of Toronto since it has a higher degree of conformity with the policy directions in the Central Waterfront Plan currently before the Ontario Municipal Board which are as follows:

"5A.37 It is the policy of Council to support proposals for the Outer Harbour Headland which are in accordance with Section 5A.36 and which:

(a) ensure that roads and intensive activities in the open space area do not adversely affect the character of the Environmental Resource Area;

(b) provide recreation opportunities for a wide variety of users;

(c) permit public access, notwithstanding construction and fill activities;

(d) use parking in peak periods located in adjacent areas of the Port Industrial District;

(e) provide bicycle and pedestrian paths from Unwin Avenue to the tip of the Outer Harbour Headland

(f) prohibit private recreational automobile traffic within the Environmental Resource Area; and

(g) promote the regulation of private automobile traffic from entering the Outer Harbour Headland, and encourage the use of non-motorized transportation and the use of acceptable public transit."

On December 3 and 5, 1990, City of Toronto Council endorsed an agreement with the Toronto Harbour Commissioners to lease approximately 200 acres along the north shore of the Outer Harbour for parks and open space purposes. The City of Toronto Parks and Recreation Department is currently initiating the preparation of a concept/master plan for this area as required by the lease within a sixty month time period.

The modified Master Plan reflects the following commitment by the City of Toronto Council at its meeting March 25/26, 1991 to accommodate all the community clubs in the Outer Harbour:

"Council adopted the Clause without amendment, and in so doing, took the following action:

1. Amended the body of the report (February 22, 1991) from the Commissioner of Parks and Recreation, as indicated in his further report of March 6, 1991.

2. Deemed that the specifications contained in Section 4.0 of the report (February 22, 1991) from the Commissioner of Parks and Recreation form the basis for legal arrangements for the Community boating Clubs to continue their right to use their existing facilities on the North Shore in the interim until such time as a Comprehensive Plan Agreement as set out in the City/Toronto Harbour Commission lease is developed (as approved by City Council on December 3rd and 5th, 1990).

3. Reaffirmed its intent to include provision for long term arrangements for windsurfing, rowing and community boating clubs, in the preparation of a Preliminary Concept Plan and a Comprehensive Plan Agreement as expressed in the draft lease between the City and the THC for the lands to be known as THC's Waterfront Park and in the future planning of additional Outer Harbour Parklands including those lands that may be acquired by the City pursuant to Recommendation No. 62 of the "Watershed" report by the Royal Commission on the Future of the Toronto Waterfront (adopted by City Council on November 12th and 13th, 1990).

4. Agreed to consider arrangements for short term public moorings in planning for these lands and adjacent lands in the Outer Harbour area.

5. Invited the Community Boating Clubs to nominate representatives to participate with the City of Toronto, other agencies and interested parties towards the formation of the Preliminary Concept Plan for the THC's Waterfront Park, and to advise the Commissioner of Parks and Recreation of such representatives.

6. Requested the Toronto Harbour Commissioners to facilitate the necessary complementary agreements with the community clubs for effecting the water operations of the community boating clubs.

7. Granted authority to the appropriate City officials to take the necessary steps to give effect thereto."

In September, 1992, the City of Toronto released the following document: Draft Official Plan Part I Consolidation, Cityplan Final Recommendations. Section 14.40, through discussions with the City Planning Department would support the Revised Master Plan

including the existing boat club. The draft policies for the Outer Harbour Headland (Section 14.40) are as follows:

"The Outer Harbour Headland has developed natural environmental features worthy of protection. It is the policy of Council that the Outer Harbour Headland be used for year-round recreation purposes in a manner which respects the natural vegetation and wildlife habitat characteristics of this area. Accordingly, it is the policy of Council to support proposals for the Outer Harbour Headland which:

a) ensure that roads and intensive activities do not adversely affect the character of the Environmentally Significant Area;
b) permit public access, notwithstanding construction and fill activities;

c) use parking in peak periods located in adjacent areas of the Port Industrial District;

d) provide bicycle and pedestrian paths from Unwin Avenue to the tip of the Outer Harbour Headland;

e) regulate private automobile traffic on the Outer Harbour Headland and encourage the use of non-motorized transportation and the use of acceptable public transit; and

f) in the case of an undertaking related to access and facilities for an existing boat club on the Outer Harbour Headland, that an environmental impact study, as described in Section 2.29, is completed or the undertaking approved under the Environmental Assessment Act."

(Existing S:5A.47 and 5A.48 with modifications)

4.6 The Royal Commission on the Future of the Toronto Waterfront

In June of 1992 the MTRCA received a letter from the Royal Commission on the Future of the Toronto Waterfront which summarized its position on the future of the Leslie Street Spit/Tommy Thompson Park.

The recommendations made about the Spit in the "1989 Interim Report" and "Regeneration" summarize their position:

...the Royal Commission recommends that the Leslie Street Spit be recognized and protected as an urban wilderness park. In this context, 'urban wilderness' is defined as an extensive area where natural processes dominate and where public access, without vehicles, provides low-key, low-cost, unorganized recreation and contacts with wildlife (Interim Report Summer 1989, p. 159).

Interpretive facilities and parking should be accommodated at the neck of the Spit. There should be no private vehicular access to the Leslie Street Spit, with the

exception of access to the Aquatic Park Sailing Club, as under the existing arrangements (Interim Report Summer 1989, p. 172).

Opportunities to improve public transit access, such as use of a trackless train, should be explored, so that the Spit can be enjoyed by older people, the disabled, families with young children and other members of the public (Interim Report Summer 1989).

In order to protect the integrity of the spit as a habitat for wildlife, it should be kept car-free and reserved only for uses such as passive recreation that are compatible with its urban wilderness character (Regeneration, p. 408).

The revised Tommy Thompson Park Master Plan incorporates significant changes that are consistent with the Commission's recommendations and should ensure that the Spit remains as urban wilderness and car-free environment. The Commission commended the MTRCA on the revised plan and concurs with its proposals.

At the public meeting of May 27, 1992, the future of the Aquatic Park Sailing Club remained a subject of some disagreement. The Commission's position is that the APSC could remain on the Spit, as stated in the 1989 Interim Report, providing that the facility is kept at its present size and scale. The revised Master Plan also includes initiatives to further limit private vehicle access to the Club. The Commission supports such initiatives.