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AQUATICS LTD

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ATTN: Gregory Missal, Tahera Corporation

Re: Jericho River Aquatic Studies Summary

Introduction

In anticipation of possible development of the Jericho Diamond Project, a baseline inventory program was initiated in 1995. The program involved collection of data on regional meteorological conditions, water quality, hydrology, wildlife, and aquatic biota from a large study area that included the Jericho River downstream of Carat Lake. RL&L Environmental Services Ltd. was contracted to complete the aquatic biota component of the baseline inventory program. The information from the 1995 aquatic baseline inventory was presented in a comprehensive report entitled: Jericho Diamond Project Aquatic Studies, 1995.

As part of the continuing baseline inventory program in 1996, RL&L Environmental Services Ltd. was contracted to complete the aquatic biota component of the study. The Jericho River also was inventoried during this year of study. The information from the 1996 aquatic inventory was presented in a comprehensive report entitled: Jericho Diamond Project Aquatic Studies Program (1996).

During meetings with the Jericho Diamond Project reviewers, representatives of the Kitikmeot Inuit Association requested aquatic baseline information for the Jericho River downstream of the Jericho Diamond Project . This letter summarizes information for the Jericho River and its tributaries (Figure 1).

Water Quality

Water quality was sampled at two sites on the Jericho River in spring, summer, and fall 1995 by Canamera Geological Ltd. The detailed results (i.e., physical tests, dissolved anion, nutrient, and organics) are provided in Appendices A1 to A3. Many variables analyzed were below or near methodological detection limits, which reflect the oligotrophic characteristics of waterbodies in the study area. As such, the following discussion concentrates on variables that were biologically important and/or that had concentrations considerably above methodological detection limits.

Physical Tests/Dissolved Anions/Nutrients/Organics

The average pH of waterbodies in the study area was slightly acidic; the Jericho River (Site CL07) had the lowest pH of all sites measured in the study area (6.29). The Canadian Water Quality Guidelines (CWQG) for pH is between 6.5 and 9.0 for the protection of freshwater aquatic life (CCREM 1987). Site CL07 of the Jericho River was therefore noncompliant with this guideline.

Alkalinity (measured as calcium carbonate) ranged between 3.8 and 5.6 mg/L at the sites on the Jericho River. No CWQG have been set for alkalinity but the U.S. Environmental Protection Agency (USEPA) suggests a minimum of 20 mg/L (USEPA 1986).

Total Dissolved Solids (TDS) ranged between 8 and 15 mg/L at sites on the Jericho River. There is no CWQG for TDS for the protection of aquatic life (CCREM 1987). The CWQG for irrigation sets upper limits for TDS of between 500 and 3500 mg/L, while the guideline for drinking water is 500 mg/L. TDS concentrations in the Jericho River and waterbodies from the study area were well below these limits.

Hardness at the Jericho River sites ranged between 4.21 and 5.84 mg/L. There are no CWQG criteria for hardness and few guidelines have been established for the concentrations of major ions that contribute towards hardness (CCREM 1987). For sulphate, there is a CWQG of 500 mg/L for drinking water and for chloride, the CWQG suggest concentrations of 75 to 700 mg/L as limits for irrigation purposes. Both sulphate and chloride concentrations in the Jericho River and waters monitored in the study area were well below these criteria.

Concentrations of nitrate and nitrite were below or near methodological detection limits for most waterbodies in the study area, reflecting the oligotrophic nature of the waterbodies. The two Jericho River sites, were one exception, as they were at or just above the detection limit for nitrate. The CWQG for the protection of freshwater life recommends that nitrate concentrations not reach levels that would result in prolific macrophyte growth (CCREM 1987). Due to short growing seasons, and generally cold waters, macrophytes are not usually abundant in sub-arctic waterbodies in the study area. All of the nitrite concentrations in the Jericho River and study area were well below the CWQG of 0.06 mg/L for the protection of freshwater life.

The average concentration of ammonia and ammonium (NH_3-N) in the Jericho River was low. In half of the samples, NH_3-N was not detected. The CWQG for ammonia, which pertains to freshwater aquatic life, are dependent on both pH and temperature (CCREM 1987). At a temperature of 10°C and a pH of 6.5, the guideline for total ammonia is 2.2 mg/L. All samples collected in the Jericho River complied with this guideline.

Average concentrations of total phosphorus (TP) in the Jericho River were very low (0.003 to 0.005 mg/L). The TP concentrations fell at or within the range that Wetzel (1983) defines as oligotrophic (0.003 to 0.018 mg/L). To date, no CWQG criteria for TP have been established (CCREM 1987). The Alberta Water Quality Guideline for TP, as elemental phosphorus, is 0.05 mg/L (AEP 1993). This guideline was met in all samples collected from the Jericho study area.

Total organic carbon (TOC) concentrations in the Jericho River ranged from 2.6 to 5.8 mg/L (average 3.4 mg/L). These were in the mid-range when compared to other sites in the study area.

Chlorophyll *a* ranged between 0.06 and 0.53 µg/L in the Jericho River. Wetzel (1983) defines chlorophyll *a* concentrations that range between 0.3 and 4.5 µg/L, as generally being indicative of an oligotrophic system. All sites sampled in the Jericho River had chlorophyll *a* concentrations below or within Wetzel's range.

Total Metals

Metals in water can exist in a number of soluble forms, such as free metal ions or associated with colloids, and in particulate forms, such as in association with clays or organic matter. Concern about metals is due to their toxicity, potential for bioaccumulation, hazards to human health, and effects on the aesthetic quality of drinking water (CCREM 1987). Of the 34 metals analyzed in samples collected from the Jericho River, aluminum, calcium, iron, magnesium, silicon, and strontium, in at least some samples, were at detectable concentrations. These total, extractable metals are discussed below; raw data are provided in Appendix xx.

Aluminum concentrations in the Jericho River ranged between 0.019 and 0.038 mg/L. The CWQG for aluminum pertaining to the protection of freshwater aquatic life are pH dependent (CCREM 1987). At a pH of less than 6.5, 0.005 mg/L of aluminum is the maximum, while at a pH of greater than 6.5, the limit is 0.1 mg/L. Except for Site CL07 of the Jericho River, the latter guideline is more appropriate for the conditions found in waterbodies of the study area. For all sites in the study area except CL07, total aluminum concentrations were within acceptable limits. However, total aluminum concentrations at the Jericho River site CL07 exceeded the specified limit.

Calcium concentrations in the Jericho River ranged between 1.01 and 1.34 mg/L. Average total calcium concentrations varied from 0.795 to 1.87 mg/L at other sites in the study area. Federal guidelines have not been established for calcium concentrations to protect freshwater aquatic life (CCREM 1987).

Iron was detected in half of the samples collected from the Jericho River and ranged from 0.032 to 0.05 mg/L. The CWQG for iron is 0.3 mg/L (CCREM 1987). All water quality samples collected from the Jericho River complied with this guideline.

Magnesium concentrations in the Jericho River ranged from 0.447 to 0.619 mg/L (average 0.537 mg/L). At other sites in the study area, magnesium concentrations ranged from an average of 0.064 to 1.04 mg/L. There are no federal guidelines for magnesium concentrations.

Silicon concentrations in the Jericho River ranged from 0.12 to 0.49 mg/L (average 0.236 mg/L). In comparison, silicon concentrations in other waterbodies in the study area ranged from 0.106 to 0.895 mg/L. There are no federal guidelines for silicon concentrations (CCREM 1987).

Strontium is generally a minor constituent of the overall metal concentrations in surface waters (APHA 1993). Although found at detectable concentrations in the Jericho River, its concentrations were low (0.008 to 0.011 mg/L; average 0.00983 mg/L). The Jericho River sites had the lowest average total strontium concentration of all sites sampled in the study area. The CWQG (drinking water), for strontium refers to the radioactivity of ^{90}SR, not to concentration, and thus cannot be evaluated (CCREM 1987).

Dissolved Metals

The same metals analyzed for total, extractable concentrations also were analyzed for their dissolved concentrations. Both total and dissolved concentrations were highly correlated, generally no more than 5% difference in relative concentration was observed, and only five metals were detected in the samples. These included aluminum, calcium, magnesium, silicon, and strontium. The results of dissolved metals analysis are provided in Appendix xx.

Sediment Quality

Canamera Geological Ltd. personnel implemented and conducted a sediment quality sampling program in the Jericho study area during 1995. Sediment samples were collected from 10 sites, including two on the Jericho River. Among the 28 metal constituents analyzed, aluminum, iron, and magnesium concentrations were greater than the other metals. Some metals (i.e., antimony, beryllium, cadmium, molybdenum, selenium, silver, and tin) had concentrations that were below methodological detection limits. In comparison to other sites in the study area, the concentrations for most metals in the Jericho River were lower. A summary of the sediment quality data is provided in Appendix A4.

Periphyton

A limited periphyton sampling program was conducted as part of baseline studies in the summer of 1996. Three replicate periphyton samples were collected from Site B4 in the Jericho River. In terms of density, the

dominant species in the Jericho River was *Gomphosphaeria naegelianum*, a species of cyanobacteria (428 221±217 399 cells/ cm^2). The next most abundant species included two species of cyanobacteria, *Chroococcus dispersus* (102 965±81 358 cells/ cm^2) and *Pseudanabaena* spp. (114 607±35 476 cells/ cm^2) and one diatom (Bacillariophyta), *Achnanthes minutissima* (81 261±29 380 cells/ cm^2).

Chlorophyll *a* concentrations in the Jericho River ranged from 0.209 to 1.414 µg/cm^2 (average=0.739± 0.355 µg/cm^2). Ash Free Dry Mass concentrations ranged from 10.83 to 43.62 mg/cm^2 (mean=24.09±9.970 mg/cm^2). The periphytic biomass estimate was low and characteristic of oligotrophic conditions. Data on algal density and taxa identified are presented in Appendix A5.

Benthic Macroinvertebrates

A benthic macroinvertebrate sampling program was conducted in summer 1996. One sample site was established on the Jericho River (B4). The benthic macroinvertebrate community at the Jericho River site was dominated, in order of decreasing abundance, by chironomids, oligochaetes, ostracods, and nematodes.

The overall mean density of benthic macroinvertebrates was low in the Jericho River (1387±526/m^2). The Jericho River site had a total of 24 benthic taxa. In general, the species composition and low densities were typical of nutrient poor systems. Benthic macroinvertebrate taxa identified in the replicate samples are provided in Appendix A6. The mean density of dominant benthic macroinvertebrates at the Jericho River site is provided in Appendix A7.

Fish

Species Composition and Abundance

To assess fish species composition and abundance, streams in the Jericho study area were sampled using a variety of methods including backpack electrofishing, snorkelling, angling, and visual observations. Because multiple survey methods were used and most sampling was at a synoptic level, no standardized catch-per-unit-effort data were calculated. Sampling was conducted during spring, summer, and fall 1995 and 1996. Sampled areas in 1995 included the Jericho River proper and four tributary streams (Sites O1 to O4). The sampled area in 1996 expanded to include the upper Jericho River (5 tributaries and the mainstem) and the lower Jericho River (5 tributaries and the mainstem). The lower section of the Jericho River and tributaries were included in the fisheries program to ascertain its importance to fish populations that may also utilize upstream areas of the river.

Species recorded in the Jericho River and tributary streams in 1995 included Arctic grayling (*Thymallus arcticus*), round whitefish (*Prosopium cylindraceum*), lake trout (*Salvelinus namaycush*), burbot (*Lota lota*), ninespine stickleback (*Pungitius pungitius*), and sculpin (*Cottus* spp.). A small number of preserved sculpin specimens indicated that captured fish were slimy sculpin (*Cottus cognatus*). Overall, Arctic grayling was the most numerous fish encountered (82%). No other species exceeded 5% of the total catch (Table 1).

In total, five streams were inventoried during 1995 surveys in the Jericho River area. These streams consisted of the one large outlet stream to the Carat Lake watershed (Jericho River) and four small tributaries (O1 to O4) that fed into this major stream. Species diversity and relative numbers of fish were highest in the Jericho River. In the remaining four streams, species diversity and fish numbers were highest in Stream O2. No more than three species were recorded in each of the streams and only Stream O2 contained more than 20 fish. A summary of sampling effort and number of fish recorded are presented in Appendix A8.

Arctic grayling dominated numerically at each of the sites. Highest numbers were recorded in the Jericho River and Site O2. In general, slimy sculpin and ninespine stickleback were the next most numerous fish in the outlet area streams. Although not abundant, lake trout, round whitefish, and burbot were also encountered in the Jericho River.

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Table 1 Percent composition of fish species recorded in sampled streams, Jericho River area, 1995 and 1996.

Species	Jericho River Streams						1996 Data Combined	
	1995		1996					
			Upper		Lower			
	No.	%	No.	%	No.	%	No.	%
Arctic char			6	2.8			6	1.5
Arctic grayling	69	82.1	68	31.9	146	77.7	214	53.4
Burbot	1	1.2	33	15.5			33	8.2
Lake trout	3	3.6	8	3.8			8	2.0
Round whitefish	3	3.6	7	3.3	2	1.1	9	2.2
Ninespine stickleback	4	4.8	88	41.3	38	20.2	126	31.4
Sculpin spp.	4	4.8	3	1.4	2	1.1	5	1.2
Total	**84**	**100**	**213**	**100**	**188**	**100**	**401**	**100**

In 1996, all the above species were recorded as well as one additional species, Arctic char (*Salvelinus alpinus*). In the Jericho River area, 213 fish were encountered in the upper section, while 188 fish were recorded in the lower section (Table 1). These summaries include fish captured in the Jericho River and tributary sites. Fish capture data are included in Appendix A8.

The number of species encountered varied depending on sampling area. Highest diversity occurred in the upper Jericho River area where seven species were recorded; four species occurred in the lower Jericho River area. It should be noted that ninespine stickleback were not encountered in any waterbody upstream of the cascade on the Jericho River (situated immediately downstream of Jericho Lake).

The relative importance of each species differed among areas. In the upper Jericho River area, ninespine stickleback was the most numerous fish (41%), although Arctic grayling also accounted for a large percentage of the sample (32%). In the lower section of the Jericho River area, Arctic grayling was much more important relative to ninespine stickleback (77% compared to 20%, respectively).

The number of fish and species composition also varied between individual streams within each area. In total, 11 systems were inventoried in the Jericho River area. These included five tributaries situated in the upper reach of the Jericho River (Streams O1 to O4 and O8), five tributaries in the lower reach of the Jericho River (Streams O23 to O27) and the mainstem Jericho River (Section O7A upper and O7B lower). In the upper reach of the Jericho River, the highest species diversity (5) and fish number (114) occurred in Stream O1. Ninespine stickleback was the dominant species in this system. Stream O7A contained the same number of species (5) and the next highest number of fish (57); Arctic grayling dominated in this stream. Lower numbers of fish were recorded in all other tributaries of the upper Jericho River (<25 fish).

In the lower Jericho River, diversity was lower (between one and three species). In this area, Arctic grayling was the numerically dominant species in most sampled tributaries. Numbers were highest in Streams O7B (54), O25 (40) and O24 (33). Ninespine stickleback were also relatively abundant in Streams O25 and O26.

With the possible exception of the Jericho River, sampled streams provided habitat to fish only during the open water period (most likely frozen to the channel bottom in winter). Therefore, the presence of species such as Arctic grayling and burbot in study area streams indicated that adults of these species were present in the nearby lakes, even though they were not encountered during lake sampling.

Biological Characteristics

Length data were collected in both years on fish that were captured by backpack electrofishing (Table 2; Appendix A9). In 1995, all the Arctic grayling captured were juvenile fish. Combined ageing data for this species from other sites in the study area indicated that the largest fish captured in the Jericho River tributaries may have been 2 years of age. Since fish observed while snorkelling could not be accurately measured, this subset of fish are missing from the summary. However, based on estimates of length, fish observed while snorkelling in 1995 included seven adult Arctic grayling, a juvenile burbot, three adult lake trout, and three juvenile round whitefish.

Table 2. Summary of length data (mm) collected from fish in the Jericho River and tributaries, 1995 and 1996.

Species	Number		Minimum		Maximum		Average	
	1995	1996	1995	1996	1995	1996	1995	1996
Arctic char		4		99		116		106.3
Arctic grayling	15	99	64	40	141	258	81.7	66.4
Burbot		11		26		168		50.9
Ninespine stickleback	2	18	40	22	49	64	44.5	45.3
Slimy sculpin	3	3	30	40	75	70	46.7	50.7

Ageing data from the 1996 study area suggested that the Arctic char captured from the Jericho River sites were probably 1 year old fish (based on length). The Arctic grayling included young-of-the-year, juvenile, and adult fish. These fish probably ranged from 0 to 4 years based on data collected from study area lakes and streams. Based on length, both young-of-the-year and juvenile burbot were captured in the Jericho River and tributaries. Average lengths for ninespine stickleback and slimy sculpin were similar amongst years; it is likely that a variety of life stages use habitats in the area.

On a whole, fish populations in the Jericho study area waterbodies were slow growing, late maturing, and were generally dominated by older age-classes. To some extent, this reflected the sampling methodology employed, however, these data are typical of sub-arctic fish populations residing in cold, oligotrophic waterbodies.

Fish Habitat and Habitat Use

Aquatic habitat in the Jericho study area was inventoried during spring and summer sampling periods in 1995 and 1996. During these inventories, lake and stream habitat was described and its value to fish communities assessed. In 1995, information was collected on the Jericho River and four tributary streams (O1 to O4). In 1996, several additional sites were sampled and included the upper Jericho River (five tributaries and mainstem) and the lower Jericho River (five tributaries and mainstem). Detailed data on habitat characteristics at each site surveyed are provided in Appendices A10 to A13.

Jericho River Cascade

The Jericho River serves as the outlet system to waterbodies in the Jericho study area. It is unique in that it is the largest stream in the study area and several small tributaries drain into the section investigated. A major barrier to fish passage exists on the Jericho River immediately downstream of Jericho Lake. Within this 120 m section, the stream drops approximately 15 m. The channel disperses over bedrock and boulders as it falls through a series of cascades. Although this section is a major barrier to fish passage, it is not a complete barrier, particularly during high flow periods.

Upper Jericho River (O7A)

In 1996, the Jericho River was divided into an upper and lower portion. Based on these surveys, the upper Jericho River (O7A) is dominated by deep long FLAT habitats interspersed with short RAPID sections. Water

depth varied within this portion of the Jericho River, but observations during snorkelling suggested that depths greater than 3.0 m are not uncommon. The substrate varies between sand in FLAT habitats, to boulder and cobble in RAPID habitats.

Due to its large size and habitat diversity, the surveyed section of the Jericho River provided good quality fish habitat. Because of its depth, it provided feeding areas for adult fish and possibly overwintering areas. Surveys documented the presence of adult Arctic char, lake trout and Arctic grayling at several locations in this stream. The presence of numerous juvenile Arctic grayling also suggested that this species reared within the Jericho River. The absence of gravel substrates in the section investigated indicated that the stream was not used for spawning by Arctic grayling, however, conditions (RAPID habitats) were suitable for spawning by species such as lake trout.

Streams O1, O2, O3
Due to the similarity in habitat characteristics, these streams will be discussed as a group. These tributaries to the Jericho River are small, exhibit low to moderate slopes, are dominated by small substrates (sand, gravel, and cobble), and have zero flow during periods of low rainfall. All contain an abundance of RUN habitat. The presence of smaller substrates in these streams, in combination with moderate to low gradients, created rearing and spawning habitat for species such as Arctic grayling. Their value as rearing habitat was confirmed by the presence of juvenile Arctic grayling and Arctic char in all three streams. Although adult Arctic grayling were not encountered during spring sampling, habitat conditions suggest that these streams were also used for spawning purposes.

Stream O4
Habitat characteristics of the surveyed section of Stream O4 were similar to characteristics in Streams O1, O2, and O3. Unlike the smaller watercourses, however, it had stable flows during the summer sampling period in 1995. Only the lower portion of the surveyed section provided useful fish habitat. Approximately 300 m upstream from its confluence with the Jericho River, the channel dispersed over an extensive area dominated by boulders. The lower section was characterized by a series of POOL, RUN, and RIFFLE habitats. The presence of juvenile Arctic grayling in this section suggested that Stream O4 was used for rearing purposes by this species.

Stream O8
This stream was sampled during 1996 only. Habitat characteristics of the surveyed section of Stream O8 are similar to characteristics in Streams O1 to O4. Unlike the smaller watercourses, however, it had stable flows during the summer sampling period. Extensive areas of this stream provide fish habitat. The well-defined channel is characterized by a series of POOL, RUN, and RIFFLE habitats and an abundance of gravel substrates.

During spring sampling, Arctic grayling eggs were collected from Stream O8 and young-of-the-year fish were recorded in this system during summer. The presence of Arctic grayling eggs and fish, combined with an abundance of spawning and rearing habitat strongly suggested that Stream O8 was used for spawning and rearing purposes by this species.

Lower Jericho River (O7B)
The habitat characteristics of this section of the lower Jericho River differed from those of the upper Jericho River. The watercourse in this area is shallow and dominated by RUN habitat interspersed by RAPID/POOL complexes. Although FLAT habitat is present, these areas generally exhibit shallow water depths. The substrates in this section are dominated by sand and boulders interspersed with patches of gravels. Due to the

lack of deep water areas, this section has limited value as feeding habitat for adult fish. However, these characteristics provide good quality spawning and rearing habitat for species such as Arctic grayling. Not surprisingly, large numbers of young-of-the-year and juvenile Arctic grayling were documented in this section.

Stream O23
This tributary to the lower Jericho River is small, exhibits a low slope, and is dominated by sand substrate. Zero flow during summer period severely limits its value as fish habitat. A small number of young-of-the-year Arctic grayling were recorded in this stream (*n*=2). The absence of suitable spawning substrate suggests that these fish originated from the Jericho River and not from Stream O23.

Streams O24, O25, O26, and O27
Due to the similarity in habitat characteristics, these streams will be discussed as a group. These tributaries to the lower Jericho River varied in size, with Stream O24 exhibiting the lowest discharge and Stream O27 the highest. They are small, exhibit low slopes, and are dominated by sand substrates interspersed with small pockets of gravel (Stream O27 is the exception; gravel was the dominant substrate type). All these streams contain an abundance of RUN habitat. The presence of smaller substrates in these streams, in combination with low gradients, create good quality spawning and rearing habitat for species such as Arctic grayling.

Their value as spawning and rearing habitat was confirmed by the presence of young-of-the-year and juvenile Arctic grayling in all four streams. Other species encountered in these stream were ninespine stickleback (Streams O25, O26, and O27), and slimy sculpin (Stream O27).

A summary of fish habitat quality ratings for sampled streams and the Jericho River is provided in Table 3.

Table 3. Fish habitat quality ratings for sampled streams, Jericho River and tributaries 1995 and 1996.

Area	Stream	Rating of Habitat Quality		
		Spawning	Rearing	Feeding
Jericho River (Upper)	O1	Moderate	Moderate	Nil
	O2	Low	Moderate	Low
	O3	Low	Low	Nil
	O4	Low	Moderate	Nil
	O7A (Jericho River)	Low	Moderate	High
	O8	Moderate	Moderate	Low
Jericho River (Lower)	O7B (Jericho River)	Moderate	Moderate	Low
	O23	Nil	Low	Nil
	O24	High	Moderate	Low
	O25	Moderate	Moderate	Low
	O26	Low	Moderate	Low
	O27	High	Moderate	Low

Summary
The upper and lower sections of the Jericho River and several of their tributary streams contained good quality habitat. The Jericho River, the largest stream in the study area, exhibited a well-defined channel and contained a mixture of slow, deep water areas and fast shallow water areas. As such, rearing habitat was available for juveniles and feeding habitat was present for use by adult fish. Deep water areas in the upper Jericho River also suggested that it may provide overwintering habitat for fish. Tributary streams associated with the Jericho River were small, but several had well-defined channels and smaller substrates. As such,

these systems provided good quality spawning and rearing habitat for species such as Arctic grayling. Tributaries exhibiting these characteristics were Streams O1, O8, O24, O25, and O27.

A significant feature of the Jericho River was the presence of a cascade area approximately 15 m in height that was located near the outlet of Jericho Lake. Although not an absolute barrier, this area created a significant impediment to fish passage between the Jericho River system and lakes situated farther upstream. This may explain why ninespine stickleback were recorded downstream of the cascade area, but were absent from waterbodies situated upstream.

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Regards,

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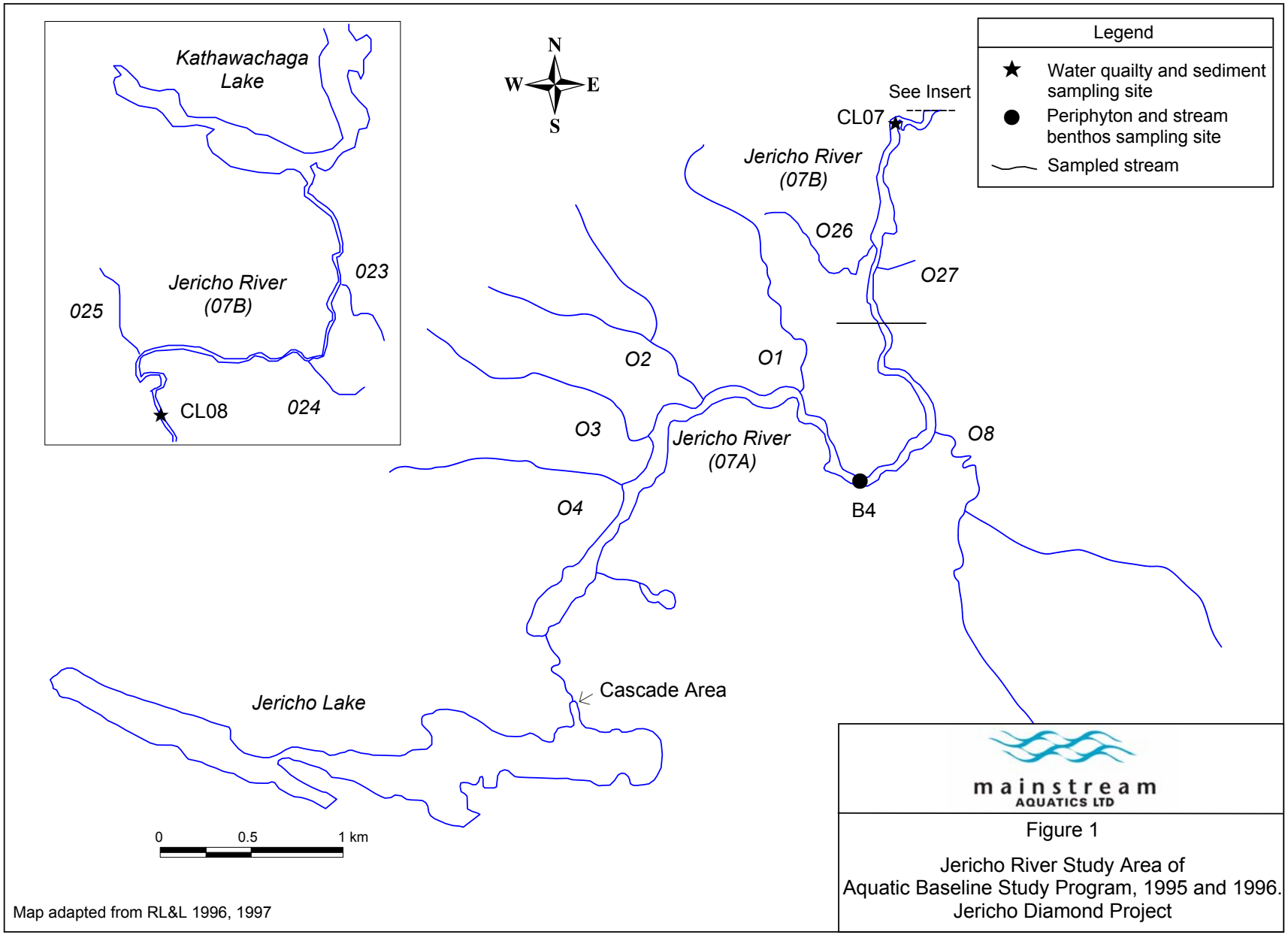

Map adapted from RL&L 1996, 1997

Figure 1

Jericho River Study Area of
Aquatic Baseline Study Program, 1995 and 1996.
Jericho Diamond Project

Appendix A1. Summary of physical tests, dissolved anions, nutrients, and organic analyses of water samples collected during spring, summer, and fall in the Jericho River, 1995.

Waterbody **Date** **Site** **Depth** **Variable** (mg/L unless otherwise indicated)	 **Detection Limit**	Jericho River 15-Jul-95 CL07 0.3	Jericho River 15-Jul-95 CL08 0.5	Jericho River 22-Aug-95 CL07 0.3	Jericho River 22-Aug-95 CL08 0.4	Jericho River 10-Sep-95 CL07 0.3	Jericho River 13-Sep-95 CL08 0.5
Physical Tests							
Total Dissolved Solids	1	9	9	8	15	11	11
Hardness as CaCO3	0.05	4.21	5.26	4.51	5.55	4.78	5.84
ph Units (@20ºC)	n/a	6.36	6.51	5.68	6.89	6.84	6.75
Total Suspended Solids	1	nd	3	nd	nd	3	1
Dissolved Anions							
Acidity as CaCO3	1	1.3	1.4	2.4	2.2	4.1	1.9
Alkalinity - Total as CaCO3	1	3.8	4.4	4.1	5.1	4.2	5.6
Alkalinity - Bicarbonate	1	3.8	4.4	4.1	5.1	4.2	5.6
Alkalinity - Carbonate	1	nd	nd	nd	nd	nd	nd
Chloride	0.5	0.6	nd	nd	nd	nd	nd
Flouride	0.02	0.03	0.03	0.023	0.02	0.02	0.02
Sulphate	1	nd	nd	nd	nd	2.2	1.6
Nutrients							
Ammonia Nitrogen	0.005	0.01	0.011	0.012	nd	nd	nd
Nitrate Nitrogen	0.005	0.005	0.012	0.01	0.008	0.006	0.007
Nitrite Nitrogen	0.001	0.001	0.001	0.001	nd	nd	0.001
Dissolved ortho-Phosphate	0.001	nd	nd		0.002	nd	nd
Total Dissolved Phosphate	0.001	0.003	0.002	0.002	0.002	0.003	0.002
Total Phosphorous	0.001	0.004	0.004	0.004	0.003	0.005	0.003
Organics							
Chlorophyll *a* (ug/L)	0.04	0.06	0.06	0.53	0.5	0.52	0.33
Total Organic Carbon	0.5	3.3	2.8	3	5.8	2.9	2.6

nd = not detected
n/a = not applicable

Appendix A2. Total metals in water samples collected during spring, summer, and fall in the Jericho River, 1995.

Waterbody		Jericho River	Jericho River	Jericho River	Jericho River	Jericho River	Jericho River
Date		15-Jul-95	15-Jul-95	22-Aug-95	22-Aug-95	10-Sep-95	13-Sep-95
Site		CL07	CL08	CL07	CL08	CL07	CL08
Depth		0.3	0.5	0.3	0.4	0.3	0.5
Variable	**Detection Limit (mg/L)**						
Aluminum	0.005	0.030	0.019	0.038	0.035	0.037	0.030
Antimony	0.001	nd	nd	nd	nd	nd	nd
Arsenic	0.0001	nd	nd	nd	nd	nd	nd
Barium	0.01	nd	nd	nd	nd	nd	nd
Beryllium	0.005	nd	nd	nd	nd	nd	nd
Bismuth	0.01	nd	nd	nd	nd	nd	nd
Boron	0.1	nd	nd	nd	nd	nd	nd
Cadmium	0.0002	nd	nd	nd	nd	nd	nd
Calcium	0.05	1.01	1.22	1.05	1.31	1.12	1.34
Chromium	0.015	nd	nd	nd	nd	nd	nd
Cobalt	0.001	nd	nd	nd	nd	nd	nd
Copper	0.01	nd	nd	nd	nd	nd	nd
Iron	0.03	0.032	nd	0.049	nd	0.05	nd
Lead	0.001	nd	nd	nd	nd	nd	nd
Lithium	0.015	nd	nd	nd	nd	nd	nd
Magnesium	0.005	0.447	0.573	0.472	0.616	0.496	0.619
Manganese	0.005	nd	nd	nd	nd	nd	nd
Mercury	0.00005	nd	nd	nd	nd	nd	nd
Molybdenum	0.001	nd	nd	nd	nd	nd	nd
Nickel	0.001	nd	nd	0.002	nd	nd	nd
Phosphorous	0.3	nd	nd	nd	nd	nd	nd
Potassium	2	nd	nd			nd	nd
Selenium	0.0005	nd	nd	nd	nd	nd	nd
Silicon	0.05	0.18	0.12	0.30	0.14	0.49	0.19
Silver	0.0001	nd	nd	nd	nd	nd	nd
Sodium	2	nd	nd	nd	nd	nd	nd
Strontium	0.001	0.011	0.008	0.009	0.010	0.011	0.010
Thallium	0.1	nd	nd	nd	nd	nd	nd
Tin	0.3	nd	nd	nd	nd	nd	nd
Titanium	0.01	nd	nd	nd	nd	nd	nd
Tungsten	0.1	nd	nd	nd	nd	nd	nd
Uranium	0.0005	nd	nd	nd	nd	nd	nd
Vanadium	0.03	nd	nd	nd	nd	nd	nd
Zinc	0.005	nd	nd	nd	nd	nd	nd

nd = not detected

Appendix A3. Dissolved metals in water samples collected during spring, summer, and fall in the Jericho River, 1995.

Waterbody		Jericho River	Jericho River	Jericho River	Jericho River	Jericho River	Jericho River
Date		15-Jul-95	15-Jul-95	22-Aug-95	22-Aug-95	10-Sep-95	13-Sep-95
Site		CL07	CL08	CL07	CL08	CL07	CL08
Depth		0.3	0.5	0.3	0.4	0.3	0.5
Variable	**Detection Limit (mg/L)**						
Aluminum	0.005	0.014	0.006	0.010	nd	0.021	0.007
Antimony	0.001	nd	nd	nd	nd	nd	nd
Arsenic	0.0001	nd	nd	nd	nd	nd	nd
Barium	0.01	nd	nd	nd	nd	nd	nd
Beryllium	0.005	nd	nd	nd	nd	nd	nd
Bismuth	0.01	nd	nd	nd	nd	nd	nd
Boron	0.1	nd	nd	nd	nd	nd	nd
Cadmium	0.0002	nd	nd	nd	nd	nd	nd
Calcium	0.05	0.98	1.16	1.03	1.25	1.10	1.31
Chromium	0.015	nd	nd	nd	nd	nd	nd
Cobalt	0.001	nd	nd	nd	nd	nd	nd
Copper	0.01	nd	nd	nd	nd	nd	nd
Iron	0.03	nd	nd	nd	nd	nd	nd
Lead	0.001	nd	nd	nd	nd	nd	nd
Lithium	0.015	nd	nd	nd	nd	nd	nd
Magnesium	0.005	0.431	0.573	0.472	0.588	0.496	0.619
Manganese	0.005	nd	nd	nd	nd	nd	nd
Mercury	0.00005	nd	nd	nd	nd	nd	nd
Molybdenum	0.001	nd	nd	nd	nd	nd	nd
Nickel	0.001	nd	nd	nd	nd	nd	nd
Phosphorous	0.3	nd	nd	nd	nd	nd	nd
Potassium	2	nd	nd			nd	nd
Selenium	0.0005	nd	nd	nd	nd	nd	nd
Silicon	0.05	0.16	0.12	0.24	0.14	0.48	0.16
Silver	0.0001	nd	nd	nd	nd	nd	nd
Sodium	2	nd	nd	nd	nd	nd	nd
Strontium	0.001	0.011	0.008	0.010	0.009	0.011	0.010
Thallium	0.1	nd	nd	nd	nd	nd	nd
Tin	0.3	nd	nd	nd	nd	nd	nd
Titanium	0.01	nd	nd	nd	nd	nd	nd
Tungsten	0.1	nd	nd	nd	nd	nd	nd
Uranium	0.0005	nd	nd	nd	nd	nd	nd
Vanadium	0.03	nd	nd	nd	nd	nd	nd
Zinc	0.005	nd	nd	nd	nd	nd	nd

nd = no detected

Appendix A4. Summary of sediment quality data collected from the Jericho River, August 1995.

Variable	Detection Limit[a]	Site CL07	Site CL08
Aluminum	10	6440	10 500
Antimony	10	nd	nd
Arsenic	0.05	1.8	1.2
Barium	0.1	24	47
Beryllium	1	nd	nd
Boron	0.5	7.8	11
Cadmium	0.25	nd	nd
Calcium	1	1750	3050
Chromium	2	12	24
Cobalt	1	3	6
Copper	1	6	12
Iron	2	9880	15 900
Lead	1	1	2
Magnesium	0.1	3330	5400
Manganese	0.2	97	172
Mercury	0.001	0.004	0.006
Molybdenum	4	nd	nd
Nickel	2	10	17
Phosphorus (elemental)	20	1090	1300
Selenium	0.5	nd	nd
Silver	2	nd	nd
Sodium	5	127	227
Strontium	0.1	11	15
Tin	5	nd	nd
Titanium	0.3	441	528
Uranium	0.05	1.2	2
Vanadium	0.5	16	29
Zinc	1	25	51
Moisture (%)	0.01	27.1	24.2
Total Organic Carbon (%)	0.019	0.54	0.47
Total Kjeldahl Nitrogen (%)	0.0059	0.06	0.07
Phosphorus (total)	40	1230	1560

[a] unless otherwise indicated, all concentrations are expressed as ug/g on a dry weight basis.

nd = not detected

Appendix A5. Density of periphyton in the Jericho River in summer, 1996.

Taxonomic Group	Jericho River				
	Rep. 1	Rep. 2	Rep. 3	Mean	SE
BACILLARIOPHYTA (Diatoms)					
Achnanthes detha	P	P	P	0	0
Achnanthes flexella	P	471	9216	3229	2997
Achnanthes lanceolata	0	0	0	0	0
Achnanthes lanceolata v. dubia	0	P	P	0	0
Achnanthes minutissima	24943	123939	94900	81261	29380
Anomoeoneis sphaerophora v.guntherii	0	0	P	0	0
A. minutissima v.cryptocephala	P	P	P	0	0
Caloneis sp.	0	0	0	0	0
Cocconeis pediculus	164	P	0	55	55
Cocconeis placentula	0	0	0	0	0
Cocconeis sp.	0	0	0	0	0
Coscinodiscus denarius	P	0	0	0	0
Cyclotella comta	1556	P	P	519	519
Cyclotella glomerata	0	0	P	0	0
Cyclotella keutzingiana	P	0	0	0	0
Cyclotella meneghiniana	0	0	0	0	0
Cyclotella ocellata	P	2824	1993	1606	838
Cymbella cistula	P	P	P	0	0
Cymbella gracilis	1147	941	3238	1775	734
Cymbella hebridica	P	0	0	0	0
Cymbella lunata	P	P	0	0	0
Cymbella minuta	P	1883	P	628	628
Diatoma vulgare	0	P	0	0	0
Eunotia glacialis	P	0	0	0	0
Eunotia praerupta	328	1459	498	762	352
Eunotia praerupta v.bidens	627	P	P	209	209
Eunotia triodon	P	P	0	0	0
Eunotia vanheurckiiv. intermedia	328	0	0	109	109
Fragilaria brevistriata	0	P	P	0	0
Fragilaria construens v.binodis	0	0	0	0	0
Fragilaria crotonensis	0	0	0	0	0
Fragilaria intermedia	0	0	0	0	0
Fragilaria pinnata	P	0	0	0	0
Frustulia vulgaris	P	P	P	0	0
Gomphonema angustatum	0	0	0	0	0
Gomphonema gracile	655	34046	24873	19858	9960
Gomphonema parvulum	P	0	0	0	0
Melosira ambigua	P	6589	P	2196	2196
Melosira islandica	0	P	P	0	0
Melosira varians	0	0	0	0	0
Meridion circulare	P	0	P	0	0
Navicula cryptocephala	P	0	0	0	0
Navicula tuscula	P	P	P	0	0
Navicula zanoni	0	0	0	0	0
Nedium bisulcatum	328	941	8220	3163	2535
Nedium iridis v.amphigomphus	0	P	P	0	0
Nedium sp.	0	0	0	0	0
Nitzschia amphibia	P	0	P	0	0
Nitzschia angustata	P	P	P	0	0
Nitzschia filiformis	0	P	4733	1578	1578
Nitzschia fonticola	0	0	0	0	0
Nitzschia obtusa	0	0	0	0	0

Appendix A5. Density of periphyton in the Jericho River in summer, 1996.

Taxonomic Group	Jericho River				
	Rep. 1	Rep. 2	Rep. 3	Mean	SE
Nitzschia palea	0	P	498	166	166
Nitzschia sigmoidea	0	0	0	0	0
Pinnularia biceps	0	0	0	0	0
Pinnularia brauniiv. amphicephala	0	0	0	0	0
Pinnularia dactylus	P	0	0	0	0
Pinnularia microstauron	0	P	P	0	0
Pinnularia sp.	P	P	0	0	0
Stauroneis acuta	0	0	0	0	0
Stauroneis anceps	P	0	P	0	0
Stauroneis sp.	P	0	0	0	0
Surirella brightwellii	0	0	0	0	0
Surirella sp.	0	0	P	0	0
Synedra sp.	1065	7530	2825	3807	1930
Tabellaria fenestrata	P	0	0	0	0
Tabellaria flocculosa	28302	42358	31758	34139	4229
Total Bacillariophyta	**59443**	**222981**	**182752**	**155059**	**49198**
CHLOROPHYTA (Green Algae)					
Ankistrodesmus falcatus	P	P	P	0	0
Bulbochaete sp.	P	0	P	0	0
Closterium sp.	0	0	P	0	0
Coeloastrum printzii	0	P	P	0	0
Cosmarium bioculatum	1311	941	2491	1581	467
Cosmarium capitulum	0	0	0	0	0
Cosmarium holmiense	0	0	0	0	0
Cosmarium sp.	819	941	P	587	295
Cosmarium undulatum	328	941	498	589	183
Cylindrocystis sp.	164	1883	1494	1180	520
Elakatothrix gelatinosa	0	941	0	314	314
Euastrum bidentatum	164	941	1494	866	386
Euastrum dubium	0	0	0	0	0
Euastrum gemmatum	0	0	0	0	0
Golenkinka radiata	0	0	0	0	0
Gonatozygon monotaenium	P	0	0	0	0
Mougeotia sp.	0	P	832	277	277
Oedogonium sp.	1024	0	0	341	341
Oocystis gigas	0	12237	10960	7732	3884
Oocystis solitaria	0	0	0	0	0
Oocystis sp.	2130	9413	6974	6172	2140
Scenedesmus acuminatus	0	0	P	0	0
Scenedesmus ecornis	P	P	1993	664	664
Scenedesmus quadricauda	0	0	0	0	0
Schroedaria sp.	0	0	0	0	0
Sphaerocystis schroeteri	0	57419	P	19140	19140
Staruastrum borgeanum	0	0	0	0	0
Staruastrum sp.	0	P	P	0	0
Staurastrum apiculatum	328	2353	498	1060	649
Staurastrum brebissonii	0	0	498	166	166
Staurastrum hexacerum	164	941	0	368	290
Staurastrum obliculare	0	0	P	0	0
Staurastrum paradoxum	0	0	P	0	0
Staurastrum paradoxum v. parvum	0	1883	498	794	563
Staurodesmus triangularis	328	P	P	109	109
Zygonema sp.	0	0	0	0	0

Appendix A5. Density of periphyton in the Jericho River in summer, 1996.

Taxonomic Group	Jericho River				
	Rep. 1	Rep. 2	Rep. 3	Mean	SE
Total Chlorophyta	**6760**	**90834**	**28230**	**41941**	**25220**
CHRYSOPHYTA (Golden-Brown Algae)					
Dinobryon sociale	0	0	0	0	0
Dinobryon divergens	0	0	0	0	0
Dinobryon sertularia v.protuberans	2416	5648	2389	3484	1082
Dinobryon sociale	P	0	0	0	0
Isthmochloron trispinatum	P	P	0	0	0
Mischococcus sp.	0	0	0	0	0
Ophiocytium sp.	0	0	P	0	0
Pseudokephyrion angulosum	491	941	498	643	149
Stichogloea doederleinii	0	0	0	0	0
Unidentified statospore	1147	2353	3238	2246	606
Total Chrysophyta	**4054**	**8942**	**6125**	**6374**	**1417**
CRYPTOPHYTA (Cryptomonads)					
Cryptomonas ovata	0	0	P	0	0
Cryptomonas reflexa	0	0	0	0	0
Total Cryptophyta	**0**	**0**	**0**	**0**	**0**
CYANOPHYTA (Cyanobacteria)					
Agmenellum thermale	0	0	0	0	0
Anabaena sp.	0	0	0	0	0
Anacystis montana	37517	106365	0	47961	31146
Anacystis thermalis	27687	52712	30886	37095	7863
Aphanizomenon flos-aquae	0	0	0	0	0
Aphanocapsa elachista	0	P	P	0	0
Aphanothece clathrata	5406	0	8967	4791	2607
Chroococcus dispersus	0	263562	45333	102965	81358
Chroococcus turgidus	819	6589	P	2469	2073
Dactylococcopsis sp.	P	P	5978	1993	1993
Gomphosphaeria lacustris	0	0	0	0	0
Gomphosphaeria naegelianum	125821	849982	308860	428221	217399
Lyngbya limnetica	16711	81892	82197	60267	21778
Microcystis flos-aquae	0	190140	19926	70022	60334
Nostoc commune	0	0	P	0	0
Oscillatoria sp.	P	P	P	0	0
Phormidium sp.	0	0	0	0	0
Pseudanabaena sp.	63074	182610	98138	114607	35476
Scytonema figuratum	P	0	26403	8801	8801
Stigonema mamillosum	0	0	0	0	0
Total Cyanophyta	**277035**	**1733852**	**626688**	**879192**	**439089**
EUGLENOPHYTA (Green Flagellates)					
Trachelomonas sp.	0	0	0	0	0
Total Euglenophyta	**0**	**0**	**0**	**0**	**0**
PYRROPHYTA (Dinoflagellates)					
Gymnodinium uberrimum	0	0	0	0	0
Peridinium sp.	0	0	P	0	0
Unidentified cyst	0	0	0	0	0
Total Pyrrophyta	**0**	**0**	**0**	**0**	**0**
Algal Density per Sample (No. cells/cm²)	**347292**	**2056609**	**843795**	**1082565**	**507674**
Total Number of Taxa per Sample	**66**	**64**	**73**	**68**	**3**

Appendix A6. Benthic macroinvertebrates collected from the Jericho River, summer 1996.

Taxonomic Group	Jericho River, Site B4		
	Replicate		
	1	2	3
COELENTERATA			
Hydridae			
Hydra	2		2
ANNELIDA			
OLIGOCHAETA			
Enchytraeidae	5	1	1
Lumbriculidae	7		2
Naididae	25	8	5
Tubificidae	7	1	
ARTHROPODA			
HYDRACARINA	14	5	2
CRUSTACEA			
CLADOCERA			
Bosminidae	48		
Chydoridae	98	3	4
Daphnidae			
Daphnia	2		1
Holodedidae			
Holopedium	40		
CONCHOSTRACA	40		
COPEPODA			
Calanoida	162	1	3
Cyclopoida	16	4	3
Harpacticoida	8		
OSTRACODA			
Species a	30	13	10
Species b	2		
INSECTA			
COLEOPTERA			
Dytiscidae			
Oreodytes	3	2	1
DIPTERA			
Chironomidae			
Chironomini	2		
Chironomus	4	2	2
Dicrotendipes	11		3
Phaenospectra	5		
Diamesinae		9	
Orthocladiinae	2		

Appendix A6. Benthic macroinvertebrates collected from the Jericho River, summer 1996.

Taxonomic Group	Jericho River, Site B4		
	Replicate		
	1	2	3
Abiskomyia	3		
Corynoneura	2	1	1
Eukiefferiella		9	2
Heterotrissocladius			
Orthocladius/Cricotopus	5		1
Psectrocladius		8	1
Zalutschia			
Tanypodinae			
Ablabesmyia	20	10	3
Tanytarsini			
Paratanytarsus	5	8	18
Empididae			
Clinocera			
Hemerodromia			
Simuliidae			1
Tipulidae			
Dicranota			
Tipula	3	2	3
Chironomidae Pupae			
PLECOPTERA	8		
Perlodidae			
Cultus			
Nemouridae			2
Nemoura		2	1
TRICHOPTERA			
Limnephilidae			
Grensia			
MICROTURBELLARIA			
Tricladida			
MOLLUSCA			
GASTROPODA			
Valvatidae			
Valvata	1		
NEMATODA	12	10	9
TARDIGRADA			
Total Number of Animals	**592**	**99**	**81**
Total Number of Taxa	**29**	**19**	**23**

Table A7. Mean density (+/- 1 standard error) of dominant benthic macroinvertebrates in the Jericho River, summer 1996.

Taxonomic Group	Density
COELENTERATA	14 (7)
Hydridae	
Hydra	
ANNELIDA	
OLIGOCHAETA	222 (127)
ARTHROPODA	
HYDRACARINA	75 (39)
CRUSTACEA	
COPEPODA	
Harpacticoida	29 (29)
OSTRACODA	197 (74)
INSECTA	
DIPTERA	
Chironomidae	490 (289)
Chironomini	104 (68)
Diamesinae	32 (32)
Orthocladiinae	125 (94)
Tanypodinae	118 (53)
Tanytarsini	111 (42)
Simuliidae	4 (4)
Tipulidae	29 (4)
PLECOPTERA	
Nemouridae	18 (13)
NEMATODA	111 (9)
Total No. Benthic Taxa/m^2	24 (3)
Total No. Benthic Invertebrates/m^2	1387 (526)

Appendix A8. Backpack electrofishing and snorkelling effort, and number of fish recorded in the Jericho River and tributary streams 1995.

Session	Method	Stream	Date	Effort[a]	Arctic grayling			Burbot		Lake trout		Round whitefish		Ninespine stickleback	Sculpin spp.
					YOY	Juvenile	Adult	Juvenile	Adult	Juvenile	Adult	Juvenile	Adult		
Spring	Electrofishing	O1	23-Jun-95	621		5								1	
		O2	23-Jun-95	317		19								3	3
		O3	23-Jun-95	215		1									
		O4	23-Jun-95	257		1									
	Snorkelling	Jericho River	28-Jun-95	900		1	1	1			2				1
Summer	Electrofishing	O1	6-Aug-95	620											
		O2	6-Aug-95	524		1									
		O3	10-Aug-95	178											
		O4	6-Aug-95	551		1									
		Jericho River	10-Aug-95	178		4									
	Snorkelling	Jericho River	10-Aug-95	900		28	3					3			
Fall	Snorkelling	Jericho River	15-Sep-95	900		1	3				1				
Total						**62**	**7**	**1**	**0**	**0**	**3**	**3**	**0**	**4**	**4**

[a] Backpack electrofishing effort in seconds; snorkelling effort in metres.

Appendix A9. Fish biological characteristics information for Jericho River and tributaries 1995 and 1996.

SNUM	Species	Length (mm)	Weight (g)	Age	Age Method	Capture Method	Date	Site	Capture Code
1669	NNST	40				EF	23-Jun-95	TO1	0
1670	ARGR					EF	23-Jun-95	TO1	0
1671	ARGR	65				EF	23-Jun-95	TO1	0
1672	ARGR	76	2			EF	23-Jun-95	TO1	0
1673	ARGR	64				EF	23-Jun-95	TO1	0
1674	ARGR	86	6			EF	23-Jun-95	TO2	0
1675	ARGR					EF	23-Jun-95	TO2	0
1676	ARGR					EF	23-Jun-95	TO2	0
1677	ARGR					EF	23-Jun-95	TO2	0
1678	ARGR					EF	23-Jun-95	TO2	0
1679	ARGR					EF	23-Jun-95	TO2	0
1680	NNST					EF	23-Jun-95	TO2	0
1681	SCUL	35				EF	23-Jun-95	TO2	0
1682	ARGR	84	4			EF	23-Jun-95	TO2	0
1683	ARGR	78				EF	23-Jun-95	TO2	0
1684	ARGR	85	4			EF	23-Jun-95	TO2	0
1685	ARGR	67				EF	23-Jun-95	TO2	0
1686	ARGR	80	4			EF	23-Jun-95	TO2	0
1687	ARGR	69				EF	23-Jun-95	TO2	0
1688	ARGR	69				EF	23-Jun-95	TO2	0
1689	SCUL	75				EF	23-Jun-95	TO2	0
1690	SCUL	30				EF	23-Jun-95	TO2	0
1691	NNST	49				EF	23-Jun-95	TO2	0
1692	ARGR	84	4			EF	23-Jun-95	TO2	0
1693	ARGR	78				EF	23-Jun-95	TO3	0
1694	ARGR					EF	23-Jun-95	TO4	0
1882	ARGR					EF	23-Jun-95	TO1	0
1883	ARGR					EF	23-Jun-95	TO2	0
1884	ARGR					EF	23-Jun-95	TO2	0
1885	ARGR					EF	23-Jun-95	TO2	0
1886	ARGR					EF	23-Jun-95	TO2	0
1887	ARGR					EF	23-Jun-95	TO2	0
1888	NNST					EF	23-Jun-95	TO2	0
1989	ARGR					SN	28-Jun-95	TJERI	0
1990	ARGR					SN	28-Jun-95	TJERI	0
1991	BURB					SN	28-Jun-95	TJERI	0
1992	LKTR					SN	28-Jun-95	TJERI	0
1993	LKTR					SN	28-Jun-95	TJERI	0
1994	SCUL					SN	28-Jun-95	TJERI	0
2491	ARGR	141	28	2	SC	EF	6-Aug-95	TO4	0
2492	ARGR	99	5	1	SC	EF	6-Aug-95	TO2	0
2503	ARGR					SN	10-Aug-95	TJERI	0
2504	ARGR					SN	10-Aug-95	TJERI	0
2505	ARGR					EF	10-Aug-95	TJERI	0
2506	ARGR					EF	10-Aug-95	TJERI	0
2507	ARGR					EF	10-Aug-95	TJERI	0
2508	ARGR					SN	10-Aug-95	TJERI	0
2509	ARGR					SN	10-Aug-95	TJERI	0
2510	ARGR					SN	10-Aug-95	TJERI	0

Appendix A9. Fish biological characteristics information for Jericho River and tributaries 1995 and 1996.

SNUM	Species	Length (mm)	Weight (g)	Age	Age Method	Capture Method	Date	Site	Capture Code
2511	ARGR					SN	10-Aug-95	TJERI	0
2512	ARGR					SN	10-Aug-95	TJERI	0
2513	ARGR					SN	10-Aug-95	TJERI	0
2514	ARGR					SN	10-Aug-95	TJERI	0
2515	ARGR					SN	10-Aug-95	TJERI	0
2516	ARGR					SN	10-Aug-95	TJERI	0
2517	ARGR					SN	10-Aug-95	TJERI	0
2518	ARGR					SN	10-Aug-95	TJERI	0
2519	ARGR					SN	10-Aug-95	TJERI	0
2520	ARGR					SN	10-Aug-95	TJERI	0
2521	ARGR					SN	10-Aug-95	TJERI	0
2522	ARGR					SN	10-Aug-95	TJERI	0
2523	ARGR					SN	10-Aug-95	TJERI	0
2524	ARGR					SN	10-Aug-95	TJERI	0
2525	ARGR					SN	10-Aug-95	TJERI	0
2526	ARGR					SN	10-Aug-95	TJERI	0
2527	ARGR					SN	10-Aug-95	TJERI	0
2528	ARGR					SN	10-Aug-95	TJERI	0
2529	ARGR					SN	10-Aug-95	TJERI	0
2530	ARGR					SN	10-Aug-95	TJERI	0
2531	ARGR					SN	10-Aug-95	TJERI	0
2532	ARGR					SN	10-Aug-95	TJERI	0
2533	ARGR					SN	10-Aug-95	TJERI	0
2534	ARGR					SN	10-Aug-95	TJERI	0
2535	ARGR					SN	10-Aug-95	TJERI	0
2536	ARGR					SN	10-Aug-95	TJERI	0
2537	RNWH					SN	10-Aug-95	TJERI	0
2538	RNWH					SN	10-Aug-95	TJERI	0
2539	RNWH					SN	10-Aug-95	TJERI	0
2540	ARGR					SN	10-Aug-95	TJERI	0
	ARGR					SN	15-Sep-95	TJERI	0
	ARGR					SN	15-Sep-95	TJERI	0
	ARGR					SN	15-Sep-95	TJERI	0
	ARGR					SN	15-Sep-95	TJERI	0
	LKTR					SN	15-Sep-95	TJERI	0
30	BURB	168	32			EF	17-Jun-96	TO01	0
31	ARGR	119	20	1	SC	EF	17-Jun-96	TO01	0
32	ARGR	135	24	2	SC	EF	17-Jun-96	TO01	0
33	ARGR	124	22	2	SC	EF	17-Jun-96	TO01	0
34	ARGR	119	16	1	SC	EF	17-Jun-96	TO01	0
35	ARGR	58	0			EF	17-Jun-96	TO01	0
36	ARGR	110	16	1	SC	EF	17-Jun-96	TO01	0
37	ARGR	131	22	2	SC	EF	17-Jun-96	TO01	0
38	ARGR	121	18	2	SC	EF	17-Jun-96	TO01	0
39	ARGR	123	16	1	SC	EF	17-Jun-96	TO02	0
40	ARGR	125	14	2	SC	EF	17-Jun-96	TO02	0
41	ARGR	168	48	2	SC	EF	17-Jun-96	TO03	0
42	ARGR	258	202	4	SC	EF	17-Jun-96	TO04	0
43	ARGR	171	54	3	SC	EF	17-Jun-96	TO04	0

Appendix A9. Fish biological characteristics information for Jericho River and tributaries 1995 and 1996.

SNUM	Species	Length (mm)	Weight (g)	Age	Age Method	Capture Method	Date	Site	Capture Code
44	ARGR	170	56	2	SC	EF	17-Jun-96	TO04	0
45	ARGR	181	58	3	SC	EF	17-Jun-96	TO04	0
46	ARGR	125	20	2	SC	EF	17-Jun-96	TO04	0
1665	SLSC	70				EF	24-Jun-96	TO08	0
166	ARGR	62				EF	24-Jun-96	TO08	0
167	ARGR	58				EF	24-Jun-96	TO08	0
209	ARGR					SN	21-Jun-96	TO07A	0
226	ARGR					EF	17-Jun-96	TO02	0
237	ARGR					EF	24-Jun-96	TO08	0
238	ARGR					EF	24-Jun-96	TO08	0
239	ARGR					EF	24-Jun-96	TO08	0
240	ARGR					EF	24-Jun-96	TO08	0
241	ARGR					EF	24-Jun-96	TO08	0
1404	LKTR					SN	3-Aug-96	TO07A	0
1405	LKTR					SN	3-Aug-96	TO07A	0
1406	LKTR					SN	3-Aug-96	TO07A	0
1407	LKTR					SN	3-Aug-96	TO07A	0
1408	LKTR					SN	3-Aug-96	TO07A	0
1409	ARCH					SN	3-Aug-96	TO07A	0
1410	ARGR					SN	3-Aug-96	TO07A	0
1411	ARGR					SN	3-Aug-96	TO07A	0
1412	ARGR					SN	3-Aug-96	TO07A	0
1413	LKTR					SN	3-Aug-96	TO07A	0
1414	SLSC					SN	3-Aug-96	TO07A	0
1415	ARGR					SN	3-Aug-96	TO07A	0
1416	ARGR					SN	3-Aug-96	TO07A	0
1417	ARGR					SN	3-Aug-96	TO07A	0
1418	ARGR					SN	3-Aug-96	TO07A	0
1419	ARGR					SN	3-Aug-96	TO07A	0
1420	ARGR					SN	3-Aug-96	TO07A	0
1421	ARGR					SN	3-Aug-96	TO07A	0
1422	ARGR					SN	3-Aug-96	TO07A	0
1423	ARGR					SN	3-Aug-96	TO07A	0
1424	ARGR					SN	3-Aug-96	TO07A	0
1425	ARGR					SN	3-Aug-96	TO07A	0
1426	ARGR					SN	3-Aug-96	TO07A	0
1427	ARGR					SN	3-Aug-96	TO07A	0
1428	ARGR					SN	3-Aug-96	TO07A	0
1429	ARGR					SN	3-Aug-96	TO07A	0
1430	ARGR					SN	3-Aug-96	TO07A	0
1431	ARGR					SN	3-Aug-96	TO07A	0
1432	ARGR					SN	3-Aug-96	TO07A	0
1433	LKTR					SN	3-Aug-96	TO07A	0
1434	ARGR					SN	3-Aug-96	TO07A	0
1435	ARGR					SN	3-Aug-96	TO07A	0
1436	ARGR					SN	3-Aug-96	TO07A	0
1437	ARGR					SN	3-Aug-96	TO07A	0
1438	ARGR					SN	3-Aug-96	TO07A	0
1439	LKTR					SN	3-Aug-96	TO07A	0

Appendix A9. Fish biological characteristics information for Jericho River and tributaries 1995 and 1996.

SNUM	Species	Length (mm)	Weight (g)	Age	Age Method	Capture Method	Date	Site	Capture Code
1440	ARGR					SN	3-Aug-96	TO07A	0
1441	ARGR					SN	3-Aug-96	TO07A	0
1442	ARGR					SN	3-Aug-96	TO07A	0
1443	ARGR					SN	3-Aug-96	TO07A	0
1444	ARGR					SN	3-Aug-96	TO07A	0
1445	ARGR					SN	3-Aug-96	TO07A	0
1446	ARGR					SN	3-Aug-96	TO07A	0
1447	ARGR					SN	3-Aug-96	TO07A	0
1448	ARGR					SN	3-Aug-96	TO07A	0
1449	ARGR					SN	3-Aug-96	TO07A	0
1450	ARGR					SN	3-Aug-96	TO07A	0
1451	ARGR					SN	3-Aug-96	TO07A	0
1452	ARGR					SN	3-Aug-96	TO07A	0
1453	RNWH					SN	3-Aug-96	TO07A	0
1454	RNWH					SN	3-Aug-96	TO07A	0
1455	RNWH					SN	3-Aug-96	TO07A	0
1456	RNWH					SN	3-Aug-96	TO07A	0
1457	RNWH					SN	3-Aug-96	TO07A	0
1458	RNWH					SN	3-Aug-96	TO07A	0
1459	RNWH					SN	3-Aug-96	TO07B	0
1460	ARGR					SN	3-Aug-96	TO07B	0
1461	ARGR					SN	3-Aug-96	TO07B	0
1462	ARGR					SN	3-Aug-96	TO07B	0
1463	ARGR					SN	3-Aug-96	TO07B	0
1464	ARGR					SN	3-Aug-96	TO07B	0
1465	ARGR					SN	3-Aug-96	TO07B	0
1466	ARGR					SN	3-Aug-96	TO07B	0
1467	ARGR					SN	3-Aug-96	TO07B	0
1468	ARGR					SN	3-Aug-96	TO07B	0
1469	ARGR					SN	3-Aug-96	TO07B	0
1470	ARGR					SN	3-Aug-96	TO07B	0
1471	ARGR					SN	3-Aug-96	TO07B	0
1472	ARGR					SN	3-Aug-96	TO07B	0
1473	ARGR					SN	3-Aug-96	TO07B	0
1474	ARGR					SN	3-Aug-96	TO07B	0
1475	ARGR					SN	3-Aug-96	TO07B	0
1476	ARGR					SN	3-Aug-96	TO07B	0
1477	ARGR					SN	3-Aug-96	TO07B	0
1478	ARGR					SN	3-Aug-96	TO07B	0
1479	ARGR					SN	3-Aug-96	TO07B	0
1480	ARGR					SN	3-Aug-96	TO07B	0
1481	ARGR					SN	3-Aug-96	TO07B	0
1482	ARGR					SN	3-Aug-96	TO07B	0
1483	ARGR					SN	3-Aug-96	TO07B	0
1484	ARGR					SN	3-Aug-96	TO07B	0
1485	RNWH					SN	3-Aug-96	TO07B	0
1486	ARGR					SN	3-Aug-96	TO07B	0
1487	ARGR					SN	3-Aug-96	TO07B	0
1488	ARGR					SN	3-Aug-96	TO07B	0

Appendix A9. Fish biological characteristics information for Jericho River and tributaries 1995 and 1996.

SNUM	Species	Length (mm)	Weight (g)	Age	Age Method	Capture Method	Date	Site	Capture Code
1489	ARGR					SN	3-Aug-96	TO07B	0
1490	ARGR					SN	3-Aug-96	TO07B	0
1491	ARGR					SN	3-Aug-96	TO07B	0
1492	ARGR					SN	3-Aug-96	TO07B	0
1493	ARGR					SN	3-Aug-96	TO07B	0
1494	ARGR					SN	3-Aug-96	TO07B	0
1495	ARGR					SN	3-Aug-96	TO07B	0
1496	ARGR					SN	3-Aug-96	TO07B	0
1497	ARGR					SN	3-Aug-96	TO07B	0
1498	ARGR					SN	3-Aug-96	TO07B	0
1499	ARGR					SN	3-Aug-96	TO07B	0
1500	ARGR					SN	3-Aug-96	TO07B	0
1501	ARGR					SN	3-Aug-96	TO07B	0
1502	ARGR					SN	3-Aug-96	TO07B	0
1503	ARGR					SN	3-Aug-96	TO07B	0
1504	ARGR					SN	3-Aug-96	TO07B	0
1505	RNWH					SN	3-Aug-96	TO07B	0
1506	ARGR					SN	3-Aug-96	TO07B	0
1507	ARGR					SN	3-Aug-96	TO07B	0
1508	ARGR					SN	3-Aug-96	TO07B	0
1509	ARGR					SN	3-Aug-96	TO07B	0
1510	ARGR					SN	3-Aug-96	TO07B	0
1511	ARGR					SN	3-Aug-96	TO07B	0
1512	ARGR					SN	3-Aug-96	TO07B	0
1513	ARGR					SN	3-Aug-96	TO07B	0
1514	ARGR					SN	3-Aug-96	TO07B	0
1515	ARGR					SN	3-Aug-96	TO07B	0
107	NNST	22				EF	30-Jul-96	TO01	0
108	BURB	42				EF	30-Jul-96	TO01	0
109	NNST	22				EF	30-Jul-96	TO01	0
110	NNST	41				EF	30-Jul-96	TO01	0
111	BURB	28				EF	30-Jul-96	TO01	0
112	BURB	34				EF	30-Jul-96	TO01	0
113	BURB	48				EF	30-Jul-96	TO01	0
114	BURB	44				EF	30-Jul-96	TO01	0
115	BURB	26				EF	30-Jul-96	TO01	0
116	BURB	40				EF	30-Jul-96	TO01	0
117	ARGR	47				EF	30-Jul-96	TO01	0
118	BURB	45				EF	30-Jul-96	TO01	0
119	BURB	45				EF	30-Jul-96	TO01	0
120	BURB	40				EF	30-Jul-96	TO01	0
121	ARGR	172	60	2	SC	EF	30-Jul-96	TO04	0
122	ARGR	43		0	SC	EF	30-Jul-96	TO04	0
123	ARGR	101	14	1	SC	EF	30-Jul-96	TO04	0
124	ARCH	106	10			EF	30-Jul-96	TO04	0
125	ARCH	116	18		SC	EF	30-Jul-96	TO04	0
126	ARCH	104	6			EF	30-Jul-96	TO03	0
127	ARCH	99	12			EF	30-Jul-96	TO03	0
327	NNST					EF	30-Jul-96	TO01	0

Appendix A9. Fish biological characteristics information for Jericho River and tributaries 1995 and 1996.

SNUM	Species	Length (mm)	Weight (g)	Age	Age Method	Capture Method	Date	Site	Capture Code
328	NNST					EF	30-Jul-96	TO01	0
329	NNST					EF	30-Jul-96	TO01	0
330	NNST					EF	30-Jul-96	TO01	0
331	NNST					EF	30-Jul-96	TO01	0
332	NNST					EF	30-Jul-96	TO01	0
333	NNST					EF	30-Jul-96	TO01	0
334	NNST					EF	30-Jul-96	TO01	0
335	NNST					EF	30-Jul-96	TO01	0
336	NNST					EF	30-Jul-96	TO01	0
337	NNST					EF	30-Jul-96	TO01	0
338	NNST					EF	30-Jul-96	TO01	0
339	NNST					EF	30-Jul-96	TO01	0
340	NNST					EF	30-Jul-96	TO01	0
341	NNST					EF	30-Jul-96	TO01	0
342	NNST					EF	30-Jul-96	TO01	0
343	NNST					EF	30-Jul-96	TO01	0
344	NNST					EF	30-Jul-96	TO01	0
345	NNST					EF	30-Jul-96	TO01	0
346	NNST					EF	30-Jul-96	TO01	0
347	NNST					EF	30-Jul-96	TO01	0
348	NNST					EF	30-Jul-96	TO01	0
349	NNST					EF	30-Jul-96	TO01	0
350	NNST					EF	30-Jul-96	TO01	0
351	NNST					EF	30-Jul-96	TO01	0
352	NNST					EF	30-Jul-96	TO01	0
353	NNST					EF	30-Jul-96	TO01	0
354	NNST					EF	30-Jul-96	TO01	0
355	NNST					EF	30-Jul-96	TO01	0
356	NNST					EF	30-Jul-96	TO01	0
357	NNST					EF	30-Jul-96	TO01	0
358	NNST					EF	30-Jul-96	TO01	0
359	NNST					EF	30-Jul-96	TO01	0
360	NNST					EF	30-Jul-96	TO01	0
361	NNST					EF	30-Jul-96	TO01	0
362	NNST					EF	30-Jul-96	TO01	0
363	NNST					EF	30-Jul-96	TO01	0
364	BURB					EF	30-Jul-96	TO01	0
365	BURB					EF	30-Jul-96	TO01	0
366	BURB					EF	30-Jul-96	TO01	0
367	BURB					EF	30-Jul-96	TO01	0
368	BURB					EF	30-Jul-96	TO01	0
369	BURB					EF	30-Jul-96	TO01	0
370	BURB					EF	30-Jul-96	TO01	0
371	BURB					EF	30-Jul-96	TO01	0
372	BURB					EF	30-Jul-96	TO01	0
373	BURB					EF	30-Jul-96	TO01	0
374	NNST					EF	30-Jul-96	TO01	0
375	NNST					EF	30-Jul-96	TO01	0
376	NNST					EF	30-Jul-96	TO01	0

Appendix A9. Fish biological characteristics information for Jericho River and tributaries 1995 and 1996.

SNUM	Species	Length (mm)	Weight (g)	Age	Age Method	Capture Method	Date	Site	Capture Code
377	NNST					EF	30-Jul-96	TO01	0
378	NNST					EF	30-Jul-96	TO01	0
379	NNST					EF	30-Jul-96	TO01	0
380	NNST					EF	30-Jul-96	TO01	0
381	NNST					EF	30-Jul-96	TO01	0
382	NNST					EF	30-Jul-96	TO01	0
383	NNST					EF	30-Jul-96	TO01	0
384	NNST					EF	30-Jul-96	TO01	0
385	NNST					EF	30-Jul-96	TO01	0
386	NNST					EF	30-Jul-96	TO01	0
387	NNST					EF	30-Jul-96	TO01	0
388	NNST					EF	30-Jul-96	TO01	0
389	NNST					EF	30-Jul-96	TO01	0
390	NNST					EF	30-Jul-96	TO01	0
391	NNST					EF	30-Jul-96	TO01	0
392	NNST					EF	30-Jul-96	TO01	0
393	NNST					EF	30-Jul-96	TO01	0
394	NNST					EF	30-Jul-96	TO01	0
395	NNST					EF	30-Jul-96	TO01	0
396	NNST					EF	30-Jul-96	TO01	0
397	NNST					EF	30-Jul-96	TO01	0
398	NNST					EF	30-Jul-96	TO01	0
399	NNST					EF	30-Jul-96	TO01	0
400	NNST					EF	30-Jul-96	TO01	0
401	NNST					EF	30-Jul-96	TO01	0
402	NNST					EF	30-Jul-96	TO01	0
403	NNST					EF	30-Jul-96	TO01	0
404	NNST					EF	30-Jul-96	TO01	0
405	NNST					EF	30-Jul-96	TO01	0
406	NNST					EF	30-Jul-96	TO01	0
407	NNST					EF	30-Jul-96	TO01	0
408	ARCH					EF	30-Jul-96	TO01	0
409	SLSC					EF	30-Jul-96	TO01	0
410	BURB					EF	30-Jul-96	TO01	0
411	BURB					EF	30-Jul-96	TO01	0
412	BURB					EF	30-Jul-96	TO01	0
413	BURB					EF	30-Jul-96	TO01	0
414	BURB					EF	30-Jul-96	TO01	0
415	BURB					EF	30-Jul-96	TO01	0
416	BURB					EF	30-Jul-96	TO01	0
417	BURB					EF	30-Jul-96	TO01	0
418	NNST					EF	30-Jul-96	TO02	0
419	NNST					EF	30-Jul-96	TO02	0
420	NNST					EF	30-Jul-96	TO02	0
421	NNST					EF	30-Jul-96	TO02	0
422	NNST					EF	30-Jul-96	TO02	0
423	NNST					EF	30-Jul-96	TO02	0
424	NNST					EF	30-Jul-96	TO02	0
425	NNST					EF	30-Jul-96	TO02	0

Appendix A9. Fish biological characteristics information for Jericho River and tributaries 1995 and 1996.

SNUM	Species	Length (mm)	Weight (g)	Age	Age Method	Capture Method	Date	Site	Capture Code
426	NNST					EF	30-Jul-96	TO02	0
427	NNST					EF	30-Jul-96	TO02	0
428	NNST					EF	30-Jul-96	TO02	0
429	NNST					EF	30-Jul-96	TO02	0
430	NNST					EF	30-Jul-96	TO02	0
431	NNST					EF	30-Jul-96	TO02	0
432	BURB					EF	30-Jul-96	TO02	0
433	BURB					EF	30-Jul-96	TO02	0
434	BURB					EF	30-Jul-96	TO02	0
435	BURB					EF	30-Jul-96	TO02	0
84	ARGR	48				EF	1-Aug-96	TO23	0
85	ARGR	47				EF	1-Aug-96	TO23	0
86	ARGR	54				EF	1-Aug-96	TO24	0
87	ARGR	51				EF	1-Aug-96	TO24	0
88	ARGR	47				EF	1-Aug-96	TO24	0
89	ARGR	49				EF	1-Aug-96	TO24	0
90	ARGR	54				EF	1-Aug-96	TO24	0
91	ARGR	49				EF	1-Aug-96	TO24	0
92	ARGR	51				EF	1-Aug-96	TO24	0
93	ARGR	50				EF	1-Aug-96	TO24	0
94	ARGR	48			SC	EF	1-Aug-96	TO24	0
95	ARGR	55				EF	1-Aug-96	TO24	0
96	ARGR	45				EF	1-Aug-96	TO24	0
97	ARGR	55				EF	1-Aug-96	TO24	0
98	ARGR	53				EF	1-Aug-96	TO24	0
99	ARGR	48				EF	1-Aug-96	TO24	0
100	ARGR	49				EF	1-Aug-96	TO24	0
101	ARGR	49				EF	1-Aug-96	TO24	0
102	ARGR	56				EF	1-Aug-96	TO24	0
103	ARGR	49				EF	1-Aug-96	TO24	0
104	ARGR	57				EF	1-Aug-96	TO24	0
105	ARGR	43				EF	1-Aug-96	TO24	0
106	ARGR					EF	1-Aug-96	TO24	0
107	ARGR					EF	1-Aug-96	TO24	0
108	ARGR					EF	1-Aug-96	TO24	0
109	ARGR					EF	1-Aug-96	TO24	0
110	ARGR					EF	1-Aug-96	TO24	0
111	ARGR					EF	1-Aug-96	TO24	0
112	ARGR					EF	1-Aug-96	TO24	0
113	ARGR					EF	1-Aug-96	TO24	0
114	ARGR					EF	1-Aug-96	TO24	0
115	ARGR					EF	1-Aug-96	TO24	0
116	ARGR					EF	1-Aug-96	TO24	0
117	ARGR					EF	1-Aug-96	TO24	0
118	ARGR					EF	1-Aug-96	TO24	0
119	ARGR	98	10			EF	1-Aug-96	TO25	0
120	ARGR	47				EF	1-Aug-96	TO25	0
121	ARGR	40				EF	1-Aug-96	TO25	0
122	ARGR	44				EF	1-Aug-96	TO25	0

Appendix A9. Fish biological characteristics information for Jericho River and tributaries 1995 and 1996.

SNUM	Species	Length (mm)	Weight (g)	Age	Age Method	Capture Method	Date	Site	Capture Code
123	ARGR	45				EF	1-Aug-96	TO25	0
124	ARGR	47				EF	1-Aug-96	TO25	0
125	ARGR	45				EF	1-Aug-96	TO25	0
126	ARGR	43				EF	1-Aug-96	TO25	0
127	ARGR	42				EF	1-Aug-96	TO25	0
128	ARGR	44				EF	1-Aug-96	TO25	0
129	ARGR	48				EF	1-Aug-96	TO25	0
130	ARGR	45				EF	1-Aug-96	TO25	0
131	ARGR	43				EF	1-Aug-96	TO25	0
132	ARGR	43				EF	1-Aug-96	TO25	0
133	ARGR	49				EF	1-Aug-96	TO25	0
134	NNST	64				EF	1-Aug-96	TO25	0
135	NNST	63				EF	1-Aug-96	TO25	0
136	NNST	55				EF	1-Aug-96	TO25	0
137	NNST	59				EF	1-Aug-96	TO25	0
138	NNST	36				EF	1-Aug-96	TO25	0
139	NNST	33				EF	1-Aug-96	TO25	0
140	NNST	29				EF	1-Aug-96	TO25	0
141	NNST	36				EF	1-Aug-96	TO25	0
142	ARGR	49				EF	1-Aug-96	TO25	0
143	ARGR	49				EF	1-Aug-96	TO25	0
144	ARGR	51				EF	1-Aug-96	TO25	0
145	ARGR	54				EF	1-Aug-96	TO25	0
146	ARGR	43				EF	1-Aug-96	TO25	0
147	ARGR	52				EF	1-Aug-96	TO25	0
148	ARGR	45				EF	1-Aug-96	TO25	0
149	ARGR	53				EF	1-Aug-96	TO25	0
150	ARGR	52				EF	1-Aug-96	TO25	0
151	ARGR	56				EF	1-Aug-96	TO25	0
152	ARGR	49				EF	1-Aug-96	TO25	0
153	ARGR	51				EF	1-Aug-96	TO25	0
154	ARGR	52				EF	1-Aug-96	TO25	0
155	ARGR	54				EF	1-Aug-96	TO25	0
156	ARGR	45				EF	1-Aug-96	TO25	0
157	ARGR	44				EF	1-Aug-96	TO25	0
158	ARGR	52				EF	1-Aug-96	TO25	0
159	ARGR	41				EF	1-Aug-96	TO25	0
160	ARGR	43				EF	1-Aug-96	TO25	0
161	ARGR	59				EF	1-Aug-96	TO25	0
162	ARGR	52				EF	1-Aug-96	TO25	0
163	ARGR	49				EF	1-Aug-96	TO25	0
164	ARGR	53				EF	1-Aug-96	TO25	0
165	ARGR	44				EF	1-Aug-96	TO25	0
166	ARGR	46				EF	1-Aug-96	TO25	0
167	NNST					EF	1-Aug-96	TO25	0
168	NNST					EF	1-Aug-96	TO25	0
169	NNST					EF	1-Aug-96	TO25	0
170	NNST					EF	1-Aug-96	TO25	0
171	NNST					EF	1-Aug-96	TO25	0

Appendix A9. Fish biological characteristics information for Jericho River and tributaries 1995 and 1996.

SNUM	Species	Length (mm)	Weight (g)	Age	Age Method	Capture Method	Date	Site	Capture Code
172	ARGR	102	10		SC	EF	1-Aug-96	TO26	0
173	ARGR	47				EF	1-Aug-96	TO26	0
174	ARGR	48				EF	1-Aug-96	TO26	0
175	ARGR	47				EF	1-Aug-96	TO26	0
176	ARGR	49				EF	1-Aug-96	TO26	0
177	NNST	37				EF	1-Aug-96	TO26	0
178	NNST	52				EF	1-Aug-96	TO26	0
179	NNST	63				EF	1-Aug-96	TO26	0
180	NNST	57				EF	1-Aug-96	TO26	0
181	NNST	60				EF	1-Aug-96	TO26	0
182	ARGR	54				EF	1-Aug-96	TO26	0
183	ARGR	50				EF	1-Aug-96	TO26	0
184	ARGR	48				EF	1-Aug-96	TO26	0
185	ARGR	52				EF	1-Aug-96	TO26	0
186	ARGR	49				EF	1-Aug-96	TO26	0
187	ARGR	52				EF	1-Aug-96	TO26	0
188	ARGR	47				EF	1-Aug-96	TO26	0
189	ARGR	44				EF	1-Aug-96	TO26	0
190	NNST	29				EF	1-Aug-96	TO26	0
191	ARGR					EF	1-Aug-96	TO26	0
192	ARGR					EF	1-Aug-96	TO26	0
193	NNST					EF	1-Aug-96	TO26	0
194	NNST					EF	1-Aug-96	TO26	0
195	NNST					EF	1-Aug-96	TO26	0
196	NNST					EF	1-Aug-96	TO26	0
197	NNST					EF	1-Aug-96	TO26	0
198	NNST					EF	1-Aug-96	TO26	0
199	NNST					EF	1-Aug-96	TO26	0
200	NNST					EF	1-Aug-96	TO26	0
201	NNST					EF	1-Aug-96	TO26	0
202	NNST					EF	1-Aug-96	TO26	0
203	NNST					EF	1-Aug-96	TO26	0
204	NNST					EF	1-Aug-96	TO26	0
205	NNST					EF	1-Aug-96	TO26	0
206	NNST					EF	1-Aug-96	TO26	0
207	NNST					EF	1-Aug-96	TO26	0
208	NNST					EF	1-Aug-96	TO26	0
209	NNST					EF	1-Aug-96	TO26	0
210	NNST					EF	1-Aug-96	TO26	0
211	ARGR	44				EF	1-Aug-96	TO27	0
212	ARGR	54				EF	1-Aug-96	TO27	0
213	NNST	57				EF	1-Aug-96	TO27	0
214	SLSC	40				EF	1-Aug-96	TO27	0
215	SLSC	42				EF	1-Aug-96	TO27	0

Appendix A10. Habitat characteristics[a] measured during stream surveys, Jericho River and tributaries 1995.

Stream	Date Sampled	Water Temp. (ºC)	Habitat Type	Stream Width (m)	Habitat Length (m)	Bank Type	Channel Type	Bank Type (%)			Substrate Type (%)				
								Shrub	Grass	Rock	Silt/Sand	Gravel	Cobble	Boulder	Bedrock
O1	6-Aug-95	8	P3	0.5	2	D1	C1	60	40	0	100	0	0	0	0
			P3	2	5	D1	C1	50	50	0	100	15	0	0	0
			R3	3.7	80	D1	C1	0	100	0	80	0	5	0	0
			R3	1.5	30	D1	C1	0	100	0	100	0	0	0	0
			R3		20	D2	C1	0	100	0	20	0	80	0	0
			R3		30	D2	C2	0	100	0	0	0	30	70	0
			R3		150	D2	C2	50	50	0	100	0	0	0	0
			R3	0.4	32	D2	C2	50	50	0	100	0	0	0	0
			R3	0.3	20	D2	C2	0	100	0	90	10	0	0	0
O2	6-Aug-95	8	P3	0.6	3	D1	C1	0	100	0	100	0	0	0	0
			P3	0.4	6	D1	C1	0	100	0	100	0	0	0	0
			P3	0.3	3	D1	C1	0	100	0	100	0	0	0	0
			P3	0.6	2	D1	C1	0	100	0	100	0	0	0	0
			P3	0.6	1	D1	C1	0	100	0	100	0	0	0	0
			P3	4	4	D1	C1	0	100	0	100	0	0	0	0
			P3		2	D1	C1	0	100	0	100	0	0	0	0
			P3	0.3	10	D1	C1	0	100	0	100	0	0	0	0
			P3	0.4	1	D1	C1	0	100	0	100	0	0	0	0
			P3		2	D2	C1	0	100	0	100	0	0	0	0
			R3	0.8	260	D2	C1	0	100	0	100	0	0	0	0
			R3		200	D2	C1	30	60	10	75	5	5	15	0
			R3		3	D2	C1	0	100	0	0	0	0	100	0
			R3	0.8	22	D2	C1	0	100	0	90	0	0	10	0
			R3		10	D2	C1	0	100	0	100	0	0	0	0
O3	23-Jun-95	7	R3	0.4	150	D1	C1	0	100	0	50	10	30	10	0
O4	6-Aug-95		P3		6	D1	C1	70	30	0	10	0	20	70	0
			P3	1	6	D1	C1	60	30	10	20	80	0	0	0
			P3		132	D2	C2	60	30	10	70	0	10	20	0
			R3BG	1.2	116	D2	C2	30	70	0	70	0	10	20	0
			RFBG	0.7	87	D2	C2	60	40	0	10	0	20	70	0
Jericho R.	27-Jun-95	6	F1BG	45	1100	D1	C1	0	50	50	40	0	60	0	0
			F3BG	35	250	D1	C1	0	10	90	0	0	10	80	10
			R2BG	29	120	D1	C1	0	20	80	0	0	10	80	10
			RABG	21	50	D1	C1	0	10	90	0	0	0	40	60
			RABG	25	75	D1	C1	0	20	80	0	0	20	70	10
			CASCADE		120	D1	C2	0	10	90	0	0	0	80	20

[a] Habitat characteristic definitions in RL&L (1996).

Appendix A11. Summary of habitat characteristics[a] of inventoried streams during spring and summer, Jericho River and tributaries 1995.

Area	Stream	Surveyed Length (m)	Average Width (m)	Discharge[b] (m3/s)	Slope (%)	Channel Type (%)		Bank Type (%)		Habitat Type (%)						Substrate Type (%)				
						Single	Multiple	Distinct	Indistinct	Pool	Run	Flat	Cascade	Riffle	Rapid	Si/Sa	Gr	Co	Bo	Bed
Jericho R.	O1	369	0.4	0.03	1	37.1	62.9	31.7	68.3	1.9	98.1					82.7	3.8	7.9	5.7	
	O2	529	0.9	0.01	2	100		6	94	6.3	93.7					89.6	1.9	1.9	6.7	
	O3	150	0.4	0.01	1.5	100		100			100					50	10	30	10	
	O4	347	1	0.08	4	3.5	96.5	3.5	96.5	3.5	71.4			25.1		53.1	1.4	12.5	33.1	
	Jericho R.	1715	37.9	N/D	1.5	93	7	100			7	78.7	7		7.3	25.7		41.5	27.1	5.7

[a] Habitat characteristic definitions in RL&L (1996).

[b] Discharge measured during late spring immediately after snow melt.

Appendix A12. Habitat characteristics[a] measured during stream surveys, Jericho River and tributaries 1996.

Stream	Reach	Date	Length (m)	Average Width (m)	Average Depth (m)	Slope	Channel Type (%)			Bank Type (%)		Habitat Type (%)					
							C1	C2	C3	D1	D2	POOL	RUN	FLAT	RF/RA	CA	DIS
TO01	1	30-Jul-96	350	7.50	0.10	1	100			10	90	0	25	70	5		
TO02	1	30-Jul-96	500			1	100			90	10	40	60	0	0		
TO02	2	30-Jul-96	300	1.50	0.10		100			10	90	25	75	0	0		
TO03	1	30-Jul-96	75	0.40	0.10	4	100			100		25	75	0	0		
TO04	1	30-Jul-96	100	0.40	0.20	4	100			100		10	75	0	0	15	
TO07A	1	06-Aug-96	1715	37.90		2	93	7		100			7	79	7	7	
TO07B	1	06-Aug-96	2500	35.00		2	95	5		100		5	45	30	20		
TO08	1	03-Aug-96	224	1.70		2	100			15	85	2	75		23		
TO23	1	01-Aug-96	50	0.60	0.80		100			100		0	0	100	0		
TO24	1	01-Aug-96	30	0.70	0.30		100			100		0	60	30	10		
TO24	2	01-Aug-96	320	0.50	0.40		100			100		0	50	40	10		
TO25	1	01-Aug-96	45	1.10	0.20		100			100		5	85	10	0		
TO25	2	01-Aug-96	35					100			100	0	0	0	0		100
TO25	3	01-Aug-96	300	1.00	1.00		100			100		10	80	10	0		
TO25	4	01-Aug-96	300	1.00	0.30		100			100		10	90	0	0		
TO26	1	01-Aug-96	200	2.00	0.90		100				100	50	50	0	0		
TO27	1	01-Aug-96	100	1.50			95	5		100		25	55	0	20		

Stream	Reach	Substrate Type (%)						
		OM	Si	Sa	Gr	Co	Bo	BD
TO01	1	45	45	5		5		
TO02	1	60	35	5				
TO02	2	20	75	5				
TO03	1	45	20	25			10	
TO04	1		5	5	5	10	75	
TO07A	1			26		41	27	6
TO07B	1			30	10	15	35	10
TO08	1			17	42	33	9	
TO23	1		85			5	10	
TO24	1	50			15	5	30	
TO24	2	75			5	5	15	
TO25	1		50				50	
TO25	2						100	
TO25	3		15		5		80	
TO25	4		15		5		80	
TO26	1	30		60		5	5	
TO27	1			15	70	10	5	

[a] Habitat characteristic definitions in RL&L (1997).

Appendix A13. Summary of habitat characteristics[a] of inventoried streams during spring and summer, Jericho River and tributaries 1996.

Area	Stream	Surveyed Length (m)	Average Width (m)	Discharge[b] (m3/s)	Slope (%)	Channel Type (%)		Bank Type (%)		Habitat Type (%)						Substrate Type (%)				
						Single	Multiple	Distinct	Indistinct	Pool	Run	Flat	Cascade	Riffle/ Rapid	Dispersed	Si/Sa	Gr	Co	Bo	Bed
Jericho River (Upper)	O1[c]	369	0.4	0.005	1	37.1	62.9	31.7	68.3	1.9	98.1					82.7	3.8	7.9	5.7	
	O2	529	0.9	0.001	2	100		6	94	6.3	93.7					89.6	1.9	1.9	6.7	
	O3	150	0.4	0	1.5	100		100			100					50	10	30	10	
	O4	347	1	0.005	4	3.5	96.5	3.5	96.5	3.5	71.4			25.1		53.1	1.4	12.5	33.1	
	O7A	1715	37.9	n/d	1.5	93	7	100			7	79	7	7		26		41	27	6
	O8	224	1.7	n/d	1.5	100		15	85	2	75			23		17	42	33	9	
Jericho River (Lower)	O7B	2500	35	n/d	1.5	95	5	100		5	45	30		20		30	10	15	35	10
	O23	50	0.6	0	1	100		100				100				85		5	10	
	O24	350	0.6	0.016	1.5	100		100			55	35		10		65	10	5	20	
	O25	680	0.8	0.025	1.5	75	25	75	25	10	60	5			25	20	5	5	70	
	O26	200	2	0.043	1.5	100		100		50	50					85	5	5	5	
	O27	100	1.5	0.054	1	95	5	100		25	55		20			15	70	10	5	

[a] Habitat characteristic definitions in RL&L (1997).

[b] Discharge measured during summer.

[c] Habitat data for O1 to O4 collected during 1995 study; discharge measured during 1996.

n/d=no data