PROVENCHER BRIDGE PROJECT

ARCHAEOLOGICAL IMPACT ASSESSMENT

Prepared for
WARDROP ENGINEERING INC.

QUATERNARY CONSULTANTS LTD.
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TABLE OF CONTENTS

TABLE OF CONTENTS (cont.)

LIST OF FIGURES

LIST OF PLATES

1.0 INTRODUCTION

The City of Winnipeg will be undertaking an upgrading of the Provencher Bridge. This, as well as the extension of York and St. Mary Avenue to the Bridge, will impact areas within the East Yard. The Historic Resources Branch of Manitoba Culture, Heritage and Recreation determined that a heritage resource impact assessment was necessary for the area.

Accordingly, the project engineers, Wardrop Engineering Inc., issued a call for tenders (July 15, 1988) for a heritage resource impact assessment of the areas to be affected. Quaternary Consultants Ltd. (QCL) was engaged (August 5, 1988) to conduct an archaeological impact assessment of the lands which would be impacted by the development.

In accordance with the provisions of the Manitoba Heritage Resources Act, Quaternary Consultants applied for and received Manitoba Heritage Permit #A58-88 to conduct the project. In addition, a City of Winnipeg Services Report (#5665) was obtained.

Field operations were conducted in three phases, between August 22 and August 31. The initial aspect, Phase I, consisted of a series of 10 exploratory excavations along the future locations of York and St. Mary Avenues. Phase II consisted of surface inspection of the impact areas on both sides of the Red River. Phase III consisted of monitoring the 16 geo-technical drill holes along the York Extension and St. Mary Avenue locations and the Provencher Bridge abutment location on the west side of the Red River.

2.0 INVESTIGATION METHODOLOGY

The provenience of all investigation locations has been surveyed into The Forks Archaeological Survey Grid. This metric grid is based upon the City of Winnipeg survey marker (87R548) as the Site Datum. This marker is located on the north end of the Low Line Bridge across the Assiniboine River. The marker has been assigned the arbitrary provenience of 1000N/1000W. The 1000E/W Baseline extends from the marker to the second concrete pier (to the south of the embankment) of the CNR Main Line. The placements of the geo-technical bore holes and the backhoe exploratory excavation test holes have been located in relation to the Site Datum and the E/W Baseline. The proveniences are recorded in Appendix D.

2.1 Phase I: Exploratory Backhoe Test Excavations

An archaeological team, consisting of a backhoe with a skilled operator, the senior archaeologist, three assistant archaeologists and two field assistants, was deployed. A series of ten test holes were excavated within the proposed impact zone (Figure 1). Five test holes were placed within the right-of-way of the extension of York Avenue, between the North/South Access Road and Christie Street. An additional five test holes were excavated within the right-of-way of the extension of St. Mary Avenue. Each test hole was three meters long and was excavated to a depth of 3.5m.

The method of investigation was the same as had been developed during the North Assiniboine Node Archaeological Impact Assessment. The backhoe, using a 24", smooth-edged bucket, would excavate the exploratory test hole in thin layers, usually 10 cm thick. The extractant soil would be dumped at the side of the test hole and the archaeological team would examine it, using

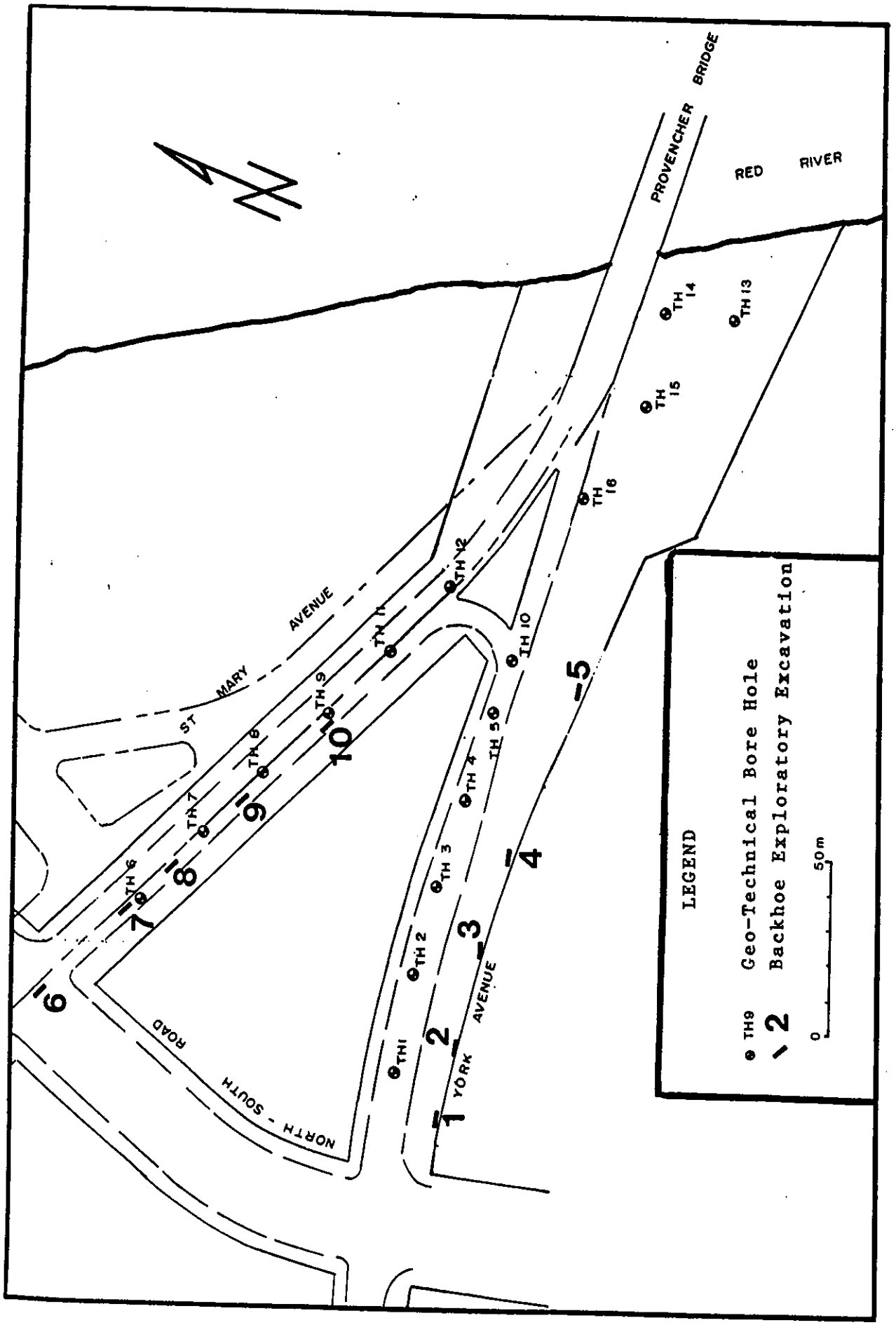

Figure 1: Location of Sub-Surface Investigations

garden rakes to spread the material (Plate 1). The presence of relict soil zones and/or cultural material required detailed examination of the excavated soil, using trowels. All artifacts were collected and the depth below surface was recorded for each recovery. Soil samples of cultural levels were collected in labelled bags and taken to the laboratory facility for water-screening to recover small artifacts (lithic flakes, ceramic sherdlets, clam shells and fish bones). The soil profile of the excavated trench was recorded, to permit sub-surface mapping of the stratigraphy of the impact area.

2.2 Phase II: Surface Investigations

An investigation team, consisting of the senior archaeologist and two field assistants, inspected the impact zone on both sides of the Red River. All but the actual river banks showed evidence of recent, extensive surface modification. Accordingly, the investigations concentrated upon the portions of the river banks which retained a moderately undisturbed vegetative cover.

The examination methodology consisted of visual inspection of all exposed surfaces, bank slumps, tree root tilts, etc. Trowel and shovel tests of potential locations were made.

2.3 Phase III: Monitoring of Geo-Technical Drilling

In order to ascertain the quality of the sub-strate for road construction, Dyregrov & Burgess conducted a geo-technical drilling program. A series of sixteen holes, 16" diameter, were drilled at various locations along the impact zone (Figure 1). As part of the archaeological impact assessment, Quaternary Consultants Ltd. arranged to monitor the program, with the goal of observing and recording any archaeological data encountered during the sub-surface examinations.

During the drilling, the depth of the railroad fill level, usually cinder or gravel, was noted. All relict soil horizons were noted and examined for cultural material. Depths of these former soil levels were measured where possible.

Recoveries of artifacts from a drilling program are usually minimal. The size of the investigatory drill results in the examination of approximately one square foot. As well, due to the mechanical stresses acting upon the extractant material, most organic material (wood, bone, charcoal) is usually crushed or deformed. Thin soil zones become mixed with river silt deposition layers due to the rotary action of the drill and, often, are not observed within the drilling extractant. Finally, the operation proceeds at a rapid pace, as the primary goal is the determination of soil texture. The drilling crews accord as much time, within their schedule, for archaeological examination of the extractant soil, as feasible. Contents of individual drill drives would, on request, be deposited to the side of the operation for archaeological examination, when deemed necessary.

2.4 Laboratory Procedures

All recovered artifacts were washed, identified and sorted by provenience (i.e., location on the site and stratigraphic level). Identification procedures consisted of identifying the object and the material of which it is composed, as well as determining the function of the object and the method of manufacture. Additional descriptive data, such as color, date of manufacture, name of manufacturer, and condition of the artifact, were recorded where ascertainable. Wherever possible, the cultural affiliation of the artifact was determined (e.g., Blackduck; Recent Euro-Canadian; Pre-Contact; etc.). In the case of faunal remains, the name of the bone element and the most

appropriate taxonomic level were recorded. Faunal remains were identified to species, whenever possible.

After the artifacts had been prepared, the locational and identifying data was entered into the computer cataloging system. This system is the national archaeological database system (Canadian Heritage Information Network) that is recommended in The Forks Archaeological Impact and Management Plan (Appendix D). The CHIN system is used to enable compatability of data for the various archaeological endeavours at The Forks. It has been used for the North/South Access Road Archaeological Impact Assessment and the North Assiniboine Node Archaeological Impact Assessment.

In accordance with the decision of the Ad Hoc Coordinating Committee for The Forks Renewal Archaeology, based upon the necessity of being able to readily separate recoveries from the various archaeological projects at The Forks, each project is assigned a specific designator. The Provencher Bridge Project has been designated as '88E'. Accordingly, the artifacts were given the designation 'D1Lg-33/88E' plus a sequential catalog number (Appendix C).

3.0 ARCHAEOLOGICAL RECOVERIES

For all sub-surface investigations, soil profiles were recorded and the recovered artifacts were curated and cataloged. All stratigraphic sequences were divided into three major levels, to conform with data recovered from other locations in the East Yard. These levels are:

Level 1	Railroad Fill Stratum	Usually consisting of gravel, cinder, ash, sand or clay. Often containing historic artifacts.
Level 2	Historic Flood Stratum	Correlated with the historic floods which occurred between 1826 and 1881. Consists of two or three discrete clay strata, occasionally separated by a thin, juvenile soil layer. At locations away from the north bank of the Assiniboine River, the level contains few artifacts.
Level 3	Pre-Contact Native Ceramic Stratum	Numerous discrete soil zones separated by layers of river-deposited silts and clays. Several soil zones contain evidence of occupation: fish and mammal bone, ceramic sherds, lithic tools and flakes, hearths, etc. These occupation strata have been designated as Cultural Zones I to V.

3.1 Phase I: Exploratory Backhoe Test Excavations

Ten exploratory test units were excavated by backhoe along the proposed routes of York and St. Mary Avenues (Figure 1).

3.1.1 Test Hole 1

The upper 66 cm was railroad period fill (Level 1), made up of gravel, clay and ash. The soil profile below the fill contained two thin clay strata separated by a juvenile soil layer (Level 2). Below Level 2, the soil consisted of a series of relict soil zones separated by bands of riverine silt and clay (Level 3). The following table lists the depths of the relict soil surfaces.

Depth Below Surface (cm)	Stratum Description	Level	Culture Zone
0 - 54	clay & gravel	Level 1	
54 - 60	grey ash	"	
60 - 66	brown ash	"	
66 - 70	riverine clay	Level 2	
70 - 71	juvenile soil	"	
71 - 72	riverine clay	"	
86 - 87	juvenile soil	Level 3	
90 - 91	juvenile soil	"	
101 - 102	juvenile soil	"	
126 - 127	juvenile soil	"	
148 - 149	juvenile, fauna	"	I
166 - 170	mature soil, ceramic	"	II
203 - 204	juvenile soil	"	
232 - 235	mature soil, fauna	"	IV
260 - 261	juvenile soil	"	
275 - 276	juvenile soil	"	
327 - 328	juvenile soil	"	

Three historic artifacts were recovered from Level 1: a green glass sherd from a beverage bottle, a brown-on-white sherd from a porcelain plate, and a white porcelain sherd from an unidentified vessel. The artifacts were located in the ash strata. No artifacts were recovered from Level 2.

Three Pre-Contact occupation strata (Zone I, II and IV) were observed in Level 3. Zone I was a thin soil stratum containing some charcoal and a small amount of poorly preserved fish bone. No artifacts were recovered.

Zone II was a 4 cm thick, relatively mature soil stratum. It contained a large quantity of cultural artifacts: 378 specimens of faunal remains and 54 ceramic sherds. The ceramic recoveries included one rimsherd (Plate 2) decorated with characteristic Blackduck cord-wrapped object impressions (CWOI). The bodysherds and bodysherdlets were both textile-impressed and smooth. The fauna remains included bones from bison (Bison bison), freshwater drum (Aplodinotus grunniens), catfish (Ictalurus sp.) and goldeye (Hiodon sp.). Severely fragmented bone could not be identified further than designating it as mammal or fish. In addition, shells of at least one species of freshwater clam (Amblema plicata) were recovered.

Zone IV was a 3 cm thick, relatively mature soil stratum. It contained considerable artifactual material: 7 ceramic sherds, a chalcedony bifacially flaked knife, 153 lithic flakes of seven different materials, and 47 faunal remains. The ceramic bodysherds were textile-impressed. The asymmetric biface (Plate 2) is finely flaked on all edges. The lithic detritus, representing the residue from tool manufacture, consists of Knife River Flint, quartzite, siltstone, Swan River Chert, Selkirk Chert, non-specific chert and jasper. The faunal remains

include shell from freshwater clams, fragmented fish bone and fragmented mammal bone.

3.1.2 Test Hole 2

Excavation of this unit encountered oil-saturated sediments to a depth of 130 cm. The soils were colored a dark slate blue and were quite odorous.

The upper 76 cm consisted of a railroad period fill, made up of gravel, clay and ash. The soil profile below the fill layer (Level 1) contained a single clay stratum (Level 2). Below Level 2, the soil consisted of a series of relict soil zones separated by bands of riverine silt and clay. The following table indicates the depths of these former soil surfaces.

Depth Below Surface (cm)	Stratum Description	Level	Culture Zone
0 - 76	gravel, clay, ash	Level 1	
66 - 82	riverine clay	Level 2	
90 - 91	juvenile soil	Level 3	
110 - 111	juvenile soil	"	
148 - 149	juvenile, fauna	"	I
162 - 163	juvenile soil	"	
175 - 176	Juvenile, ceramic	"	II
195 - 197	juvenile, fauna	"	III
238 - 242	mature soil, fauna	"	IV
303 - 306	mature soil, fauna	"	V

No artifacts were recovered from Level 1 (Railroad Fill) or Level 2 (Historic Flood Stratum). Five cultural levels were observed in Level 3.

Cultural Zone I contained charcoal and poorly preserved fish bone. No artifacts were recovered.

Cultural Zone II contained numerous artifacts: 306 faunal remains, charcoal, fire-cracked rock, a Swan River Chert flake, a Selkirk Chert core, and 11 ceramic sherds. The ceramic specimens included a rimsherd which was decorated with cord-wrapped object impressions (CWOI) and punctates and bosses, denoting it as representative of the Blackduck ceramic tradition. The ten bodysherds and bodysherdlets were textile impressed. The faunal remains included shell from at least one species of freshwater clam (Lampsilis radiata). Fish bone indicated the presence of sturgeon (Acipenser fulvescens), sucker (Catastomidae), two freshwater drum (Aplodinotus grunniens), and a minimum of four catfish (Ictalurus sp.). The mammalian bone showed the presence of bear (Ursus americanus) and bison. One avian long bone was recorded. Much of the bone was fragmented and was only identifiable to class.

Cultural Zone III contained charcoal and three bones which could be identified as lower leg bones from a bison. No diagnostic artifacts were recovered.

Cultural Zone IV contained charcoal, fire-cracked rock, a flake of Swan River Chert, 45 faunal remains and 8 ceramic sherds. The faunal remains included scutes from sturgeon and a section of jaw from a catfish, as well as fragments identified as large mammal. The ceramic sherds consisted of four textile-impressed and three smooth body sherds, plus a textile-impressed neck section.

Cultural Zone V contained sparse, poorly preserved fish bone. No recoveries were made from this level in this unit.

3.1.3 Test Hole 3

The upper 79 cm consisted of a railroad period fill, made up of black ash and cinder, overlaying grey sand and gravel. The soil profile below the fill layer (Level 1) contained a layer of light brown sand (Level 2). Below Level 2, the soil consisted of a series of relict soil zones separated by bands of riverine silt and clay. The following table indicates the depths of these former soil surfaces.

Depth Below Surface (cm)	Stratum Description	Level	Culture Zone
0 - 64	ash & cinder	Level 1	
64 - 79	grey sand & gravel	"	
79 - 94	riverine sand	Level 2	
114 - 114	juvenile soil, fish	Level 3	?
118 - 118	juvenile, charcoal	"	?
136 - 137	juvenile, fish, char.	"	?
144 - 145	juvenile, fauna	"	I
180 - 181	juvenile soil	"	
208 - 209	juvenile soil	"	
239 - 242	mature soil, fauna	"	IV
300 - 301	juvenile, fauna	"	V

The correlations of the upper strata within Level 3 are tenuous. It would appear that the soil layers at 180 cm and 208 cm correspond with Culture Zones II and III, as found in Test Hole 2. Three soil layers containing possible cultural occupations overlie Cultural Zone I. No artifacts were located in any of these strata and, as yet, they have not been designated as cultural strata.

Cultural Zone I contained only poorly preserved fish remains, none of which were recovered.

Cultural Zone IV was not as plentiful as in Test Hole 1 and Test Hole 2. The recoveries consisted of 3 textile-impressed ceramic bodysherds and a flake of Knife River Flint.

Cultural Zone V contained a significant quantity of material: eight lithic flakes of Knife River Flint, Swan River Chert, quartzite and non-specific chert; 3 fragments of hazelnut (Corylus sp.), 11 ceramic sherds; and 238 faunal remains. The ceramic recoveries included rimsherds from two different vessels. One sherd is decorated with CWOI and punctates, the other has CWOI and stamped design. Three different surface finishes are represented on the body sherds: smooth, brushed and textile-impressed. The faunal remains included bone fragments from large mammal, bird and fish. Three species of fish (freshwater drum, sucker and catfish) were represented. In addition, at least one species of freshwater clam (Proptera alata) was represented.

3.1.4 Test Hole 4

The upper 76 cm consisted of a railroad period fill, made up of black cinder and ash. The soil profile below the fill layer (Level 1) contained a riverine silt deposit (Level 2). Below Level 2, the soil consisted of a series of relict soil zones separated by bands of riverine silt and clay. The following table indicates the depths of these former soil surfaces.

Depth Below Surface (cm)	Stratum Description	Level	Culture Zone
0 - 72	black cinder & ash	Level 1	
72 - 76	grey ash	"	
76 - 100	riverine silt	Level 2	
175 - 177	sand layer	Level 3	
240 - 243	mature soil, fauna	"	IV
271 - 272	juvenile,fauna,ceramic	"	V ?
314 - 319	sand lenses	"	

An amethyst glass sherd from a one quart milk bottle was recovered from Level 1. The sherd shows panelling and is embossed with "BO...". As yet, the manufacturer has not been identified.

Only faunal remains were recovered from Level 2. The specimens consisted of a pectoral spine from a catfish, an unidentified leg bone fragment from a large mammal, and the mandible from a sheep (Ovis aries).

Cultural Zone IV, in Level 3, contained the remnants of a hearth: charcoal, ash, and fire-hardened clay. Sparse, poorly preserved fish bone was observed, but not collected.

Cultural Zone V (?) may not correlate with the stratum that has been previously designated. The depth below surface in Test Hole 2 and Test Hole 3 was recorded at 303 cm and 300 cm. The depth at this location is only 271 cm. It is possible that the ground surface at the time of occupation was undulating and that the cultural level does correlate with Cultural Zone V. However, it is possible that this occupation occurred between Zone IV and Zone V. The Blackduck rimsherd is decorated with characteristic cord-wrapped object impressions (CWOI), but the style is not

distinct enough to definitely match it with, or separate it from, the ceramic artifacts from Cultural Zone V in the other test units.

3.1.5 Test Hole 5

The upper 104 cm consisted of a railroad (or late historic) period fill, made up of black ash and cinder, overlaying light brown sand and manure. The soil profile below the fill layer (Level 1) contained clay fill with wood inclusions (Level 2). Below Level 2, the soil was oil-saturated to the base of the excavation (360 cm), resulting in a dark slate blue discoloration. Thin soil strata were largely undiscernible. A few relict soil zones were observed. The following table indicates the depths of these former soil surfaces.

Depth Below Surface (cm)	Stratum Description	Level	Culture Zone
0 - 20	asphalt	Level 1	
20 - 41	black cinder & ash	"	
41 - 57	clay fill	"	
57 - 63	black cinder & ash	"	
63 - 93	light brown sand	"	
93 - 104	manure	"	
104 - 158	clay, wood	Level 2 ?	
158 - 160	juvenile soil, wood	"	
241 - 242	juvenile soil	Level 3	
303 - 304	juvenile soil	"	

No artifacts were recovered from any of the levels in this unit. The pieces of wood found between 104 cm and 160 cm appeared to be broken pieces of planks and boards, although they were too fragmentary to identify.

3.1.6 Test Hole 6

The upper 104 cm consisted of a railroad period fill, made up of sand and gravel, overlaying grey clay fill. The soil profile below the fill layer (Level 1) did not appear to indicate any evidence of Level 2. Below Level 1, the soil consisted of a series of relict soil zones separated by bands of riverine silt and clay. The following table indicates the depths of these former soil surfaces.

Depth Below Surface (cm)	Stratum Description	Level	Culture Zone
0 - 42	brown sand & gravel	Level 1	
42 - 61	grey clay & gravel	"	
61 - 66	grey sand & gravel	"	
66 - 87	brown/grey clay fill	"	
87 - 104	grey clay fill	"	
107 - 108	juvenile soil	Level 3	
116 - 117	juvenile soil	"	
123 - 124	juvenile soil	"	
144 - 145	juvenile soil	"	
150 - 151	juvenile soil	"	
162 - 163	juvenile soil	"	
235 - 237	juvenile, fauna	"	IV
254 - 255	juvenile, fauna	"	?
270 - 278	sand layer	"	
280 - 281	juvenile soil	"	

No artifacts were recovered from Level 1 or the upper relict soil zones of Level 3. The occupation horizon at 235 cm is correlated with Cultural Zone 4, as observed in the test units along the York Avenue right-of-way. The recovered artifacts included 5 ceramic sherds and 75 faunal remains. The two

rimsherds fit together and have a shallow lip castellation. No other decoration technique was employed. The body sherds are textile-impressed. The faunal material included specimens of three different species of freshwater clam: Lampsilis radiata, Lampsilis ventricosa, and Liguma recta. A phalanx of a bison was identified, along with a fragment of a tibia from a large mammal. The fish bones included specimens from catfish and freshwater drum.

Some severely decomposed fish bone was noted in a juvenile soil layer at 254 cm. Given the strong correlation of Cultural Zone IV, it is not probable that this layer represents Cutlural Zone V, due to the depth variation. It probably represents a small scale, short-term visitation.

3.1.7 Test Hole 7

The upper two meters consisted of recent fill, made up of gravel and clay. No evidence of Level 2 was seen in the soil profile. Below the fill, the soil consisted of a series of relict soil zones separated by bands of riverine silt and clay. The following table indicates the depths of these former soil surfaces.

Depth Below Surface (cm)	Stratum Description	Level	Culture Zone
0 - 40	gravel	Level 1	
40 - 200	cement, clay & gravel	"	
245 - 247	mature soil	Level 3	
300 - 301	juvenile soil	"	

No artifacts were recovered from this test unit.

3.1.8 Test Hole 8

The upper 102 cm consisted of a railroad period fill, made up of black ash, black cinder and clay. The soil profile below the fill did not have a representation of Level 2. Below Level 1, the soil consisted of a series of relict soil zones separated by bands of riverine silt and clay. The following table indicates the depths of these former soil surfaces.

Depth Below Surface (cm)	Stratum Description	Level	Culture Zone
0 - 28	brown sand & gravel	Level 1	
28 - 60	black cinder & ash	"	
60 - 84	brown & grey clay	"	
84 - 102	grey clay & cinder	"	
114 - 115	juvenile soil	"	
159 - 160	juvenile soil	"	
163 - 164	juvenile soil	"	
168 - 169	juvenile soil	"	
173 - 174	juvenile soil	"	
194 - 195	juvenile soil	"	
245 - 246	juvenile soil	"	
300 - 301	juvenile soil	"	

No artifacts were recovered from this excavation unit. Many of the relict soil zones correspond with soil horizons which contained artifactual material in the test units along the York Avenue right-of-way. This would tend to indicate that the St. Mary location was not as favorable for a campsite. Current data suggests that the area north of the York Avenue extension would have been low-lying and marshy, especially to the east of the North/South Access Road.

3.1.9 Test Hole 9

The upper 106 cm consisted of a railroad period fill, made up of black ash, gravel and clay. No evidence was seen of the presence of Level 2. Below the fill, the soil consisted of a series of relict soil zones separated by bands of riverine silt and clay. The following table indicates the depths of these former soil surfaces.

Depth Below Surface (cm)	Stratum Description	Level	Culture Zone
0 - 37	brown sand & gravel	Level 1	
37 - 49	black cinder & ash	"	
49 - 75	brown & grey clay	"	
75 - 106	cinder & grey clay	"	
110 - 111	juvenile soil	Level 3	
115 - 116	juvenile soil	"	
129 - 130	juvenile soil	"	
138 - 139	juvenile soil	"	
145 - 146	juvenile soil	"	
183 - 184	juvenile soil	"	
206 - 207	juvenile soil	"	
240 - 241	juvenile soil	"	
300 - 301	juvenile soil	"	

No artifacts were recovered from this unit. Again, there is a strong correlation of the depths of the relict soil horizons with those recorded in other excavation units.

3.1.10 Test Hole 10

The upper 130 cm consisted of recent fill, made up of clay, sand and gravel. The soil profile below the fill layer (Level 1) did not contain evidence of Level 2. The lower soil consisted of a series of relict soil zones separated by bands of riverine silt and clay. The following table indicates the depths of these former soil surfaces.

Depth Below Surface (cm)	Stratum Description	Level	Culture Zone
0 - 19	brown sand & gravel	Level 1	
19 - 46	black ash & gravel	"	
46 - 58	grey sand & gravel	"	
58 - 81	brown & grey clay	"	
81 - 130	grey clay	"	
134 - 135	juvenile soil	Level 3	
153 - 154	juvenile soil	"	
222 - 223	juvenile soil	"	
238 - 242	sand layer	"	
242 - 244	mature soil	"	
298 - 299	juvenile soil	"	

No artifacts were recovered from this excavation unit. The correlations of the relict soils with depth encountered in other test units is good. It would appear that the former soil surfaces are relatively uniform and that the thickness of flood deposits is similar across the impact zone.

3.2 Surface Investigations

The areas of impact, on both banks of the Red River, were thoroughly investigated. Only very recent debris was found on the surface. The soil layer, visible in exposed areas, appears to date to silt deposition by the 1950 flood. No artifacts pre-dating this event were located during trowel testing of exposed surfaces.

3.3 Geo-Technical Drilling Program

The primary data recovered from the drilling monitor program consisted of information concerning former soil horizons (Appendix A). As several culture-bearing strata had been identified by the backhoe exploratory excavations, this data is useful in determining the areal extent of the pre-Contact occupations. Artifactual recovery was minimal; consisting mainly of traces of faunal remains. Usually, the mechanical stresses of the auger traumatized the material to the extent that it could only be identified as bone material. These traces of faunal deposits were noted. Specimens were not collected. No other cultural evidence (ceramic sherds, lithic flakes, etc.) were observed.

4.0 INTERPRETATIONS

A quantity of significant cultural data was recovered during the phases of the impact assessment. Artifacts and soil data provide information with considerable time depth, estimated to be approximately 1000 years. This information will be discussed by the three designated levels, which are equated to specific cultural and temporal periods.

4.1 Level 1

Level 1 is identified as the period of railroad utilization of the East Yard. This period begins in 1885 and continues until present. The most notable feature of this period is that the level of the ground was raised; i.e., fill consisting of gravel, cinders, ash, clay, etc., was used to increase the elevation. Sub-surface disturbances, occasioned by installation of below-ground services, were localized. The thickness of the fill layer ranges from 0.4 to 2.8 meters (Appendix A). The thickness of the level increases from west to east, with the widest portion of the layer near the bank of the Red River.

Few artifacts were recovered from this stratum. Three were retrieved from Test Hole 1. Two sherds (D1Lg-33/88E-26, 27) are from white, porcelain dinnerware vessels and probably are related to food services provided by the rail companies. A single sherd of green glass, from a beverage bottle, was also recovered from Test Hole 1. The only other artifact located in Level 1 is an amethyst glass sherd from Test Hole 4. The sherd has multiple panels and is embossed with "BO...". The style of the bottle identifies it as a one-quart, milk bottle and the color of the sherd dates it to prior to 1914. To date, the dairy which produced the bottle has not been identified.

4.2 Level 2

This level is defined as the historic stratum and is characterized by multiple floods (1826, 1852, 1861, 1882). At least two layers of silt, deposited by these floods, have been identified in Test Hole 1.

Geo-technical drilling encountered sub-surface structural remains which can be correlated with this time period. A concrete layer was encountered at a depth of 1.5m in Hole #15. Wood planking, possibly deriving from a cellar, was found at a depth of 2.8m in Hole #7. During the geo-technical studies for the North/South Road, a concrete layer was encountered in Hole #3 (approximately at the middle of the intersection of St. Mary Avenue and N/S Road). This material was at a depth of 1.3m (North/South Access Road Archaeological Impact Assessment, Appendix A). The planking in Hole #7 and the concrete in N/S Road Hole #3 probably are associated with buildings which existed on the south side of Water Avenue, prior to the construction of Freight Shed #1, in 1888 (The Forks Archaeological Impact Assessment and Management Plan). The concrete encountered in Hole #15 is probably associated with one of the construction episodes of the Provencher Bridge.

In addition, a layer of manure (20 cm thick) was found at Hole #5, during the drilling program, overlying clay fill. This indicates the presence of domestic animals and, given the presence of the clay fill, must post-date the Experimental Farm of the 1840's.

Artifacts from this level were found only in Test Hole 4 (DlLg-33/88E-117, 118, 119). The material consisted of a portion of a leg bone from a large mammal, a mandible from a sheep (Ovis aries) and a pectoral spine from a catfish (Ictalurus sp.). The

presence of the sheep and large mammal can be correlated with the manure layer encountered in Hole #5 (see Figure 1). It is probable that the occupants of a dwelling on Water Avenue maintained a stable and/or byre. The sheep may have been raised on the property.

4.3 Level 3

At least five cultural occupations have been identified within Level 3. All manifestations are representative of the ceramic manufacturing 'Late Woodland Culture'. Lithic artifacts and sherds from native pottery have been recovered from three of these strata (Plate 2). The deepest cultural zone was encountered at a depth of 3.0 meters and contained ceramic sherds which have been identified as 'Blackduck'. The 'Blackduck' culture existed from A.D. 500 to 1750. The distinctive pottery of this culture was recovered from several occupation strata, during the 1984 Parks Canada excavations at The Forks. A radiocarbon date of A.D. 510 was obtained from the earliest stratum.

The occupation strata observed during the Provencher Bridge Project Impact Assessment have yet to be radiocarbon dated. The age of the lowest stratum is estimated to be 700 to 800 years old, based upon typology of the ceramic decorative technique.

The majority of the evidence of these pre-Contact occupation strata was recovered from the backhoe exploratory excavations along the York Avenue extension (Figure 2). The area nearest to the intersection with the North/South Access Road contains most of the evidence. While equivalent relict soil strata are encountered in the eastern portion of the York Avenue extension and the majority of the St. Mary extension, cultural material was not located within these soil horizons.

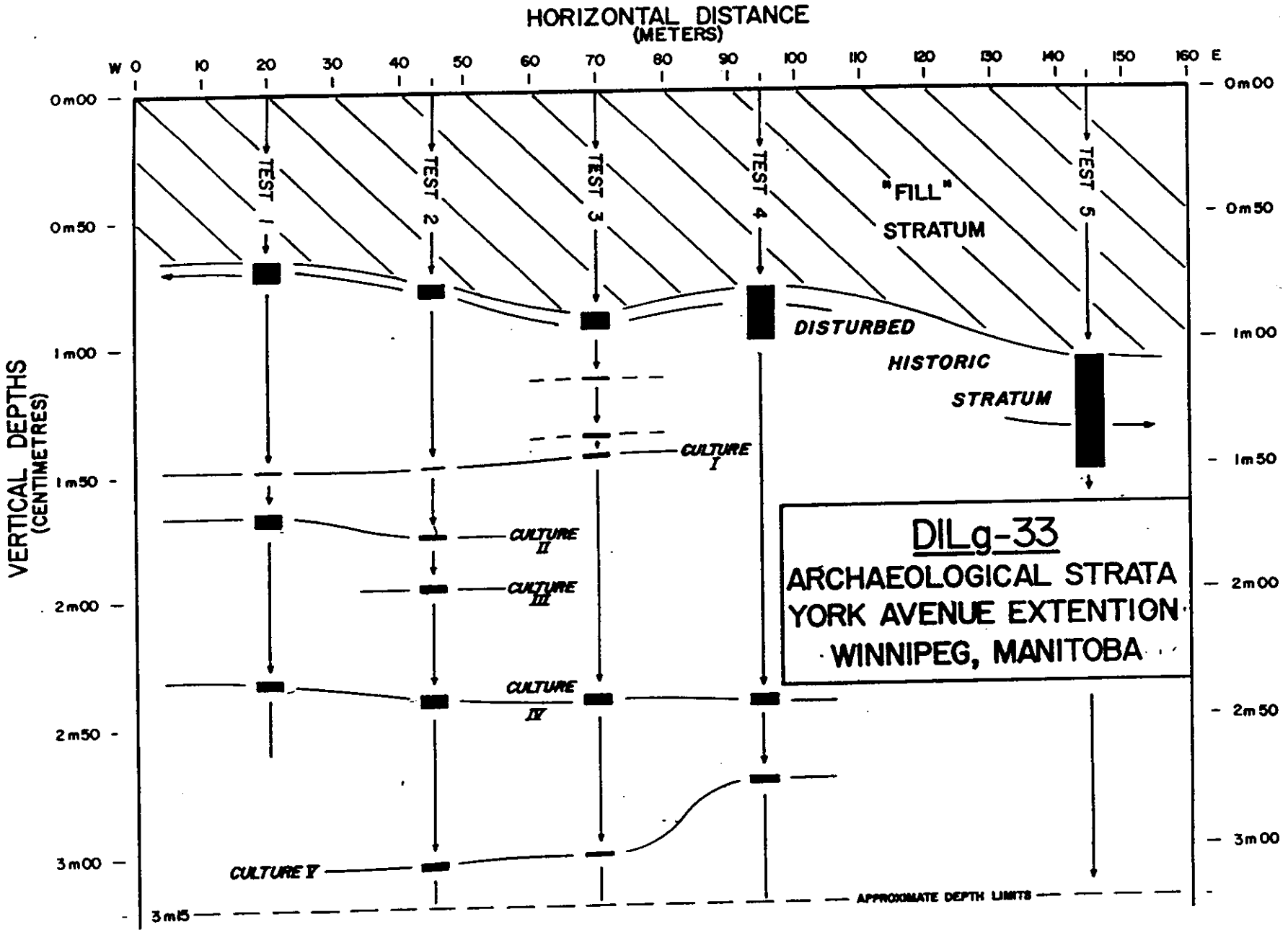

Figure 2: Cultural Profile Along York Avenue Extension

Plate 1: Backhoe exploratory excavations

Plate 2: Artifact recoveries from Level 3 Cultural Zones

4.3.1 Cultural Zone I

This thin relict soil horizon, containing charcoal and scattered fish bone, was observed in Test Hole 1, 2 and 3. The depth was almost consistently 148 cm below surface. No artifacts were recovered from this cultural zone. However, some admixture with Cultural Zone II, during the excavation of Test Hole 2, is suspected. It is possible that some of the faunal remains assigned to Cultural Zone II may derive from the upper stratum. The age of Cultural Zone I is estimated at more than 300 years.

4.3.2 Cultural Zone II

This occupation stratum is 4 cm thick in Test Hole 1, tapering to a thin (1 cm) layer at Test Hole 2. The stratum is 166 cm below surface at Test Hole 1, sloping to 175 cm at Test Hole 2. This same soil layer is found at Test Hole 3 (180 cm) and Test Hole 6 (162 cm). Test Hole 8, 9 and 10 have two or more relict soil strata at this general depth. However, correlation with a specific stratum is not possible.

The material at Test Hole 1 consisted of faunal remains and ceramic fragments. Diagnostic ceramic sherds, lithic material, charcoal and faunal remains were recovered at Test Hole 2 (DiLg-33/88E-1 to 25, 43 to 75). Two similar 'Blackduck' rim-sherds were obtained, one from each excavation unit. Both have the characteristic cord-wrapped object impressions (CWOI) on the lip and upper neck of the vessel. The rimsherd from Test Hole 1 (#21) has a flat, wedge-shaped lip, decorated with CWOI in a herringbone pattern. The neck is decorated with a row of oblique CWOI at the lip and five parallel bands of CWOI below. The rimsherd from Test Hole 2 has a flat, exterior L-shaped lip decorated with an oblique CWOI pattern. The neck has a row of oblique CWOI at the lip, five parallel bands of CWOI below, and

a row of oblique CWOI at the neck juncture. Large punctates are impressed at the middle parallel band of CWOI. Both textile-impressed (50) and smooth (5) bodysherds and bodysherdlets were recovered from this stratum, as well as 8 bodysherdlets which were too fragmented to identify the surface finish.

Lithic material was only found at Test Hole 2. This consisted of a core of Selkirk Chert, a flake of Swan River Chert and a fragment of fire-cracked granite. A charcoal sample was obtained from Test Hole 2.

A large quantity of faunal material (681 specimens) was recovered from both units. Most of the material was fragmented fish bone, which could not be identified to element, or fish vertebrae and ribs which cannot be identified to species. The following chart summarizes the recoveries.

SPECIES	Test Hole 1	Test Hole 2
Bison (Bison bison)	3	2
Bear (Ursus americanus)	-	1
Unidentified large mammal	24	18
Unidentified bird	-	1
Drum (Aplodinotus grunniens)	3	5
Catfish (Ictalurus sp.)	30	30
Goldeye (Hiodon sp.)	2	-
Sucker (Catostomidae)	-	3
Sturgeon (Acipenser fulvescens)	-	3
Unidentified fish	308	227
Freshwater clam (Amblema plicata)	1	-
Freshwater clam (Lampsilis radiata)	-	5
Unidentified clam	7	8
Totals	378	303

Based upon the frequency of elements per species, it is possible to obtain the minimum number of individuals which are represented by the faunal remains. One bison and one bear are present, as well as a single bird. A minimum of 4 freshwater drum, 13 catfish, 1 goldeye, 1 sucker and 1 sturgeon indicate an intensive use of the aquatic resources of the Red and Assiniboine Rivers. The total faunal remains represent a balanced utilization of land and water food sources.

4.3.3 Cultural Zone III

This cultural occupation horizon was only encountered in Test Hole 2, at a depth of 195 cm. The stratum contained charcoal and 3 lower hind leg bones from a bison (DlLg-33/88E-76, 77). The metatarsus bone demonstrated spiral fracture indicating breakage while fresh, i.e., the breakage occurred, perhaps for the recovery of marrow, during butchering of the animal. As no diagnostic artifacts were recovered, the age and cultural affiliation of the occupants of this stratum is unknown.

It is likely that the discovery represents an outlier portion of the major occupation area. The primary location could be either north or south of the test unit.

4.3.4 Cultural Zone IV

Cultural Zone IV was located in Test Hole 1, 2, 3, 4 and 6 during the Provencher Bridge impact assessment. In addition, this stratum was identified in Test Hole B, C and F during the North/ South Road impact assessment. The depth of this layer is slightly less than 2.5 meters below surface and apparently extends over a large area. The east/west distance from Test Hole F to Test Hole 4 is 100 meters, while the north/south distance

from Test Hole 1 to Test Hole C is 120 meters. The occupational evidence, found within this stratum, could derive from numerous small contemporaneous occupations which may slightly overlap or from a single large-scale occupation site covering several thousand square meters. The first instance could be the result of repeated seasonal visitation by a small group of people, who set up camp in a slightly different location each year. The second instance could be the result of a massive gathering of a large number of people. Either explanation may be valid. Until block excavations determine the boundaries and internal geography of the cultural zone, it is not possible to select one explanation over the other.

Ceramic artifacts were recovered from Test Hole 1, 2, 3 and 6. Only three rimsherds are represented in the recoveries; one of which is a lower neck portion which is not diagnostic. The other two rimsherds (DlLg-33/88E-125), from Test Hole 6, fit together and have a smooth, shallowly castellated lip. No decoration occurs on the neck. All three rimsherds, as well as 13 bodysherds and 4 bodysherdlets are textile-impressed. Three smooth bodysherds were located in Test Hole 2. The diagnostic rimsherd is a style which has been identified within Blackduck assemblages, albeit from the southwestern portion of Manitoba.

Lithic material was retrieved from Test Hole 1, 2, 3, B and C. A fragment of ochre and three flakes were recovered from the test units on the North/South Road. A piece of fire-cracked granite occurred in Test Hole 2. A single flake of Knife River Flint was found in Test Hole 3 and a single flake of Swan River Chert was located in Test Hole 2. An asymmetric, bifacially flaked chalcedony knife and large quantities of lithic detritus were recovered from Test Hole 1. The 153 flakes consisted of specimens of Knife River Flint, Swan River Chert, Selkirk Chert, non-specific chert, jasper, siltstone and quartzite. The

materials are derived from several sources: North Dakota (Knife River Flint); Upper Assiniboine River area (Swan River Chert); Lockport locality (Selkirk Chert) and Souris region (jasper). The wide range of lithic source areas represented tends to indicate extensive travelling by a single group or, more probably, extensive trade patterns between groups.

The faunal remains were, as usual, plentiful. The frequency was not as high as in Cultural Zone II. Much of the material was fragmented fish and mammal bone which could not be identified to element or to species. The following chart summarizes the recoveries.

SPECIES	Hole 1	Hole 2	Hole 6
Bison (*Bison bison*)	-	1	1
Unidentified large mammal	33	5	7
Drum (*Aplodinotus grunniens*)	-	-	1
Catfish (*Ictalurus* sp.)	-	1	5
Sturgeon (*Acipenser fulvescens*)	-	2	-
Unidentified fish	8	36	58
Freshwater clam (*Liguma recta*)	-	-	1
Freshwater clam (*Lampsilis radiata*)	-	-	1
Freshwater clam (*Lampsilis ventricosa*)	-	-	1
Unidentified clam	5	-	-
Totals	46	45	75

No recoveries were made in Test Hole 4, although the remains of a hearth (ash and charcoal) were found. Faunal remains occurred in the vicinity of the hearth. However, preservation was too poor to allow recovery of the material.

4.3.5 Cultural Zone V

Cultural Zone IV was identified in Test Hole 2, and 3 during the Provencher Bridge impact assessment. The depth of this layer is generally 3.0 meters below surface. However, the depth of the equivalent occupation zone in Test Hole 4 is only 271 cm. This could mean that the original ground surface was higher at Test Hole 4 or that the material is representative of a different occupation which occurred between Culture Zone IV and Culture Zone V. For the present interpretation, the first explanation has been chosen. In addition, this stratum is tentatively correlated with the Blackduck stratum located in Test Hole 2 during the North/South Road impact assessment. While no cultural material was recovered from Test Hole 6 at this depth, a relict soil zone does occur. Thus, the occupation evidence found at Test Hole 2 on the North/South Road, even though not contiguous, could be contemporaneous with Culture Zone V as represented in the test excavations along the York Avenue extension. Even occurring at the same time, there need be no overlap of loci within a single large-scale occupation.

Ceramic recoveries were made in Test Hole 3 and 4. A single rimsherd (DlLg-33/88E-124) was obtained from Test Hole 4. Test Hole 3 produced 3 rimsherds and 8 bodysherds. All of the rimsherds have the characteristic Blackduck cord-wrapped object impressions (CWOI) on the lip and upper neck of the vessel. The rimsherd from Test Hole 4 has a flat, outflared lip, decorated with oblique CWOI. The neck is decorated with a row of oblique CWOI at the lip and a band of stamped CWOI below. One rimsherd from Test Hole 3 (#97) has a flat, straight lip decorated with an oblique CWOI pattern. The neck has a row of oblique CWOI at the lip with large punctates are impressed below. The other rimsherd (#96) has a flat, straight lip, decorated with CWOI in an oblique pattern. The neck is decorated (from lip to neck)

with a row of oblique CWOI at the lip, a row of oblique stamped CWOI, three parallel bands of CWOI, and a row of oblique stamped CWOI at the neck juncture. These are similar to the rimsherd from the North/South Road (DlLg-33/88B-111) which had a flat, outflared lip decorated with perpendicular CWOI and a neck decoration consisting of vertical CWOI with a row of fingernail impressions below. Both textile-impressed (5), brushed (1), and smooth (1) bodysherds and bodysherdlets were recovered from this stratum, as well as one bodysherdlet which was too fragmented to permit identification of the surface finish.

Lithic recoveries were minimal, consisting of one Knife River Flint flake from Test Hole 4 and 8 flakes (Knife River Flint, Swan River Chert, quartzite and non-specific chert) from Test Hole 3.

Three fragments of a hazelnut (Corylus) were recovered in Test Hoe 3. This is the first indication of the types of plant resources which were used for food. In addition, the presence of the nut identifies the season of occupation as the fall of the year.

Faunal remains in Test Hole 2 were sparse, poorly preserved fish bone. No specimens were recovered. The material was also limited in Test Hole 4, although preservation was better. Dense deposits and good preservation resulted in the recovery of numerous specimens from Test Hole 3. Most of the material was fragmented fish bone which could not be identified to element or species. The following chart summarizes the recoveries.

SPECIES	Test Hole 3	Test Hole 4
Unidentified large mammal	4	-
Unidentified bird	3	-
Drum (Aplodinotus grunniens)	1	2
Catfish (Ictalurus sp.)	7	1
Sucker (Catostomidae)	1	-
Unidentified fish	218	8
Freshwater clam (Proptera alata)	1	-
Unidentified clam	3	-
Totals	237	11

The faunal representation is sparse when compared with other strata. However, as in the higher strata, a well-balanced resource utilization strategy is evident. This would indicate familiarity with the food resources of the locality, showing that the occupants of the site were familiar with the area, at least on a seasonal basis.

4.4 Summary

1387 artifacts were recovered, representing three major time periods and a minimum of seven discrete occupations.

The railroad period is characterized by minimal artifacts. Most of the determinable activity consisted of building up the level of the ground surface using gravel and cinders, for enhanced drainage. Some in-filling of depressions along St. Mary Avenue extension appears to have occurred. The buildings of a construction company are known to have been located within the impact area, to the east of Christie (Gilroy) Street, at the west foot of the Provencher Bridge.

The historic (pre-railroad) period produced some evidence of occupation along the current location of Water Avenue. Sub-surface examinations have indicated the presence of structural elements at some depth, probably the remnants of cellars. Evidence of the maintenance of domestic animals was also observed.

The Late Woodland period (Level 3), covering seven or eight centuries, has evidence of at least five occupations of the impact area (Figure 2). Diagnostic ceramic artifacts of the Blackduck culture were recovered as well as indications that the occupants of the site were engaged in extensive trade. The faunal remains indicated that the people were quite familiar with the area, as all types of local food resources (terrestrial and aquatic) were utilized. To date, only Culture Zone V can be determined as to seasonality - a fall visitation to The Forks, perhaps coinciding with the northward migration of the bison herds.

5.0 RECOMMENDATIONS

The activities of the archaeological impact assessment resulted in recovery of data concerning the soil stratigraphy of the test locations and the discovery of several pre-Contact occupations.

The recommendations are predicated upon the knowledge that the depth of impact will vary throughout the site. The construction of the road bed, to an approximate depth of 130 cm will result in minimal disruption of pre-Contact archaeological deposits. The installation of various services (land drainage sewer, sanitary waste sewer and water main) will result in disruptions to depths of greater than six meters - beyond the depths of the geo-technical bore holes or the backhoe exploratory test holes.

During the summer of 1988, discussions were held with officials of Historic Resources Branch, engineers of Wardrop Engineering Inc., the Site Archaeologist of The Forks Renewal Corporation and other interested parties. Because of the techniques employed during the installation of sub-surface conduits, it is impossible to halt construction at every minor discovery. Such delays would create considerable downtime and add substantially to the cost of the operation. Additionally, the size of the equipment does not permit close examination of all extracted soil, thereby frustrating archaeological recoveries. In order to satisfy all parties, a methodology called the 'adjacent trench' technique was evolved (Appendix B: QCL letter to Wardrop).

This technique involves the excavation of a short trench parallel to the sewer or water main trench. It takes advantage of the fact that sub-surface services are usually placed parallel to each other. Thus, the adjacent trench can be placed within the impact zone and may be initiated during the installation of the first sub-surface service. The adjacent

trench, with appropriate back-sloping or use of a safety cage, is used by archaeologists for recovery of archaeological material equivalent to that which is being disrupted by the construction. The methodology is described in Appendix B.

Where the location and depth of archaeological deposits is known, through prior investigations, the adjacent trench can be sited, prior to the onset of construction. Where the location of archaeological resources is unknown, the location of the trench, if necessary, would be unknown until archaeological deposits are recognized through the monitoring of the service trench.

Considering the above preamble, Quaternary Consultants Ltd. can propose the following recommendations for the impact zone of the Provencher Bridge Project.

1. It is recommended that all sub-surface modification be monitored by an archaeologist or archaeological team, depending upon the scale of the construction.

2. It is recommended that two 'adjacent trenches', each 20 meters in length, be excavated within the impact zone along the York Avenue extension, in conjunction with the installation of sub-surface services. The optimum locations for these trenches are in the vicinity of Test Hole 2, 3 and 4. Given the minimal amount of archaeological material discovered during the impact assessment of the St. Mary Avenue extension, it is not presently envisioned that the 'adjacent trench' technique will need to be employed in this portion of the project.

3. It is recommended that the construction contractor(s) be apprised of the needs of the archaeological monitoring team and of the potential of limited downtime for archaeological recovery during construction excavation.

4. It is recommended that the construction contractor(s) be made aware of the implementation of the 'adjacent trench' technique for heritage resources recovery and the attendant need for parallel excavations and supply of safety cages.

5. It is recommended that the archaeological monitoring team be apprised of the necessity for minimizing construction downtime.

6. It is recommended that all archaeological activity conform to professional standards, as set forth in Appendix D of The Forks Archaeological Impact Assessment and Management Plan.

7. Under Section 44 of the Manitoba Heritage Resources Act, The City of Winnipeg has custody rights for the recovered artifacts. It is recommended that this right of custody be transferred to the Manitoba Museum of Man and Nature. All artifacts from adjacent recoveries on CN and FRC lands are deposited at the Museum and it would be reasonable to keep related material together in a single repository.

APPENDIX A

DATA RECOVERED DURING ARCHAEOLOGICAL MONITORING OF GEO-TECHNICAL DRILLING PROGRAM

TABLE OF DATA

HOLE NO.	STRATIGRAPHIC AND ARTIFACT DATA
1	Historic fill to 0.6m - cinder, gravel River silts and clays containing thin, poorly defined soil zones Relict soil with fish bone @ 2.5m
2	Historic fill to 1.0m - gravel, cinder, wood Clay fill River silts and clays containing thin, poorly defined soil zones Two relict soils with fish bone @ 2.5 & 3.0m
3	Gravel, sand, cinder fill to 0.6m River silts and clays containing thin, poorly defined soil zones Relict soil with charcoal @ 2.5m
4	Sand/Gravel to 0.5m Black clay fill to 1.7m River silts and clays containing thin, poorly defined soil zones
5	Gravel to 0.5m Manure 0.5 - 0.7m Clay fill to 1.8m River silts and clays containing thin, poorly defined soil zones
6	Gravel/Sand to 0.60m Brown-black clay fill to 0.9m River silts and clays containing thin, poorly defined soil zones
7	Gravel fill to 0.6m Clay to 2.8m (fill ?/ 1881 flood ?) Wood planking @ 2.8m River silts and clays containing thin, poorly defined soil zones
8	Gravel to 0.4m River silts and clays containing thin, poorly defined soil zones
9	Clay/Gravel to 0.5m Brown silt/clay fill to 1.2m River silts and clays containing thin, poorly defined soil zones

10	Gravel/Clay/Sand to 0.8m Sand (fill?) to 3.0m River silts and clays containing thin, poorly defined soil zones
11	Gravel/Clay fill to 0.7m River silts and clays containing thin, poorly defined soil zones
12	Gravel/Sand to 1.5m Concrete - termination of hole @ 1.5m
13	Gravel/Brick fill River silts and clays
14	Gravel/Clay fill to 2.4m River silts and clays
15	Asphalt/Gravel to 0.9m Clay fill River silts and clays containing thin, poorly defined soil zones
16	Gravel/Concrete to 0.6m Clay/Gravel fill

APPENDIX B

DOCUMENTATION RELATING TO THE PROVENCHER BRIDGE PROJECT ARCHAEOLOGICAL IMPACT ASSESSMENT

Quaternary Consultants Limited

773 Jessie Ave.
Winnipeg, Manitoba
R3M 0Z6

(204) 453-3642

October 17, 1988

Mr. D. Stewart
Wardrop Engineering Inc.
77 Main Street
Winnipeg, Manitoba
R3C 3H1

Dear Doug;

Re: Mitigative Archaeological Procedures for the Provencher Bridge Project

The following is a possible mitigative program for addressing the archaeological resources which will be impacted by sewer line construction during the Provencher Bridge Project. The procedures take advantage of the 'adjacent trench' technique and will not substantially delay construction.

As mentioned in the Preliminary Report, monitoring of the main-line trenching by an archaeological team is necessary. This can be carried out by a senior archaeologist and one assistant. Samples of archaeological material would be removed from the excavated soil during construction, with minimal delay of the operation. Time frame of this field operation would be dependant upon the rate of excavation of the sewer line. For budget estimate purposes, it has been estimated at five days.

In conjunction with the extensive, stratified archaeological deposits along the York Avenue extension, I suggest the excavation of two adjacent trenches, each 20 meters in length. I would propose that the first trench be excavated to a depth of 140 cm to permit the mitigative recovery of the upper cultural levels, and the second trench be excavated to a depth of 220 cm to enable the mitigative recovery of the lower cultural levels.

The mitigative procedures, within each trench, would consist of the following methodology:

a. shovel-strip the overburden to the cultural level,
b. sub-divide the trench into one meter square units,
c. map the entire exposed cultural level using a super-imposed grid,
d. excavate, using a trowel, four units which contain the most relevant archaeological features (hearths, lithic or ceramic concentrations, structural evidence, etc.),
e. sub-divide the remaining 16 units into small blocks, 25 cm x 25 cm,
f. remove, using a shovel, each of the sub-units and place in a bag labelled with the provenience for off-site processing,
g. using shovels and power equipment, where possible, remove the overburden to the next cultural level, and
h. repeat the procedure.

The off-site processing of the archaeological material would consist of:

a. washing all artifacts recovered during trowelling,
b. wet-screening, using 1/4" over 2 mm mesh, all deposits which were removed en bloc,
c. identification of all recovered material (ceramics, lithics, faunal remains, etc.)
d. computer cataloguing of all artifacts, using the CHIN (Canadian Heritage Inventory Network) system, which is to be applied to all archaeological recoveries from The Forks area,
e. preparation of all artifacts to 'storage-ready' conditions, as required by the Manitoba Museum of Man and Nature,
f. analysis of the recovered material to provide interpretive data for a final report,
g. photography of selected artifacts for a final report,
h. drafting of necessary map, profiles, etc., and
i. preparation of a final report which will detail the field operations, the recoveries and the interpretations of the recovered data.

The timeframe for the field operations can be estimated with a fair degree of accuracy, barring inclement weather which would preclude activity. With a field crew of five persons, each 20 meter cultural level could be removed in three days. Given that three upper cultural levels would be removed in Trench 1 and two lower cultural levels would be removed in Trench 2, the combined total consists of 15 days of field operations (approximately 600 person-hours). Off-site processing (laboratory operations) would require a laboratory supervisor and laboratory assistant at the onset of the project. The field crew would continue work at the lab after completion of the field operations. The laboratory

operations, analysis and report preparation require considerably more time than the field extraction of the resources. Depending upon the quantity of material recovered, the ratio ranges from 2.5 to 4.0:1. Based upon the nature of the deposits observed during the backhoe testing and the evidence observed during the monitoring of the services installation of The Forks - Stage I, the upper figure is the more probable. For budget purposes, a ration of 3.3:1 will be used. This means that the off-site operations will require approximately 2000 person-hours to adequately complete the processing, curation, and analysis of all archaeological material recovered during the monitoring and excavation operations. This figure also includes time required for preparation of the final report.

I have developed an estimated budget based upon the above procedures and timeframe. As these mitigative operations have been accepted by Historic Resources Branch, the budget should be firm. A 10% contingency component has been included, should any unexpected discoveries occur.

Yours truly,

Sid Kroker
Senior Archaeologist

cc. P. Badertscher

APPENDIX C

CATALOG RECORD OF ARTIFACTS RECOVERED DURING THE PROVENCHER BRIDGE PROJECT ARCHAEOLOGICAL IMPACT ASSESSMENT

SPECIMEN CATALOGUE RECORD

Site: DlLg-33/88E / THE FORKS Area: RED RIVER

Donor: THE CITY OF WINNIPEG Acc. No.: A1988-22

Cat. #	Qty	Object Name / Object Type	Material / Cultural Phase	Location on Site	Coll. Date
1	7	UNDETERMINED	BONE BLACKDUCK	TEST HOLE 1	19880822
2	1	MANDIBLE BISON BISON	BONE; TOOTH BLACKDUCK	TEST HOLE 1	19880822
3	1	TIBIA BISON BISON	BONE BLACKDUCK	TEST HOLE 1	19880822
4	10	LONG BONE MAMMALIA	BONE BLACKDUCK	TEST HOLE 1	19880822
5	2	LONG BONE MAMMALIA	BONE BLACKDUCK	TEST HOLE 1	19880822
6	1	LONG BONE MAMMALIA	BONE BLACKDUCK	TEST HOLE 1	19880822
7	280	UNDETERMINED FISH	BONE BLACKDUCK	TEST HOLE 1	19880822
8	4	VERTEBRA MAMMALIA	BONE BLACKDUCK	TEST HOLE 1	19880822
9	1	METACARPAL BISON BISON	BONE BLACKDUCK	TEST HOLE 1	19880822
10	3	OTOLITH APLODINOTUS GRUNNIENS	BONE BLACKDUCK	TEST HOLE 1	19880822
11	8	PECTORAL SPINE ICTALURUS	BONE BLACKDUCK	TEST HOLE 1	19880822
12	1	CLEITHRUM ICTALURUS	BONE BLACKDUCK	TEST HOLE 1	19880822
13	3	CLEITHRUM ICTALURUS	BONE BLACKDUCK	TEST HOLE 1	19880822
14	9	DENTARY ICTALURUS	BONE BLACKDUCK	TEST HOLE 1	19880822
15	6	ANGULAR ICTALURUS	BONE BLACKDUCK	TEST HOLE 1	19880822
16	3	QUADRATE ICTALURUS	BONE BLACKDUCK	TEST HOLE 1	19880822
17	2	OPERCULUM HIODON	BONE BLACKDUCK	TEST HOLE 1	19880822
18	28	VERTEBRA FISH	BONE BLACKDUCK	TEST HOLE 1	19880822
19	7	VALVE UNIONIDAE	SHELL BLACKDUCK	TEST HOLE 1	19880822
20	1	VALVE AMBLEMA PLICATA	SHELL BLACKDUCK	TEST HOLE 1	19880822
21	1	RIM SHERD LIP; NECK	EARTHENWARE BLACKDUCK	TEST HOLE 1	19880822
22	27	BODY SHERD BODY	EARTHENWARE BLACKDUCK	TEST HOLE 1	19880822
23	13	BODY SHERDLET BODY	EARTHENWARE BLACKDUCK	TEST HOLE 1	19880822
24	5	BODY SHERDLET BODY	EARTHENWARE BLACKDUCK	TEST HOLE 1	19880822
25	8	BODY SHERDLET BODY	EARTHENWARE BLACKDUCK	TEST HOLE 1	19880822

SPECIMEN CATALOGUE RECORD

Site: DlLq-33/88E / THE FORKS Area: RED RIVER

Donor: THE CITY OF WINNIPEG Acc. No.: A1988-22

Cat. #	Qty	Object Name / Object Type	Material / Cultural Phase	Location on Site	Coll. Date
26	1	SHERD PLATE	PORCELAIN HISTORIC	TEST HOLE 1	19880822
27	1	SHERD UNIDENTIFIED	PORCELAIN HISTORIC	TEST HOLE 1	19880822
28	1	SHERD BOTTLE	GLASS HISTORIC	TEST HOLE 1	19880822
29	8	UNDETERMINED FISH	BONE BLACKDUCK	TEST HOLE 1	19880822
30	33	UNDETERMINED MAMMALIA	BONE BLACKDUCK	TEST HOLE 1	19880822
31	1	VALVE GASTROPODA	SHELL BLACKDUCK	TEST HOLE 1	19880822
32	5	VALVE UNIONIDAE	SHELL BLACKDUCK	TEST HOLE 1	19880822
33	1	BIFACE ASYMMETRIC	CHALCEDONY BLACKDUCK	TEST HOLE 1	19880822
34	22	FLAKE	KNIFE RIVER FLINT BLACKDUCK	TEST HOLE 1	19880822
35	20	FLAKE	QUARTZITE BLACKDUCK	TEST HOLE 1	19880822
36	65	FLAKE	SILTSTONE BLACKDUCK	TEST HOLE 1	19880822
37	1	FLAKE	JASPER BLACKDUCK	TEST HOLE 1	19880822
38	18	FLAKE	SELKIRK CHERT BLACKDUCK	TEST HOLE 1	19880822
39	23	FLAKE	SWAN RIVER CHERT BLACKDUCK	TEST HOLE 1	19880822
40	4	FLAKE	CHERT BLACKDUCK	TEST HOLE 1	19880822
41	3	BODY SHERD BODY	EARTHENWARE BLACKDUCK	TEST HOLE 1	19880822
42	4	BODY SHERDLET BODY	EARTHENWARE BLACKDUCK	TEST HOLE 1	19880822
43	1	RIM SHERD LIP; NECK	EARTHENWARE BLACKDUCK	TEST HOLE 2	19880822
44	6	BODY SHERD BODY	EARTHENWARE BLACKDUCK	TEST HOLE 2	19880822
45	4	BODY SHERDLET BODY	EARTHENWARE BLACKDUCK	TEST HOLE 2	19880822
46	1	CORE	SELKIRK CHERT BLACKDUCK	TEST HOLE 2	19880822
47	1	FLAKE	SWAN RIVER CHERT BLACKDUCK	TEST HOLE 2	19880822
48	2	FIRE-CRACKED ROCK	GRANITE BLACKDUCK	TEST HOLE 2	19880822
49	3	CHARCOAL	CHARCOAL BLACKDUCK	TEST HOLE 2	19880822
50	1	LONG BONE AVES	BONE BLACKDUCK	TEST HOLE 2	19880822

SPECIMEN CATALOGUE RECORD

Site: DlLq-33/88E / THE FORKS Area: RED RIVER

Donor: THE CITY OF WINNIPEG Acc. No.: A1988-22

Cat. #	Qty	Object Name / Object Type	Material / Cultural Phase	Location on Site	Coll. Date
51	1	PHALANX BISON BISON	BONE BLACKDUCK	TEST HOLE 2	19880822
52	1	MOLAR BOVIDAE	TOOTH BLACKDUCK	TEST HOLE 2	19880822
53	1	VERTEBRA MAMMALIA	BONE BLACKDUCK	TEST HOLE 2	19880822
54	1	SESAMOID MAMMALIA	BONE BLACKDUCK	TEST HOLE 2	19880822
55	7	LONG BONE MAMMALIA	BONE BLACKDUCK	TEST HOLE 2	19880822
56	9	UNDETERMINED MAMMALIA	BONE BLACKDUCK	TEST HOLE 2	19880822
57	5	VALVE LAMPSILIS RADIATA	SHELL BLACKDUCK	TEST HOLE 2	19880822
58	8	VALVE UNIONIDAE	SHELL BLACKDUCK	TEST HOLE 2	19880822
59	3	VALVE GASTROPODA	SHELL BLACKDUCK	TEST HOLE 2	19880822
60	1	METATARSUS URSUS AMERICANUS	BONE BLACKDUCK	TEST HOLE 2	19880822
61	3	SCUTE ACIPENSER FULVESCENS	BONE BLACKDUCK	TEST HOLE 2	19880822
62	1	DENTARY CATOSTOMIDAE	BONE BLACKDUCK	TEST HOLE 2	19880822
63	1	HYOMANDIBULAR CATOSTOMIDAE	BONE BLACKDUCK	TEST HOLE 2	19880822
64	1	MAXILLA CATOSTOMIDAE	BONE BLACKDUCK	TEST HOLE 2	19880822
65	4	OTOLITH APLODINOTUS GRUNNIENS	BONE BLACKDUCK	TEST HOLE 2	19880822
66	1	SPINE APLODINOTUS GRUNNIENS	BONE BLACKDUCK	TEST HOLE 2	19880822
67	6	DENTARY ICTALURUS	BONE BLACKDUCK	TEST HOLE 2	19880822
68	1	CERATOHYAL ICTALURUS	BONE BLACKDUCK	TEST HOLE 2	19880822
69	2	PECTORAL SPINE ICTALURUS	BONE BLACKDUCK	TEST HOLE 2	19880822
70	1	QUADRATE ICTALURUS	BONE BLACKDUCK	TEST HOLE 2	19880822
71	7	ANGULAR ICTALURUS	BONE BLACKDUCK	TEST HOLE 2	19880822
72	4	PREOPERCULUM ICTALURUS	BONE BLACKDUCK	TEST HOLE 2	19880822
73	4	CLEITHRUM ICTALURUS	BONE BLACKDUCK	TEST HOLE 2	19880822
74	5	HYOMANDIBULAR ICTALURUS	BONE BLACKDUCK	TEST HOLE 2	19880822
75	227	UNDETERMINED FISH	BONE BLACKDUCK	TEST HOLE 2	19880822

SPECIMEN CATALOGUE RECORD

Site: DlLq-33/88E / THE FORKS Area: RED RIVER

Donor: THE CITY OF WINNIPEG Acc. No.: A1988-22

Cat. #	Qty	Object Name / Object Type	Material / Cultural Phase	Location on Site	Coll. Date
76	2	TARSUS BISON BISON	BONE BLACKDUCK	TEST HOLE 2	19880822
77	1	METATARSUS BISON BISON	BONE BLACKDUCK	TEST HOLE 2	19880822
78	1	PHALANX BOVIDAE	BONE BLACKDUCK	TEST HOLE 2	19880822
79	1	UNDETERMINED MAMMALIA	BONE BLACKDUCK	TEST HOLE 2	19880822
80	4	RIB MAMMALIA	BONE BLACKDUCK	TEST HOLE 2	19880822
81	2	SCUTE ACIPENSER FULVESCENS	BONE BLACKDUCK	TEST HOLE 2	19880822
82	1	OPERCULUM ICTALURUS	BONE BLACKDUCK	TEST HOLE 2	19880822
83	36	UNDETERMINED FISH	BONE BLACKDUCK	TEST HOLE 2	19880822
84	1	FLAKE	SWAN RIVER CHERT BLACKDUCK	TEST HOLE 2	19880822
85	1	FIRE-CRACKED ROCK	GRANITE BLACKDUCK	TEST HOLE 2	19880822
86	3	BODY SHERD BODY	EARTHENWARE BLACKDUCK	TEST HOLE 2	19880822
87	4	BODY SHERD BODY	EARTHENWARE BLACKDUCK	TEST HOLE 2	19880822
88	1	RIM SHERD NECK	EARTHENWARE BLACKDUCK	TEST HOLE 2	19880822
89	1	CHARCOAL	CHARCOAL BLACKDUCK	TEST HOLE 2	19880822
90	3	BODY SHERD BODY	EARTHENWARE BLACKDUCK	TEST HOLE 3	19880822
91	1	FLAKE	KNIFE RIVER FLINT BLACKDUCK	TEST HOLE 3	19880822
92	3	FLAKE	SWAN RIVER CHERT BLACKDUCK	TEST HOLE 3	19880822
93	2	FLAKE	KNIFE RIVER FLINT BLACKDUCK	TEST HOLE 3	19880822
94	1	FLAKE	CHERT BLACKDUCK	TEST HOLE 3	19880822
95	2	FLAKE	QUARTZITE BLACKDUCK	TEST HOLE 3	19880822
96	2	RIM SHERD LIP; NECK; SHOULDER	EARTHENWARE BLACKDUCK	TEST HOLE 3	19880822
97	1	RIM SHERD LIP; NECK	EARTHENWARE BLACKDUCK	TEST HOLE 3	19880822
98	5	BODY SHERD BODY	EARTHENWARE BLACKDUCK	TEST HOLE 3	19880822
99	1	BODY SHERDLET BODY	EARTHENWARE BLACKDUCK	TEST HOLE 3	19880822
100	1	BODY SHERDLET BODY	EARTHENWARE BLACKDUCK	TEST HOLE 3	19880822

SPECIMEN CATALOGUE RECORD

Site: DlLg-33/88E / THE FORKS Area: RED RIVER

Donor: THE CITY OF WINNIPEG Acc. No.: A1988-22

Cat. #	Qty	Object Name / Object Type	Material / Cultural Phase	Location on Site	Coll. Date
101	1	BODY SHERDLET BODY	EARTHENWARE BLACKDUCK	TEST HOLE 3	19880822
102	2	LONG BONE MAMMALIA	BONE BLACKDUCK	TEST HOLE 3	19880822
103	1	CARPUS?/TARSUS? MAMMALIA	BONE BLACKDUCK	TEST HOLE 3	19880822
104	1	UNDETERMINED MAMMALIA	BONE BLACKDUCK	TEST HOLE 3	19880822
105	3	LONG BONE AVES	BONE BLACKDUCK	TEST HOLE 3	19880822
106	1	VALVE GASTROPODA	SHELL BLACKDUCK	TEST HOLE 3	19880822
107	3	VALVE UNIONIDAE	SHELL BLACKDUCK	TEST HOLE 3	19880822
108	1	VALVE PROPTERA ALATA	SHELL BLACKDUCK	TEST HOLE 3	19880822
109	1	OTOLITH APLODINOTUS GRUNNIENS	BONE BLACKDUCK	TEST HOLE 3	19880822
110	1	MAXILLA CATOSTOMIDAE	BONE BLACKDUCK	TEST HOLE 3	19880822
111	3	QUADRATE ICTALURUS	BONE BLACKDUCK	TEST HOLE 3	19880822
112	2	PECTORAL SPINE ICTALURUS	BONE BLACKDUCK	TEST HOLE 3	19880822
113	1	DENTARY ICTALURUS	BONE BLACKDUCK	TEST HOLE 3	19880822
114	218	UNDETERMINED FISH	BONE BLACKDUCK	TEST HOLE 3	19880822
115	3	NUT CORYLUS	NUT BLACKDUCK	TEST HOLE 3	19880822
116	1	SHERD BOTTLE	GLASS HISTORIC	TEST HOLE 4	19880823
117	1	LONG BONE MAMMALIA	BONE HISTORIC	TEST HOLE 4	19880823
118	1	MANDIBLE OVIS ARIES	BONE; TOOTH HISTORIC	TEST HOLE 4	19880823
119	1	PECTORAL SPINE ICTALURUS	BONE HISTORIC	TEST HOLE 4	19880823
120	1	OPERCULUM ICTALURUS	BONE BLACKDUCK	TEST HOLE 4	19880823
121	2	SPINE APLODINOTUS GRUNNIENS	BONE BLACKDUCK	TEST HOLE 4	19880823
122	8	UNDETERMINED FISH	BONE BLACKDUCK	TEST HOLE 4	19880823
123	1	FLAKE	KNIFE RIVER FLINT BLACKDUCK	TEST HOLE 4	19880823
124	1	RIM SHERD LIP; NECK	EARTHENWARE BLACKDUCK	TEST HOLE 4	19880823
125	2	RIM SHERD LIP; NECK	EARTHENWARE BLACKDUCK	TEST HOLE 6	19880823

SPECIMEN CATALOGUE RECORD

Site: DlLg-33/88E / THE FORKS Area: RED RIVER

Donor: THE CITY OF WINNIPEG Acc. No.: A1988-22

Cat. #	Qty	Object Name / Object Type	Material / Cultural Phase	Location on Site	Coll. Date
126	3	BODY SHERD BODY	EARTHENWARE BLACKDUCK	TEST HOLE 6	19880823
127	1	VALVE LAMPSILIS VENTRICOSA	SHELL BLACKDUCK	TEST HOLE 6	19880823
128	1	VALVE LAMPSILIS RADIATA	SHELL BLACKDUCK	TEST HOLE 6	19880823
129	1	VALVE LIGUNIA RECTA	SHELL BLACKDUCK	TEST HOLE 6	19880823
130	1	PHALANX BISON BISON	BONE BLACKDUCK	TEST HOLE 6	19880823
131	6	UNDETERMINED MAMMALIA	BONE BLACKDUCK	TEST HOLE 6	19880823
132	1	TIBIA MAMMALIA	BONE BLACKDUCK	TEST HOLE 6	19880823
133	1	HYOMANDIBULAR APLODINOTUS GRUNNIENS	BONE BLACKDUCK	TEST HOLE 6	19880823
134	1	CLEITHRUM ICTALURUS	BONE BLACKDUCK	TEST HOLE 6	19880823
135	1	HYOMANDIBULAR ICTALURUS	BONE BLACKDUCK	TEST HOLE 6	19880823
136	2	PECTORAL SPINE ICTALURUS	BONE BLACKDUCK	TEST HOLE 6	19880823
137	1	ANGULAR ICTALURUS	BONE BLACKDUCK	TEST HOLE 6	19880823
138	58	UNDETERMINED FISH	BONE BLACKDUCK	TEST HOLE 6	19880823

78

1387

APPENDIX D

PROVENIENCE OF SUB-SURFACE INVESTIGATION UNITS IN RELATION TO SITE DATUM

TABLE OF DATA
(refer to Figure 1)

INVESTIGATION	NORTH	WEST
Geo-technical Hole 1	1684.2	1250.0
Geo-technical Hole 2	1657.7	1257.6
Geo-technical Hole 3	1634.8	1265.2
Geo-technical Hole 4	1605.0	1271.2
Geo-technical Hole 5	1574.8	1279.5
Geo-technical Hole 6	1539.0	1281.5
Geo-technical Hole 7	1465.8	1255.6
Geo-technical Hole 8	1419.6	1235.3
Geo-technical Hole 9	1371.3	1215.5
Geo-technical Hole 10	1325.7	1196.3
Geo-technical Hole 11	1281.8	1179.0
Geo-technical Hole 12	1233.6	1155.6
Geo-technical Hole 13	1189.5	1136.8
Geo-technical Hole 14	1144.2	1115.0
Geo-technical Hole 15	1053.0	1075.0
Geo-technical Hole 16	1188.0	1253.5
Backhoe Test Hole 1	1510.0-10.5	1240.5-45.2
Backhoe Test Hole 2	1512.5-13.2	1220.6-24.5
Backhoe Test Hole 3	1515.8-16.6	1191.3-95.8
Backhoe Test Hole 4	1519.0-20.5	1162.5-67.0
Backhoe Test Hole 5	1521.6-22.8	1112.0-15.5
Backhoe Test Hole 6	1630.3-32.0	1256.5-60.0
Backhoe Test Hole 7	1616.3-18.0	1224.2-27.8
Backhoe Test Hole 8	1609.4-10.8	1208.0-11.6
Backhoe Test Hole 9	1598.0-00.2	1181.0-85.4
Backhoe Test Hole 10	1585.2-87.8	1150.4-55.2