

ARCHAEOLOGICAL MONITORING AND MITIGATION OF THE WEST ROADS PROJECT

Submitted to

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EXECUTIVE SUMMARY

The construction of the roads to connect with the new paired Provencher Bridge was a major undertaking lasting from the spring of 2001 until the summer of 2003. The construction consisted of a slight southward realignment of Water Avenue and a major realignment of Pioneer Avenue east of the CNR rail line trestles, as well as rebuilding of both roads west of the trestles and Westbrook Street. Sub-surface services (water, waste water, and land drainage) were installed in conjunction with the new road alignments.

All construction that could impact upon heritage resources was archaeologically monitored. Historic artifacts were recovered from the south edge of Water Avenue where the new alignment encroached upon the former rail yard territory and in the new right-of way of Pioneer Avenue where it diagonally cut across the area that had been previously occupied by structures between Water Avenue and Pioneer Avenue. Pre-Contact archaeological resources were encountered during excavations for the land drainage sewer along Water Avenue and during roadbed excavations for both roads.

A total of 7050 artifacts was recovered during this project. The 49 historic artifacts derived from the Industrial Period (1870 - 1989). The Pre-Contact artifacts (7001) derived from a total of thirteen Pre-Contact archaeological locations. They are all tentatively attributed to the Peace Meeting horizon which was identified and extensively described during The Forks Access Project. That report detailed the evidence deriving from an upper cultural level which represents a large gathering of diverse people from central and southern Manitoba, northwestern Ontario, northeastern Minnesota, and the Red River valley in the Dakotas.

The various archaeological assessments, construction monitoring projects, and mitigation programs, including the West Roads Project, confirm the presence of extensive cultural resources throughout this area of The Forks. Accordingly, it is recommended that no development occur on the periphery of the West Roads Project without the implementation of a detailed heritage resource management plan. Secondly, additional academic research on the recovered artifacts is recommended.

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1.0 INTRODUCTION

In conjunction with the construction of the new Provencher Bridge, the City of Winnipeg has undertaken a reconfiguration of Pioneer and Water Avenues. The construction of the new routes (Figure 1), currently designated as the West Roads Project, will consist of:

- ◆ a southward displacement of Pioneer Avenue beginning immediately east of the CNR embankment;
- ◆ a southward displacement of Water Avenue beginning halfway between the embankment and the Pioneer Boulevard intersection;
- ◆ a southward displacement of the intersection;
- ◆ construction of a twinned, curved roadway from the new intersection to the foot of the new Provencher Bridge; and
- ◆ reconstruction of the existing portions of Water Avenue from the CNR embankment to west of the intersection with Westbrook Street, Pioneer Avenue from the CNR embankment to west of the intersection with Westbrook Street, and Westbrook Street from Pioneer Avenue to Water Avenue.

In addition, considerable realignment and/or replacement of existing sub-surface services (watermains and land drainage sewer lines) will occur (Figure 1):

- ◆ land drainage sewer replacement on Water Avenue from the CNR embankment to the intersection with Waterfront Drive;
- ◆ new land drainage sewer installation on Water Avenue from the intersection to the west abutment of the Provencher Bridge;
- ◆ land drainage sewer realignment along the new configuration of Pioneer Avenue from the CNR embankment to a junction location midway between the CNR embankment and the intersection at Waterfront Drive;
- ◆ land drainage sewer replacement along Westbrook Street and Pioneer Avenue to the CNR embankment;
- ◆ replacement of watermain along Westbrook Street from north of the Portage Avenue East intersection to Pioneer Avenue;
- ◆ replacement of watermain along Water Avenue from west of Westbrook Street to the CNR embankment;
- ◆ installation of new watermain from the Waterfront Drive intersection to the west abutment of the new Provencher Bridge; and
- ◆ installation of new wastewater sewer from the Waterfront Drive intersection to the west abutment of the new Provencher Bridge.

As well, sub-surface excavations for other services such as MTS ductlines, Hydro ductlines, street lighting, and signal light cables occurred at various locations throughout the construction zone.

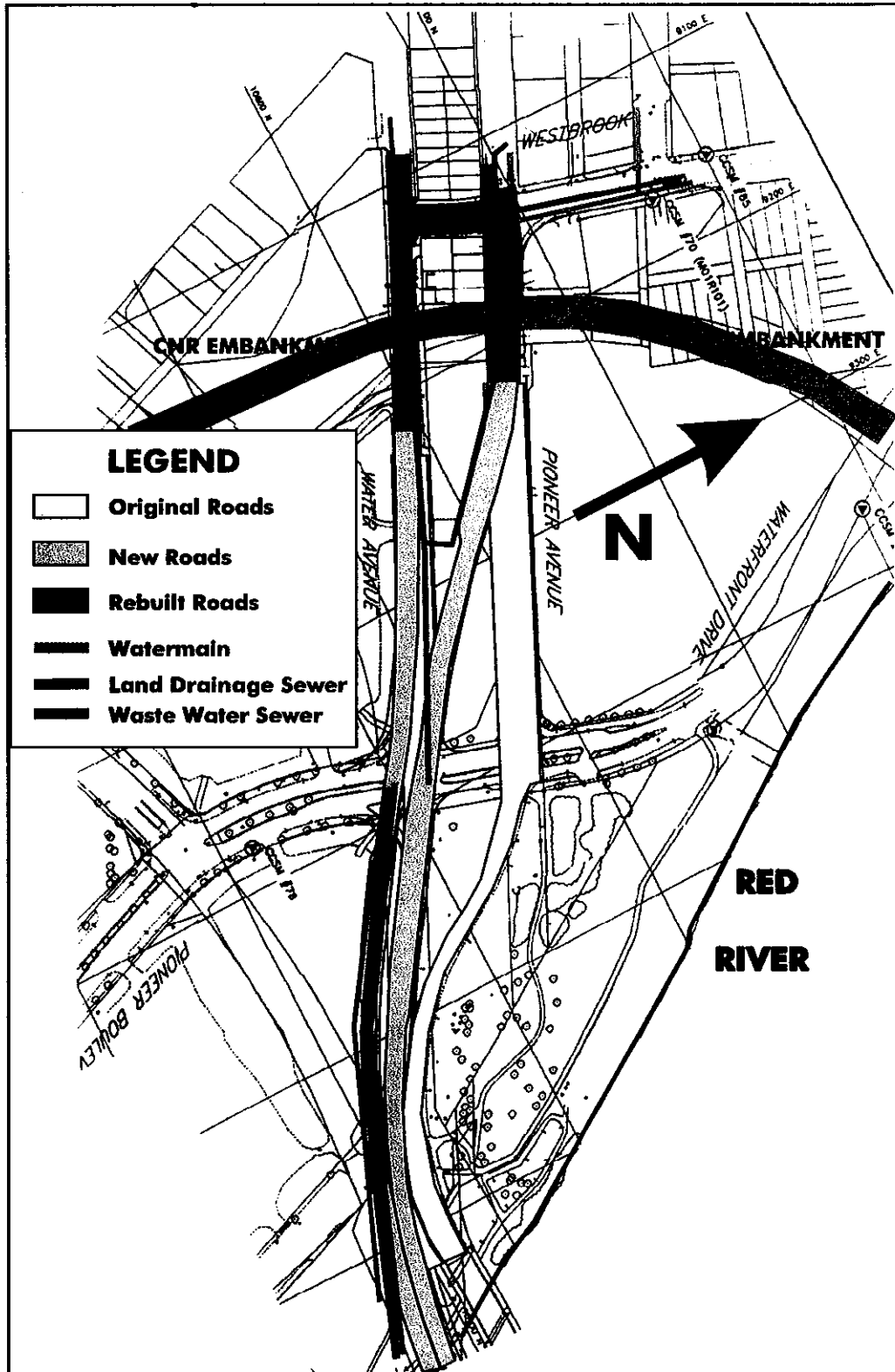


Figure 1: Location of Project Components

Previous projects to the south of the proposed construction impact zone have encountered extensive archaeological resources with several cultural horizons relating to different time periods (Quaternary 1988, 1989, 1990a, 1990b, 1990c, 1999a, 2000a, 2000b). Archaeological impact assessments and construction monitoring programs to the north of the construction area recovered evidence that some of these Pre-European horizons extended into the ballpark area (Quaternary 1996, 2000c, 2003). Archaeological monitoring of the construction of the new Provencher Paired Bridges resulted in the recovery of Industrial Period artifacts (Quaternary 2002a, 2002b). The geo-technical program preceding the construction, which recovered historic and pre-European data, was monitored by Sid Kroker of Quaternary Consultants Ltd. (Quaternary 2001a). Due to the known presence of archaeological resources and the potential requirement of mitigation due to impact from construction, Quaternary Consultants was engaged by Wardrop Engineering to undertake archaeological monitoring of the entire construction program. This monitoring was undertaken under the terms of Heritage Permit A75-01, issued by Historic Resources Branch, Manitoba Culture, Heritage and Tourism (Appendix A). The parameters of the monitoring program had been formulated as a Heritage Resource Management Program based upon recoveries during the geo-technical program (Quaternary 2001a:30-31).

1.1 Scope and Scheduling of the Project

The first phase of the construction was the installation of the land drainage sewer (LDS), beginning at the eastern end. It was located on the south edge of the new alignment of Water Avenue until the intersection with Waterfront Drive. From Waterfront Drive to the CNR Embankment, the land drainage sewer line was installed along the north edge of the original alignment of Water Avenue (Figure 1). The pipe was installed by horizontal boring between vertical shafts which were drilled with a large diameter bit on a truck-mounted auger. While the LDS was being installed, the installation of the wastewater sewer line and the watermain east of the Waterfront Drive intersection was undertaken. These lie south of the new alignment of Water Avenue (Figure 1). The process was similar in that the pipes were installed by horizontal boring, with the vertical shafts being backhoe excavated lineal cuts about 5 meters long. The remainder of the services west of the CNR embankment—watermain on Water Avenue and Westbrook Street, LDS on Westbrook Street— were installed while road construction occurred in the eastern portion of the project.

The road construction was done in staged sections to accommodate the heavy traffic which uses this route. Generally, much of the new section of Water Avenue east of the embankment occupied the original roadbed, with only a slight shift to the south which became more pronounced to the east. At the intersection with Waterfront Drive, Water Avenue was now lying completely south of its original location and continued to do so until the new road connected with the west abutment of the new Provencher Bridge. The new alignment of Pioneer Avenue curved south from its original location at the embankment to occupy the original location of Water Avenue at the Waterfront intersection (Figure 1). From the intersection to the bridge abutment, the placement coincided, to a degree, with the original location of Water Avenue.

All of the sub-surface services installations occurred during Stage 1 of the project during the spring of 2001. The construction of Water Avenue, part of the western end of Pioneer Avenue, and south

Westbrook Street occurred during this stage. The reconfiguration of the Pioneer Boulevard intersection and portions of the new Pioneer Avenue, east and west of the intersection, occurred during Stage 2 in the summer and fall of 2001. Stage 3, during the fall of 2002, consisted largely of finalizing the construction of Pioneer Avenue just east of the railroad underpass. The final component—Stage 4—consisted of construction of the linkage of Pioneer Avenue to the westbound span of the new Provencher Bridge, rebuilding Waterfront Drive (north of the intersection) to correct elevations, and reconstruction of the northern portion of Westbrook Avenue.

1.2 Study Team

The construction monitoring project was directed by Sid Kroker, Senior Archaeologist. The field component was undertaken by Sid Kroker and Barry Greco. Laboratory operations were conducted by Sid Kroker and Pam Goundry. Computer cataloguing of recovered artifacts was conducted by Pam Goundry. Artifact analysis and report preparation was undertaken by Pam Goundry and Sid Kroker. The computer drawn image of the project was adapted from drawings provided by Wardrop Engineering.

1.3 Archaeological Monitoring Methods

1.3.1 Sub-surface Services Installation

All of the sub-surface services were installed by horizontal boring between vertical shafts which had been excavated to the appropriate depth. For the land drainage sewer, the vertical shafts were excavated with a large truck-mounted drill using a 96" auger. The vertical shafts for the waste water lines and the watermains were excavated by a rubber-mount backhoe. In all instances, safety considerations required the installation of a retaining mechanism—a cylindrical sleeve for the drilled holes and sewer cages for the rectangular, backhoe-excavated holes.

During the drilling of the LDS holes, the driller would auger downward until the bit length was filled. When the auger was brought to the surface, the monitoring archaeologist examined the soil on the auger and recorded changes in soil stratigraphy including the depths and thicknesses of different soil layers. Due to the rotary action of the auger, thin soil layers (less than 3 cm thick) may not always be discernable. The degree of disruption by the auger tends to increase with the diameter of the bit. Thus, large diameter bits such as those used for the LDS installation result in considerable churning of the soil before it is brought to the surface. Also, the walls of the hole are often smeared, decreasing the visibility of distinct layers of differing textures. In addition to recording the soil stratigraphy, the archaeologist recovered all artifacts present. In the upper levels, these artifacts were from the historic fill horizons and included some diagnostic artifacts, i.e., those which can provide evidence of time period, company of manufacture, and/or function.

The monitoring archaeologist watched for buried soil horizons and changes in soil texture which could indicate possible former ground surfaces. The indicators watched for are charcoal layers, ash lenses, and/or reddish stained soil. The colour change is usually indicative of oxidation of the iron particles in Red River silt by heat—the more intense the heat, the redder the soil. These features can indicate either

a natural event such as a brush or prairie fire or a cultural event such as a campfire. When evidence of fire is observed, the layer is investigated to ascertain if the cause was natural or cultural. The presence of food remains, particularly mammal or fish bones, resting upon a buried soil is a positive indicator of an archaeological occupation horizon. Other positive indicators are fragments of earthenware containers and/or lithic tools or flakes resulting from tool manufacture.

In instances where pre-European cultural horizons were observed, the operator would temporarily cease operations to allow time to remove material—usually bulk collections of the cultural matrix—from the auger. If time constraints did not permit this action, the operator would spin the material off the auger in a location out of the active zone to permit the archaeologist the opportunity to work in the material and retrieve all of the excavated cultural horizon. As the general cut consisted of a depth of 15 to 25 cm of soil, the thin cultural layers (2 to 4 cm thick) were mixed with a considerable amount of soil from above and below the layer. The optimum method of recovery was bulk retrieval with the subsequent wet-screening of the matrix at the laboratory facilities. This technique ensured maximum recovery.

Similarly, when cultural horizons were encountered during the backhoe excavations, the horizon, along with the encapsulating matrix, was removed from the active area and processed by the monitoring archaeologist. Bulk recovery, often consisting of several pails of soil and cultural material, was conducted. This process results in considerable laboratory time to recover the many minute artifacts which would not have been recoverable in a field processing situation.

1.3.2 Road Construction

The roadbed excavations were undertaken with large backhoes and the soil immediately loaded into trucks for removal from the site. The usual cuts extended from surface to the base of excavations at 130 cm depth. The monitoring archaeologist would watch the face of the excavation to determine if cultural horizons were encountered. In addition, soil profiles were recorded from the sides of the roadbed excavation. In instances where a cultural horizon was observed, the backhoe operator would remove the layer and place the horizon, with the encapsulating soil matrix, to the side of the operation area where the archaeologist was able to process the extracted material for artifact recovery.

1.4 Archaeological Site Designation

Each archaeological site in Canada receives a Borden designation consisting of a four-letter prefix and a numerical suffix. This is a national system of identifying archaeological sites based upon latitude and longitude (Borden 1954). The four letter identifier, DILg, designates a geographical block between 49° 50' and 50° 00' North latitude and 97° 00' and 97° 10' West longitude. Within each block, archaeological sites are assigned sequential numbers upon discovery. This site, lying north of Water Avenue, west of the Red River, east of the CNR Main Line Embankment, and south of Lombard Avenue had been previously designated as DILg-69 (Quaternary 1996). As this was the latest of several projects to be conducted at the site, it had been decided to add a year identifier (01) to the Borden number for the geo-technical program (Quaternary 2001a). As the construction program proceeded rapidly after the geo-

technical program, the same year identifier was continued for cataloguing and identification purposes for recoveries from the current primary pipes and road construction project.

A change in the southern boundary of the designated site (DILg-69) has occurred with the southward displacement of Water Avenue. This means that the recoveries from the south edge of the construction activity would have been considered as deriving from the contiguous site—DILg-33. Discussions with the Archaeological Sites Database Manager at Historic Resources Branch resulted in the decision that site designation will reflect current landmarks rather than eradicated, and probably undeterminable, previous landmarks, i.e., the original location of the south edge of Water Avenue. Thus, it behooves any future researcher and/or consultant working on projects in this vicinity to examine data pertaining to both the southern edge of DILg-69 (Quaternary 2001a) and the northern edge of DILg-33 (Quaternary 1990a, 1990b, 1990c, 1999a).

1.5 Laboratory Procedures

During the project, all recovered artifacts were brought to Quaternary Consultants laboratory facilities, where they were washed and sorted by material class and identified by the lab personnel. The Pre-Contact cultural layer was wet-screened through diminishing meshes. Larger artifacts were retrieved on the 4 mm mesh, while smaller artifacts and fragments of artifacts were recovered on the 2 mm and 1 mm meshes. Due to the high montmorillonitic clay content of the soil, considerable soaking and deflocculation with Calgon® was necessary.

Material of the same type (e.g., plain white dinnerware plate sherds, catfish dentaries) from the same hole and/or location were combined under a single catalogue number. The unidentifiable fragments recovered on the smaller meshes were catalogued as a sample containing charcoal, shell, and bone fragments. A total of 7050 artifacts were recovered—49 historic specimens and 7001 Pre-Contact specimens.

Each artifact received a catalogue number consisting of the Borden designation for the site and a sequential number for permanent identification—DILg-69:01/####. All pertinent data associated with the artifact was entered into a computer cataloguing system, based upon the Canadian Heritage Inventory Network (CHIN) system (Manitoba Museum of Man and Nature 1986; Kroker and Goundry 1993a:Appendix B). The cataloguing program, derived from DBASE3®, generates individual artifact catalogue cards.

Processed artifacts were prepared for storage by inserting the specimens and the catalogue card into standard plastic storage bags, then stapling the bags closed. At the end of the project, all recovered artifacts will be delivered to the Manitoba Museum which has been the repository designated by the City of Winnipeg for artifacts recovered during projects near The Forks.

2.0 STRATIGRAPHY

The stratigraphic data was recorded from sub-surface excavations from Westbrook Street to the west abutment of the new Provencher Bridge. The quality of the data varies, depending on the mechanism used for excavation. During the drilling of the holes for the land drainage sewer, a large diameter (96" which equals 245 cm) auger was used. This results in considerable disruption of the soil column during extraction, limiting the ability to observe thin layers. Accordingly, only macro-stratigraphy is able to be recorded during this operation. In addition, close examination of the walls of the hole is not possible as metal sleeves are installed as soon as the drilling is completed. Where backhoe trenching was used to excavate the vertical shafts (usually 3 to 4 metres long) for watermain and waste water installations, the archaeologist was able to enter the excavation after the sewer cage had been installed and thus was able to record the stratigraphic details from the ends of the trench. During roadbed excavations, stratigraphic profiles were recorded at the vertical walls on both sides of the excavated area.

As the project extended slightly more than 800 metres—from west of Westbrook Street to the west abutment of the new Provencher Bridge, considerable variation in the stratigraphy was observed. The simplest stratigraphic profiles occurred west of the CNR embankment: along Westbrook Street, Water Avenue, Pioneer Avenue, and Portage Avenue East. Generally, the soil profile consisted of recent fill overlying remnants of top soil. The top soil layer usually only consisted of a dark blackish brown B horizon, although in some instances traces of the A horizon were present. The top soil rested on a layer of light brown or tan silty clay which in turn rested on a dark brown silty clay which became more clay-like with depth. This type of soil column was encountered throughout the two Main Street projects (Quaternary 1999b, 2001b) and on the western edge of the Waterfront Drive project (Quaternary 2001c:9). This profile seems to be indicative of the upper bank of the Red River channel, indicating minimal flood deposition over the past several centuries. It was observed that considerable prior impact had occurred within the construction zone—watermains, sewer lines, hydro ductlines, MTS ductlines, and traffic signals, as well as previous road construction. In many excavations, the fill layer had replaced all or most of the top soil horizons (Table 1).

To the east of this former bank level, layers of riverine deposited sediments increase in depth, indicating that the original, post-glacial channel of the Red River was considerably wider than present or that the river has migrated back and forth within an area bounded by the present east bank in St. Boniface and the present location of the CNR embankment. Generally, the riverine sediments are a brown silty clay. The texture tends towards a higher clay content in the deeper portions of the holes. Occasional sand and/or sandy silt layers indicate fast moving waters from a massive flood episode. The riverine sediments overlay lacustrine clays deposited in Glacial Lake Agassiz, which drained circa 8500 years ago.

The thickness of the riverine and fill deposits increase to the east or, stated in a different way, the elevation of the top of the underlying Agassiz clays decreases to the east, reaching the lowest level at the eastern edge of the project and still continuing to diminish toward the current bank of the Red River (Quaternary 2002a). Given that numerous holes were drilled for the installation of the LDS, as well as backhoe trenches for the watermain and waste water sewer lines, a plethora of soil profiles were recorded. Rather than tabulate each of the holes, a generalized graph of the stratigraphy west of the

Waterfront intersection is presented (Figure 2). The profile extends diagonally from the Waterfront Drive intersection northwest to the intersection of Pioneer Avenue and Westbrook Street.

The depth of the fill layer varied depending on whether the excavations occurred within former streets or across the building lots that lay between Water Avenue and Pioneer Avenue. Two major features that had resulted in considerable prior impact were the basement for the former CN/CP Telecommunications building and the footings for the trestle for the CNR Main Line. Below the fill layers, the riverine deposits were predominantly silty clay with some thin layers of sandy silt. Occasional buried soil horizons were encountered, although the diameter of the auger bit diminished the possibility of observing the thinner ones. Cultural material, relating to the 700 year old Peace Meeting horizon, was recovered in the eastern portion of the excavations at Holes 2, 3, 4, and 5. This horizon, generally 2 cm thick, was relatively level in this vicinity at a depth of 200 to 212 cm.

Stratum	Location 1*	Location 2*	Location 3*	Location 4*
Asphalt		0 - 7		0 - 13
Concrete	0 - 25	7 - 42	0 - 32	13 - 67
Gravel	25 - 46	42 - 80	32 - 55	67 - 80
Fill (silt, sand, etc.)	46 - 82		55 - 86	
Dark brown B Horizon	82 - 90	80 - 94	86 - 91	80 - 115
Light tan silty clay	90 - 158 (base)	90 - 203	91 - 180	
Medium brown silty clay		203 - 290	180 - 225	115 - 212
Buried soil horizon				212 - 212
Dark brown clayey silt			225 - 330	212 - 320
Grey brown clay		290 -	330 -	320 -

* Location 1: South side of Water Avenue, west of Westbrook Street

Location 2: Southeast side of intersection of Pioneer Avenue and Westbrook Street

Location 3: Southeast corner of intersection of Westbrook Street and Portage Avenue East

Location 4: Pioneer Avenue west of CNR Embankment

Table 1: Soil Profiles from Western Portion of Project

The existence of an extensive Pre-Contact cultural horizon had already been determined during prior projects. It had been recorded, immediately adjacent to this project, during the watermain installation in conjunction with the CanWest Global Park Baseball Facility (Quaternary 2000c:98-102). The recoveries from Holes 2, 3, 4, and 5 are comparable to the recoveries from the watermain installation in December, 1998 which occurred in virtually the same locality along Water Avenue (Quaternary 2000c:98-102). The recoveries from the relocated Pioneer Avenue, slightly north of the LDS, occurred at diminishing depths to the west. The occurrence at 336.5 East was at 180 cm below surface, while that at 360.0 East occurred at 125 cm. These shallower depths of cultural deposits are comparable with those recorded on the south side of Water Avenue where the three loci were at depths slightly below 100 cm. This also compares with the recoveries during the St. Mary Archaeological Recovery Project which found extensive occupation evidence at depths of 95 cm below surface (Quaternary 1990c:18).

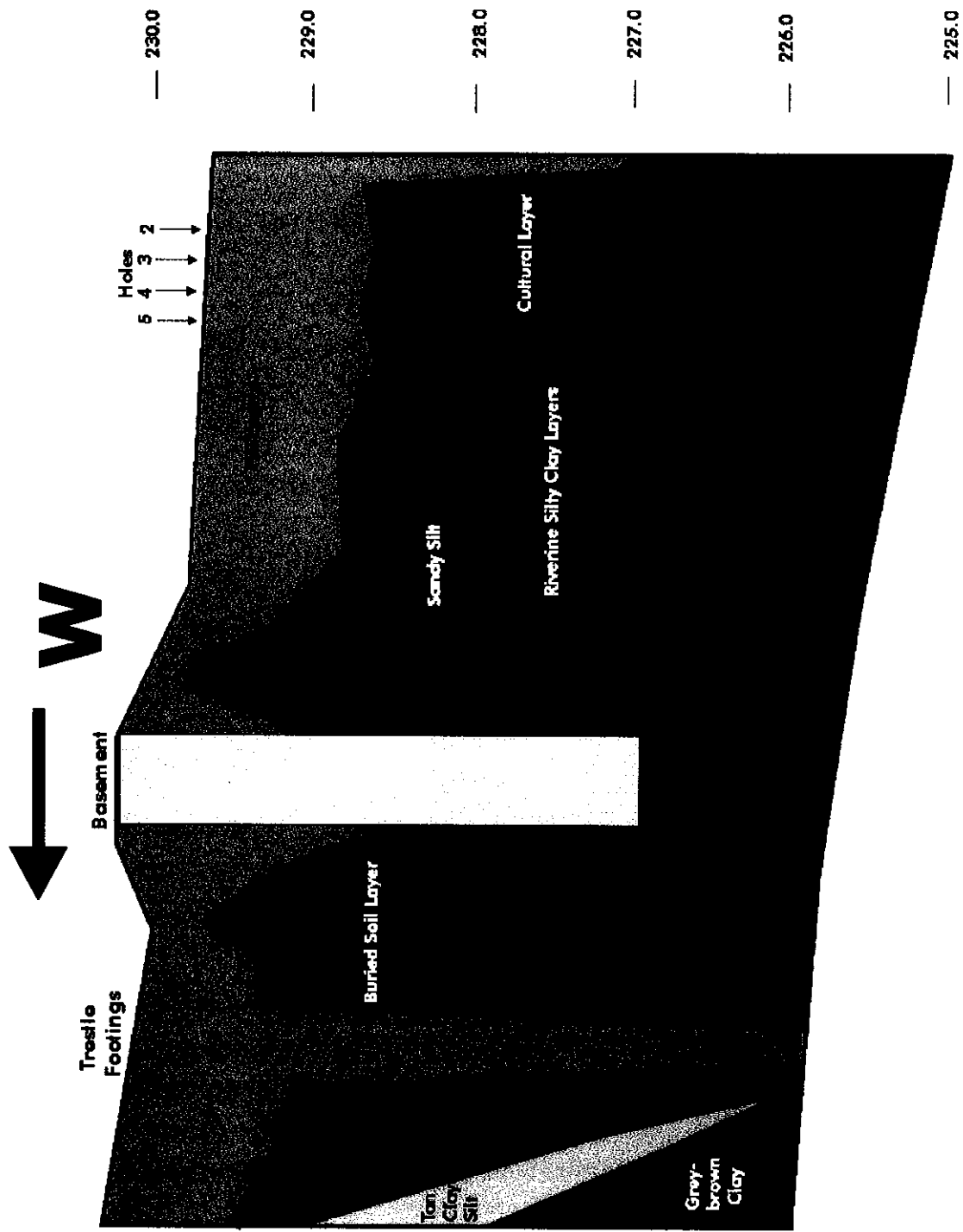


Figure 2: Composite Soil Profile Between Waterfront Drive and Westbrook Street

The absence of this extensive horizon to the east of the Waterfront intersection suggests that the culturally preferred area of occupation curved to the southeast. Evidence was found south of Water Avenue along Pioneer Boulevard (Quaternary 1999a) and east of Pioneer Boulevard at the York Avenue intersection (Quaternary 1989, 2000a). The stratigraphy showing numerous high water episodes suggests that the area currently occupied by the new Water Avenue may have been low lying and subject to multiple floods (Table 2).

SOIL LAYER	AUGER HOLE	BACKHOE HOLE
railroad cinders	0-26	0-30
disturbed top soil	26-43	
medium brown silty clay	43-55	30-195
buried soil horizon	55-55	
medium brown silty clay	55-59	
buried soil horizon	59-59	
dark brown silty clay	59-65	
buried soil horizon	65-66	
medium brown sandy silt	66-68	
buried soil horizon	68-68	
medium brown sandy silt	68-69	
buried soil horizon	69-70	
medium brown silty clay	70-85	
buried soil horizon	85-85	
medium brown silty clay	85-94	
dark brown clay	94-95	
medium brown sandy silt	95-103	
buried soil horizon	103-104	
medium brown silty clay	104-109	
buried soil horizon	109-111	
medium brown silty clay	111-117	
medium brown sandy silt	117-129	
buried soil horizon	129-129	
medium brown silty clay	129-137	
medium brown sandy silt	137-140	
medium brown silty clay	140-178	
medium brown sandy silt	178-185	195-200
medium brown silty clay	185-213 (base)	200-300
medium brown sandy silt		300-310
medium brown silty clay		310-400 (base)

Table 2: Comparative Profiles from Adjacent Holes Excavated by Different Methods

The section east of the Waterfront intersection was marked by a berm paralleling Water Avenue. This berm, approximately 1.5 metres high, had been built on top of the original level of the rail yard. Below the base of the berm, the upper level, consisting of gravel, sand, railroad deposited cinders, and clay or silty clay fill, would have been deposited during land modification activities over the past century while the area was part of the East Yard. The depth of this layer varied from 120 cm to 260 cm, possibly reflecting excavations for ephemeral railroad structures. Below the fill layer, relatively uniform riverine silty clay sediments extended to the base of the excavations. Intermittent manifestations of sand, sandy silt, and buried soil horizons were observed. No cultural material was present. Due to the linear extent of this section and the minimal variability of the profiles recorded at the several excavations for the LDS, the waste water sewer, and the water main installations, it was not deemed useful to provide a graphic representation.

One of the problems with using a large diameter bit is the resultant smearing and difficulty of observing thin sedimentary layers. As a case in point, a backhoe excavation for a fire hydrant occurred adjacent to an auger drilled hole for the LDS. The observed stratigraphic profiles for both are depicted in Table 2. In both soil columns, measurements are taken below original grade, i.e., at the base of the berm which was 100 cm high at this location and consisted of gravel, cinder, and silty clay. It is obvious that the micro-stratigraphy details were lost due to the rotary action of the larger diameter bit and the construction process does not permit access into the drilled hole to record the wall stratigraphy as is the case with backhoe excavations which have sewer cages inserted. Hence, a soil horizon must be relatively thick or have an extremely pronounced variation in colour to be able to be discerned during drilling operations with a bit greater than 40 cm.

3.0 HISTORIC ARTIFACTS

The historic artifacts, recovered during this project, have been analysed within functional categories based on the Canadian Heritage Inventory Network (CHIN) cataloguing format. A total of 49 historic artifacts were recovered.

3.1 Architectural Objects

Artifacts used in the construction, the maintenance, and the furnishing of structures are catalogued in this category. However, due to corrosion and fragmentation, many metal, glass, or wood architectural objects cannot be assigned to a manufacturer or a time period. One artifact in the sub-category of Hardware was curated. DILg-69:01/572 is a complete, square, sheet-cut nail with only a minimal coating of rust. It measures 129.3 mm in length. Sheet-cut nails were developed about 1790 (Nelson 1968:8) and were mass produced by rolling sheets of iron or steel to a uniform thickness then cutting the sheet into nails which taper from top to bottom. The thickness of the nail remains constant from head to point, while the width tapers. The T-shaped or L-shaped head was added to each individual shank. DILg-69:01/572 has an L-shaped head.

Sheet-cut nails were being produced in Montreal in the early part of the 19th century; however they only became common in The Forks area after 1860 when river steamboats transported quantities of American goods into this region (Kroker *et al.* 1991:105; McLeod 1983:148). The first steam boat to arrive in the vicinity of The Forks was the Anson Northup which came up the Red River from Minnesota (Collard 1967:39). Her first regular run began in June of 1860 and two years later she was replaced by a larger steamboat.

3.2 Manufacturing Equipment

This category refers to tools and/or implements used to manufacture other artifacts. DILg-69:01/573 was catalogued in this category, although its exact function is unknown. This rusty iron artifact measures approximately 225 mm in length with 125 mm of that being a flat piece which measures 17.2 mm in width and 7.5 mm in thickness. This flat segment turns into a hollowed out section with a U-shaped opening along one side and is topped with a knob with a hole through the centre. The end of the flat piece is not fine enough to constitute a chisel-like instrument, although it may have been broken and the chisel end is missing. The artifact may have also been a gouge-like tool.

3.3 Clothing

One shoe, DILg-69:01/347, was recovered. It consists of the sole, an insole, and part of the upper of either a small man's shoe or a woman's shoe. The upper is a solid piece of leather with no indication of the type of closure, i.e., eyelets for laces, etc. Many of the iron nails, some rusted, are still intact on the sole and it appears that this shoe might have undergone repair at some point. A double row of nails,

which is not as rusty as the single row, occurs on the sole, near the instep, while in the middle of the sole, there is a heart-shaped design of nails. Perhaps this was added to increase the traction of the shoe on ice.

3.4 Recreation

The recreation category can include such items as smoking equipment, games, musical instruments, and toys. DILg-69:01/581 is one-half of a porcelain saucer from a child's tea set. The diameter is 45.6 mm and the thickness measures 2.6 mm. It is plain white with no indication of a coloured pattern and there are no marks on the base to indicate the manufacturer of this artifact.

3.5 Adornment

The adornment category includes items of jewellery as well as toiletry pieces. DILg-69:01/343 is a complete, black, double-sided plastic comb. It measures 76.4 mm in length and 41.2 mm in width with the teeth on both sides being very closely spaced. These combs are known as fine-toothed combs or louse or nit combs. The 1902 Sears Roebuck Catalogue (Amory 1969) illustrates 3" x 1⁵/₈" hard rubber fine tooth combs with teeth on both sides priced at 4¢ each.

3.6 Medicine

DILg-69:01/344 is a clear plastic syringe, 80.2 mm long. It has a graduated scale, printed in black, of 10 to 100 units on one side with "USE U-100 INSULIN ONLY", "USE ONCE AND DESTROY", and "B-D in a box" on the other side. This syringe contained insulin used in the treatment of diabetes. The "B-D" stands for the Becton Dickinson and Company, of New Jersey, which is a medical technology company that manufactures and sells a wide range of supplies and devices (including insulin needles) for use by medical professionals, research institutions, and the general public (<http://diabetes.about.com>).

3.7 Faunal Remains

Eleven faunal artifacts were recovered, all butchering remains. The specimens were identified using standard references: Gilbert (1973), Olsen (1960, 1964, 1971), and Schmid (1972) and all were examined and identified as specifically as possible: body part, age of individual, and species. Any evidence of butchering techniques, such as cutting or sawing, was recorded as was the condition of the specimens, i.e., charred, broken, chewed, or gnawed.

Ten of the elements could be identified as cow (*Bos taurus*), with a total weight of 1376.3 gms (Table 3). All of the specimens derive from adult animals with several showing evidence of butchering activities such as sawing, axing, and cutting at the joints. Some of the cuts indicate that the animal was sectioned into roasts and steaks. Two examples are the thin slice of bone from the thigh represented by DILg-69:01/585 as a round steak and the cuts of the spinal process of the thoracic vertebra represented by DILg-69:01/584 indicating a shoulder roast.

ELEMENT	CAT.#	QTY	WT	COMMENTS
humerus	157	1	209.8	sawn
	346	1	525.4	-
metatarsus	156	1	271.2	axed
femur	585	1	23.0	sawn
calcaneus	155	1	118.8	axed
rib	154	1	35.2	spiral fracture
	345	2	60.2	sawn, cut marks
metacarpal	587	1	113.2	sawn
vertebra	584	1	19.5	sawn
TOTAL		10	1376.3	

Table 3: *Bos taurus* (cow) Remains

The remaining faunal element is a tibia from a sheep (*Ovis aries*). DILg-69:01/586 weighs 62.3 grams and has been sawn from both sides and then snapped apart.

3.8 Containers

This category includes all artifacts, or portions of artifacts, which are used to contain products. As such, it tends to cross-cut other functional divisions, with assignment to the category based upon form, as much as function. The category contains several sub-categories (Manitoba Museum of Man and Nature 1986), four of which are applicable to the recovered artifacts:

- a. Storage - the purpose of the container is to hold material, e.g., bottles, jars, tin cans;
- b. Cooking - containers used in the preparation of food, e.g., pots and pans;
- c. Dinnerware - the artifact is used in the serving or eating of food; and
- d. Toiletry - artifacts used for personal hygiene, e.g., washbasins, shaving mugs, etc.

3.8.1 Storage

Storage containers include most of the commonly used artifacts in today's material culture. Many products are sold, transported, carried, or stored in a container of some type: bag, box, barrel, jar, sealer, can, bottle, pail. Containers come in a variety of material types such as metal, plastic, paper, ceramic, and glass. Only ceramic and glass artifacts were recovered from this project.

3.8.1.1 Ceramic Containers

Two ceramic artifacts were recovered. Ceramic containers were prevalent during the 19th and earlier part of the 20th century. Many products were sold in stoneware bottles, jars, or jugs and stoneware crocks were used for storage, food processing, or home preserving.

DILg-69:01/583 is a brown, lip, neck, shoulder, handle sherd from a standard shoulder jug. The standard shoulder jug has a sharp demarcation between the vertical body and the domed shoulder/neck (DePasquale *et al.* 1990:27). The handle is the more common style of handle, i.e., a strap handle versus a bale handle. While crocks were used to store predominantly dry goods, jugs were the common storage container for liquid products such as vinegar, wine, spirits, and syrup.

DILg-69:01/336 is a portion of a circular stoneware artifact. In cross-section, the artifact has a flat L-shaped configuration. All surfaces are glazed suggesting that it was inserted into a circular opening. The glazes on the surfaces are dark brown for the interior edge, mottled red-brown on grey for the flat base, grey for the external edge, and grey grading into red-brown for the L-shaped surface. The size of the interior opening versus that of the exterior opening eliminates the possibility that this is a lid from a butter churn (cf. DePasquale *et al.* 1990:53-58, 150).

3.8.1.2 Glass Containers

A large number of complete glass containers and sherds were recovered. Indications of the method of manufacture, which provide information about time period and technology, are often present on these artifacts. Where possible, the specimens have been identified to type of container, i.e., bottle, sealer, and to a functional sub-type such as milk bottle, soft drink bottle, wine bottle, etc.

3.8.1.2.1 Condiment and Food Produce Containers

Representatives of this class are often difficult to identify as many producers used unmarked bottles to which paper labels were affixed. Sometimes the shape of a sherd or a bottle can identify the product, such as the distinctive Ketchup bottle. Some producers had bottles manufactured in private molds which were embossed with their name, e.g., the Heinz Company. One jar, DILg-69:01/597, was designated as a condiment container. This complete clear jar, manufactured in an automatic bottling machine, is relatively large, 193.8 mm in height, and has a mouth diameter of 58.1 mm. It is modified rectangular in cross-section with slight convex longer sides and two panels on each of the ends. A molded vertical frame occurs at each edge of the convex sides. The jar would have been closed with a metal screw cap tightening onto the interrupted lugs. Given the size and diameter of the mouth, the specimen probably contained pickles, olives, or onions. The base is embossed with the "D in a diamond" logo of the Dominion Glass Company as well as "RD 1934", "8", and "4503".

3.8.1.2.2 Milk (or Dairy) Bottles

One incomplete bottle was identified to a non-local dairy. DILg-69:01/596 is a one pint clear bottle which is missing the upper portion of the neck and the finish. The word "LAURENTIA" is embossed on the body in an ascending script. The base is embossed with an "L", in script, and "T. MFG. CO.". This represents the Laurentia Milk Company which is registered in Alberta and Saskatchewan (Chopping 1978:168, 170, 344, 352). Distribution points appear to be Red Deer, Sylvan Lake, Bowden, Olds, and Calgary in Alberta and Battleford and North Battleford in Saskatchewan. The bottle was produced by the Thatcher Manufacturing Company of Elmira, New York, which specialised in milk bottles (Toulouse 1971:496-497).

3.8.1.2.3 *Soft Drink Bottles*

Many bottling firms produced alcoholic and non-alcoholic beverages, often using the same bottles which were identified by paper labels. Specimens recovered archaeologically can only be assigned to the Soft Drink category if the artifact is identified with a brand name or a company name of a firm which only produced non-alcoholic beverages. Those specimens which could not be identified as soft drink containers are discussed in the more generic Beverage section. Four artifacts were identified as soft drink containers.

One Coca Cola bottle, DILg-69:01/591, was curated. This clear specimen is lacking the neck and finish. Beginning in 1917, Coca Cola insisted that all bottlers use the same style which had a pinch waist and vertical ribbing. This style was known as the Mae West bottle (Davis 1967). The embossed text is "COCA COLA", in script, and "TRADEMARK REGISTERED", in print, on both sides of the body, at the shoulder junction. Additional text, "MIN. CONTENTS 6-FL. OZS.", occurs on the body, at the shoulder junction. The base is unusual in that the standard Coca Cola text is missing and the only mark present is the "C in a diamond" of Consumers Glass Company. Given the size of the bottle, it was probably produced between 1945 and 1955.

Coca Cola was invented by Doctor John Pemberton in 1886 and first sold publicly at a soda fountain in Atlanta, Georgia (www.usfirehouse.com). Coca Cola established offices in Winnipeg in 1916 and has maintained a presence in the city ever since. In addition to Coca Cola, the company also produced Gold Seal, Squeeze, and more recently Tab, Sprite, and Fanta (Stock 1978:31-34).

Two complete bottles are identified to a soft drink produced by Drewry's Limited—Golden Key. DILg-69:01/577 is an aqua bottle which has experienced considerable heat trauma. However, evidence of blown-in-mold manufacture is still present as is all of the identifying embossed text. "THE GOLDEN KEY BRAND AERATED WATERS", "REGISTERED TRADEMARK", "E.L. DREWRY", and "WINNIPEG MANITOBA" occur on the body of the bottle along with an outline of a skeleton key. The base is embossed with a "D" and "97" indicating manufacture in 1897. This specimen is identified as Chopping Type MWIN BG6-3 (Chopping 1978:116). The later specimen, DILg-69:01/576, was also blown-in-mold and is clear but has a slight amethyst tint. The standard Winnipeg ownership clause, "THIS BOTTLE IS OUR PROPERTY ANY CHARGE MADE THEREFOR SIMPLY COVERS ITS USE WHILE CONTAINING GOODS BOTTLED BY US AND MUST BE RETURNED WHEN EMPTY", is embossed vertically on the body. The identification "GOLDEN KEY AERATED WATERS" and "REGISTERED TRADEMARK" are embossed in horizontal text around the shoulder. The base is embossed with "E.L. DREWRY", "WINNIPEG", and "01". Chopping (1978:117) identifies this style of bottle as MWIN BG8 but lists it as aqua. This specimen, therefore, would be a sub-variety of that Chopping number.

The Drewry company began in 1877 when E.L. Drewry leased the Redwood Brewery and produced beverages labeled with his name. In 1904, the company name was changed to E.L. Drewry Limited and, in 1921, it became Drewrys Limited. As well as the Redwood location, Drewry purchased the premises of the Empire Brewing Company at Mulvey Avenue East in 1892. Those facilities were sold to Blackwood Brothers shortly after the turn of the century (Peterson and Sweeney 1998:27). In addition

to this brand—Golden Key Brand Aerated Waters—Drewry produced numerous other soft drinks as well as several brands of beer (Stock 1978:11-19).

DLG-69:01/592 is a body, base sherd from an aqua bottle. It has "N.W.A.W. CO." and "...NIPEG" embossed vertically on the body. Chopping (1978:140) illustrates two types of bottles used by the Northwest Aerated Water Company. Both are Hutchinson type closures and have a rounded truncated torpedo base. The difference is in the size and placement of the embossed letters which leads to the identification of this specimen as MWIN B11 (Chopping 1978:140). Stock (1978:26) states that this company began, in Winnipeg, in 1889. It was situated in the Cauchon Building on York Avenue at Main Street until it closed in 1894.

3.8.1.2.4 Beverage Bottles

As noted earlier, breweries bottled both soft drinks and beer and often used the same type of bottle for both products. Without paper labels, it is usually impossible to ascribe a specific product to an archaeologically recovered bottle. Thus, the bottles are assigned to the generalized Beverage class. Depending upon the data embossed on the artifact, it may be possible to identify the producer of the contents, the manufacturer of the container, both, or neither. Based on the extracted information, the recovered specimens are discussed in two sections: those attributable to Winnipeg bottling firms and those attributed to non-Winnipeg bottling firms.

3.8.1.2.4.1 Winnipeg Bottling Firms

The passage of the Manitoba Temperance Act in 1916 resulted in all Winnipeg brewers concentrating on the manufacture of soft drinks and beer for export. The local market for 'Temperance Beer' and medicinally prescribed spirits was further diminished by the 1918 Federal War Measures Act which was in force for one year and prevented importation of alcohol. Broad-based restrictions were eliminated by the introduction of the Liquor Control Act in 1923.

There was an active beverage industry in Winnipeg with several firms vying for the market. Recoveries from this project include bottles representing two of these companies that dominated the local market: Blackwoods and Drewry (Table 4). Blackwood Brothers, later Blackwoods Limited, is better known as a bottler of soft drinks while E.L. Drewry Limited appears to have concentrated on brewing beer.

Blackwoods has a long and involved history. In 1882, it began as the Manitoba Brewing Company and became Blackwoods Brothers shortly after. In 1901, the name was changed to Blackwoods Limited. Another name change occurred in 1921, this time to Blackwoods Beverages (Aerated Water Manufacturing Company Limited). In 1923, the Whistle Bottling Company was formed to take over Blackwoods' business and, in 1934, the name reverted to Blackwoods Beverages Limited (Stock 1978:19; Chopping 1978:99-109). The early incarnations of the Blackwoods business had various locations. Just after 1900, William and A.T.R. Blackwood bought a pre-existing building (built in the early 1880s) at 409-421 Mulvey Avenue East. In 1920, Blackwoods sold this property. Originally, the building on the Mulvey site had been a factory and then, over the years, it was the home of other brewing

companies—E.L. Drewry, Pelissier Brewery, Labatts. Today, various manufacturing companies occupy it (Peterson and Sweeney 1998:27).

DILg-69:01/593 is a complete, pale greenish aqua bottle with the standard ownership clause printed on the body with the addition of “BLACKWOOD'S LIMITED”. “BLACKWOODS” and “WINNIPEG” (inverted) is embossed horizontally on the body, at the base. The company logo, two Bs in a triangle, occurs on the base along with the phrase “OUR TRADE MARK”.

COMPANY	CAT. #	QTY	COLOUR	PORTION	CHOPPING NO.
Blackwoods	593	1	aqua	complete	MWIN BA18-4
Drewry	574	1	green	body,base	MWIN BG18-3
	575	1	clear	complete	MWIN BG9-2
	594	1	aqua	complete	MWIN BG12-1
TOTAL		4			

Table 4: Identified Winnipeg Beverage Bottles

As previously noted, the Drewry company began in 1877. As well as beers and ales, the firm produced several brands of soft drinks over the years (Stock 1978:11-13).

Three different types of Drewry bottles were recovered (Table 4) and identified using Chopping (1978). Drewry products are extremely useful as temporal markers in that the date of manufacture is embossed on the base of the bottles. The recovered artifacts represent the years 1902, 1905, and 1911. The Winnipeg-specific ownership clause is embossed on the body of all specimens. The company name and Winnipeg are embossed in various locations—most often on the shoulder and the base.

3.8.1.2.4.2 Non-Winnipeg Bottling Firms

DILg-69:01/595 is a complete dark green bottle with a crown closure. The base is embossed with an “M in a large circle” and “7”. The mark identifies the Maryland Glass Corporation of Baltimore, Maryland which was a wholly owned subsidiary of the Emerson Drug Company (Toulouse 1971:339). The bottle was manufactured in an automatic machine which, for this company, would have been after 1915. The shape and colour are reminiscent of 6 ounce 7-UP or Ginger Ale bottles and may represent one of those brands, possibly an American product.

3.8.1.2.5 Wine Bottles

DILg-69:01/578 was designated as a wine bottle. One of the identifying features of early wine bottles was the kick-up which is a raised section of the base. This feature originated as a sediment trap and is currently retained as a tradition. Often, a mamelon—a small downward projecting dome of glass—is present in the centre of the kick-up. Colour is another indicator of early wine bottles as is the type of lip.

Most 19th century bottles are olive in colour and have applied lips which would be closed with a cork. DILg-69:01/578 is a neck, body, base sherd from a dark olive wine bottle and it has a kick-up, but no mamelon.

3.8.1.2.6 Gin Bottles

One body, base sherd is tentatively identified as a gin bottle. DILg-69:01/590 is square in cross-section with no decoration or markings. It probably is a case gin bottle. These bottles are distinguishable by their square cross-section and decorative vertical ribbing. The shape was a function of ocean shipment of the product: square bottles could be packed with more to a box and were less likely to break, due to rough handling, than round bottles. They were made in Holland, England, and America in the 19th century. Bottles with no embossing were probably made pre-1850, while bottles with embossing were manufactured post-1850 (Klamkin 1971:82-83).

3.8.1.2.7 Whisky Bottles

Three specimens were assigned to the Whisky category. DILg-69:01/599 and 600 are very similar in shape and finish. Both are oval in cross-section and have an applied V-shaped string rim finish (Jones and Sullivan 1985:96). DILg-69:01/599 is slightly shorter and is a dark olive green in colour with an outlined rectangular panel on one side of the body, probably for a paper label. DILg-69:01/600 is taller and is a lighter brownish olive colour. Neither bottle has any markings to identify the contents, the product manufacturer, or the bottle manufacturer.

DILg-69:01/598 is a complete, clear, flask-shaped bottle. It has an applied flattened side finish with an internal constriction of the bore. The sides of the flask are concave and the bottle tapers from the shoulder to the base. No markings are present.

3.8.1.2.8 Unassigned Bottles

Artifacts in this grouping have some identifying characteristics, such as shape or manufacturer's marks. However, the data is insufficient to permit identification of the function of the container; i.e., sealer versus milk bottle or medicine bottle versus condiment bottle. Some specimens with marks could be attributed to a manufacturer but not to a functional grouping. Occasionally, the style of manufacture of the neck and lip of bottles suggests the possible contents of the container. Also, the type of closure and evidence of manufacturing technique can provide approximate dates. For example, the length of the mold seam can indicate a general age; e.g., if the seam extends to the lip of the bottle, it was produced after 1920.

There are three complete bottles and one incomplete specimen in this sub-type. DILg-69:01/337 is a cylindrical, aqua bottle with an applied square ring finish. The shape and lip are suggestive of flavouring extracts but there are no markings to indicate this. DILg-69:01/579 is a rectangular clear bottle with chamfered corners. The attenuate neck has an applied down tooled finish which would have been closed with a cork. There are no markings on this artifact. DILg-69:01/588 is a small, square bottle with traces of an applied finish which may be a square ring lip. Again, there are no markings on this bottle. DILg-69:01/589 is an aqua lip, neck sherd with a down tooled, V-shaped string rim (Jones and Sullivan

1985:92, 96). The combination of vertical and horizontal seams indicate manufacture in an early automatic machine. The size and shape of the specimen suggest that it could have been a liquor bottle.

3.8.2 *Cooking*

One artifact was assigned to the Cooking category. DILg-69:01/582 is a body sherd from a stoneware mixing bowl. The interior surface is a deep yellow while the exterior surface has a pattern of three horizontal white stripes with black edges on the yellow background. The stripes each measure 11.3 mm in width. While not identical to any illustrated, these types of mixing bowls are typical of those produced by the various potteries in Red Wing, Minnesota and Medicine Hat, Alberta (DePasquale *et al.* 1990; Getty 1994; Symonds 1974).

3.8.3 *Dinnerware*

Dinnerware comes in a variety of material types, but only ceramic artifacts were recovered from the West Roads Project. Ceramic dinnerware includes place settings—plates, small bowls, cups and saucers—and serving pieces—platters, large bowls, creamers, etc. Archaeological recoveries are often too fragmented to allow exact identification and this is reflected in the use of object types such as bowl?, plate?/saucer?, and bowl?/cup?. Because dinnerware is usually manufactured in sets of the same pattern, the decorative features of a set cross-cut the types of objects. The eight dinnerware artifacts include seven white specimens and one blue-on-white specimen. Within these colour categories, decorative design and any information such as manufacturer, jobber, company of use, etc. will be discussed.

3.8.3.1 *White Ceramics*

White sherds are only fragments of complete objects—there may be patterns with other colours that fit onto these sherds. Of the seven white sherds, two have no indication of a pattern or a manufacturer. DILg-69:01/338 is a very thick, 7.0 mm, body,base sherd from a saucer, while DILg-69:01/580 is a much thinner, 2.8 mm, lip,body sherd from a cup. The thickness of the saucer sherd may indicate age as earlier products were often thicker or, more likely, represents the distinction between coarse utilitarian everyday ware versus the finer, more expensive special occasion china.

3.8.3.1.1 *Manufacturers of White Ceramics*

Two of the white sherds have portions of a maker's mark which, in some cases, permits the identification of the company that manufactured the dinnerware item. In addition to identifying the company, the period of manufacture can often be determined due to changes in the logos over time. Occasionally, the client for whom the dinnerware was produced is denoted by a name or insignia on the sherd.

DILg-69:01/335 is a lip,body,base sherd from a thick, 7.5 mm, dinner-sized plate. The upper surface is heavily crazed which is the crackling of the glaze into an overlapping dendritic pattern. This is usually a result of age. The base has a black Royal Arms mark with "ROYAL...", printed above it, and "CLEMENTSON...", printed below it. This is the mark of the Clementson Brothers Ltd. of Hanley, Staffordshire, England which was in business from 1865 until 1916. Godden (1964:149) notes that the

Royal Arms mark was used between 1867 and 1880, however his illustrated mark does not have the Royal... above it. It is possible that this was a later addition and therefore, could have been used after 1880.

DILg-69:01/571 is a body,base sherd from an unusual shaped dish. The complete dish would have been oval in shape with a molded body. The interior of the dish has a raised wave-like piece that goes from side to side. It is possible that there was a similar corresponding piece at the other end of the dish, but this is now missing. This dish may have been used as a holder for cutlery or for some type of food. The base has a portion of a black Royal Arms mark. The British Royal Arms mark was used by many firms in England, the United States, and Europe, so it is often impossible to assign these marks to any one company without further information on the sherd.

3.8.3.1.2 Embossing and Molding on White Ceramics

Three white sherds have decorative designs formed by embossing or molding. Embossed patterns were very common during the Victorian era. Two lip,body plate sherds—DILg-69:01/334, which has a very obvious Wheat pattern, and DILg-69:01/340, which has an obscured Wheat pattern—were curated.

The Wheat pattern is a long-lived popular design which was manufactured by many companies in England, a few in Scotland, at least one in Canada, and possibly one in France (Sussman 1985:7-10). In addition, Sussman notes that the Wheat pattern seems to have been manufactured solely for the North American market, and although expensive in the beginning (the 1850s and 1860s), it eventually became, by 1897, one of the cheaper dinnerwares. Sussman (1985:15) states that often the patterns of wheat from various companies are not distinguishable. She divides the Wheat pattern into a type with three rows of kernels in the head and a second type with two rows of kernels in the head. DILg-69:01/334 is a three row kernel, while DILg-69:01/340 is indistinguishable. Neither sherd has a manufacturer's mark but the leaf design on DILg-69:01/334 does resemble the pattern of the Robert Cochran and Company of Glasgow as well as those on the Turner, Goddard and Company specimens of Tunstall, England. DILg-69:01/340 is heavily crazed and stained which adds to the obscuring of the design.

DILg-69:01/339, also a lip,body plate sherd, has an embossed pattern on the body. This is the rope and ribbons portion of the wheat, rope and ribbons pattern as illustrated in Sussman (1985:71) which was only produced by Thomas Furnival and Sons of Cobridge, Staffordshire. The pattern, which is unnamed, was registered on April 20, 1878. Thomas Furnival and Sons produced pottery, under this name, until 1890 when the name was changed to Furnivals Limited. Sussman notes that:

As marked examples of this pattern have not been found, there is no saying how long it was produced. There is no evidence that the pattern was produced by any other manufacturer. (Sussman 1985:71)

3.8.3.2 Blue-on-White Ceramics

One lip,body sherd, from a thick-walled (6.7 mm) plate, was recovered. DILg-69:01/342 has an extensive blue-on-white pattern starting with a band, occurring just below the lip, which consists of zig-zag lines between two thin royal blue lines. The zig-zags have a single solid blue triangle, either right way

up or inverted, between them. This band measures 6.3 mm. Below this, on the body, is a 21.9 mm band which is outlined with a solid blue line and has a pattern of interlocking lines on a blue background. The lines are wide with a pale blue pattern line on white with a line of darker blue dots in the centre of the pale blue portion. At the junction of the body with the base is a thinner band measuring 3.3 mm. This band is outlined, on the upper edge, with the royal blue colour and has a horizontal line of dots in the centre of it. This is a transfer print pattern and the join where the pattern would have overlapped is obvious on this sherd; where the pattern meets, there are two upright triangles instead of one.

The border on this sherd is identical to that of one illustrated in Sussman (1979:222). She notes that the pattern is called Turco (or D4365) and it appeared in the W.T. Copeland and Sons catalogue in 1882. DILg-69:01/342 has no indication of a manufacturer and in all likelihood was not made by the Spode/Copeland companies as it is a much coarser paste, thicker in body, and not particularly well executed in the pattern. It is probably of more recent manufacture, perhaps in the early part of the 20th century.

3.8.4 Toiletry

Although toiletry occurs as a sub-category of the Adornment category, and includes artifacts like combs, mirrors, razors, etc., some specimens do not fit into that definition. The sub-category of toiletry was also added to the Container category and this would include items which were used to achieve personal hygiene—wash bowls, water pitchers, soap dishes, shaving mugs, and brush mugs. These items could be purchased separately or as a part of a Toilet Set.

DILg-69:01/341 is a thick, large lip, body sherd from a bowl. The size and curvature of this sherd would indicate that it most likely was part of a wash basin from a toilet set. The pattern is a Wheat pattern and, although a spall occurs in the middle of the wheat head, it appears to be a three row kernel. While there is no manufacturer's mark on this sherd, the leaves and wheat head do resemble those on a chamber pot, illustrated by Sussman (1985:42), which has a Wheat and Hops pattern. The chamber pot was manufactured by Alfred Meakin Limited of Tunstall, England and bears a mark of circa 1914 to 1930. DILg-69:01/341 cannot be definitely assigned to either this particular pattern or the maker.

4.0 PRE-CONTACT ARTIFACTS

During the monitoring of the construction activities (sub-surface services and roadbed excavation), Pre-Contact cultural resources were recorded at several locations (Figure 3).

The loci in close proximity and at similar depths below surface likely represent portions of a single occupation event. The linkage becomes more tenuous as the distance between locations increases.

The Contractors's Survey Grid was used to identify the geographical locations of the recoveries. Thus, using the construction plans, with the noted bench marks, all locations can be relocated through standard surveying techniques. The comprehensiveness of the recoveries varied, depending upon the construction activity that was occurring. Artifacts could be recovered from the augers during the drilling for vertical shafts. This procedure would result in 80 - 90% recovery, either through hand retrieval or bulk recovery of the cultural matrix for further processing at the laboratory. During roadbed excavations, slumpage of material at the excavation face could obscure the presence of cultural horizons for one or more buckets. After observation, the monitoring archaeologist would have the backhoe operator remove the overburden, then scoop out the 2 - 5 cm thick cultural deposit, and place the soil and encapsulated artifacts to the side of the active working area for archaeological examination and artifact recovery.

Thirteen discrete loci were identified with archaeological resources. From these, a total of 7001 Pre-Contact artifacts were recovered.

4.1 Hole 2

In many archaeological sites, the preponderance of recovered artifacts are the remains resulting from food procurement. The combinations of permeable types of soil, frequent floods causing relatively thick layers of riverine sedimentation, and the lack of forest fires result in a very high degree of preservation of faunal material within the general area of The Forks.

All recovered faunal material was identified using the standard references: Casteel (1976), Clarke (1981), Gilbert (1973), Mundell (1975), Olsen (1960, 1964, 1968, 1971), Schmid (1972). The faunal remains were examined and identified as specifically as possible: body part, age of individual, and species. Evidence of butchering techniques, such as cut marks, was recorded as was the condition of the specimen, i.e., charred, broken, chewed, or gnawed.

Three faunal specimens were recovered from Hole 2, all from a depth of 240.0 centimetres DBS. DILg-69:01/160 is a rib from a medium mammal. It weighs 5.2 grams and has evidence of butchering in the form of cut marks. DILg-69:01/161 is a long bone, weighing 15.9 gms, from a large mammal. DILg-69:01/162 is a metatarsus from a deer (*Odocoileus* sp.). It weighs 72.7 grams. This specimen shows evidence of carnivore chewing, either by a dog, wolf, or fox.

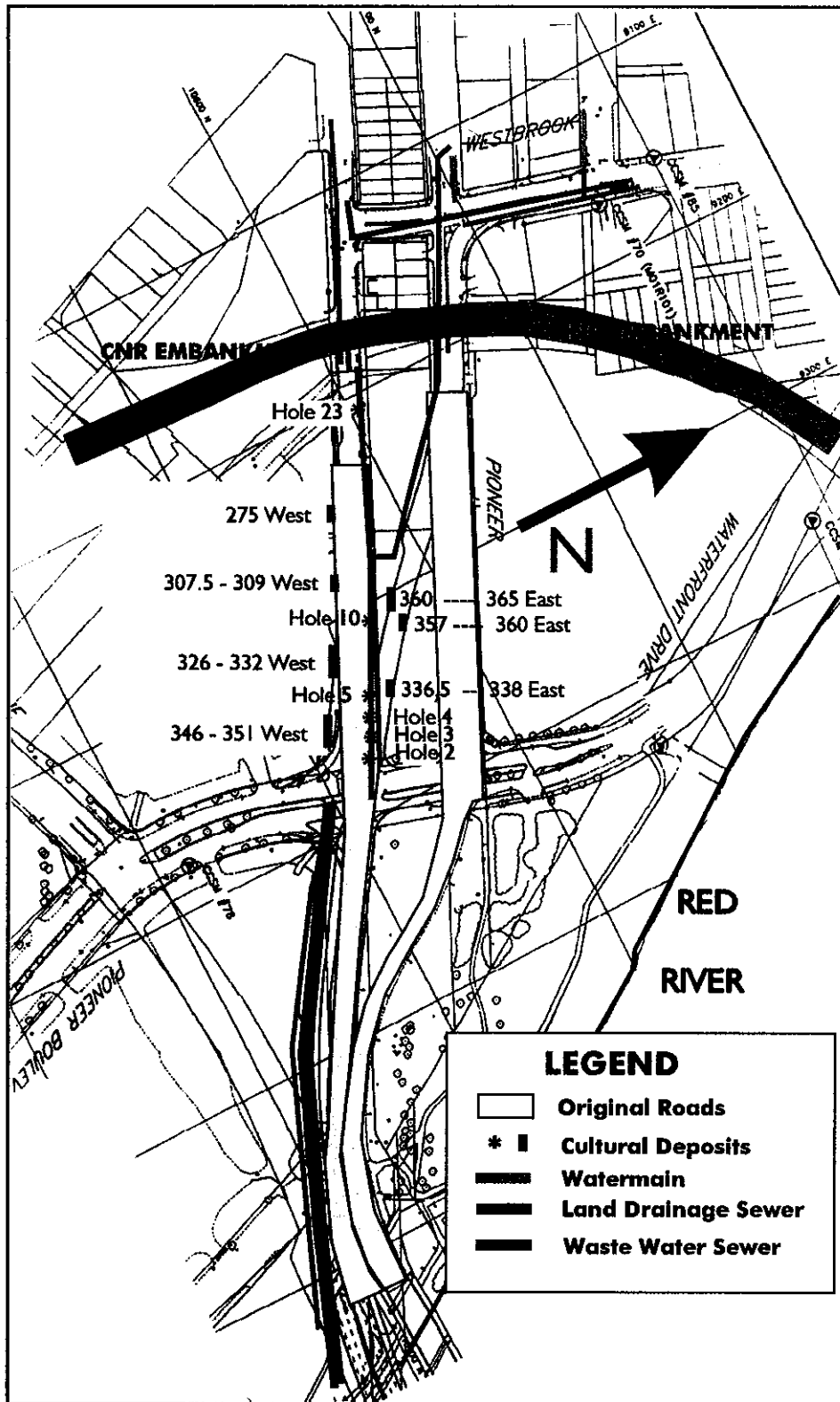


Figure 3: Location of Pre-Contact Archaeological Recoveries

4.2 Hole 3

A total of 383 artifacts were recovered from Hole 3, all at a depth of 210.0 cm DBS. These include lithic, ceramic, faunal, and floral material.

4.2.1 Lithic Artifacts

The lithic component of pre-European tool kits is the portion that tends to preserve the best. Bone and wooden tools, as well as clothing and other organic artifacts, decay or burn during prairie/forest fires. Due to the indestructibility of stone artifacts, they have become one of the standard diagnostic tools for assessing cultural affiliations. This assessment is predicated upon the assumption that there were standardized forms for each type of artifact within each cultural group at a specific time period. However, considerable variation can occur due to the degree of skill of the individual tool maker, the quality of the lithic material from which the tool is being made, and the borrowing of ideas from other cultural groups. The above discussion applies to tools such as projectile points and scrapers, rather than non-diagnostic lithic detritus. The eight lithic artifacts consist of seven flakes and one fragment of fire-cracked rock.

4.2.1.1 Detritus

Detritus is the category under which the byproducts and waste elements of the tool manufacturing process are catalogued. This category refers to lithic material and includes flakes and cores. It can also include fragments of copper and, in proto/post-Contact times, iron. This category also includes waste products from the manufacture of bone or wooden tools.

The manufacture of stone tools is a complex process. Cobbles and pebbles of the desired raw material are struck with a hammerstone to remove flakes. A source cobbles with flakes removed is known as a core. The flakes which have been removed are further shaped, using a stone or antler billet to strike off smaller flakes to thin the original object and to produce the desired shape. At this time, a pointed implement called a flaker, usually made of antler, is used to press small flakes from the edge to produce a sharp, straight cutting edge. During this process, many flakes are produced—some are further modified as retouched flakes, others are used *as is* as expedient cutting tools, but most are discarded at the place of manufacture.

Within the seven flakes, four lithic material types are represented, the predominant one being undifferentiated chert (Table 5).

Lithic source areas for tool manufacture can be divided into six groups—three of which, Group II, Group IV, and Group V are present in the recovered material:

- Group I: Materials found throughout the western portion of Manitoba. This group includes Swan River Chert from the Swan River Valley region near the Saskatchewan border and St. Ambrose Chert from Lake Manitoba. Other materials, i.e., chalcedony and jasper, are found in deposits such as the Souris Gravel Pits.

- Group II: Materials found to the south. The primary example of this group is Knife River Flint which occurs at quarry locations in North Dakota.
- Group III: Materials associated with the Canadian Shield, found to the east and to the north of the Red River. This group consists of quartz and rhyolite.
- Group IV: Materials whose distribution is a result of glacial transportation and can be found throughout the province. This group is represented by quartzite, siltstone, silicified sediment, and the various types of undifferentiated chert.
- Group V: Materials from nearby quarry sources. This group is represented by Selkirk Chert and the limestone matrix in which the nodules occur.
- Group VI: Materials from the western Lake Superior area, especially around Thunder Bay. This group includes Gunflint Chert and Jasper Taconite.

MATERIAL	GROUP	QUANTITY	FREQUENCY	WEIGHT	FREQUENCY
Knife River Flint	II	1	14.3	0.1	3.3
Chert	IV	3	42.9	0.1	3.3
Quartzite	IV	1	14.3	2.5	83.3
Selkirk Chert	V	2	28.6	0.3	10.0
TOTAL		7	100.1	3.0	99.9

Table 5: Flake Recoveries from Hole 3 by Material Type

Inasmuch as lithic materials are not available at the site, all material would have been transported to the location by the occupants. Some materials, such as Group IV, could have been obtained at creek mouths and riffle areas to the west along the Assiniboine River. The Selkirk Chert (Group V) would have been obtained from the limestone outcrops at the St. Andrews Rapids, slightly north along the Red River. The Knife River Flint (Group II) probably was obtained by trade as the source areas are along the Knife River in North Dakota (Burns 1995:33-34). The most predominant groupings of lithic materials often represent source areas recently visited by the occupants.

A limited assemblage such as this one, which albeit showing very strong reliance on locally obtained material, is too small to enable definitive statements about the source areas represented within the entire site. The presence of locally obtainable material indicates a knowledge of regional lithic source areas and suggests the practise of gathering tool-quality material when the opportunity arises. As certain types of material are favoured for specific tools, often that type of material is carried until needed. Thus, representations of previously visited areas or source areas accessed by traders can often occur as components of a lithic assemblage.

4.2.1.2 Fire-cracked Rock

Fire-cracked rocks are those specimens which have evidence of being subjected to intense heat. Depending upon the structure of the rock, extreme temperature variations cause different results. Fine-

grained homogenous lithic cobbles, such as limestone, quartzite, and rhyolite, will spall and shatter into angular fragments, while coarse-grained granitic rocks will tend to decompose into smaller granular fragments of the different parent materials, i.e., granite, granodiorite, diorite, etc. One granite fire-cracked rock fragment (DILg-69:01/171) was recovered. It weighs 32.8 grams.

4.2.2 *Ceramics*

Seven ceramic sherds were recovered. These consist of one body sherd, five body sherdlets, and one rim sherd.

4.2.2.1 *Body Sherds*

As with every ceramic assemblage, the bulk of the sherds are from the body of the pot. Mathematically, this makes sense since the decorated upper portions of the vessel, which are defined as the rim, usually account for less (generally much less) than 20% of the total vessel surface. Body sherds have traditionally been considered less diagnostic than the rims, necks, and shoulders that comprise the decorated portion of the vessel. However, it is the experience of archaeologists who replicate pottery that decorations are normally easier to reproduce than surface impressions. Until a systematic method of analyzing and describing the visible variation in the body sherds is developed, the level of description tends to be relatively coarse.

Surface treatment was the only attribute apart from weight that was systematically examined for every item in this assemblage. DILg-69:01/165, the body sherd, displays an obliterated textile impressed surface. The surface impressions (or lack thereof) could not be determined, due to exfoliation, for the five body sherdlets (DILg-69:01/166). The total weight of all these sherds is 2.7 grams.

4.2.2.2 *Rim Sherds*

Rim sherds are defined as the upper, usually decorated, portion of the vessel and consist minimally of the lip and parts of the neck. For some types of ceramic wares, the decorations extend to the shoulder junction and fragments of these also fall under the definition of rim sherd. One rim sherd, DILg-69:01/164, was recovered from Hole 3. It is decorated with at least three horizontal rows of cord wrapped impressions (CWOI). Two small oblong punctates have been added after the horizontal impressions were made and thereby obliterate a portion of one of the horizontal rows. This style of decoration is either Blackduck or a derivative pattern that could be attributed to the Rainy River Complex. The sherd weighs 5.0 grams and measures 26.7 mm wide and 22.6 mm long and derives from the neck portion of the vessel.

4.2.3 *Faunal Remains*

The largest number of artifacts consists of faunal objects. These include a bone tool, butchering remains, a sample, and natural faunal deposits.

4.2.3.1 Faunal Tools

DILg-69:01/163 is a gracile bone needle. The specimen is long, 136.1 mm, and skinny, with a maximum width of 3.8 mm. It weighs 1.7 grams. The distal tip has been ground to a fine rounded point but very little modification appears to have occurred on the rest of the specimen except for a diagonal knife slice at the extreme proximal end. Considerable wear polish occurs from the medial point (which may have been where it was grasped) to the distal end with lesser polish towards the proximal end. Although modified, it is possible to determine that the bone derives from the pubis of a large bird (Aves), probably waterfowl.

4.2.3.2 Butchering Remains

As is usually the case, food residue in the form of butchering remains is the highest percentage of recovery. A total of 343 artifacts, with a combined weight of 144.0 grams, was recovered. While samples could be construed as butchering remains, in that they are the result of cluster cataloguing of minute residue obtained during the wet screening process, they are not included in the quantities or weights of butchering remains. This is done so as not to skew the percentages inordinately in favour of undetermined or unidentifiable fragments. As such, the quantities that can be identified to specific taxa more closely reflect the actual food procurement practices of the peoples that camped here.

For comparative purposes, the identified taxa are listed in Table 6. The frequencies of each taxon are calculated on the combined weight and quantities of all recoveries to give a picture of the relative frequency within the entire faunal food assemblage.

Some post-depositional trauma occurs during or immediately after the food preparation process when bone fragments are placed into the fire. The result is bone which is either charred or calcined (so thoroughly burned that only the inorganic white calcium carbonate remains). Eleven unidentifiable mammal bone fragments are charred and three are calcined. In addition, one unidentifiable fish bone is calcined.

Archaeologists have many techniques to analyse the protein component of Pre-Contact diets. The most common method is to determine the minimum number of individuals of each species represented at the site. This is done by selecting the most frequent element, e.g., left dentary of a catfish, right femur of a bison, etc., and using that number as the minimum number of animals that would have been harvested. A rigorous analysis uses these minimum numbers and an average body weight of the particular species to determine the amount of usable meat that is represented by the bones in the faunal assemblage. This can be further refined by using base line measurements of the specific element and calculating percentage size ratios of the recovered specimens and then applying that corrected value to the usable meat formula. As an example, a dentary from a 10 kilogram catfish measures a certain length and the archaeological specimens may range from 50% to 150% of that size. The usable meat would be a compilation of the combined ratios times 10 kilograms. A study of this type is applicable when large portions of an occupation site have been excavated. It is not valid for a project like this where a very limited sampling of the cultural horizon has occurred.

The frequency of the butchering remains is calculated by both quantity and weight (Table 6). In quantity, the fish remains overwhelm the other taxa. However, as fish bone is small and light in comparison to the larger and denser mammal bone, the proportions are reversed when weight is considered. In this rather simplistic type of analysis, the amount of available meat is deemed to be relatively proportional to the weight of the residue, although in the case of shellfish, the weight of the discarded shell is considerably greater than that of the available meat.

TAXON	QTY	FREQUENCY	WT	FREQUENCY
Aves				
Medium Bird	1	0.3	0.7	0.5
TOTAL AVES	1	0.3	0.7	0.5
Mammal				
Large Mammal	8	2.3	50.4	35.0
Undetermined Mammal	70	20.4	32.4	22.5
Rodent Family (Rodentia)				
Beaver (<i>Castor canadensis</i>)	2	0.6	2.6	1.8
TOTAL MAMMAL	80	23.3	85.4	59.3
Undifferentiated Fish	216	63.0	17.7	12.3
Catfish (<i>Ictalurus</i> sp.)	37	10.8	22.5	15.6
Drum (<i>Aplodinotus grunniens</i>)	1	0.3	0.1	0.1
Sucker family (Catostomidae)	2	0.6	0.3	0.2
TOTAL FISH	256	74.6	40.6	28.2
Freshwater Clam (Unionidae)	4	1.2	1.8	1.3
Black Sand-shell (<i>Ligumia recta</i>)	2	0.6	15.5	10.8
TOTAL SHELLFISH	6	1.7	17.3	12.0
TOTAL BUTCHERING REMAINS	343	99.9	144.0	100.0

Table 6: Faunal Recoveries from Hole 3

The recoveries are not sufficient to be able to make substantive statements as to dietary preferences. Large mammals, perhaps bison, were a significant component with beaver, catfish, and sucker (and possibly other species of fish) contributing to the remainder of the protein in the diet. Freshwater clams were harvested. The undocumented portion of the diet is that which was contributed by plants. As plant fragments, except for charred seeds, are rarely preserved, the percentage of vegetable components within the diet is undeterminable.

4.2.3.3 Samples

Samples are an expeditious mechanism for the cataloguing of myriads of minuscule recoveries. These consist of specimens recovered on a 2 or 1 millimetre screen and contain diverse artifacts, i.e., charcoal fragments, shell fragments, and small fragmented bone elements. Intensive detailed study of the material catalogued as samples may result in the identification of various plant or animal species, but most of the dominant taxa are already represented by larger recoveries. The additional information obtained through a comprehensive analysis of samples is usually that of degree and further confirmation of specific taxa rather than the identification of previously unrecorded species. One sample (DILg-69:01/213), weighing 19.4 grams, was catalogued.

4.2.3.4 Naturally Deposited Fauna

One specimen of non-food faunal remains was curated. DILg-69:01/174 is a single freshwater snail, Lymnaeidae, weighing 0.1 grams. Freshwater snails are deposited as part of the sediment load during flood episodes and are part of the soil substrate below the cultural level. As the cultural material mixes slightly with the upper portion of the original soil, these taxa are incorporated within the cultural matrix.

4.2.4 Floral Remains

The 22 floral recoveries encompass charcoal (21 specimens) and one seed. An intensive analysis to determine the representative species of charcoal (DILg-69:01/172) is beyond the scope of a mitigative report, however, it can be assumed that most of it would derive from locally available trees. These would include oak, maple, willow, poplar, and birch. Several of the charcoal specimens are large enough for species determination at a macro-analysis level. cursory examination of random specimens indicates that the charcoal derives from deciduous trees rather than coniferous. The total weight of the charcoal is 1.1 grams, indicating the extremely fragmentary nature of the recoveries.

DILg-69:01/173 is a single seed weighing 0.1 grams. Using Montgomery (1977), the seed is identified as puccoon (*Lithospermum* sp.). The three native species of this genus grow in grassland communities (Looman and Best 1979:613-615).

4.3 Hole 4

A total of 1040 artifacts were recovered from Hole 4, all at a depth of 208.0 cm DBS. These include lithic, ceramic, faunal, and floral material.

4.3.1 Lithic Artifacts

Thirty-seven lithic artifacts were recovered. These consist of detritus from tool manufacture and fire-cracked rock.

4.3.1.1 Detritus

Within the seventeen flakes, six lithic material types are represented. The predominant one is undifferentiated chert (Table 7) which could have been obtained in the nearby area.

The lithic recoveries fall into five groups: Group I, Group II, Group III, Group IV, and Group V. This indicates that, while local materials such as Group IV and Group V are present, material obtained either through trade or during visits to other areas was also carried until used for tool manufacture. The materials from the east, Group III, the south (Group II), and the west, Group I, could have either been obtained during the seasonal round or by trade. If only obtained by direct harvesting, this would indicate an extensive transhumanic pattern from near the Saskatchewan border to the eastern Canadian Shield areas in the Whiteshell region. Alternatively, small task groups could have gone on quarrying expeditions and rejoined the main group later. Most likely, some of the lithic material was obtained by trade with other groups while camped at The Forks. There is considerable evidence that, because of the confluence of the rivers, this area has long been a trading and meeting nexus (Kroker and Goundry 1993b, 1994).

MATERIAL	GROUP	QUANTITY	FREQUENCY	WEIGHT	FREQUENCY
Chalcedony	I	3	17.6	0.1	5.3
Swan River Chert	I	4	23.5	0.1	5.3
Knife River Flint	II	2	11.8	0.1	5.3
Rhyolite	III	1	5.9	0.1	5.3
Chert	IV	6	35.3	1.4	73.7
Selkirk Chert	V	1	5.9	0.1	5.3
TOTAL		17	100.0	1.9	100.2

Table 7: Flake Recoveries from Hole 4 by Material Type

4.3.1.2 Fire-cracked Rock

Twenty specimens of granitic fire-cracked rock were recovered. DILg-69:01/222 has a total weight of 5.3 grams.

4.3.2 Ceramics

Seventeen ceramic sherds—consisting of three body sherds, eleven body sherdlets, and three rim sherds—were recovered,

4.3.2.1 Body Sherds

The surface treatment of the three body sherds (DILg-69:01/216) is textile impressed. The exterior surface of the sherds also shows a significant degree of carbon encrustation—the result of placing the pot in the fire for cooking. While the surface impressions for most of the eleven body sherdlets (DILg-

69:01/217) could not be determined, due to exfoliation, some of the small fragments show evidence of textile impressions. The total weight of all these sherds is 15.0 grams.

4.3.2.2 Rim Sherds

Two rim sherds (DILg-69:01/214) have traces of a minimal decoration. As no lip is present, both specimens derive from the neck portion of a vessel. Both sherds have a stamped impression of paired, immediately adjacent, short linear marks. The curvature of the larger sherd suggests that they derive from a vessel with an S-shaped neck profile. The other sherd, DILg-69:01/215, is a shoulder sherd with no decorative elements. It, like the body sherds, has carbon encrustation below the point of inflection. The specimens are too incomplete to permit assignment to a ceramic tradition. The neck sherds weigh 4.6 grams and the shoulder sherd weighs 9.3 grams.

4.3.3 Faunal Remains

The largest number of artifacts consists of faunal objects. These include butchering remains, a sample, and natural faunal deposits.

4.3.3.1 Butchering Remains

A total of 920 artifacts, with a combined weight of 419.7 grams, was recovered. For comparative purposes, the identified taxa are listed in Table 8. As noted earlier, the frequencies of each taxon are calculated on the combined weight and quantities of all recoveries to give a picture of the relative frequency within the entire faunal food assemblage.

Some post-depositional trauma occurs during or immediately after the food preparation process when bone fragments are placed into the fire. The result is bone which is either charred or calcined (so thoroughly burned that only the inorganic white calcium carbonate remains). The four small/medium mammal bones are charred and one unidentifiable mammal bone is calcined. In addition, five unidentifiable fish bones and the clamshell are charred.

The frequency of the butchering remains is calculated by both quantity and weight (Table 8). In quantity, the fish remains overwhelm the other taxa. As fish bone is small and light in comparison to the larger and denser mammal bone, the proportions are reversed when weight is considered.

The recovery area is a small, unknown percentage of the entire occupation area and other loci could present a different pattern. Thus, it is not possible to make substantive statements as to dietary preferences. Large mammals, perhaps bison and definitely deer, were a significant component with catfish, sucker, drum, and sturgeon contributing to the diet. Freshwater clams were harvested.

4.3.3.2 Samples

One sample was recovered from Hole 4. DILg-69:01/277 weighs 60.0 grams and consists of bone, shell, and charcoal.

TAXON	QTY	FREQUENCY	WT	FREQUENCY
Aves				
Large Bird	1	0.1	0.5	0.1
Medium Bird	1	0.1	0.1	<0.1
TOTAL AVES	2	0.2	0.6	0.1
Mammal				
Large Mammal	94	10.2	266.7	63.5
Small/Medium Mammal	4	0.4	1.2	0.3
Undetermined Mammal	1	0.1	0.2	<0.1
Deer/Cow Family (Artiodactyla)	3	0.3	45.3	10.8
Deer Family (Cervidae)				
Deer (<i>Odocoileus</i> sp.)	1	0.1	33.6	8.0
TOTAL MAMMAL	103	11.2	347.0	82.7
Undifferentiated Fish	760	82.6	42.3	10.1
Catfish (<i>Ictalurus</i> sp.)	41	4.5	26.7	6.4
Drum (<i>Aplodinotus grunniens</i>)	1	0.1	1.3	0.3
Sturgeon (<i>Acipenser fulvescens</i>)	1	0.1	0.4	<0.1
Sucker family (Catostomidae)	11	1.2	1.3	0.3
TOTAL FISH	814	88.5	72.0	17.2
Freshwater Clam (Unionidae)	1	0.1	0.1	0.3
TOTAL SHELLFISH	1	0.1	0.1	0.3
TOTAL BUTCHERING REMAINS	920	100.0	419.7	100.3

Table 8: Faunal Recoveries from Hole 4

4.3.3.3 Naturally Deposited Fauna

One instance of non-food faunal remains was curated from Hole 4. DILg-69:01/224 consists of seven undetermined bones from a frog or toad (Amphibia). The bones weigh a total of 0.4 grams and could have been the result of a frog burrowing into the soil for hibernation.

4.3.4 Floral Remains

DILg-69:01/223 consists of 58 pieces of charcoal, weighing a total of 1.9 grams. It can be assumed that most of the charcoal would derive from locally available trees. Several of the charcoal specimens are large enough for species determination and a cursory examination of some specimens indicates that the charcoal derives from deciduous rather than coniferous trees.

4.4 Hole 5

A total of 1632 artifacts were recovered from Hole 5, all at a depth of 200.0 cm DBS. These include lithic, ceramic, faunal, and floral material.

4.4.1 Lithic Artifacts

Twenty-six lithic artifacts were recovered. These consist of detritus from tool manufacture (9), fire-cracked rock (15), and hematite (2).

4.4.1.1 Detritus

Within the nine flakes, four lithic material types are represented, the predominant one being Swan River Chert (Table 9).

MATERIAL	GROUP	QUANTITY	FREQUENCY	WEIGHT	FREQUENCY
Swan River Chert	I	4	44.4	0.1	4.0
Quartz	III	2	22.2	0.1	4.0
Rhyolite	III	1	11.1	0.8	32.0
Chert	IV	2	22.2	1.5	60.0
TOTAL		9	99.9	2.5	100.0

Table 9: Flake Recoveries from Hole 5 by Material Type

The lithic recoveries fall into three groups: Group I, Group III, and Group IV. This indicates that, while local materials such as Group IV are present, material obtained either through trade or during visits to other areas was also carried until used for tool manufacture. The materials from the east, Group III, could have either been obtained during the seasonal round or by trade.

4.4.1.2 Fire-cracked Rock

Fifteen fragments of granitic fire-cracked rock were recovered. DILg-69:01/288 has a total weight of 19.6 grams.

4.4.1.3 Unmodified Lithic Material

Two small specimens of reddish ochre (DILg-69:01/289), weighing 0.2 grams, were recovered. Ochre is a naturally occurring deposit of iron oxide found in two forms—limonite has a yellow or yellow-brown colour while hematite is reddish. Ochre was used for decorative purposes with the mineral being pulverized and mixed with a variety of suspending media, e.g., bear grease, fish oil, or goose fat. The resultant pigment was used either as a personal cosmetic or general purpose paint for teepees, ceramics,

parfleches, etc. In addition, powdered ochre was frequently added to dye mixes as the iron content would assist in setting the dye (Densmore 1974:370-373).

4.4.2 Ceramics

Nineteen ceramic sherds were recovered—eight body sherds, nine body sherdlets, and two rim sherds.

4.4.2.1 Body Sherds

The surface treatment of two of the body sherds (DILg-69:01/281) is textile impressed. The exterior surface of the sherds also shows some carbon encrustation. The remaining six body sherds (DILg-69:01/282) have an obliterated textile impressed surface finish. The surface impressions on all of the nine body sherdlets (DILg-69:01/283) could not be determined. The total weight of all the body sherds and sherdlets is 16.4 grams.

4.4.2.2 Rim Sherds

The two rim sherds (DILg-69:01/280) are from the neck portion of a vessel and weigh 1.4 grams. Both sherds have parallel, horizontal, trailed lines. The larger of the sherds has three lines.

4.4.3 Faunal Remains

The largest number of artifacts consists of faunal objects: butchering remains, a sample, and natural faunal deposits.

4.4.3.1 Butchering Remains

A total of 1550 artifacts, with a combined weight of 149.9 grams, was recovered. For comparative purposes, the identified taxa are listed in Table 10. The frequencies of each taxon are calculated on the combined weight and quantities of all recoveries to give a picture of the relative frequency within the entire faunal food assemblage.

Minor amounts of post-depositional trauma are present. Eleven unidentifiable mammal bones are charred.

The frequency of the butchering remains is calculated by both quantity and weight (Table 10). In quantity, the fish remains overwhelm the other taxa. However, as fish bone is small and light in comparison to the larger and denser mammal bone, the proportions are reversed when weight is considered.

The recoveries, while greater than those from the previous loci, are not sufficient to be able to make substantive statements as to dietary preferences. Large mammals, especially bison, were a significant component with catfish, sucker, perch, drum, and sturgeon contributing to the diet. Freshwater clams were harvested.

TAXON	QTY	FREQUENCY	WT	FREQUENCY
Aves				
Medium Bird	1	0.1	0.3	0.2
TOTAL AVES	1	0.1	0.3	0.2
Mammal				
Large Mammal	17	1.1	67.9	45.3
Small/Medium Mammal	1	0.1	0.1	0.1
Undetermined Mammal	62	4.0	10.5	7.0
Deer/Cow Family (Artiodactyla)				
Cow Family (Bovidae)				
Bison (<i>Bison bison</i>)	1	0.1	17.0	11.3
TOTAL MAMMAL	81	5.2	95.5	63.7
Undifferentiated Fish	1426	92.0	34.0	22.7
Catfish (<i>Ictalurus</i> sp.)	31	2.0	16.3	10.9
Perch (<i>Perca flavescens</i>)	2	0.1	0.1	0.1
Drum (<i>Aplodinotus grunniens</i>)	1	0.1	1.2	0.8
Sturgeon (<i>Acipenser fulvescens</i>)	1	0.1	0.1	0.1
Sucker family (Catostomidae)	4	0.3	0.2	0.1
TOTAL FISH	1465	94.5	51.9	34.6
Freshwater Clam (Unionidae)	3	0.2	2.2	1.5
TOTAL SHELLFISH	3	0.2	2.2	1.5
TOTAL BUTCHERING REMAINS	1550	100.0	149.9	100.0

Table 10: Faunal Recoveries from Hole 5

4.4.3.2 Samples

One sample was recovered from Hole 5. DILg-69:01/333 weighs 42.8 grams and consists of bone, shell, and charcoal.

4.4.3.3 Naturally Deposited Fauna

Four aquatic shellfish were recovered from the cultural matrix. Three pea clams (Sphaeriidae)—DILg-69:01/291—and one pond snail (Lymnaeidae)—DILg-69:01/292—would have been deposited during a high water episode prior to the occupation and would have become incorporated into the soil matrix underlying the cultural deposits.

4.4.4 Floral Remains

DILg-69:01/290 consists of 32 pieces of charcoal, weighing a total of 1.0 grams. A cursory examination of random specimens indicates that the charcoal derives from deciduous trees, probably locally available trees, such as oak, maple, willow, poplar, and birch.

4.5 Hole 10

One second phalanx of a bison (*Bison bison*) was recovered from a depth of 180 cms DBS. This specimen weighs 3.7 grams.

4.6 Hole 23

Two fragments of a long bone from a large mammal were recovered. These weigh 23.0 grams and were recovered from a depth of 240.0 cms DBS.

4.7 North Lane - 336.5 - 338.0 East

The artifacts at this location were recovered from the excavation for the sub-drain on the north side of the two-lane section of the reconfigured Pioneer Avenue (Figure 3). A total of 774 artifacts were recovered from this location, all at a depth of 180.0 cm DBS. These include lithic, ceramic, faunal, and floral material.

4.7.1 Lithic Artifacts

Six lithic artifacts were recovered, with all being detritus from tool manufacture. Within the six flakes, three lithic material types are represented, the predominant one being Swan River Chert (Table 11).

The lithic recoveries fall into three groups: Group I, Group II, and Group IV. This indicates that, while local materials such as Group IV are present, other lithic material was also used. The materials from the south, Group II, and the west, Group I, could have either been obtained during the seasonal round or by trade.

MATERIAL	GROUP	QUANTITY	FREQUENCY	WEIGHT	FREQUENCY
Swan River Chert	I	3	50.0	0.3	60.0
Knife River Flint	II	1	16.7	0.1	20.0
Chert	IV	2	33.3	0.1	20.0
TOTAL		6	100.0	0.5	100.0

Table 11: Flake Recoveries from North Lane 336.5 East

4.7.2 Ceramics

Two ceramic sherds were recovered. DILg-69:01/348 consists of two small body sherdlet fragments showing an obliterated textile impressed surface finish. The total weight is 1.3 grams.

4.7.3 Faunal Remains

The largest number of artifacts consists of faunal objects. These include butchering remains and a sample.

4.7.3.1 Butchering Remains

A total of 744 artifacts, with a combined weight of 119.8, was recovered. For comparative purposes, the identified taxa are listed in Table 12. The frequencies of each taxon are calculated on the combined weight and quantities of all recoveries to give a picture of the relative frequency within the entire faunal food assemblage.

TAXON	QTY	FREQUENCY	WT	FREQUENCY
Mammal				
Large Mammal	1	0.1	3.6	3.0
Medium/Large Mammal	1	0.1	8.6	7.2
Undetermined Mammal	7	0.9	3.1	2.6
TOTAL MAMMAL	9	1.2	15.3	12.8
Undifferentiated Fish	660	88.7	45.0	37.6
Catfish (<i>Ictalurus</i> sp.)	50	6.7	51.7	43.2
Pike (<i>Esox lucius</i>)	1	0.1	0.2	0.2
Sucker family (Catostomidae)	8	1.1	0.7	0.6
TOTAL FISH	719	96.6	97.6	81.5
Freshwater Clam (Unionidae)	15	2.0	5.5	4.6
Fat Mucket (<i>Lampsilis radiata</i>)	1	0.1	1.4	1.2
TOTAL SHELLFISH	16	2.2	6.9	5.8
TOTAL BUTCHERING REMAINS	744	100.0	119.8	100.1

Table 12: Faunal Recoveries from North Lane 336.5 East

The frequency of the butchering remains is calculated by both quantity and weight (Table 12). In quantity, the fish remains overwhelm the other taxa. This location is unusual in that the proportions do not substantially change when weight is considered. The larger bones identified to catfish results in a high proportion of the weight of the fish bone being ascribed to this species.

The evidence suggests that large mammals do not occupy a significant portion of the diet which is predominately fish with a major component being catfish. Sucker and pike also contributed to the diet. Freshwater clams were harvested. However, portions of the food processing area in the immediate vicinity may present a totally different picture of the composition of the diet.

4.7.3.2 Samples

One sample was recovered from this location. DILg-69:01/389 weighs 20.3 grams and consists of bone, shell, and charcoal

4.7.4 Floral Remains

DILg-69:01/353 consists of 20 pieces of charcoal, weighing a total of 0.2 grams. The small fragments suggest that they derive from local deciduous trees.

DILg-69:01/352 is a small charred seed identified as *Cornus canadensis* (bunchberry) (Montgomery 1977:90). This plant occurs in shady woodlands (Looman and Best 1979:565) and produces edible, if somewhat bland, berries (Williams 1977:115-116).

4.8 North Lane - 357.0 - 360.0 East

A total of 99 artifacts were recovered from this location on the new alignment of Pioneer Avenue at a depth of 110.0 cm DBS. These include lithic, ceramic, faunal, and floral material.

4.8.1 Lithic Artifacts

One lithic artifact was recovered. A chalcedony flake (DILg:69:01/554), weighing 0.2 grams, is the result of tool manufacture.

4.8.2 Ceramics

Five body sherdlets (DILg-69:01/553), weighing 0.9 grams, were recovered. Due to exfoliation, the surface finish could not be determined.

4.8.3 Faunal Remains

The largest number of artifacts consists of faunal objects. These include butchering remains, a sample, and natural faunal deposits.

4.8.3.1 Butchering Remains

Again, food residue in the form of butchering remains is the highest percentage of recovery. A total of 85 artifacts, with a combined weight of 12.5 grams, was recovered. For comparative purposes, the identified taxa are listed in Table 13. The frequencies of each taxon are calculated on the combined

weight and quantities of all recoveries to give a picture of the relative frequency within the entire faunal food assemblage.

In terms of quantity, the specimens are almost all fish. However, as fish bone is small and light in comparison to the larger and denser mammal bone, the proportions are reversed when weight is considered.

TAXON	QTY	FREQUENCY	WT	FREQUENCY
Mammal				
Large Mammal	1	1.2	7.5	60.0
Medium Mammal	1	1.2	0.1	0.8
Undetermined Mammal	1	1.2	0.2	1.6
TOTAL MAMMAL	3	3.5	7.8	62.4
Undifferentiated Fish	79	92.9	3.6	28.8
Catfish (<i>Ictalurus</i> sp.)	2	2.4	1.0	8.0
Sucker family (Catostomidae)	1	1.2	0.1	0.8
TOTAL FISH	82	96.5	4.7	37.6
TOTAL BUTCHERING REMAINS	85	100.0	12.5	100.0

Table 13: Faunal Recoveries from North Lane 357.0 East

4.8.3.2 Samples

One sample was recovered from this location. DILg-69:01/570 weighs 6.1 grams and consists of bone, shell, and charcoal.

4.8.3.3 Naturally Deposited Fauna

One instance of non-food faunal remains was curated. DILg-69:01/556 is a partial skull from a mouse-sized rodent, weighing 1.7 grams. Part of the skull, including the mandible and cheek teeth, is present. A tentative identification, using Hoffman and Pattie (1968), is that it represents a species of vole (*Microtus* sp.). The most likely candidate is the meadow vole (*Microtus pennsylvanica*). However, final identification would require the use of a comprehensive faunal reference collection. The rodent probably burrowed into the soil and died during winter hibernation.

4.8.4 Floral Remains

DILg-69:01/555 consists of six small pieces of charcoal, weighing a total of 0.1 grams. Some fragments appear to be carbonized bark. It can be assumed that most of the charcoal would derive from locally available trees.

4.9 North Lane - 360.0 - 365.0 East

A total of 1056 artifacts were recovered from this location on the new alignment of Pioneer Avenue at a depth of 125.0 to 130.0 cm DBS. These include lithic, ceramic, faunal, and floral material.

4.9.1 Lithic Artifacts

Seven lithic artifacts were recovered. These consist of six flakes from tool manufacture and one fire-cracked rock.

Within the six flakes, two lithic material types are represented. DILg-69:01/484 is a single chalcedony flake (Group I) weighing 0.1 grams. DILg-69:01/485 consists of five flakes of Selkirk Chert (Group V) and weighs 2.4 grams. In this location, the locally obtainable material is predominant. The single specimen of granitic fire-cracked rock, DILg-69:01/486, weighs 0.1 grams.

4.9.2 Ceramics

Fifty-two ceramic sherds were recovered—15 body sherds, 36 body sherdlets, and one rim sherd.

4.9.2.1 Body Sherds

The surface treatment of three body sherds (DILg-69:01/480) is textile impressed. The remaining twelve body sherds (DILg-69:01/481) have an obliterated textile impressed surface finish. The majority of the body sherdlets (DILg-69:01/482) have a textile impressed surface finish. Four of the body sherdlets (DILg-69:01/483) have suffered exfoliation and the surface finish cannot be determined. The total weight of all these sherds is 35.0 grams.

4.9.2.2 Rim Sherds

The rim sherd (DILg-69:01/479) has traces of a potential decoration. The curvature suggests that it derives from a vessel with an S-shaped neck profile, with a pronounced medial point of inflection. The decorative elements appear to be two vertical rows of lightly-impressed, irregular stamps. Alternatively, these could represent knots in the fabric used for the surface finish treatment. Another potentially anomalous feature is that the upper edge appears to be a coil break, suggesting that the vessel was made by using horizontally laid strands of hand-rolled clay to form the container. This feature is not usually found in Late Woodland ceramics, being a characteristic of earlier Laurel ceramics. The sherd weighs 6.2 grams.

4.9.3 Faunal Remains

The largest number of artifacts consist of faunal objects: butchering remains and a sample.

4.9.3.1 Butchering Remains

A total of 964 artifacts, with a combined weight of 42.6 grams, was recovered. For comparative purposes, the identified taxa are listed in Table 14. The frequencies of each taxon are calculated on the combined weight and quantities of all recoveries to give a picture of the relative frequency within the entire faunal food assemblage. Two of the unidentifiable fish bones are calcined.

TAXON	QTY	FREQUENCY	WT	FREQUENCY
Mammal				
Undetermined Mammal	4	0.4	0.6	1.4
Deer/Cow Family (Artiodactyla)				
Cow Family (Bovidae)				
Bison (<i>Bison bison</i>)	1	0.1	15.5	36.4
TOTAL MAMMAL	5	0.5	16.1	37.8
Undifferentiated Fish	944	97.9	21.3	50.0
Catfish (<i>Ictalurus</i> sp.)	13	1.3	5.0	11.7
Drum (<i>Aplodinotus grunniens</i>)	1	0.1	0.1	0.2
Sucker family (Catostomidae)	1	0.1	0.1	0.2
TOTAL FISH	959	99.5	26.5	62.2
TOTAL BUTCHERING REMAINS	964	100.0	42.6	100.0

Table 14: Faunal Recoveries from North Lane 360.0 East

In quantity, the fish remains overwhelm the other taxa (Table 14). However, as fish bone is small and light in comparison to the larger and denser mammal bone, the proportions are not quite as preponderant when weight is considered.

The recoveries are not sufficient to be able to make substantive statements as to dietary preferences. Large mammals, such as bison, in conjunction with catfish, sucker, and drum made up the protein component of the diet.

4.9.3.2 Samples

One sample was curated. DILg-69:01/510 weighs 20.9 grams and consists of bone, shell, and charcoal.

4.9.4 Floral Remains

DILg-69:01/487 consists of 32 pieces of charcoal, weighing a total of 0.9 grams. A cursory examination of random specimens indicates that the charcoal derives from local deciduous trees.

4.10 South Lane - 275.0 West

Only faunal remains were recovered from this location at a depth of 106.0 cm DBS. All of the 410 faunal recoveries are butchering remains (Table 15). The frequencies of each taxon are calculated on the combined weight and quantities of all recoveries to give a picture of the relative frequency within the entire faunal food assemblage.

TAXON	QTY	FREQUENCY	WT	FREQUENCY
Mammal				
Large Mammal	2	0.5	11.7	9.7
Deer/Cow Family (Artiodactyla)				
Cow Family (Bovidae)				
Bison (<i>Bison bison</i>)	406	99.0	108.8	90.1
TOTAL MAMMAL	408	99.5	120.5	99.8
Undifferentiated Fish	1	0.2	0.1	0.1
TOTAL FISH	1	0.2	0.1	0.1
Freshwater Clam (Unionidae)	1	0.2	0.1	0.1
TOTAL SHELLFISH	1	0.2	0.1	0.1
TOTAL BUTCHERING REMAINS	410	99.9	120.7	100.0

Table 15: Faunal Recoveries from South Lane 275.0 West

Nearly all of the recoveries derive from a bison skull and attached horn core. Only one unidentifiable fish bone and a fragment of freshwater clam shell occurred at this location.

4.11 South Lane - 307.5 - 309.0 West

A total of 202 artifacts were recovered from this location on the new alignment of Water Avenue at a depth of 103 cm DBS. These include lithic, ceramic, faunal, and floral material.

4.11.1 Lithic Artifacts

Two lithic artifacts were recovered. DILg-69:01/513 is a Swan River Chert flake from tool manufacture. DILg-69:01/514 is a small fragment of granitic fire-cracked rock. Each specimen weighs 0.1 grams.

4.11.2 Ceramics

Four sherds were recovered, one body sherd and three body sherdlets. The surface treatment of the body sherd (DILg-69:01/511) is textile impressed. The surface impressions for the three body sherdlets (DILg-69:01/512) cannot be determined. The total weight of these sherds is 1.7 grams.

4.11.3 Faunal Remains

The largest number of artifacts consists of faunal objects. These include butchering remains, a sample, and natural faunal deposits.

4.11.3.1 Butchering Remains

As is usually the case, food residue in the form of butchering remains is the highest percentage of recovery. A total of 184 artifacts, with a combined weight of 56.6 grams, was recovered. For comparative purposes, the identified taxa are listed in Table 16. The frequencies of each taxon are calculated on the combined weight and quantities of all recoveries to give a picture of the relative frequency within the entire faunal food assemblage.

TAXON	QTY	FREQUENCY	WT	FREQUENCY
Mammal				
Large Mammal	1	0.5	15.3	27.0
Medium/Large Mammal	2	1.0	5.6	9.9
Medium Mammal	1	0.5	0.5	0.9
Undetermined Mammal	10	5.4	4.2	7.4
TOTAL MAMMAL	14	7.6	25.6	45.2
Undifferentiated Fish	150	81.5	11.4	20.1
Catfish (<i>Ictalurus</i> sp.)	18	9.8	19.3	34.1
Sucker family (Catostomidae)	1	0.5	0.2	0.4
TOTAL FISH	169	91.8	30.9	54.6
Freshwater Clam (Unionidae)	1	0.5	0.1	0.2
TOTAL SHELLFISH	1	0.5	0.1	0.2
TOTAL BUTCHERING REMAINS	184	99.9	56.6	100.0

Table 16: Faunal Recoveries from South Lane 307.5 West

The large mammal long bone, DILg-69:01/521, has butchering evidence in the form of cut marks. Post-depositional trauma, in the form of charring, occurs on one unidentifiable mammal bone and one unidentifiable fish bone.

The frequency of the butchering remains is calculated by both quantity and weight (Table 16). In quantity, the fish remains overwhelm the other taxa. When weight is considered, the mammal bone makes up nearly one-half of the recoveries. The data are not sufficient to be able to make statements as to diet. Mammal along with fish and clams provided protein. Catfish and sucker are identified as harvested species of fish.

4.11.3.2 Samples

One sample was recovered. DILg-69:01/547 weighs 9.3 grams and consists of bone, shell, and charcoal.

4.11.3.3 Naturally Deposited Fauna

One specimen of non-food faunal remains was curated. DILg-69:01/517 is a single freshwater snail, Lymnaeidae, weighing 0.1 grams. As noted earlier, freshwater snails are deposited as part of the sediment load during flood episodes and are part of the soil substrate below the cultural level. As the cultural material mixes slightly with the upper portion of the original soil, these taxa are incorporated within the cultural matrix.

4.11.4 Floral Remains

DILg-69:01/516 consists of eight pieces of charcoal, weighing a total of 0.1 grams. It can be assumed that most of the charcoal would derive from locally available trees, including oak, maple, willow, poplar, and birch.

DILg-69:01/515 is two small seeds identified as *Cornus canadensis* (bunchberry) (Montgomery 1977:90). One specimen is charred.

4.12 South Lane - 326.0 - 332.0 West

A total of 528 artifacts were recovered from an undulating cultural layer at this location. The depth varied from 101.0 to 126.0 cm DBS. The artifacts include lithic, ceramic, faunal, and floral material.

4.12.1 Lithic Artifacts

Twenty lithic artifacts were recovered. These consist of detritus from tool manufacture and fire-cracked rock.

4.12.1.1 Detritus

Within the nineteen flakes, four lithic material types are represented, the predominant one being Selkirk Chert (Table 17).

The lithic recoveries fall into three groups: Group I, Group IV, and Group V. The assemblage indicates a strong reliance on locally obtainable material. The smallness of the flakes, especially of the local

material, indicates that they are the result of the finishing touches on the manufacture of tools. The western material (Group I) could have been obtained during the seasonal round.

MATERIAL	GROUP	QUANTITY	FREQUENCY	WEIGHT	FREQUENCY
Chalcedony	I	3	15.8	0.1	2.7
Swan River Chert	I	3	15.8	2.5	67.6
Chert	IV	2	10.5	0.8	21.6
Selkirk Chert	V	11	57.9	0.3	8.1
TOTAL		19	100.1	3.7	100.0

Table 17: Flake Recoveries from South Lane 326.0 West

4.12.1.2 Fire-cracked Rock

One granitic fragment of fire-cracked rock was recovered. DILg-69:01/444 weighs 0.1 grams.

4.12.2 Ceramics

Twenty-four ceramic sherds were recovered, all of them body sherds (11) or body sherdlets (13). The total weight of all these sherds is 40.6 grams. Textile impressed surface finish occurs on eight body sherds, DILg-69:01/439, and six body sherdlets, DILg-69:01/437. Obliterated textile impressed surface occurs on one body sherd, DILg-69:01/438, and seven body sherdlets, DILg-69:01/436.

Two body sherds, DILg-69:01/435, have obliterated textile impressed surfaces as well as an apparent ochre wash on the interior surface. A preparation of a thin clay slurry with added pulverized hematite was occasionally applied to the interior or the exterior of a vessel prior to firing to yield a red/orange colour. Complicating the determination of this is the fact that the firing of the vessels, in highly oxidizing situations, can also result in a similar colour of the earthenware.

4.12.3 Faunal Remains

Again, the largest number of artifacts consists of faunal objects. These include butchering remains and a sample.

4.12.3.1 Butchering Remains

A total of 442 artifacts, with a combined weight of 76.7 grams, was recovered. For comparative purposes, the identified taxa are listed in Table 18. The frequencies of each taxon are calculated on the combined weight and quantities of all recoveries to give a picture of the relative frequency within the entire faunal food assemblage. Four unidentifiable mammal bones and five unidentifiable fish bones have been charred.

TAXON	QTY	FREQUENCY	WT	FREQUENCY
Mammal				
Undetermined Mammal	29	6.6	15.6	20.3
Deer/Cow Family (Artiodactyla)	2	0.5	6.5	8.5
Rodent Family (Rodentia)				
• Beaver (<i>Castor canadensis</i>)	1	0.2	9.0	11.7
TOTAL MAMMAL	32	7.2	31.1	40.5
Undifferentiated Fish	377	85.3	20.2	26.3
Catfish (<i>Ictalurus</i> sp.)	31	7.0	24.7	32.2
Drum (<i>Aplodinotus grunniens</i>)	1	0.2	0.6	0.8
Sucker family (Catostomidae)	1	0.2	0.1	0.1
TOTAL FISH	410	92.8	45.6	59.5
TOTAL BUTCHERING REMAINS	442	100.0	76.7	100.0

Table 18: Faunal Recoveries from South Lane 326.0 West

The frequency of the butchering remains is calculated by both quantity and weight (Table 18). The fish bone is dominant in terms of quantity, but due to the larger and denser mammal bone, the frequency is lessened when weight is considered.

Large mammals, perhaps bison or deer, were a significant component of the diet, along with catfish, sucker, and drum.

4.12.3.2 Samples

One sample of bone, shell, and charcoal was curated. DILg-69:01/478 weighs 25.1 grams.

4.12.4 Floral Remains

The forty-one floral specimens consist of thirty-nine charcoal fragments and two nuts. DILg-69:01/447, the charcoal fragments, weigh 0.8 grams.

DILg-69:01/445 is part of the outer shell of a hazelnut (*Corylus* sp.). Two species, *Corylus americana* and *C. cornuta*, grow in this area (Looman and Best 1979). The specimen was too incomplete to distinguish which species it represented. It weighs 0.1 grams. DILg-69:01/446, also weighing 0.1 grams, is identified as a charred pit from chokecherry (*Prunus virginiana*) (Montgomery 1977:181). This plant occurs throughout the Prairie provinces (Looman and Best 1979) and produces an edible berry.

4.13 South Lane - 346.0 - 351.0 West

A total of 871 artifacts were recovered from this location, all at a depth of 120.0 cm DBS. These include lithic, ceramic, faunal, and floral material.

4.13.1 Lithic Artifacts

Twenty-seven lithic artifacts, detritus from tool manufacture and fire-cracked rock, were recovered.

4.13.1.1 Detritus

Within the twenty-four flakes, six lithic material types are represented (Table 19).

MATERIAL	GROUP	QUANTITY	FREQUENCY	WEIGHT	FREQUENCY
Chalcedony	I	6	25.0	0.5	9.8
Swan River Chert	I	6	25.0	0.4	7.8
Knife River Flint	II	4	16.7	0.2	3.9
Rhyolite	III	1	4.2	0.3	5.9
Chert	IV	1	4.2	0.1	2.0
Selkirk Chert	V	6	25.0	3.6	70.6
TOTAL		24	100.1	5.1	100.0

Table 19: Flake Recoveries from South Lane 346.0 West

The lithic recoveries fall into five groups: Group I, Group II, Group III, Group IV, and Group V. The larger flakes of Selkirk Chert, indicated by the greater weight, suggests that some degree of primary reduction was occurring upon the locally obtainable material. The materials from the west, Group I, make up 50% of the assemblage but the smaller flakes indicate that manufacturing activity focussed upon secondary reduction and tool refurbishment. The materials from the east, Group III, and the south, Group II, could have either been obtained during the seasonal round or by trade.

4.13.1.2 Fire-cracked Rock

Three small specimens of granitic fire-cracked rock were recovered. DILg-69:01/402 has a total weight of 0.3 grams.

4.13.2 Ceramics

Twenty-four ceramic sherds were recovered: six body sherds, fourteen body sherdlets, two rim sherds, and two rim sherdlets.

4.13.2.1 Body Sherds

The surface treatment of two body sherds (DILg-69:01/392) is textile impressed and that of four body sherds (DILg-69:01/393) is obliterated textile impressed. While the surface impressions for many of the body sherdlets (DILg-69:01/394) could not be determined, some of the small fragments show evidence of obliterated textile impressions. The total weight of all these sherds is 9.3 grams.

4.13.2.2 Rim Sherds

DILg-69:01/390 is an ornately decorated rim sherd with oblique cord wrapped object impressions (CWOI) extending to 15.5 mm below the lip. A horizontal series of oblique oblong punctates occurs below the CWOI band producing a chevron-like design. The lip, 6.7 mm wide, is stamped with a continual sequence of thin linear marks at a slight oblique angle. The combination of the design elements suggests that this sherd represents a vessel of Rainy River ware rather than the predeceasing Blackduck ware. This rim sherd weighs 6.3 grams.

DILg-69:01/391 is a portion from the neck of a vessel and is decorated with parallel trailed lines. While similar to DILg-69:01/280, from Hole 5, this specimen differs in that the trailed lines are wider and more closely spaced. It, however, would be from the same cultural type of ceramic ware. It weighs 0.8 grams.

The two rim sherdlets, DILg-69:01/395, have no decoration and can only be identified as rim sherds due to the presence of an in-sloping lip on both sherds. They weigh 0.8 grams.

4.13.3 Faunal Remains

The largest number of artifacts consists of faunal objects. These include butchering remains and a sample.

4.13.3.1 Butchering Remains

As is usually the case, food residue in the form of butchering remains is the highest percentage of recovery. A total of 760 artifacts, with a combined weight of 110.1 grams, was recovered. For comparative purposes, the identified taxa are listed in Table 20. The frequencies of each taxon are calculated on the combined weight and quantities of all recoveries to give a picture of the relative frequency within the entire faunal food assemblage.

Minimal post-depositional trauma was observed. Only three small unidentifiable mammal bone fragments are charred.

The frequency of the butchering remains is calculated by both quantity and weight (Table 20). In quantity, the fish remains overwhelm the other taxa. However, as fish bone is small and light in comparison to the larger and denser mammal bone, the proportions are not as extreme when weight is considered.

The recoveries are not sufficient to be able to make substantive statements as to dietary preferences or food availability. Catfish were a significant component of the diet with other fish and mammals contributing. Freshwater clams were harvested.

TAXON	QTY	FREQUENCY	WT	FREQUENCY
Mammal				
Large Mammal	5	0.7	24.7	22.4
Small/Medium Mammal	1	0.1	0.1	0.1
Undetermined Mammal	40	5.3	9.1	8.3
TOTAL MAMMAL	46	6.1	33.9	30.8
Undifferentiated Fish	666	87.6	30.0	27.2
Catfish (<i>Ictalurus</i> sp.)	43	5.7	44.7	40.6
Drum (<i>Aplodinotus grunniens</i>)	1	0.1	0.7	0.6
Sucker family (Catostomidae)	2	0.3	0.2	0.2
TOTAL FISH	712	93.7	75.6	68.7
Freshwater Clam (Unionidae)	2	0.3	0.6	0.5
TOTAL SHELLFISH	2	0.3	0.6	0.5
TOTAL BUTCHERING REMAINS	760	100.1	110.1	100.0

Table 20: Faunal Recoveries from South Lane 346.0 West

4.13.3.2 Samples

One sample was recovered. DILg-69:01/434 weighs 30.5 grams and consists of bone, shell, and charcoal.

4.13.4 Floral Remains

DILg-69:01/403 consists of 59 pieces of charcoal, weighing a total of 1.9 grams. It can be assumed that most of the charcoal would derive from locally available trees, including oak, maple, willow, poplar, and birch.

4.14 Summary of Pre-Contact Recoveries

Based upon the archaeological recoveries from adjacent projects: Pioneer Boulevard (Quaternary 1988, 1999a); Legacy Estates Project (Quaternary 2000a); St. Mary Avenue Right-of-Way (Quaternary 1989, 1990a, 1990b, 1990c); and the CanWest Global Baseball Facility (Quaternary 1996, 2000c, 2003), it would appear that the archaeological loci identified during this project are all part of an extensive cultural horizon that extends from the York Avenue/Pioneer Boulevard intersection into the area occupied by the baseball park. This cultural horizon has been identified with the Peace Meeting recorded in Aboriginal oral tradition. The recoveries, especially from Pioneer Boulevard (Quaternary 1999a) and the ball park, confirm the basic data in the history which states that more than 500 years ago, eight or nine nations met at The Forks. The archaeological material consists of several styles of ceramic ware which can be identified with areas to the north, east, south, southwest, and west.

While the ceramic recoveries from this project are not as extensive as those in the other projects, they are manifestations of ceramic wares that were found in the Peace Meeting horizon. Ceramics representing the Rainy River complex were found at Hole 3 and South Lane - 346 West. With Plains Woodland material at Hole 5 and South Lane - 346 West. The rim sherd from Hole 4 may be very tentatively identified as Bird River, indicating that at least three ceramic traditions are present in the archaeological horizon.

If the lithic materials (Table 21) reflect the source areas that are within the home territories of the different groups—southern, eastern, and western groups are represented. As the recoveries do not appear to come from lithic workshop areas, the sample detailed in the table is the result of random tool manufacture and resultant scatter of flakes. Flakes can be relocated from their original point of deposition by foot traffic through adhering to the soles of moccasins or the paws of camp dogs.

MATERIAL	GROUP	QUANTITY	FREQUENCY	WEIGHT	FREQUENCY
Chalcedony	I	14	15.6	1.0	5.1
Swan River Chert	I	21	23.3	3.5	17.9
Knife River Flint	II	8	8.9	0.5	2.6
Rhyolite	III	3	3.3	1.2	6.2
Quartz	III	2	2.2	0.1	0.5
Chert	IV	16	17.8	4.0	20.5
Quartzite	IV	1	1.1	2.5	12.8
Selkirk Chert	V	25	27.8	6.7	34.4
TOTAL		90	100.0	19.5	100.0

Table 21: Cumulative Lithic Flake Recoveries

The quantity of local Group V material (28%) suggests that it was being actively gathered at the time of occupation. The larger size of the flakes, reflected in the frequency by weight (34.4%), would suggest

that the knapping techniques were not as meticulously applied as in the case of the non-local materials such as Knife River Flint or chalcedony.

Considerable faunal material was recovered and should be considered as a unit in concert with the other archaeological specimens. The composite faunal recoveries are depicted in Table 22 and analysed by both quantity and weight.

TAXON	QTY	FREQUENCY	WT	FREQUENCY
Undifferentiated Mammal	224	3.5	75.9	5.5
Large Mammal	132	2.1	486.7	35.4
Medium/Large Mammal	3	<0.1	14.2	1.0
Medium Mammal	3	<0.1	5.8	0.4
Small/Medium Mammal	6	0.1	1.4	0.1
Deer/Cow Family (Artiodactyla)	5	0.1	51.8	3.8
Deer Family (Cervidae)	-	-	-	-
Deer (<i>Odocoileus</i> sp.)	2	<0.1	106.3	7.7
Cow Family (Bovidae)	-	-	-	-
Bison (<i>Bison bison</i>)	409	6.4	145.0	10.6
Rodent Family (Rodentia)	-	-	-	-
Beaver (<i>Castor canadensis</i>)	3	<0.1	11.6	0.8
TOTAL MAMMAL	787	12.3	898.7	65.3
Large Aves	1	<0.1	0.5	<0.1
Medium Aves	3	<0.1	1.1	0.1
TOTAL AVES	4	0.1	1.6	0.1
Undifferentiated Fish	5279	82.4	225.6	16.4
Catfish (<i>Ictalurus</i> sp.)	266	4.2	211.9	15.4
Drum (<i>Aplodinotus grunniens</i>)	6	0.1	4.0	0.3
Perch (<i>Perca flavescens</i>)	2	<0.1	0.1	<0.1
Pike (<i>Esox lucius</i>)	1	<0.1	0.2	<0.1
Sturgeon (<i>Acipenser fulvescens</i>)	2	<0.1	0.5	<0.1
Sucker family (Catostomidae)	31	0.5	3.2	0.2
TOTAL FISH	5587	87.2	445.5	32.4
Freshwater Clam (Unionidae)	27	0.4	10.4	0.8
Fat Mucket (<i>Lampsilis radiata</i>)	1	<0.1	1.4	0.1
Black Sand-shell (<i>Ligumia recta</i>)	2	<0.1	15.5	1.1
TOTAL SHELLFISH	30	0.5	27.3	2.0
TOTAL	6408	100.1	1373.1	99.8

Table 22: Cumulative Butchering Remains

The frequency of the butchering remains are illustrated by both quantity and weight (Figure 4). In the quantity graph, the fish remains overwhelm the other taxa. However, as fish bone is small and light in comparison to the larger and denser mammal bone, the proportions tend to be reversed when weight is considered. In this rather simplistic type of analysis, the amount of available meat is deemed to be relatively proportional to the weight of the residue, although in the case of shellfish, the weight of the discarded shell is considerably greater than that of the available meat.

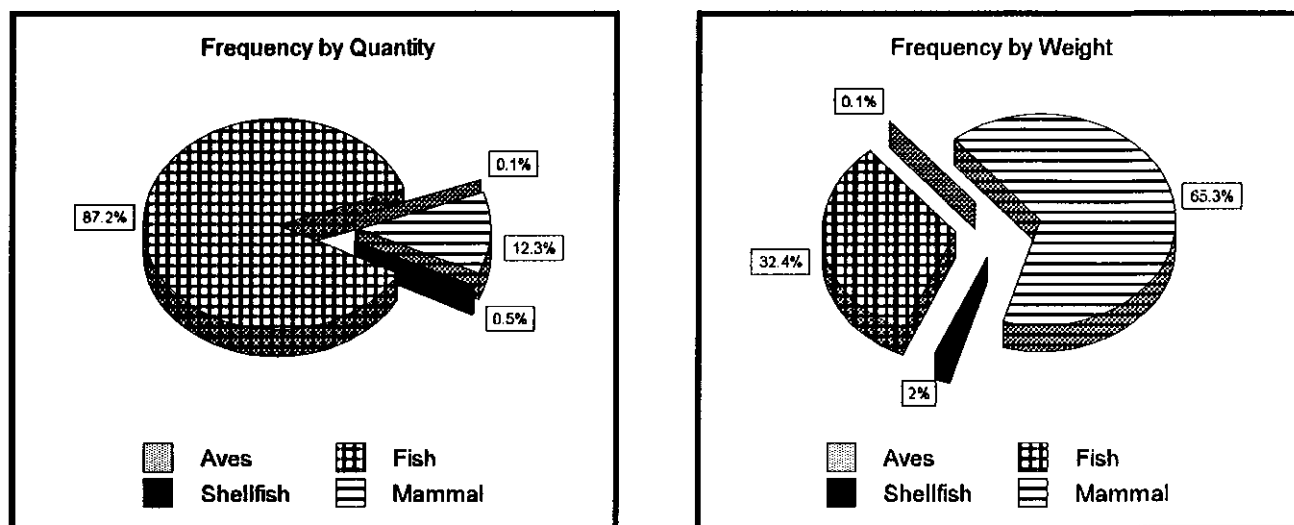


Figure 4: Cumulative Butchering Remains from West Road Cultural Horizons

With the above caveats, it can be seen that approximately two-thirds of the protein component of the occupants' diet was fulfilled by meat from mammals, with bison being the main contributor. Much of the bone that could not be identified beyond large mammal (Table 22) probably also derives from bison. The other species—deer and beaver—supplied minor amounts of the diet. In addition to use as food, these species would have also been harvested for fur and hides.

Within the fish, catfish was overwhelmingly dominant (Table 22). Seasonality is not a factor as all species identified in the assemblage spawn in the spring. The selectiveness of the harvest may be a result of the fat content of catfish flesh, with the other species caught for variety. Alternatively, if bulk fishing techniques, such as netting, were utilized, the mix of species may be representative of the aquatic biotic assemblage at the fishing location. Further analysis of vertebra and scales, which can often be identified to specific taxa within a rigorous analysis, could produce data which would determine the season of harvest, as annular growth rings (like tree rings) occur in both elements.

The low proportion of bird remains suggests that the occupation did not take place during either the spring or fall migration periods. Alternatively, the option of bird hunting was not as economically productive as that of fishing or big game hunting and birds were only obtained when the opportunity arose during other activities. It would seem that shellfish were actively gathered—perhaps an activity for children, along with plant and berry harvesting.

If one compares the cumulative faunal assemblage with that which was recovered from Horizon B during The Forks Access Project (Quaternary 1999a:129-131), there are similarities in the frequency of the taxa. In that project, 41,451 faunal remains weighing 35,451.3 grams were recovered—nearly seven times as many specimens with a weight 25 times as great. However, comparisons of the frequency of the two dominant taxa:

- fish - 84.1% versus 87.2% by quantity in the West Roads project
- 27.4% versus 32.4% by weight in the West Roads project, and
- mammal - 14.8% versus 12.3% by quantity in the West Roads project
- 69.2% versus 65.3% by weight in the West Roads project

indicate that similar subsistence strategies were occurring. Obviously, the range of identified taxa is much less in the smaller sample. One of the explanations is that none of the West Roads cultural locations encompassed a midden or refuse area and that only peripheral portions of middens or isolated disposal areas were encountered.

5.0 DISCUSSION

The pervasive extent of prior impact meant that only small areas of undisturbed original sediments were encountered during the project. The most extensive impact had occurred as a result of the construction of roads throughout the area. The previous construction of Pioneer Avenue and Water Avenue had resulted in impact to depths approximating 1 metre. The current project resulted in excavations for the roadbed to depths between 1.0 and 1.5 metres depending on topography and required slope of the road. Over the years, numerous changes to the existing roads had occurred, although they had remained within the same physical location. Evidence of the electric streetcars was present on Pioneer Avenue adjacent to the railroad underpass where ties, which would have supported the tracks, were embedded in a layer of concrete under the current layer of concrete, which in itself was superimposed on a previous layer of concrete overlying gravel. In another instance, at the approach to the west abutment of the Provencher Bridge, excavation for the new roadbed (Figure 1) bottomed out on a layer of concrete representing a former road surface. *The depth of this former road surface indicates that it probably was built between 1911 and 1920 as there would have been a level crossing for the Winnipeg Transfer Railway immediately to the west (Quaternary 1999c:7-10).*

The majority of the historic artifacts derived from two locations: the railroad layers on the south side of the new alignment of Water Avenue and the new roadbed for Pioneer Avenue where it curved through the former residential/commercial block west of the Waterfront Drive intersection. In both cases, the artifacts are the result of secondary deposition. The artifacts encapsulated in the cinder fill layers of the former rail yard, south of Water Avenue, may have been relocated two or more times through land leveling and grading operations as part of the rail yard operation. The artifacts recovered from the Pioneer Avenue roadbed would have been displaced through building demolition and land leveling activities that have occurred. This area, between Water Avenue and the original alignment of Pioneer Avenue (formerly known as Notre Dame Avenue East), originally began as a densely occupied residential area, evolving over time to a sparsely occupied commercial zone (Quaternary 2001a:26-29). Artifacts that would have originated with the original occupants would have been relocated during redevelopment components. Most of the remaining buildings were demolished between 1960 and 1980, with the area being graded to form surface parking lots. To summarize, none of the historic artifacts can be directly linked with the individuals that used them and, therefore, can only impart generalized information.

The presence of numerous Pre-Contact archaeological deposits in undisturbed areas indicates that the cultural horizon is extremely extensive. It extends from the south dugout of the CanWest Global Park Baseball Facility (Quaternary 1996, 2000c, 2003) in the north to south of the York Avenue/Waterfront Drive intersection (Quaternary 1988, 1999a, 2000a). The current data suggests that this site is kidney-shaped with the main axis angling slightly west of Waterfront Drive (formerly Pioneer Boulevard). Components of this site have also been found along the formerly proposed right-of-way for extending St. Mary Avenue (Quaternary 1990a, 1990b, 1990c), along a proposed extension of York Avenue (Quaternary 1989), and within The Forks Festival Park area (Quaternary 2000b).

The archaeological evidence of this specific event was comprehensively described and analysed based on the recoveries during The Forks Access Project (Quaternary 1999a). The site, radiocarbon dated to 675 ± 55 years Before Present and 675 ± 60 years Before Present (A.D. 1275 to 1295), contains artifacts which identify groups whose home areas lie to the north, to the east, to the south, to the southwest, and to the west. The extensiveness of this horizon, correlated with the Peace Meeting recorded in Aboriginal oral tradition, requires that any construction or development in this area pay careful attention to heritage resource management parameters.

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APPENDIX A
HERITAGE PERMIT



Heritage Permit No. A - 75 - 01

Pursuant to Section/Subsection 53 of *The Heritage Resources Act*:

Name: Quaternary Consultants Ltd.
Address: 130 Fort Street
Winnipeg MB R3C 1C7

ATTENTION: Mr. Sid Kroker

(hereinafter referred to as "the Permittee"),

is hereby granted permission to:

monitor installation of subsurface services in conjunction with the West Roads project linking existing road to the new Provencher Bridge, in order to record soil stratigraphy and recover any archaeological resources exposed through mechanical excavation.

during the period:

March 14 – June 15, 2002.

This permit is issued subject to the following conditions:

- (1) That the information provided in the application for this permit dated the 12th day of March 2002, is true in substance and in fact;
- (2) That the permittee shall comply with all the provisions of *The Heritage Resources Act* and any regulations or orders thereunder; **Please note attachment re custody and ownership of heritage objects**
- (3) That the Permittee shall provide to the Minister a written report or reports with respect to the Permittee's activities pursuant to this permit, the form and content of which shall be satisfactory to the Minister and which shall be provided on the following dates:
November 30, 2002;
- (4) That this permit is not transferable;
- (5) This permit may be revoked by the Minister where, in the opinion of the Minister, there has been a breach of any of the terms or conditions herein or of any provision of *The Heritage Resources Act* or any regulations thereunder;



(6) Special Conditions:

- a. All heritage objects are to be deposited with the Manitoba Museum by November 30, 2002, or permanent curation and storage, unless appropriate loan requirements are arranged with the Curator of Archaeology prior to that date;
- b. A complete set of archaeological field records, catalogue sheets, laboratory analysis records, photographs, reports, etc. are to be deposited with the Manitoba Museum of Man and Nature upon completion of the archaeological research, or sooner if required, and any subsequent revisions or additions to these records are to be filed as soon as possible thereafter;
- c. Neither the Government of Manitoba nor the party issuing this permit be liable for any damages resulting from any activities carried out pursuant to this permit, and the Permittee specifically agrees, in consideration for receiving this permit, to indemnify and hold harmless the Minister and the Government of Manitoba, the Minister and any employees and officials of the Government, against any and all action, liens, demands, loss, liability, cost, damage and expense including, without limitation, reasonable legal fees, which the Government, Minister or any employee or official of the Government may suffer or incur by reason of any of the activities pursuant to or related to this permit.

Dated at the City of Winnipeg, in Manitoba, this 13th day of March 2002.



Minister of Culture, Heritage and Tourism