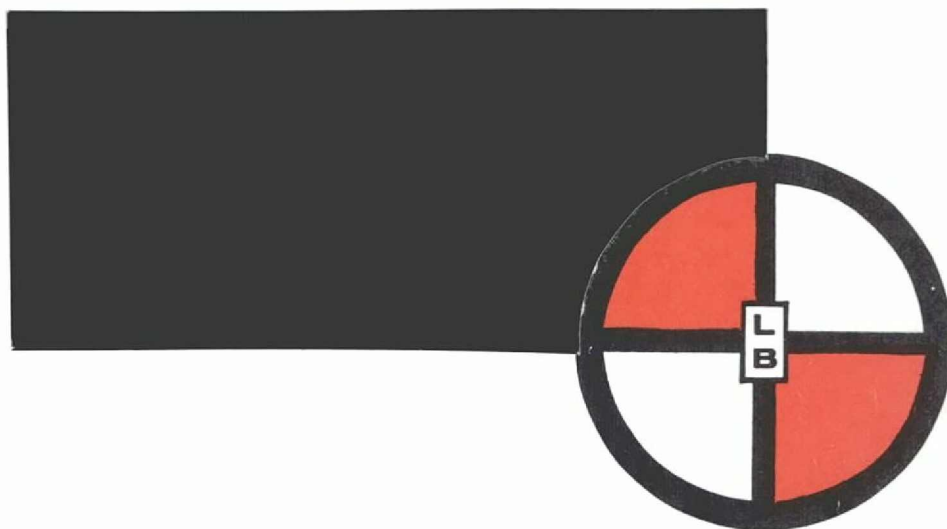


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L. B. & A. Inc. - Assay Office Site



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STATUS REPORT AND
PROPOSAL FOR COMPLETION OF
ARCHAEOLOGICAL AND HISTORICAL
INVESTIGATIONS AT THE ASSAY
OFFICE SITE, BLOCK 35,
NEW YORK, NEW YORK

1986 83-299m
TECHNICAL PROPOSAL

PREPARED FOR:

HRO, International LTD
Tower 56, 126 East 56 Street
New York, New York

PREPARED BY:

The Cultural Resource Group
Louis Berger & Associates, Inc.

April, 1986

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APPENDICES

Detailed Budget

I. INTRODUCTION

A. Background

The purpose of the proposed work is to complete a program of historical and archaeological investigations for the Financial Square Project. The Financial Square Project is located on New York City's Block 35, formerly the site of the United States Assay Office Building. In order to comply with the City's environmental quality review procedures, the Howard Ronson Organization, Ltd. (HRO), the developer of the Financial Square Project, has already sponsored a series of historical investigations and archaeological excavations in consultation with the New York City Landmarks Preservation Commission (LPC). These historical and archaeological investigations were completed by Greenhouse Consultants, Inc., (GCI). Because LPC determined that the southern portion of Block 35 had been disturbed by construction of the Assay Office Building, the archaeological investigations were limited to the northern portion of the block, an area encompassing eight of the block's original 21 lots. Greenhouse Consultants completed the fieldwork segment of the Assay site in August 1984.

Greenhouse Consultants was unable to prepare a research design for the analysis and report segment of the project that was acceptable to the client. For this reason, the Cultural Resource Group of Louis Berger & Associates, Inc., (LBA) was retained by HRO to prepare a proposal for completion of the project. The following proposal includes an overall status report of the work completed by GCI and a research design to guide the laboratory analysis and report. Whereas Greenhouse Consultants proposed a set of five research questions for completion of the project, LBA proposes three research questions to guide the analysis and data interpretation. The questions developed by LBA concern waterfront technology, urban site formation processes, and consumer behavior. These questions address the unique aspects of the site and areas of research that promise to provide information that may be applicable to future historical and archaeological projects in New York and in other cities.

Based on information developed by GCI, LBA estimates that the entire artifact collection includes more than one-half million artifacts and samples representing landfill/riverbottom contexts, feature deposits, yard deposits, a burnt warehouse, and miscellaneous finds. Whereas Greenhouse Consultants had proposed intensive analysis of both the landfill/riverbottom deposits and the occupational refuse (feature and yard deposits), LBA proposes that intensive analysis be limited to the occupational refuse, which comprises approximately 45% of the total collection or sampling universe. A detailed description of the size of the sampling universe is provided in section C.4 below and in Tables 4 and 6.

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All material pertinent to the project (artifacts, field records, research notes, proposals, reports, etc.) were turned over to LBA in mid-January 1986. The following sections provide a summary of the material received by LBA as well as an overall status report of the work completed by GCI. LBA's proposed research design, work plan, and staffing are included in subsequent chapters of this document.

B. Project Status

The project was initiated by GCI with an historical overview of Block 35, based on deeds, tax records, buildings department records, maps, plats, and city directories (Greenhouse Consultants, Inc. 1983). No effort appears to have been made to use Federal census data, although the records of the Committee on Piers and Wharves and the Committee on Streets were fully utilized. The historical overview was augmented by a discussion of relevant archaeological literature and an assessment of the archaeological potential of the block.

The overview concluded that landfill was accomplished in a sequence of fill episodes, which occurred between 1790 and 1804. By 1790, the first of these episodes had occurred; six structures, including two blacksmith's shops, two cooperages, and two unspecified houses (not necessarily dwellings) defined the Front Street frontage, and three wharves (Roosevelt's, Bache's, and Gouverneur's) extended in the East River. Between 1804 and 1835, the area was characterized by warehouses, commercial facilities, and residences. There were also small industrial sites, such as the cooperages at 40 and 41 South Street in 1810 and a block-and-pumpmaker at 46 South Street in the same year (GCI 1983:Table 2). The site was wholly destroyed in the 1835 fire, and a series of four and five-story brick rowhouses replaced the earlier structures. Between 1835 and 1930, GCI concluded that the block consisted of "commercial and residential structures serving workers and merchants of the port" (GCI 1983:21), although the East River docks were overshadowed by the Hudson River facilities after the mid-nineteenth century. These rowhouses were demolished in 1930 for construction of the United States Assay Office building and adjacent parking lot. Based on the historical documentation, it was concluded that the block had the potential to contain archaeological resources relating to its use as a waterfront area.

Two complementary archaeological testing programs were carried out, known as the Deep Testing phase and the Backyard Testing phase. The Deep Testing phase, was designed to examine the features and deposits related to the landfilling process and the use of the area as a waterfront, while the Backyard Testing phase was designed to identify features and deposits related to the occupation of the block that occurred after landfilling had been completed. The Deep Testing program involved the excavation of two large machine excavated trenches, together with a few hand excavated test cuts. The two deep test trenches, known as Test Trench West (TTW) and Test Trench East (TTE), were placed so as to cross-cut the middle portions of the lots. The backyard testing was limited to a relatively narrow strip of the block, comprising the extreme rear portions of the lots. Both machine excavations and hand excavated units were employed during the backyard testing. While the two testing programs had separate goals and were implemented in different areas of the site, the results were, in a sense, mixed. That is, archaeological resources related both to the landfilling of the block and to the occupation of the block were identified throughout the areas tested.

Archaeological data recovery was then carried out, as a result of the identification of a number of archaeological features and deposits throughout the site. The principal foci of the excavations were three stone-lined privies (Lots 6, 7 and 8), two wooden boxes (Lot 7 and Lots 6/44), two barrel cisterns (Lots 42 and 43), merchant's floor deposits (Lots 8 and 9), and a number of wharves, bulkheads, pilings, and spread footer complexes. Extensive excavations were carried out in the rear yard of Lot 7, as this

TABLE 1. Categories of Excavation Contexts

Category	Description
1	landfill bulk samples--various lots
2	stratigraphically excavated units in landfill--Lot 9*
3	stratigraphically excavated units in landfill--Lot 41
4	test cut in back yard of Lot 43
5	stratigraphically excavated units in landfill--Lot 42
6	stratigraphically excavated units in landfill--Lot 8
7	test cut in backyard of Lot 44
8	stratigraphically excavated units in landfill--wharves
9	stratigraphically excavated unit in Test Trench West
10	stratigraphically excavated units in Test Trench East
11	test cut in back yard of Lot 42
12	test cut in back yard of Lot 8
13	shovel test in Lot 43
15	test cuts in back yard of Lot 7
16	barrel (cistern?) in Lot 42
17	barrel cistern in Lot 43
18	wooden box in Lots 6 and 44
19	stone privy in Lot 7
20	stone privy in Lot 8
21	late nineteenth century deposits in Lot 43
22	late nineteenth century deposits in Lot 9
23	shovel test in Lot 8
24	shovel proves in various lots
25	pre-1835 floor deposits in Lot 8
26	pre-1835 merchants floor deposits in Lot 9
27	stone privy in Lot 6
28	wooden box in Lot 7

note: no excavation contexts were assigned to Category 14.

* also includes occupational deposits from trash pit.

TABLE 2. Artifact Estimates by Context Category and Rank.

CATEGORY AND RANK	NO. OF CONTEXTS	NO. OF BAGS	CONTEXTS	ESTIMATES BAGS	10 X SUBTTL
<u>High Priority</u>					
9	15	59	1,108	2,400	2,340
10	35	39	9,556	6,971	12,260
18	65	208	87,584	58,710	91,935
19	46	70	5,256	4,621	5,940
20	21	41	3,444	4,442	3,360
26	101	293	40,988	49,502	46,480
27	19	24	3,287	4,152	3,460
28	<u>48</u>	<u>108</u>	<u>26,678</u>	<u>40,877</u>	<u>37,070</u>
Subtotal	351	842	177,901	171,675	202,845
<u>Medium Priority</u>					
2	47	144	54,122	106,824	179,660
3	57	103	35,978	22,982	38,120
6	27	31	581	630	610
8	41	59	9,410	8,046	12,990
11	33	56	2,123	2,271	1,890
12	18	33	800	908	690
15	125	153	16,822	18,311	18,620
17	<u>14</u>	<u>25</u>	<u>1,798</u>	<u>1,788</u>	<u>1,430</u>
Subtotals	362	604	121,454	161,760	254,010
<u>Low Priority</u>					
5	29	29	1,102	-	1,140
21	6	6	72	-	120
22	15	31	893	-	1,370
25	<u>6</u>	<u>10</u>	<u>680</u>	-	<u>1,360</u>
Subtotals	56	76	2,747	-	3,990
<u>Not Prioritized</u>					
1	16	38	-	-	-
4	4	6	-	-	-
7	3	3	-	-	-
13	1	2	-	-	-
16	3	6	-	-	-
23	4	10	-	-	-
24	<u>6</u>	<u>8</u>	-	-	-
Subtotals	37	73	-	-	-
<u>Not Categorized</u>					
0	336	378	-	-	-

source: GCI lab data

area was determined to have the best preserved yard deposits and because of the presence of other features (a privy and a stone wall) in that area. A large trash pit was also excavated in the rear of Lot 9. In addition, excavations were also carried out at selected locations within the landfill, in order to obtain information on the sequence of filling and to obtain information on the content of the fill itself. Field work was completed in August 1984. ✓

Concurrent with the archaeological excavations, GCI carried out preliminary laboratory processing tasks, however completion of the laboratory analysis and preparation of a final report was not authorized. Laboratory activities that were initiated by GCI prior to interruption of the project include conservation of fragile materials, flotation processing, washing of artifacts, sorting of the collections into "rough sort" categories (curved glass, ceramics, other diagnostics, non-diagnostics, pipes, faunal, and macrofloral/shell), artifact labeling, and tabulation. It has been verbally reported that washing of the collection is 100% complete and that 90% of the collection has been sorted.

In preparation for the laboratory analysis, GCI also prepared estimates of the total number of artifacts in the collection, based on a 10% sample. The primary purpose of that exercise was to determine the size of the artifact collection, in order to establish a budget for completion of the project. The estimates of the collection size and the various context categories will be discussed further in section C.4 below.

Finally, some tasks related to preparation of the final report had been started by GCI. These include drafting of composite base maps of the excavated areas and features, stratigraphic interpretation, and preparation of manuscript summaries dealing with selected aspects of field work. ✓

C. Materials Available

1. Reports and Project Documentation

The project files contain a number of documents that provide not only a formal record of the work completed but also an outline of the research strategy and a summary of the excavation results. The formal project record begins with the historical study of the block and proceeds through the testing phases with some detail. Following the proposals for backyard and deep testing, together with a number of letters that provide additional clarification, a total of six interim reports were prepared:

- Completion of Testing in Test Trench West
- Completion of Testing in Test Trench East
- Completion of Mitigation for Test Trench West
- Completion of Testing in Backyards of Lots 9 and 41
- Completion of Testing in Backyards of Lots 7, 8, 9, 41, 42 and 43
- Completion of Testing in Backyards of Lots 6 and 44

As the list above indicates, only one mitigation report was prepared, that for Test Trench West. Mitigation in Test Trench West was completed immediately after testing, since the area was needed for construction activities. The major mitigation efforts were conducted after completion of testing in the backyard areas, and there are no formal reports that describe this work. There is no doubt that all field work has been ✓

completed to the satisfaction of the Landmarks Preservation Commission (E. Friedman to J. Ketas, August 24, 1984), but there is simply less formal documentation for the final phase field work.

2. Historical Data

Compilation of historical data on the sequence of occupations at a given location provides the critical baseline upon which subsequent archaeological analysis and interpretation rests. Making valid linkages among several related data sets (deeds, tax lists, city directories, census) is absolutely essential to the success of the undertaking since the archaeological analysis frequently seeks to make statements about material culture correlates of historical phenomena (e.g., status, function). Therefore, if the archaeological deposits have been incorrectly assigned to historical occupations, the ensuing analysis perforce proceeds to invalid conclusions.

At least three GCI researchers appear to have been involved in the collection of historical data at different points in this project, and this has resulted in some confusion in the existing notes. The notes have been taken in different formats and there is generally an absence of citations to original sources. It is therefore difficult to reconstruct what happened as well as to differentiate between what was found in the document and what information the searcher derived from the document. Additionally, there are clearly disagreements among the researchers as to the appropriate interpretation of the data sets concerning partitioning of lots and enumeration of houses along Front Street.

Twenty-eight files of historical data were delivered. These comprise several copies of the Phase I study (GCI 1983), supporting documentation, notes from various manuscript collections, notes from the city directories covering the period 1796-1850, notes from the tax records covering the period 1784-1850, and various compilations of notes from the records of the Buildings Department and deeds, which have organized by lot. "Occupation chains" have been compiled for the subject lots down to 1820.

The purpose of this work was to obtain as complete a data set as possible for the subject lots during the period circa 1790-1850. There are unfortunately some problems with this work, which may, however, be fairly easily resolved. Actual notes from the water lot grants themselves appear to be missing, although the index to the list of water lot grants was photocopied and presented in the Phase I report. There are miscellaneous notes from a court case in the late nineteenth century, which provide a plat of the water lots superimposed on the street system; this document is extremely useful and important for establishing the location of these grants. Marginalia on a draft of the Phase I report suggest that subsequent cartographic research revised the date of filling from circa 1790 to before 1782; copies of these maps on which the revised view was based are not included although the maps are briefly cited (Holland [1782]). The deed research was generally quite weak and lacked critical details. For example, the grantor and grantee were both omitted from the abstract of one early deed concerning a former water lot, and the notes on the abstract are ambiguous; were these references to block-and-lot based on the city's index, which is very complete, or on correlations by the researchers? There is no master list of deeds consulted so that it is not clear whether the information now sought was not collected or was sought and found absent at the repository. There are no citations for any of the tax and city directory data, and

finally, there appears to be some confusion over house numbers (i.e., street addresses).

Making the correct linkages among the various historic data sets that provide locational/occupational information is obviously crucial. This is time-consuming and frequently becomes an issue of professional judgement, particularly for the eighteenth and early nineteenth centuries (i.e., pre-1807). There appear to have been two address changes: one in 1807 and another in 1818. The 1818 addresses correspond to the 1835 addresses, indicated on the Bridges plat, which correspond to modern street addresses. The tax records are organized by street address, and this is reflected in the way that the notes were taken. Therefore, the problem of street addresses and record linkages, is restricted to the period prior to 1818.

The issue of street addresses along Front Street is further complicated by the fact that lots 7 and 8 or lots 8 and 9 may have been enumerated as a single address. This is again implied by the notes, which list several tax payers with the same address. Finally, an 1868 deed associated with lot 6 (now 87 Front Street) states that the "prior" address was 91 Front Street. However, the corner property appears first to have been 95 Front Street and then (i.e., post-1818) 93 Front Street. Deed research can establish ownership, and the sequence of ownership can be used to interpret the tax lists, and the tax lists then used to identify street addresses, which can corroborated through cross-references with city directories.

Unfortunately, a problem arises from the way in which data were collected from the city directories. It is not clear that researchers were aware of ambiguity in street addresses and approached the early directories by looking for street addresses rather than names, known from verified sources (i.e., deeds and tax lists). Thus, if an error were made on street addresses, it may have been carried forward into the next step in data collection. Unfortunately, the note-taking itself provides no clues as to what the document (i.e., the directory) itself said and how the researcher approached it. Still, although the manner of note-taking was less than optimal, the problem can be confined to re-checking data for the period prior to 1818, when the present house numbering system was instituted. Some correlation of street addresses is provided directly by the tax records, which list "old" and "new" street addresses for the period 1807 and 1818. Indeed, it is very probable that a re-examination of the deeds may clarify many of these problems, and re-checking of directories confined to the period 1789-1807. Further discussion of the workplan is provided in section II.C.1 of this document.

3. Field Records

Primary field data includes excavation records, plan and profile drawings, notebooks kept by field supervisors, transit log books and printouts, and photographs (both black-and-white and color slides).

With the exception of Test Trench East and Test Trench West, excavation units were designated as Test Cuts and given an alphabetical identification; for example, TCA refers to Test Cut A. Normally, excavation proceeded according to strata and levels. Within Test Cuts, strata were identified numerically and levels were identified alphabetically. As artifacts were bagged in the field, context (CX) numbers were

assigned. A unique context number was assigned to each discrete provenience, i.e., a particular stratum and level of a particular test cut. In some cases, however, more than one context number has been assigned to a particular provenience. Together with the drawings and field supervisor's notebooks, context forms comprise the basic excavation records. These forms contain information on the soil color and texture, cultural materials present, excavation techniques, weights of materials discarded in the field, stratigraphic relationships, and general comments.

4. Artifacts and Samples

While the field records and project documents are essential for completion of the project, the vast bulk of data that needs to be dealt with consists of artifacts recovered during excavation. In all, the artifact collections now occupy a total of 557 storage boxes; there are also a number of wood samples that are in storage in large plastic bags. The collection presently occupies a storage volume of approximately 700 cubic feet. It is important to define not only the total number of artifacts in the collection, the sampling universe, but also the various contexts they represent. This is an important issue, since the research questions proposed by LBA will require analysis of only the occupational refuse, which represent approximately 45% of the total universe. LBA proposes only minimal level of tabulation for the materials recovered from landfill/riverbottom deposits, whereas GCI had proposed intensive analysis for a sample of these materials.

Prior to interruption of the project, an effort was made by GCI to estimate the total number of artifacts in the collection, based on a 10% sample. In conjunction with this exercise, excavation contexts were grouped into 27 categories, which were representative of the major foci of the excavations. These categories are listed in Table 1. It should be noted that Category 2 (stratigraphically excavated units in the rear of Lot 9) appears to have been erroneously described as landfill, as it includes material excavated from a trash pit dating from the second quarter of the nineteenth century. This deposit was incongruously described as both as primary domestic refuse and a trash deposit related to a wine merchant. A 10% sample of the contexts in each category was selected and rough-sort counts were made. Subtotals for each category were computed from the rough-sort counts, and these sums were multiplied by 10 to arrive at an estimate for the total number of artifacts in each category. Categories were also assigned to three priority groups (high, medium, and low), and totals were made for the number of artifacts in each priority group.

Using the information developed by GCI, LBA estimates that the total number of artifacts in the collection, or sampling universe, is approximately 520,000 to 564,000. The major contexts represented by the collection include landfill and riverbottom deposits, feature deposits, yard deposits, deposits from a burnt warehouse on Lot 9; other contexts include stray finds, material from shovel probes on various lots, material recovered during backhoe clearing, wood samples, late nineteenth-century deposits, etc. Again using information developed by the previous consultant, LBA estimates that the proportion of total collection or universe according to primary context types is as follows:

<u>Context Type</u>	<u>Percentage</u>
Features	32%
Yard deposits	5%
Lot 9 warehouse	8%
Landfill and riverbottom	36%
Other	19%

Alternate methods of estimating the number of artifacts were devised, apparently because of doubts that the 10% sample of contexts would yield an accurate estimate of the total collection size. In an attempt to assess the validity of the 10% sample, a larger sample was drawn from one category. First, a 25% sample, and finally, a 35% sample of the Category 18 contexts was tabulated; based on the results of the larger sample of Category 18 contexts, a "correction factor" was computed and applied to the remainder of the contexts. The derivation of this correction factor is not clearly explained in any of the documents we have examined. Also, whereas the initial estimation method was based on the average number of artifacts per context, another set of estimates was based on an average number of artifacts per bag.

The various estimates developed for the context categories and priority ranks are presented in Table 2. The project files contain a number of spreadsheets with different category and priority group totals, and it is apparent that the process of estimating the number of artifacts was carried out a number of times, possibly because of errors or because an acceptable method could not be agreed upon. The estimates presented in Table 2 represent, we believe, the most recent, and thereby the most error-free, set of figures available (B. Greenhouse to L. Wyman December 11, 1985).

Results of the three different estimation methods are presented in Table 2. The range of the estimates is particularly broad for Categories 2, and 18, and for the medium priority group as a whole. Using averages of the various estimation methods for the three groups, one may obtain a total of approximately 367,000 artifacts (high priority: 184,140; medium priority: 179,075; low priority: 3,369). The most recent estimate presented by GCI was comprised of 200,000 high priority artifacts, 180,000 medium priority artifacts, and 3,000 low priority artifacts (B. Greenhouse to L. Wyman, December 11, 1985).

However, these totals presented by GCI do not include artifacts in seven categories which were not placed in the priority groups (see Not Prioritized in Table 2). No estimates were developed for categories 4, 7, 13, 16, 23, and 24, because the number of contexts in these categories was too low to permit a 10% sample. The reason Category 1 (bulk samples from landfill) was not prioritized is unknown. Using the average number of artifacts per context and per bag in the three priority groups, the number of artifacts in the Not Prioritized group may range between 28,000 and 84,000 artifacts, bringing the total collection size to roughly 400,000 to 450,000 items.

There are an additional 366 bags representing some 378 contexts that were not assigned to any category (Table 3). These contexts appear to represent selectively recovered materials, that is, those not recovered from a screened Test Cut soils. However, this group (Category 0) also contains the materials recovered from the Deep Testing phase of the project, which included stratigraphically excavated units in landfill. While the majority of these contexts have only one associated bag of artifacts, many

TABLE 3. Excavation Contexts Not Placed in Categories

Description	Approximate No. of Contexts
Bulkhead wood samples and context numbers assigned to bulkheads	51
Context numbers assigned to, and samples taken from pilings and posts	9
Context numbers assigned to architectural features (spread footers, stone walls, etc.)	110
Context numbers assigned to soil/flotation samples, in addition to normal samples from excavaton	5
Context numbers assigned to material collected during backhoe excavation	45
Context numbers assigned to miscellaneous site finds	30
Context numbers assigned to material collected during hand/shovel clearing	64
Context numbers assigned to material collected from arbitrary three-foot levels while exposing wharves	9
Context numbers assigned to material collected from arbitrary three-foot levels excavated in Test Trench West and Test Trench East	55

TABLE 4. Percentage Representation of Artifact Classes in Context Categories.

CATEGORY	TYPE	CURVED GLASS	CERAMIC	PIPES	OTHER DIAGNOSTICS	NON- DIAGNOSTICS	FAUNAL	FLORAL AND SHELL	TOTAL
2	Landfill*	3.8%	1.0%	0.0%	0.1%	94.1%	0.3%	0.7%	100.0%
3	Landfill	11.9%	77.9%	0.3%	1.2%	3.5%	4.1%	1.1%	100.0%
5	Landfill	40.4%	21.9%	1.8%	1.8%	30.7%	3.5%	0.0%	100.1%
6	Landfill	26.2%	11.5%	1.6%	3.3%	6.6%	37.7%	13.1%	100.0%
8	Landfill	50.0%	27.8%	2.2%	0.6%	1.5%	9.5%	8.4%	100.0%
9	Landfill	17.5%	16.7%	12.8%	3.0%	7.3%	38.0%	4.7%	100.0%
10	Landfill	14.0%	74.9%	0.7%	2.2%	1.2%	5.0%	2.0%	100.0%
17	Feature	18.2%	28.0%	4.2%	1.4%	30.1%	9.1%	9.1%	100.1%
18	Feature	8.0%	11.5%	0.3%	1.4%	4.0%	21.1%	53.8%	100.1%
19	Feature	9.6%	16.3%	1.7%	3.4%	11.1%	25.3%	32.7%	100.1%
20	Feature	14.0%	29.5%	2.7%	0.6%	19.0%	32.4%	1.8%	100.0%
25	Feature	10.3%	0.7%	0.7%	0.0%	88.2%	0.0%	0.0%	99.9%
26	Feature	73.8%	1.4%	12.7%	4.6%	6.5%	0.6%	0.3%	99.9%
27	Feature'	5.8%	6.9%	1.2%	5.2%	38.7%	15.0%	27.2%	100.0%
28	Feature	10.1%	11.1%	0.2%	1.8%	20.8%	26.4%	29.6%	100.0%
11	Yard Midden	14.3%	12.2%	1.1%	0.0%	68.3%	0.5%	3.7%	100.1%
12	Yard Midden	21.7%	27.5%	10.1%	2.9%	10.1%	18.8%	8.7%	99.8%
15	Yard Midden	7.5%	20.8%	5.0%	2.8%	15.3%	33.4%	15.3%	100.1%
21	Other	25.0%	25.0%	0.0%	8.3%	25.0%	0.0%	16.7%	100.0%
22	Other	63.5%	3.6%	3.6%	7.3%	15.3%	2.2%	4.4%	99.9%
Mean		22.3%	21.3%	3.1%	2.6%	24.9%	14.1%	11.7%	
Minimum		3.8%	0.7%	0.0%	0.0%	1.2%	0.0%	0.0%	
Maximum		73.8%	77.9%	12.8%	8.3%	94.1%	38.0%	53.8%	

Source: laboratory counts prepared by GCI, based on 10 percent sample of contexts.

* also includes occupational deposits from trash pit.

have two or three bags, and one context has 17 bags. Using the average number of artifacts per bag from the high and medium priority groups (no average artifacts per bag were developed for the low priority group), one may estimate a total number of artifacts in Category 0 between 69,000 and 113,000. Addition of this group would yield an estimate for the total collection (the sampling universe) of roughly 520,000 to 564,000 artifacts.

The Not Prioritized and Not Categorized artifacts reportedly occupied 24% of the total collection, as measured in cubic feet (B. Greenhouse to L. Wyman, December 11, 1985). Whereas the high, medium and low categories may number roughly 370,000 to 380,000 artifacts and account for 76% of the collection's volume, the remainder of the collection (the Not Prioritized and Not Categorized artifacts) may comprise 120,000 artifacts, using an average number of artifacts per cubic foot of storage space.

To conclude, it appears that there are at least one-half million artifacts in the collection, possibly as many as 564,000. The tallies produced by GCI during their estimate of the collection size suggest that the content of the collection is quite variable. Table 4 indicates the representation of major artifact classes according to the categories from which sample counts were made.

During excavation, soil samples were collected from selected contexts for eventual flotation processing and soils analysis. The normal procedure was to remove a six-quart volume of soil for flotation processing, and the remainder was set aside for other soils analysis. Review of the flotation log notes indicates that approximately 125 soil samples were collected in the field, of which approximately 95 have been subjected to flotation processing, i.e., water separation of light and heavy fractions.

5. Other Documentation

Other project documentation consists of various computer printouts that correlate context numbers, provenience information (lot, test cut, stratum and level), and artifact analysis categories (cf. Table 1). There are also a number of laboratory notebooks that contain hand entered logs of various aspects of the collection, including soil and flotation samples.

Preparation of the report was in a very preliminary or conceptual stage when the project was interrupted. There are a few manuscripts that outline the history of the project and that summarize the testing in some of the lots in greater detail than was presented in the interim reports. In connection with the field writeups, each of the field supervisors was responsible for stratigraphic interpretations presented in the form of Harris matrices (Harris 1979). Stratigraphic matrices appear to have been completed for many of the test cuts excavated during the testing and mitigation phases of the project. However, matrices have not been completed for the test cuts in the backyard of Lot 7 which was intensively excavated during mitigation.

II. RESEARCH DESIGN

A. Introduction

The archaeological and historical data collected during the previous investigation of the Assay site directly reflect the priorities and goals of the previous investigators' research design. As the process of archaeological excavation is inherently destructive of its own data base, it is important that an explicit research design be developed in conjunction with any archaeological excavation. However, archaeological research designs must be flexible, in order to accommodate new information that becomes available as research progresses. This is true not only during field work, where unexpected discoveries may provide new directions for research, but also during laboratory analysis, where one may discover limitations in the data that prevent higher-order analyses, or unexpected patterns may emerge that permit new interpretations. For this reason, LPC has required that archaeological work done in New York City be completed within the context of a research design that ensures preservation of data for the investigation of new research areas by future researchers.

At this juncture, it is appropriate to review the previous investigators' research design, in order to provide a framework for defining the research value or significance of the artifact collections. The previous investigators' research approach was presented in various proposals and reports, but was synthesized most recently in a proposal for completion of the laboratory work and report preparation. In that document (B. Greenhouse to L. Wyman, December 11, 1985), five research questions were proposed. These five questions addressed two principal areas of inquiry: (i) the filling of the block, and (ii) the occupation of the block. It is unlikely that all of these questions could be answered by analysis of the Assay site data, as the previous consultant acknowledged (*Ibid.*).

Two research questions related to the filling of the block were proposed. Question 1 concerned the content of the landfill and the river bottom deposits, wherein the artifacts were to be viewed as general samples of New York City material culture that would provide information on changing consumption patterns during the late Colonial and Federal periods. In the most recent proposal for completion of the laboratory analysis, GCI acknowledged that "there is a general de-emphasis today in research questions involving the content of landfill" (Greenhouse to Wyman, December 11, 1985).

Question 2 concerned the technology of the landfilling process, as manifested in the construction of the various fill retention structures, wharves, bulkheads, etc. (R. Henn and D. Wall to Baugher, April 6, 1984). This question was to have been addressed by preparation of measured drawings of the various fill retention structures, together with dating of the various features through artifact analysis. Question 2 appears to have been considered by GCI as the most readily answerable of the five questions, if not the most important as well.

The three research questions proposed by GCI pertaining to the occupation of the block concerned: the emergence of the family consumer economy, separation of home and workplace, and emergence of the "woman's sphere" or the "cult of domesticity" (Question 3); the organization of labor and workplace behavior (Question 4), and

warehousing practices (Question 5). Question 3 was to have been dealt with by an analysis of a series of domestic deposits, focusing on changes in the representation of artifacts associated with the "cult of domesticity" and the emergence of the "woman's sphere". Intensive artifact analysis was proposed to address this question, and the possibility was acknowledged that considerable analytical effort would be expended only to conclude that the collection was not suitable for addressing this question (Greenhouse to Wyman, December 11, 1985).

GCI's Question 4 concerned the organization of labor in the workplace, and it was to have been addressed by examination of the relative frequencies of alcoholic beverage bottles within commercial deposits, as a reflection of capitalist work discipline, following research that had been done at the Telco Block site (Rockman et al. 1983). Again, GCI acknowledged that extensive analysis would be required to approach this question, with the possible finding that the deposits might not be suitable to answer the question.

Finally, GCI's Question 5 was developed after the discovery of a well preserved merchant's floor and burnt deposits relating to the Great Fire of 1835. In order to provide information regarding early nineteenth-century merchandise handling practices and to record the variability and spatial distribution of the materials in the warehouse at the time of the fire, a 50% sample of the floor deposits were excavated in a checkerboard pattern (Henn and Wall to Baugher, April 4, 1984; Wall and Henn 1984a). Answering this question was considered a relatively straightforward proposition involving identification of the materials represented in the floor deposits and preparation of a distribution map (Greenhouse to Wyman, December 11, 1985).

B. Proposed Research Questions

The research design proposed by LBA for completion of the project reflects primary attention to the unique aspects of the site and to research domains that promise to yield important, substantive results that will be applicable to future projects in New York and other cities. The research design proposed by LBA follows the broad outline of the previous investigators' approach that focused on two major areas of inquiry: (i) the process of landfilling and (ii) the occupational features and deposits. While LBA's proposed research follows the broad outlines of the previous investigators' approach, it differs in the emphasis placed on particular research questions and in the overall theoretical and interpretive frameworks.

LBA has developed three principal research questions to guide the completion of the project, one of which pertains to the resources related to landfilling, and two pertaining to the occupation of the block. Issues related to landfilling are subsumed under LBA's Research Question 1 which is discussed in Section 1 below. LBA does not propose detailed examination of the content of landfill or riverbottom deposits (GCI Question 1); rather the proposed approach focuses primarily on the technology represented in the various wharves, bulkheads, etc.

Examination of the block's occupational resources will be examined primarily in reference to the broad themes of refuse disposal patterns, urban site formation processes and consumer behavior. Question 2 as proposed by LBA will examine the patterns of refuse disposal that characterize residential, commercial and industrial

activities. If deposits of sufficient integrity are identified, Question 3 will examine the consumption patterns that occur in residential and workplace settings. For two reasons, LBA does not propose examination of the emergence of the family consumer economy by analysis of landfill deposits (GCI Question 3). First, the material culture correlates of this process have not yet been defined in the archaeological literature, and second, domestic consumer behavior is best studied archaeologically by the use of deposits that can be associated with particular households. The landfill recovered from the Assay site appear to represent a mixture of domestic, commercial, and industrial refuse of unknown historical association, and is therefore inappropriate for investigating this issue. Elements of GCI's Question 4, that pertaining to workplace behavior and GCI's Question 5, that pertaining to merchandise handling practices, will be subsumed within LBA's Questions 2 and 3. LBA's approach to these questions is discussed in Section 2 below.

1. Landfill and Landfill Technology

The Assay site is one of a handful of sites in Lower Manhattan (Geismar et al. 1983; Louis Berger & Associates, in prepration; Huey 1984; Rockman et al. 1983) where research has been focused on the processes of landfilling. The Assay site is the only project at which intensive archaeological work has been undertaken for an area of lower Manhattan that was filled in the late eighteenth to early nineteenth century period, therefore the landfill deposits and features represent a period that has not yet been studied. Not only does the site represent a little known period in the expansion of Lower Manhattan's landmass, but field work at the Assay site was carried out in such a way that allowed extremely detailed archaeological recordation of the landfill retention structures. This was accomplished by the installation of steel sheet piling in Test Trenches East and West and by the contractor's installation of a slurry wall around the perimeter of the block; both of these measures allowed archeological excavations to reach depths at which flooding would have prevented work under normal circumstances.

Simply stated, the first research question, as designed by LBA, asks:

Research Question 1

How was the process of landfilling accomplished in the Assay site block? Specifically, what is the technology represented in the various fill retention structures, bulkheads and wharves, and how does it compare to the techniques used in other American and European seaports?

While the sequence and bracket dates of filling are known from historical sources, the field investigations have provided important information on the technological processes that were used to extend the shoreline of lower Manhattan. A number of structural elements were recorded during the excavations, including pilings, wharves, bulkheads, cofferdam-like boxes, etc. The technology and craftsmanship represented in these structures will be examined, with particular reference to comparable structures found at other sites excavated in New York and other cities.

The archaeological investigations at the Assay site resulted in important findings

regarding landfill technology that have not been observed at other sites in New York City. First, a type of wharf construction known as "block and bridge" appears to have been utilized in the construction of Bache's Wharf, the principal wharf built on Block 35. This type of wharf consists of a series of small cobb-wharf "blocks" which are set at intervals and connected by heavy timber spans or "bridges" that are placed above the water line. This type of wharf construction has not yet been documented archaeologically in New York and is relatively unknown in the United States (cf. Heintzelman-Muego 1983).

One element of that is of some historical interest is an inscription on a ship's mast that was incorporated into one of the wharves. The inscription has not yet been researched, but it has been suggested that it may be either a King's Mark (S. Baugher, personal communication) or a masonic symbol (D. Wall, personal communication). The insignia on the mast may be the King's Mark. Timber so blazed became the property of the Royal Navy, and there are several possible explanations for its presence in the wharf. The timber may simply have been rejected and would thus have been available for use by the Colonials. Or, it may have been salvaged from a warship. Finally, the mast may have been salvaged from a warship, used on a civilian vessel and then incorporated into the wharf when the vessel became unseaworthy.

Another archaeological find of historical interest was the recovery of a number of cast iron cannons during the slurry wall construction. After recovery by construction workers on the site, the cannons were stabilized at the Florida State Museum. The cannons were observed after excavation, and they appear to have been British-made field pieces dating to the 1730s. The cannons were probably abandoned in this area, which was open until after the Revolutionary War. The cannons are believed to have been discarded in the course of Washington's retreat from New York in 1776; further investigation may be able to substantiate this interpretation. They have been tentatively dated to the 1730s, and this type of artifact-specific research will potentially enhance current understanding of the military technology of the Patriot army in the early phases of the war as well as the conditions under which the retreat was effected.

Estimates prepared by the GCI seem to indicate that about half of the collection was recovered from landfill and riverbottom contexts. However, it should be noted that Category 2, which was described as landfill by GCI, contains occupational deposits from a trash pit in the rear of Lot 9. Clearly, the excavation of hundreds of thousands of artifacts from landfill and riverbottom contexts reflects the previous investigators' belief in the research value of this material. While the artifacts recovered from landfill and riverbottom deposits represent, in some sense, material culture in use at or before the time of deposition, assemblages of unknown historical association are not well suited for examination of consumer behavior, as proposed by GCI. Domestic consumption patterns are best studied at the level of the individual household, and the material recovered from landfill or riverbottom contexts cannot be linked with any particular household occupation. Therefore, LBA does not propose to analyze materials recovered from contexts that are clearly identifiable as landfill or riverbottom from the perspective of consumer behavior. Information concerning the landfill and riverbottom deposits excavated at the Assay site will be presented in a relatively straightforward fashion by the use of soil profiles and field descriptions from the deep excavations, together with quantitative data concerning the frequency of major material culture classes.

The material recovered from landfill/riverbottom contexts at the Assay site is expected to consist of numerous discrete deposits of highly variable material culture content, reflective of a variety of possible sources, including household, commercial, and industrial refuse as well as spoil from landscape downcutting, etc. Landfill deposits generally represent displaced refuse that cannot be linked with the historical circumstances under which the materials were initially disposed. The level of behavioral information that may be derived from landfill/riverbottom deposits is therefore extremely limited. There is little point in attempting to derive information on trade patterns from landfill, for example, since analysis of trade and its significance has been addressed by historians (e.g. Albion 1939; Shepherd 1970; Shephard and Walton 1976; Shephard and Williamson 1972).

In recent years, there have been a number of archaeological projects in lower Manhattan that have occurred within areas of made land. These include the 64 Pearl Street, 175 Water Street, 209 Water Street, Cruger's Wharf, 7 Hanover Square, Telco Block, Barclays Bank, and Schermerhorn Row sites. A substantial amount of information pertaining to landfill retention and waterfront structures has been gathered during these projects. Despite the number of separate studies of landfill sites, a consensus has yet to be achieved concerning the analytical utility of landfill material itself. In many cities, archaeologists have given only scant attention to landfill contexts, however a number of archaeologists who have worked in New York have emphasized the importance of landfill as a scientific resource (cf. Salwen 1973, 1978). Geismar (1986), for example, has demonstrated that landfill content may provide information about the types of nearby industries and public attitudes toward sanitation. Huey (1984) has attempted to reconstruct patterns of early trade, based on material recovered from the vicinity of Cruger's Wharf.

Since a number of projects have been completed at landfill sites, it is now possible to assess the results of these projects and to suggest priorities for future work in landfill contexts, especially work that must be conducted within the framework of cultural resource management funding. While landfill deposits are often quite rich in terms of material culture content, there is a need for discussion of the research value of these contexts. There is also a need to examine the appropriateness of various methodological approaches. The efficacy of various field approaches needs to be examined. Monitoring of construction has recently been undertaken by LBA in lieu of archaeological data recovery at the Shearson Lehman/American Express Information Services Center site. During foundation excavation, a number of cobb-crib wharf structures were identified and recorded archaeologically, including information concerning the joinery methods employed in the cribbing structures (Louis Berger & Associates 1985a). In this situation, monitoring of construction permitted archaeological recordation of landfill retention structures virtually throughout the entire site, rather than only in selected areas as is generally the case when archaeological data recovery is undertaken prior to construction.

2. Urban Site Formation Processes

Aside from gross estimates of the number and types of artifacts present in the collection, there is, for the most part, very little reliable information concerning the integrity, dating, or historical association of the occupational deposits recovered from

the site. These problems appear to be derived from an absence of even basic laboratory analysis following the testing programs as well as from problems with the historical research. GCI's admission that many of their research questions might not be answerable, even after extensive analysis (Greenhouse to Wyman, December 11, 1985), suggests their implicit recognition of at least some of these problems.

A minimal level of archaeological integrity is necessary in order for deposits to be useful for addressing research questions such as family consumer behavior, emergence of the "cult of domesticity" or the "woman's sphere" and the organization of labor in the workplace. Archaeological integrity may be evaluated from various perspectives, including stratigraphic integrity, temporal separation of deposits, vessel completeness, etc., however these issues have not yet been addressed. Also, there is little information concerning the dating of the major occupational deposits. The burnt deposits on the Lot 9 warehouse floor are perhaps an exception to this problem, however no laboratory analyses were undertaken to confirm the pre-1835 deposition date for the assemblage. For the remainder of the occupational deposits, only scant information is available concerning the deposit dates. The privy on Lot 6 was described as having been abandoned during the second or third quarter of the nineteenth century, however no deposit dates were given for the cofferdam/box on that lot (Wall and Henn 1984b). The deposits from the box on Lot 7 were described as early nineteenth century in origin, while the privy on that lot was described as having its last period of use in the mid-nineteenth century. No dates were provided for the Lot 7 yard deposits or for the privy on Lot 8. Material from the trash pit excavated in the rear of Lot 9 was assigned to the second quarter of the nineteenth century (Wall and Henn 1984a).

Because of limited information concerning the dating of the deposits, it is not possible to establish the historical association of many of the major excavated deposits. Aside from the Lot 9 merchant's floor deposit, the major occupational deposits were recovered from Lots 6, 7 and 8. Because of confusion over street addresses on this area of the block, additional historical research is necessary to establish the early nineteenth-century occupants of these lots.

Because of the uncertainties regarding integrity, dating and historical association discussed above, LBA proposes to examine the block's occupational deposits from a research perspective that emphasizes understanding the processes that formed the archaeological record, prior to interpretation of historical behavioral patterns and cultural systems.

One of the most basic issues facing archaeologists is the process by which one proceeds from observation of the archaeological record to valid statements about the past. This problem is particularly acute in the field of urban archaeology, given the complexity of the cultural systems under study and the range of land modification processes that occur in urban settings. Without an understanding of how the archaeological record was formed, it is not possible to understand why it was formed. The immediate need is for increased attention to middle-range research, including site formation processes, in order to provide a sound basis for examination of substantive historical research problems.

An important set of concepts and models for the understanding of archaeological formation processes has been articulated by Schiffer (1972, 1983). The life cycle concept is particularly useful for understanding the circumstances by which both material elements pass through a cultural system and ultimately enter the archaeological record. Schiffer (1972) defines two primary classes of material elements, durables and consumables. Durable elements include tools, facilities, etc. while consumable elements include food, fuel, etc. The full life cycle for durable elements (Figure 1) typically includes procurement, manufacturing and use stages before entering the archaeological record as a result of loss, discard or abandonment. The full life cycle for consumable elements (Figure 2) typically includes procurement, preparation and consumption stages before entering the archaeological context. It is important to note that the life cycles of both both classes of elements may be prolonged by lateral cycling or recycling, or cut short at any time as a result of loss, discard, or abandonment.

The available historical information for the site indicates that a complex succession of land use activities has occurred on the block. After its use as waterfront area, the block subsequently was used for residential, commercial and industrial functions. The individual lots themselves were also characterized by a pattern of mixed use or by a succession of different uses. By reference to the material element life cycle models portrayed in Figures 1 and 2, one can appreciate the potential complexity of the archeological record in situations where manufacturing, commercial and residential activities have occurred. The situation is one where material elements may have entered the archeological record at virtually any point of their life cycle. Durable elements may have entered the archaeological record prior to manufacture, during the manufacturing process, during the merchandising stage, or after use by the consumer. Consumable elements may have entered the archaeological record after procurement, during the preparation stage, or after consumption.

Prior to interpretation of manufacturing, merchandising or consumer behavior, it is necessary to determine how a given deposit was formed, i.e., at what points in the life cycle did the component material elements of the deposit enter the archeological record. A number of analytical techniques are available to address these issues.

Examination of techniques for archaeological differentiation of commercial and domestic deposits was one of the basic research goals undertaken at the 175 Water Street site (Geismar et al. 1983). Wear patterns on ceramic and glass vessels provided the initial method for distinguishing deposits associated with commercial occupations from domestic deposits. Then, South's (1977) artifact pattern analysis method was applied to assess whether this classification technique was sensitive to the commercial vs. domestic origin of selected deposits. Four features representing different deposit types were compared, and the analysts concluded that artifact pattern analysis did conform to functional assessments based on other criteria. Finally, stepwise discriminant analysis was applied to classify a number of functionally unidentified deposits as commercial refuse. Five variables were selected initially for the discriminant analysis, however ceramics and fauna emerged as the most important classes for distinguishing the two deposit types (Geismar et al. 1983).

Archaeological investigations at the Telco Block site (Rockman et al. 1983) examined the changes in consumption and discard behavior that occurred as the block's

FIGURE 1

FLOW MODEL FOR THE LIFE CYCLE OF DURABLE ELEMENTS

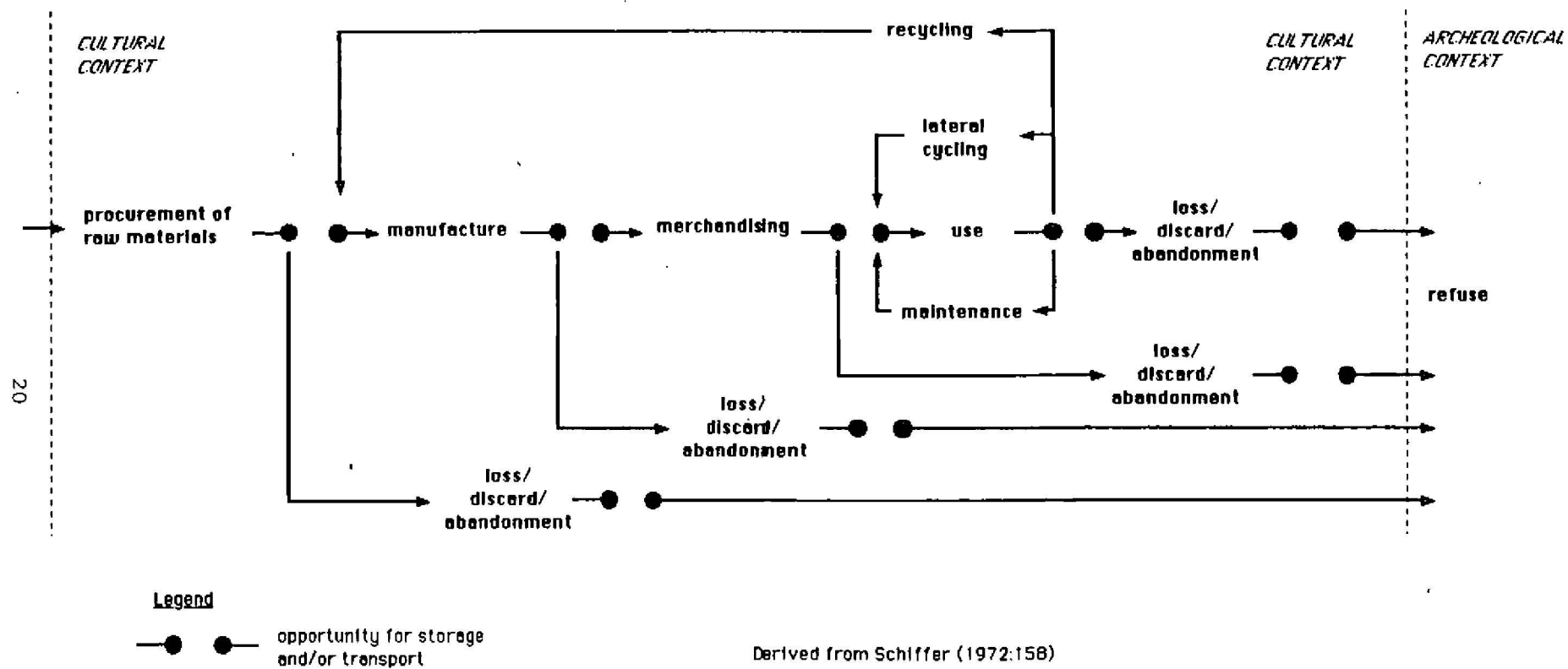
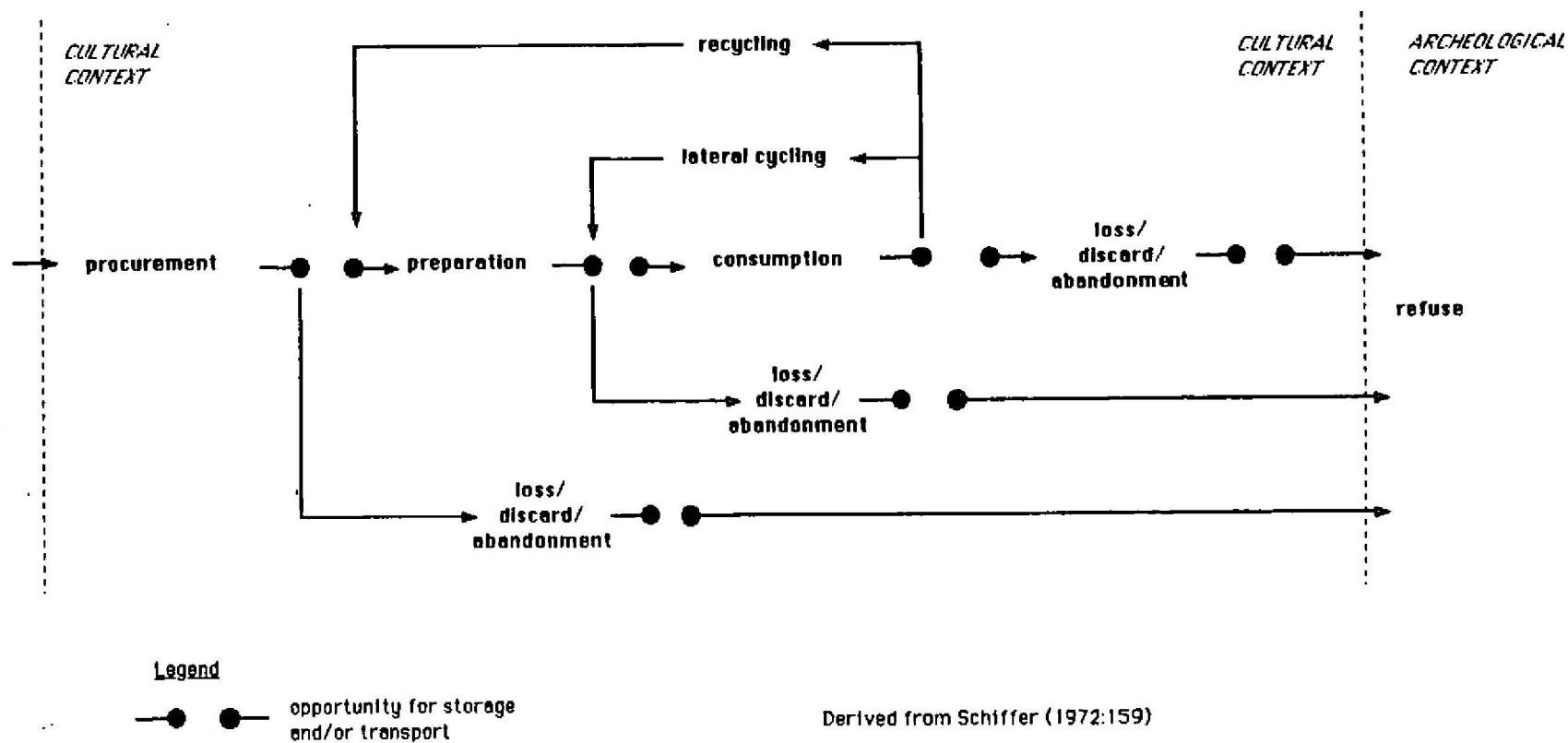


FIGURE 2

FLOW MODEL FOR THE LIFE CYCLE OF CONSUMABLE ELEMENTS



occupations shifted from primarily mixed residential/commercial to almost purely commercial during the early nineteenth century. In the archaeological record, this shift was accompanied by a decrease in the density of ceramics in feature deposits. This suggests that fundamentally different food preparation and consumption patterns occurred in the residential/commercial versus the purely commercial setting (Rockman et al. 1983).

The identification of residential, commercial, and industrial activity areas has been accomplished by Lewis (1976, 1977) at the Camden site in South Carolina. Six artifact classes were constructed: (1) artifacts related to the collection, processing and storage of subsistence products, (2) artifacts associated with the preparation and consumption of foods, (3) dietary (floral and faunal) remains, (4) artifacts associated solely with technological activities, (5) architectural artifacts, and (6) artifacts generally associated with the presence of persons. These were in turn combined into three groups: (a) subsistence (classes 1, 2 and 3), (b) subsistence-technological (classes 5 and 6), and technological (class 4). Analysis of the representation of materials in these groups resulted in the identification of three distinct types of functional areas, interpreted as domestic, residential/commercial, and non-domestic, possibly industrial activities.

Honerkamp has proposed an alternative model for discernment of site function which uses three broad artifact groups (Domestic, Miscellaneous and Activities) derived from South's (1977) classification. His model's basic assumption was that the Activities Group would be most sensitive in discerning domestic versus commercial activities. When the model was tested against two historically documented eighteenth-century occupations at Fort Frederica, Georgia, the assumption was borne out by the higher representation of Activities Group artifacts at a mixed domestic/commercial occupation site. However, when this model was applied at the Charleston Convention Center Site, it was found that the Activities Group was much less sensitive to site function than was the Domestic Group (Honerkamp 1980; Honerkamp et al. 1982).

Schiffer (1983) has summarized a number of techniques that are useful in the identification of archaeological formation processes, and a number of these may be applicable for evaluation of the deposits at the Assay site. Damage or wear patterns on artifacts may provide information concerning the life cycle of certain elements; examination of the wear patterns on glass and ceramic vessels recovered from the 175 Water Street provided a means to determine whether these elements entered the archaeological record prior to or after their use in a household setting (Geismar et al. 1983). Measurements of vessel completeness have been used at the Christina Gateway site in Wilmington, Delaware (Louis Berger & Associates, Inc. 1985b) secondary and displaced refuse types. The occurrence of distinctive vessel forms has been used at the Barclay's Bank site to distinguish residential and commercial deposits (T. Klein, personal communication).

Measurements of artifact quantity, density and diversity are also sensitive to formation processes (Schiffer 1983), and it is expected that these factors would be useful in distinguishing residential, commercial, and industrial deposits. For example, a high frequency of food storage vessels and a lack of food preparation and consumption vessels would suggest a commercial rather than a residential occupation. The concept of disorganization, i.e., the presence of items in a single deposit that are not representative of closely related behavioral systems, may provide an index of the

degree to which the archaeological record contains refuse from multiple or mixed uses (Schiffer 1983). Finally, cross-mending or artifact reassembly has been widely used not only to establish the contemporaneity of deposits, but also to examine the degree to which post-depositional disturbances have occurred.

The second research question examines the formation processes and refuse disposal patterns that characterize the block's occupational deposits.

Research Question 2

What patterns of refuse disposal characterize residential, commercial and industrial activities?

Based on the known historical development of the Assay site block (Greenhouse Consultants, Inc. 1983), it is expected that deposits dating from the late eighteenth- to the mid-nineteenth-century period will contain refuse deposits associated with residential, commercial and industrial activity. Virtually the entire material element life cycle is represented in the range of occupations on the block, so that it will be possible to examine the block's occupational resources according to a life cycle model (see Figures 1 and 2).

Occupational deposits excavated from the site fall into two major categories: (1) those excavated from closed feature contexts, such as privies, cisterns, and boxes, and (2) those excavated from open yard contexts. Closed or feature contexts include privies on Lots 6 (Category 27), 7 (Category 19) and 8 (Category 20), barrel cisterns on Lots 42 (Category 16) and 43 (Category 17), cofferdam-like wooden boxes on Lots 6/44 (Category 18) and 7 (Category 28), and burnt deposits recovered from floors in Lots 8 (Category 25) and 9 (Category 26). The trash pit on the rear of Lot 9 (Category 2) may also be included with the occupational deposits, although it seems to have been mistakenly included with the landfill deposits by GCI. Materials recovered from open yard contexts were recovered from Lots 7 (Category 15), 8 (Category 12), 9 (Category 22), 42 (Category 11), 43 (Category 4) and 44 (Category 7). The best preserved yard deposits were recovered from the rear yard of Lot 7, and this area was extensively excavated.

Both the features and the yard deposits appear to represent secondary or displaced refuse, that is, refuse that has been deposited at a location different from that of its ultimate use or consumption (c.f. Schiffer 1972; South 1977). The deposits associated with the burnt warehouse floors on Lots 8 and 9 represent a type of archaeological refuse that is fundamentally distinct from the yard and feature deposits, in that this material entered the archaeological record without having been intentionally discarded; these deposits may be classified as primary refues (Schiffer 1972) or in situ-de facto refuse (South 1977).

The burnt deposits found on the floors of Lots 8 and 9 appear to represent the remains of warehouses destroyed in the Great Fire of 1835. The burnt deposit on Lot 9 was extensively excavated and appears to represent a grocer's warehouse. It included a number of barrels and crates that contained various commodities such as coffee beans, tobacco pipes, wine/spirit bottles, etc. The Lot 9 warehouse deposit is clearly assignable to the commercial phase of the material element life cycle, whereas the remaining occupational deposits may represent industrial, commercial or residential

refuse, or a mixture of materials from these phases of the material life cycle.

Examination of the refuse disposal patterns and formation processes that occurred at the Assay site will proceed through a number of testable hypotheses or steps.

Step 1. Refuse resulting from residential activities will be characterized by a high frequency of dietary elements (floral and faunal items) and artifacts related to food preparation and consumption.

Step 2. Refuse deposits associated with residential activities will contain a variety of goods that will show evidence of recycling, wear and repair, reflecting their passage through the full material element life cycle.

Step 3. Commercial refuse deposits will be characterized by a low representation of worn or recycled items, reflecting discard or abandonment prior to purchase by the end-user or consumer.

Step 4. Commercial deposits, while containing the same general classes of durable and consumer goods as will be found in residential deposits, will exhibit differences in terms of the quantity of refuse and the variety of items found within discrete refuse deposits.

Step 5. Relative to residential deposits, commercial deposits (particularly groceries) will contain a lower proportion of food preparation and food consumption vessels than food storage vessels.

Step 6. Deposits associated with industrial activities will be characterized by the presence of waste products or scrap elements as opposed to domestic and commercial deposits that will contain, primarily, finished goods.

Step 7. Commercial refuse deposits will contain a lower representation of technological items (tools) than will industrial or residential/industrial deposits. Overall, the frequency of technical equipment in the archaeological record will be low, since these items are curated.

Step 8. Distinctive patterns will be observed in the floral and faunal assemblages for residential versus non-residential occupations.

Step 9. In mixed use settings (residential/commercial, residential industrial, etc.), deposits will be characterized by greater functional diversity in the associated artifact assemblages.

The analytical approach to be used for identification of refuse disposal patterns will involve both quantitative and qualitative analyses of the materials within the deposits as well as examination of the formation processes of the deposits themselves. Artifact analyses will involve functional analyses of individual implements and material elements, measures of the diversity of material elements, and examination of wear patterns on durable elements. Artifact pattern analysis (South 1977) provides a relatively coarse-grained method for identification of site function, however a more detailed artifact classification system, particularly for vessel forms, will be required for

examination of the hypotheses. Identification of wear patterns will also provide an important means to examine the life cycle stage represented by various refuse deposits. The distinction between durable and consumable elements will be an important consideration, therefore the floral and faunal assemblages will be an important data set, in that they are among the most perishable items and represent consumable goods with a very short use-life. The floral and faunal assemblages will be examined to determine species diversity, frequency of recovery, the distribution of various skeletal elements, and bone modification (butchery patterns, charring, rodent gnawing, etc.) in order to test hypotheses regarding the depositional patterns associated with residential, commercial and industrial activities.

Formation processes will also be examined to evaluate archaeological integrity, since this issue is important to determine whether the deposits can be used to address higher-order research questions. This will require stratigraphic analysis, dating of deposits, cross-mend analysis, measurements of vessel completeness, and general analysis of the content of the deposits.

While all of the occupational deposits will be used to address Research Question 2, the Lot 9 warehouse may be identified as one of the most important deposits for addressing this question. The circumstances under which the materials on the Lot 9 warehouse floor entered the archaeological record provide an opportunity to examine some aspects of the use-life concept that will be broadly applicable for interpretation of the archaeological record. This deposit represents an uncommon situation wherein the precise time that the materials entered the archaeological record is known historically. A large portion of the diagnostic materials in this deposit consists of glass bottles and kaolin pipes, and these artifacts are commonly used to archaeologically establish deposit dates. Comparison of the historically known deposition date (1835) with dates derived archaeologically should provide insight into the concepts use-life (Schiffer 1983:681) and manufacture-deposition lag (Hill 1982:291) of various artifacts. Understanding of these issues is important for basic archaeological dating and interpretation. Closely related to the issues of use-life and manufacture-deposition lag is the problem of recycling of goods. Wise (1985) has pointed out that the use of second-hand ceramics may skew archaeological dating and interpretation of household expenditures from the Miller ceramic economic scale. The extent to which recycling and lateral cycling of wine/spirit bottles may have occurred can be investigated by analysis of glass bottle bases for signs of wear.

Step 10. In situations where turnover of businesses has occurred, there will be distinctive patterning in the refuse deposits. This may consist of a higher proportion of architectural debris, reflecting structural modifications, discrete deposits of functionally inter-related implements, or quantitative differences in the total refuse assemblage.

Modern studies of household refuse disposal indicate that the longer households occupy the same location, the more items they accumulate and that households that have recently moved have relatively fewer items (Schiffer, Downing and McCarthy 1981). From this it may be extrapolated that departure of a household is accompanied by an episode of "house cleaning" or disposal of goods accumulated during the duration of the occupation. Secondly, it may be hypothesized that a business will behave in an analogous fashion, however the composition of the assemblage will be different. Differences will be observable when a fundamental change in the nature of

the occupations occurs (as for example, replacement of a cooper shop by a grocer) than when the successive occupants are relatively similar as, for example, the replacement of grocer by a wine merchant.

As part of the historical investigations at the 175 Water Street Site, the annual mean ages of businesses along the Front and Water Street frontages of the block were constructed (Geismar et al. 1983). The procedure involved calculating the mean age of each business each year from the baseline occupational data that had been collected. It is proposed, here, to use a similar approach, augmented, however, by several other variables. Among these will be an assessment of similarity, which will measure the type of change from business to business so that the shift from a blacksmith's shop to a merchant's warehouse will appear as a different value from the shift from one commission merchant to another. Additionally, consideration will be given to the nature of the departure. In this case, the movement from one location to another within the ward will appear differently from a movement between wards, which will appear differently from the disappearance of the business entirely due to a retirement or financial failure or migration to another city.

Responding to this step draws on the body of historical data that must be compiled on the occupational histories of the lots. It tightens the linkage between the historical and archaeological analyses by examining further the historical circumstances under which an assemblage may be created. The available historical data possess not only descriptive significance as a baseline for the archaeological analysis but also can form an analytical tool with potentially broader application in future planning studies.

3. Consumer Behavior

Consumer behavior focuses on the activities associated with the terminal phase of material element life cycle. Whereas the study of formation processes and refuse disposal patterns discussed in the preceding section focuses primarily on questions related primarily to material culture, consumer behavior represents an area of research of more broad historical interest. Before one can proceed to an examination of consumer behavior, however, it is necessary to determine, through an examination of formation processes and evaluation of archaeological integrity (Question 2), whether the deposits are suitable for addressing research questions of more general historical interest. Question 3 is therefore proposed with the assumption that deposits of appropriate integrity will be identified. If it is determined that the archaeological deposits are too badly disturbed or represent a hopeless mixture of residential, commercial and industrial refuse, then it will not be possible to examine consumer behavior.

Research Question 3

What patterns of consumption characterize residential/commercial and residential/ industrial occupations vs. solely commercial or industrial occupations?

This question directly addresses the analytical utility of examining archeological deposits from mixed use settings. It specifically addresses differences in the consumption patterns that are expected to occur in residential settings versus purely

workplace settings. These questions have been dealt with to some extent on other archaeological projects in Manhattan, and there is now sufficient information to allow not only a comparison and synthesis of the results of various archaeological projects, but also to address some of the issues from a more historiographic perspective.

A variety of approaches have been developed for examination of consumer behavior. For example: dietary patterns and foodways may be reconstructed from floral and faunal data; expenditures for certain durable goods may be measured by techniques such as the Miller (1980) ceramic economic scale and other derivative methods; ceramic vessel forms may provide information on food preparation and consumption patterns; and bottles may provide information on the consumption of medicines, various types of beverages, condiments, etc. The most important successful studies of consumer behavior are those that integrate multiple data sets.

While there have been a number of studies that attempt to define differences in consumer behavior that may be linked with ethnicity and socioeconomic status, it is more appropriate to use the household as the primary unit for analysis of domestic consumption patterns, rather than ethnic groups or socioeconomic classes. LBA's recent work at the Christina Gateway project in Wilmington, Delaware has demonstrated that household consumption patterns that are closely linked to the household's composition (especially the presence of boarders), the household's life cycle (especially the presence of young children), and the household's income strategy (presence of secondary wage earners) (Louis Berger & Associates, Inc. 1985b; LeeDecker et al. in press). When examining patterns of consumption and discard in workplace settings (commercial or industrial sites), it would be appropriate to examine the composition and the relative levels of skill of the labor force. Also, it is important to determine the type of goods that were manufactured or sold on the lots under archaeological investigation, in order to identify items that may represent commercial or industrial refuse rather than items consumed in the workplace setting.

Analysis of the Telco Block collections was also directed at examination of late nineteenth-century workplace consumption patterns, using the ceramic and glass bottles recovered from closed feature contexts. These deposits contained an extraordinarily high proportion (75%) of alcoholic beverage bottles, even when deposits associated with businesses that might have supplied alcoholic beverages were excluded. The analysts concluded that this represented consumption of alcohol within the workplace and an attendant lack of work discipline (Rockman et al. 1983).

The issue of beverage consumption can be addressed historically. It should be understood that the consumption of alcohol was subject to varying cultural norms among different ethnic groups and at different times. LBA's proposed approach to the historical examination of this issue is described in Section C.1.d below.

Archaeological deposits that are suitable for examination consumer behavior should meet the following data or integrity requirements: (1) a variety of data classes (ceramics, glass bottles, flora, fauna, etc.) should be present, (2) the deposits should exhibit a relatively high degree of integrity, in order to allow functional identification of glass and ceramic vessel forms, faunal species, etc., and (3) the deposits should be datable to a fairly limited period of time, in order to permit association with a particular historical occupation.

Laboratory analysis for the Assay site materials had not reached the point where it would be possible to state that suitable deposits are available for consumption analyses. However, the conditions mentioned above are generally met by closed feature contexts such as privies, wells, cisterns, wooden boxes, etc., therefore it is possible that the deposits recovered from Categories 2, 17, 19, 20, 27 and 28 (see Table 1) may be suitable. Category 16, the barrel cistern in Lot 42, may have too few artifacts to be useful for consumption analysis.

Generally, occupational deposits from open yard contexts are less suitable for consumption analyses than those from feature contexts, since the artifacts are more fragmented and since the deposits are not as tightly dated. Based on LBA's very preliminary examination of the materials, it appears that some of the yard deposits, especially including those from Lot 7, may be amenable to consumption analysis.

While the Lot 9 warehouse deposit appears to represent a purely commercial deposit and is therefore unsuitable for examination of consumption patterns, it does provide an indication of the range of consumer products available in New York during the 1830s as well as an opportunity to examine the larger economic context within which purchasing decisions were made at the household and individual levels. There have been a number of studies that demonstrate the importance of understanding the economic network for analysis of consumption patterns. For example, Miller and Hurry (1983) demonstrated that apparently impoverished material culture patterns observed in the Ohio Western Reserve were attributable to isolation from major rail transportation routes, rather than differences in purchasing power or socioeconomic status. As a major port city, New York occupied a quite different position in the nineteenth-century economic system than that of the Ohio Western Reserve. The mercantile development of lower Manhattan was examined during the investigations at the 175 Water Street site (Geismar et al. 1983), with reference to a model that posits a shift from the diversified merchant to the merchant-specialist and eventually to the manufacturer-distributor (Porter and Livesay 1971). It is expected that the Lot 9 merchant's deposit at the Assay site will provide an opportunity to examine aspects of this model, using both archaeological and historical data.

A number of studies that have examined historical sources such as merchant's account books and inventories have provided important information pertaining to the larger issue of consumption patterns. For example, Miller's (1984) study of a Philadelphia pottery merchant has provided information on the variety of ceramics available and their relative prices, as well as the distribution system whereby manufactured goods reached consumers in both rural and urban settings. During LBA's investigation of the Hamlin site in rural New Jersey, a store keeper's inventory was examined that provided information on the range of goods that were available during the early nineteenth century. Beyond the Hamlin site, this study has important implications for interpretations of consumer behavior than from archaeological data alone, since the inventory records provide a far broader range of material goods than were found in the archaeological record (Louis Berger & Associates, in prep.).

III. WORK PLAN

A. Historical

The historical research component of this project involves five principal tasks: (1) completing site-specific research up to 1880; (2) investigating the distinctive artifacts found in the landfill; (3) dating and describing the landfill process, based on prior research; (4) describing historical patterns of beverage consumption that may have affected the presence or absence of artifacts; and (5) describing the patterns of trade in 1835. Discussion of each of these tasks is provided in the following sections.

1. Site-Specific Research, circa 1784-1880

The deficiencies in the historical data that were provided to LBA have been described in some length (see I.C.2). For reasons indicated, LBA proposes to begin to clarify some of these issues by a re-examination of the deed research, since it is entirely possible that straightening out the timing and partitioning of the properties will solve all of the problems observed in the tax and directory data. Since no copies or abstracts of the water lot grants themselves were transmitted to LBA, at a minimum the water lot grants will be checked at the Topographic Bureau (Manhattan Office), and title searches run from the late eighteenth century to at least 1880. LBA will use copies of the abstracts on file so that future data collection will be confined to that necessary to verify extant information. In this case, an LBA deed abstract form will be attached to the photocopy of the pre-existing abstract. Deed research will be focused on lots where important deposits have been identified (i.e., lots 6, 7, 8, 9, 42, 43). After the deed research is complete, the need for further work in tax and directory data will be evaluated. At most, the reconsideration will be focused on the period circa 1784-1818.

Certain data sets, primarily the Federal census, have clearly not been exploited. Federal census data, available as early as 1790 and used effectively at the Barclays Bank site, are useful for establishing occupancy since the census taker followed a route and noted who the various residents were. The 1880 population schedule is the first to indicate house numbers per se, but the census taker's route can usually be worked out by identifying the neighborhood, finding the sequence of names that is consistent with extant information from deeds and tax records, and then cross-referencing this list with city directories. This approach was successfully implemented by LBA for a study in Wilmington, Delaware. It should be noted, however, that the level of information varies from census year to census year and that names of household members do not appear until 1850.

Tax data have been collected up to 1850, and the Phase I report summarizes tax data, collected at ten-year intervals, up to 1880. Since it is presently believed that the neighborhood was given over to commercial/industrial uses after 1835 (if not earlier), these data for the later nineteenth century will be used to access the manufacturing/industrial schedules of the Federal census, which are available for 1850-1880 in Albany.

In summary, the deed research will be used to clarify problems identified with the prior data collection and to narrow as far as possible the need for redoing any of this work as it relates to the period circa 1789-1818. This information provides a critical baseline

for the archaeological analysis. In addition, the earliest deeds together with the water lot grants are useful for timing the landfill and identifying the earliest possible occupation.

Analysis of this body of data is essential to addressing Step 10, Research Question 2, which deals with the relationship between historic successions of businesses and archaeological site formation. The historical data requirements and procedures have already been outlined. They involved (1) the length of occupation; (2) the type of occupation, and (3) character of departure. The first and second considerations (i.e., length and type) results directly from the data collected; the character of the departure, however, will require additional data collection. For each departure, the name of the departing firm/individual will be checked in the city directory for the following year. If the name "disappears", as it were, then it will be assumed that the principals of the business retired, moved out of New York City, or went bankrupt. If the principals were still in business, then the new location will be coded to reflect the distance (within the ward or within the city but out of the ward), since the magnitude of the move may have affected the decision as to what to discard.

2. Distinctive Artifacts

Two distinctive artifacts, the cannons and the mast, were found in the landfill. Consultants will be retained for purposes of identifying these pieces, since such identifications require highly specialized skills and experience. Tasks associated with interpreting their presence, however, will be handled by LBA staff. The mast will be interpreted in the context of the fill-retaining structure of which it was an integral part, and the cannons will be treated in the context of their possible deposition. Two working hypotheses can be posited to explain their presence. First, they may have been abandoned when the Americans retreated in 1776. Second, they may have been abandoned by the British when they evacuated New York in 1783. Careful reading of the circumstances of the retreat (1776) and the evacuation (1783) may enable LBA to understand their deposition. Relevant research materials pertaining to this subject may be found at the New York Historical Society, New York Public Library, and the Library of Congress, where voluminous manuscripts are housed.

3. Landfill

The historical research associated with landfill involves dating and describing common practices. The importance of deed research to this issue has already been discussed (see section C.2.a). A substantial amount of research has already been conducted on landfill practices (e.g., Geismar, et al. 1983; Friedlander 1983; Geismar 1986). Therefore, prior research will be summarized as a context within which to understand the fill-retaining structures. The attributes of the fill-retaining will be treated separately (see section II.B.1).

4. Historical Patterns of Beverage Consumption

A substantial amount of recent historical research has shown that the American diet, including beverages, has varied historically. Wine, for example, was an eighteenth-century medicinal, used as a medium in which to dissolve powdered drugs, and wine merchants in New York were frequently found in association with

apothecaries and merchants who traded in pharmaceuticals. Taking the various mineral waters was considered a health cure well in the nineteenth century, but Morgan (1975:183) has suggested that one reason behind the decrease in mortality rates in Virginia after 1644 was the substitution of locally-distilled cider for polluted water. In short, behavioral norms associated with various spirits changed.

The most efficient way to implement this type of literature search is through an on-line computer search of the relevant bibliographies. Relevant bibliographic data bases include Historical Abstracts, America: History and Life, Dissertations Abstracts, Magazine Index, New York Times, National Agricultural Library, and National Library of Medicine. These can be accessed through DIALOG and NEXUS Systems.

This task will be executed if addressing Research Question 2 has indicated that Research Question 3 can in fact be addressed archaeologically.

5. Patterns of Trade in 1835

The Lot 9 merchant's floor provides an opportunity to examine more closely patterns in merchandising. An unparalleled resource exists in Washington, namely, the Records of the Collectors of Customs, 1789-1899 (R.G. 36) at the National Archives (National Archives and Records Service 1974:168-171). The records of the collectors or collection districts, one of which was New York City, consist of correspondence; records of entrance and clearance of vessels; cargo manifests; import books; passenger lists and abstracts; warehousing, drawbacks, and embargoes; crew lists; fiscal records; and wreck reports. There is some variation from port to port; records for the New York port cover the period 1784-1919. These will be augmented as necessary by consideration of newspapers and other records.

The occupant of the property appears to have A. V. Williams & Winant. This firm will be traced, if possible, through the customs records, and the manuscript records of the New York Public Library and the New York Historical Society will be checked for possible account books. It is possible, however, that the firm did not participate in the overseas commerce directly but as a jobber. If this is the case, then an appropriate sampling scheme for characterizing the trade in 1835 will be developed so that the range of commodities that a firm such as this may have handled can be defined and possible seasonal variation identified.

B. Archaeological

1. Data Processing and Analysis

General Work Plan. The treatment of the artifact collections will consist of a number of tasks, including cleaning, sorting, labelling, tabulation, specialized analyses, conservation of fragile items, and packaging of the materials for permanent curation. All items will be subjected to basic processing tasks: cleaning, sorting, tabulation, and packaging for permanent storage. Specialized analysis will be undertaken only for those portions of the collection that may provide information important to address the proposed research questions.

LBA's proposed laboratory procedures have been designed to be compatible with the

work previously accomplished by GCI, so that future work will augment and complement, rather than repeat, tasks already accomplished. Tasks already accomplished by GCI consist primarily of preliminary processing of the collections, i.e., washing and rough-sort tabulation. It has been reported verbally that 100% of the collection has been washed, and 90% of the collection has been sorted into major artifact categories.

The proposed levels of laboratory processing and analysis are summarized in Table 5 according to the different components of the collection. Since the deposits from landfill/riverbottom contexts will not be used to address the proposed research questions, these materials will receive only a minimal level of processing and tabulation. A number of other contexts are not expected to provide information relevant to the research design, and these will also receive only minimal processing and tabulation. These are listed as "Miscellaneous Finds" and "Other Contexts" in Table 5, and they include material recovered from various shovel probes, stray finds, material collected during shovel and backhoe clearing, and late nineteenth century contexts.

While detailed analysis will not be undertaken for material recovered from landfill, general dates of the material recovered from selected landfill contexts will be determined by tabulation of ceramic wares (pearlware, creamware, delft, etc.). After completion of the initial rough-sort tabulation for the landfill contexts, a 10% sample of contexts will be selected for this general dating assessment.

Research Questions 2 and 3 were posited to deal with the occupational deposits, however it is recognized that not all deposits will be amenable to address the issues posited by Research Question 3. The analysis will be structured in such a way that analysis and interpretation will be carried forth to a point where decisions will be made whether or not a given deposit is suitable to address Research Question 3. If not, then the issues subsumed under Question 2 will constitute the end product of analyses pertinent to the occupational deposits.

While it is doubtful that all of the occupational deposits will be suitable for analysis consumer behavior, all of the occupational deposits will receive stratigraphic analysis, detailed tabulation, functional analysis, dating, and cross-mending to evaluate formation processes and to determine their appropriateness for interpretation of consumer behavior.

The principal processing and analytical tasks are described in the following paragraphs.

Rough-Sort Tabulation. After washing, the artifacts from each context were sorted into seven major classes by GCI:

<u>Class</u>	<u>Contents</u>
Curved Glass:	bottle, jar and table glass
Ceramics:	table, kitchen and household wares
Pipes:	kaolin tobacco pipes
Other Diagnostics:	coins, buttons, beads, table utensils, etc.
Non-Diagnostics:	coal, slag, architectural materials
Faunal:	dietary bone, teeth, turtle carapace

Macro-Floral:

seeds, nuts, crustacean shell

This classification will be retained by LBA for completion. For contexts that will not be subjected to specialized analysis (landfill, miscellaneous finds, and other contexts), counts will be recorded for the number of items in each of the eight rough-sort classes. Weights for the shell will also be determined for these contexts.

Stratigraphic Analysis. Using the Harris matrix method (Harris 1979), stratigraphic analysis will be utilized to understand the depositional processes in the more complex test cuts and excavation areas.

Labeling. Labeling of individual artifacts will be limited to diagnostic artifacts which are: (1) in categories that will receive detailed analysis, (2) are of a quality that they may be illustrated (3) or will be included in a type collection. Generally, this will include ceramics that will be cross-mended, diagnostic bottle elements, and pipe stems and bowls with maker's marks. A bipartite number will be applied, consisting of the site number (1284) and the context number which indicates provenience within the site.

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Specialized Analysis. Occupational deposits will be subject to a number of specialized analyses to provide information relevant to Research Questions 2 and 3. These will include functional identification of artifacts in the Non-Diagnostic class, as well as more detailed analysis of the Curved Glass, Ceramic, Pipes and Other Diagnostic classes.

Ceramics will be tabulated according to ware, type, decorative attributes, and maker's marks to provide dating information. Ceramics will also be examined for evidence of wear. Ceramic dating will include application of South's Mean Ceramic Date formula as well as Termini Post Quem (TPQs) for various contexts, levels, strata and features. Ceramics will be cross-mended in order to assess stratigraphic integrity and to provide the basis for a minimum number of vessels (MNV) count. After cross-mending, vessels will be identified, and each vessel will be identified by general category (e.g., food preparation, food storage, food service, etc.) and by form (e.g., plate, cup, saucer, etc.). For each vessel, an estimate will be made of its percentage of completeness (e.g., less than 25% complete, 50-75% complete, 100% complete, etc.), in order to provide a basis for evaluating each deposit's integrity. Sherds that are too fragmentary for identification of form will be placed in a residual category. If as a result of the initial analyses, deposits are determined to be suitable for interpretation of consumer behavior, Miller's (1980) ceramic economic scaling technique will be applied.

Curved Glass will be tabulated according to major groups (bottle glass, table glass, and other) and functionally distinct categories (e.g., tumbler, wine/spirit bottle, decanter, pharmaceutical bottle, etc.). Dates will be derived from technological attributes (e.g., pontil marks, mold seams, etc.) as well as embossments. MNV counts will be derived from vessel bases and basal fragments, and cross-mending will be restricted to basal elements. Wear patterns on bottle bases will be evaluated to evaluate questions relative to use-life and recycling.

Analysis of the tobacco pipes will include identification of maker's marks which can provide dating information and location of manufacture. Also, evidence of wear or use patterns on pipe stems and bowls is expected to provide information relative to

TABLE 5. Summary of Proposed Laboratory Processing and Analysis

PROCEDURES	LANDFILL DEPOSITS	OCCUPATIONAL DEPOSITS	MISCELLANEOUS FINDS	OTHER CONTEXTS
Labelling		X	X	
Rough Sort Tabulation	X		X	X
Detailed Tabulation		X		
Cross-Mends and MNV Counts		X		
Floral and Faunal Analysis		X		
Prepare Type Collections			X	

Landfill Deposits Include Categories 1, 2 (?), 3, 5, 6, 8, 9, and 10.

Closed Feature Deposits include Categories 2, 16, 17, 18, 19, 20, 25, 26, 27 and 28.

Yard Deposits Include Categories 2(?), 4, 7, 11, 12 and 15.

Miscellaneous Finds Include: Wood Samples from Pilings, Posts, Wharves, etc.; stray finds; and Material Collected During Shovel and Backhoe Clearing (Category 0).

Other Contexts Include Categories 13, 21, 22, 23 and 24.

questions pertinent to use-life. Because pipe-stem dating is not considered reliable in contexts dating after 1780 (Binford 1978), stem bore diameters will not be measured.

The Other Diagnostic and Non-Diagnostic artifact classes will be tabulated according to functional categories. Manufacturing dates will be recorded as appropriate (e.g., coins, etc.). Wear patterns will be recorded as appropriate for these items.

Floral and faunal analyses will be useful not only for interpretation of refuse disposal patterns and formation processes, but also for reconstruction of dietary patterns. Floral and faunal analyses will consist of identification of each element to the species or genus level, and examination of attributes such as butchering marks, rodent gnawing, charring, etc. that can provide insight into dietary habits as well as post-depositional modification. While all flotation samples will be processed, only selected samples will be submitted to the floral/faunal analyst for detailed analysis.

Computer Data Entry. A computerized data base will be established to facilitate tabulation, analysis, and information retrieval. The coding system will be broadly similar to that used on the Barclay's Bank project, but refined to suit the analytical approach proposed for the Assay site. Since different levels of analysis are proposed for the Assay site collections, a hierarchical classification system will be devised which will allow both rough-sort and detailed tabulations within the same overall format.

Preparation for Storage. After completion of the sorting, labeling, tabulation and analyses, artifacts will be placed in plastic bags with a tag indicating provenience information (context number, test cut, level, and stratum). Materials from each context will be bagged according to the eight rough-sort classes (ceramics, pipes, faunal, etc.), and the context number will be written on the exterior of each bag as well. The materials will then be boxed in standard cardboard boxes (Leahy boxes), grouped according to rough-sort classes and the 28 context categories established by GCI (see Table 1). For context categories not receiving specialized analysis, the volume of material in the eight rough-sort classes will be determined, in order to provide an indication of the amount of material in various artifact classes that is available for analysis by future researchers. Each box will be numbered, and an external label will be applied to each box, indicating its contents. Finally an index of box numbers and contents will be prepared to assist future data retrieval.

2. Conservation

During GCI's preliminary laboratory processing, a number of items were pulled from the collection for conservation. Conservation has been completed for the majority of these items, and some are presently undergoing treatment in the LBA lab. Items currently undergoing conservation will be treated until they are stabilized. It is anticipated that some additional items will be selected for conservation during the proposed laboratory processing, and these items will be treated in a manner comparable to the items already stabilized.

3. Preparation of Study Collections

The collection includes a substantial amount of material that was recovered from contexts that have relatively little analytical value, and it is proposed that this material

be utilized to prepare type collections for future researchers. These contexts include what is described in the notes as "stray finds", "material collected during backhoe clearing", and "material collected during shovel clearing". These contexts represent material that was recovered selectively rather than systematically, and LBA's preliminary examination of this material indicates that it contains mostly diagnostic artifacts, including ceramic and glass vessels that are relatively complete. These items have only general provenience information, and they were not collected by systematic recovery procedures. Since the materials do represent relatively well preserved and recognizable vessel forms, they would be appropriate for incorporation into an archaeological type collection. Materials selected for incorporation into a type collection would need to be labeled, so that the site provenience would be preserved with the artifacts.

IV. PROJECT SCHEDULE AND BUDGET

A period of approximately 16 months is proposed for completion of the project. A time line chart showing major project tasks and milestones is presented in Figure 3. The proposed schedule assumes a start date of May 1, 1986. The first tasks to be completed include; (1) developing formal laboratory procedures, including a data entry format for computer processing, (2) preliminary laboratory processing, including processing of the soil and flotation samples, organization of the collections for efficient retrieval, and (3) historical data collection. The major tasks will center on the laboratory processing and analysis of the materials from the occupational deposits, and this will require a period of approximately nine months. The laboratory analysis will be structured to focus on a single lot or major deposit at one time, proceeding through a number of discrete stages (labeling, tabulation, cross-mending, etc.). The laboratory work will be monitored closely by senior project personnel and consultations will be held with LPC to insure that analysis does not proceed beyond the level of investigation necessary to address the proposed research questions.

The draft report will be submitted approximately 14 months after the formal start date. The proposed schedule includes a period of four weeks for review of the draft by HRO and LPC. The final report will be submitted approximately four weeks after receipt of formal comments on the draft.

A summary of the estimated labor according to major project tasks is presented in Table 6. It is important to note that these labor estimates were derived by reference to completed projects of comparable scope. The major portion of the project budget pertains to laboratory processing and analysis of the artifact collections. LBA's labor estimates are derived directly from the estimated number of artifacts in various classes and categories, which are presented in Table 7. The estimates of the artifact collection size presented in Table 7 are derived from the GCI sample data.

For the laboratory processing and analysis, the total labor estimate was based on the estimated time required for discrete tasks, such as labeling, ceramic tabulation, ceramic cross-mending, curved glass tabulation, tabulation of "small finds", etc. These estimates were derived from actual work laboratory performance, particularly during analysis of the Barclays Bank site collection.

LBA proposes a cost plus fee contract, with a fixed ceiling. A detailed budget has been submitted separately, indicating the anticipated breakdown of personnel by task and itemized expenses. Invoices will be submitted to HRO on a monthly basis, together with a summary progress report.

FIGURE 3. Project Schedule

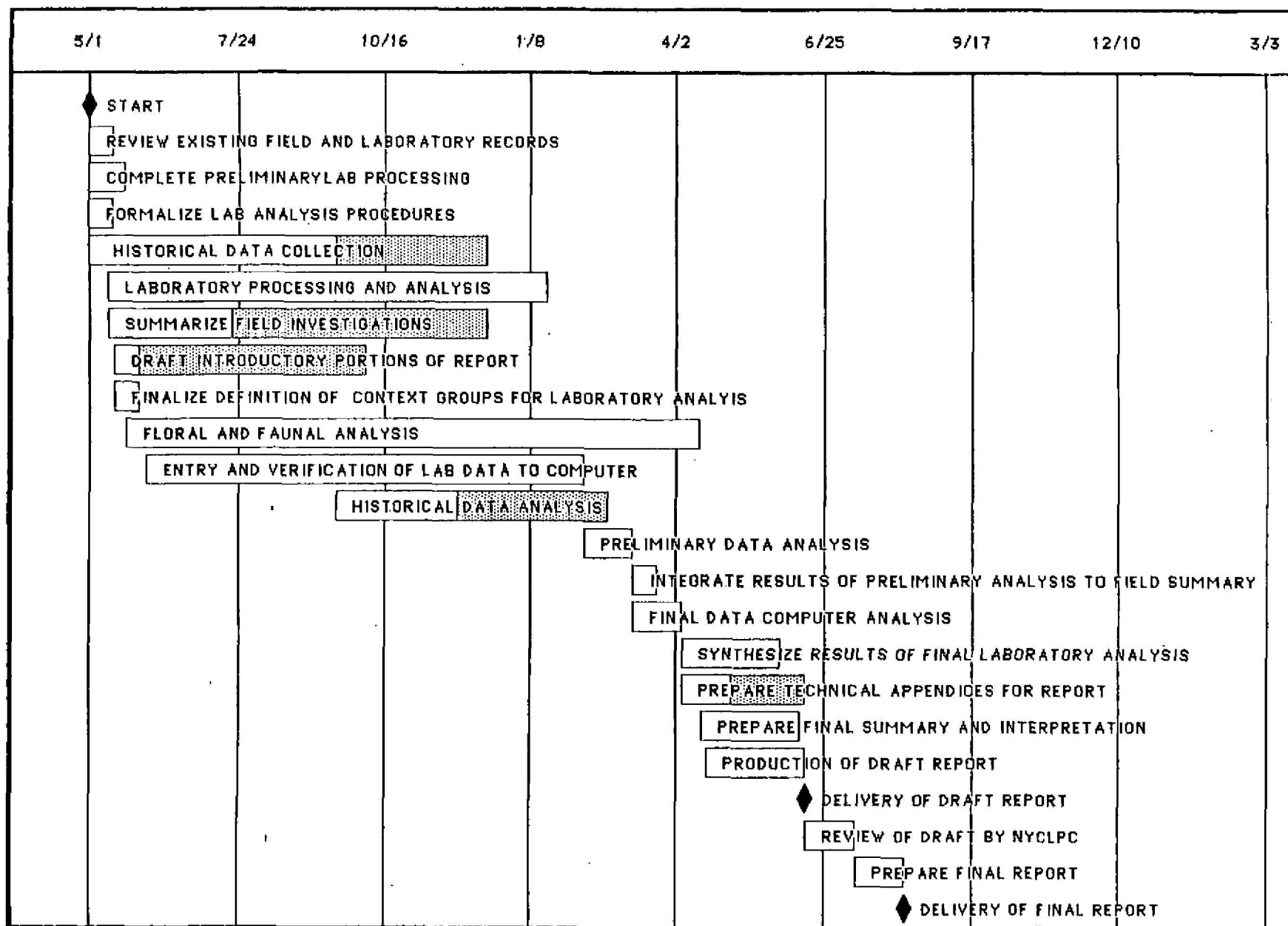


TABLE 6. Summary of Labor by Project Tasks.

TASK DESCRIPTION	LABOR ESTIMATE
<u>Direct Labor</u>	
Project Management	480 hrs
Historical Research--Data Collection	1,200 hrs
Historical Research--Analysis	600 hrs
Laboratory Processing & Analysis	9,494 hrs
Data Entry	240 hrs
Data Analysis & Interpretation	440 hrs
Report Preparation	2,200 hrs
Total Direct Labor	14,654 hrs
<u>Consultants</u>	
Floral/ Faunal Analyst	235 days
Diana Wall (GCI co-PI)	12 days
Colonial Armament Specialist	2 days
Waterfront Structure Specialist	5 days
Naval Architecture Specialist	2 days
Conservation Consultant	5 days
Total Consultants	264 days

TABLE 7. Artifact Estimates by Category

CATEGORY	CURVED GLASS	CERAMIC	PIPES	OTHER DIAGNOSTICS	NON- DIAGNOSTIC	FAUNAL	FLORAL AND SHELL	ESTIMATED TOTAL
Landfill								
Category 1	2,562	6,101	110	144	17,943	680	385	27,925
Category 2*	4,314	1,135	0	114	106,838	341	795	113,535
Category 3	3,851	25,208	97	388	1,133	1,327	356	32,360
Category 5	453	245	20	20	344	39	0	1,121
Category 6	159	70	10	20	40	229	80	607
Category 8	5,075	2,821	223	61	152	964	853	10,149
Category 9	341	325	249	58	142	741	92	1,949
Category 10	1,343	7,187	67	211	115	480	192	9,596
Total Landfill	18,098	43,092	776	1,016	126,707	4,801	2,753	197,242
Percent	9.2%	21.8%	0.4%	0.5%	64.2%	2.4%	1.4%	100.0%
Closed Features								
Category 16	485	528	31	81	599	1,044	1,824	4,592
Category 17	304	468	70	23	503	152	152	1,672
Category 18	6,353	9,132	238	1,112	3,176	16,756	42,723	79,410
Category 19	506	859	90	179	585	1,334	1,724	5,272
Category 20	525	1,106	101	22	712	1,215	67	3,749
Category 25	105	7	7	0	900	0	0	1,020
Category 26	33,695	639	5,798	2,100	2,968	274	137	45,657
Category 27	211	251	44	189	1,406	545	988	3,633
Category 28	3,522	3,871	70	628	7,254	9,207	10,323	34,875
Feature Total	49,228	20,732	6,519	4,962	25,357	39,734	68,261	214,755
Percent	22.9%	9.7%	3.0%	2.3%	11.8%	18.5%	31.8%	100.0%

*also includes occupational deposits from trash pit.

TABLE 7--continued.

CATEGORY	CURVED GLASS	CERAMIC	PIPES	OTHER DIAGNOSTICS	NON- DIAGNOSTIC	FAUNAL	FLORAL AND SHELL	ESTIMATED TOTAL
Yard Deposits								
Category 4	434	1,003	239	125	1,016	1,468	690	4,975
Category 7	251	579	138	72	587	847	399	2,873
Category 11	300	256	23	0	1,431	10	78	2,095
Category 12	173	220	81	23	81	150	70	799
Category 15	1,344	3,727	896	502	2,741	5,985	2,741	17,918
Total Yard Dpsts.	2,502	5,785	1,377	722	5,856	8,460	3,978	28,660
Percent	8.7%	20.2%	4.8%	2.5%	20.4%	29.5%	13.9%	100.1%
Other Contexts								
Category 13	134	309	73	39	313	451	212	1,531
Category 21	24	24	0	8	24	0	16	96
Category 22	719	41	41	83	173	25	50	1,132
Category 23	634	1,466	349	183	1,484	2,144	1,008	7,268
Category 24	601	1,390	331	174	1,407	2,033	955	6,891
Total Other Cxs.	2,112	3,230	794	487	3,401	4,653	2,241	16,918
Percent	12.5%	19.1%	4.7%	2.9%	20.1%	27.5%	13.2%	100.0%
Misc. Finds	10,056	18,010	1,020	1,295	39,688	14,280	19,351	103,700
Percent	9.7%	17.4%	1.0%	1.2%	38.3%	13.8%	18.7%	100.0%
GRAND TOTAL	81,996	90,849	10,486	8,482	201,009	71,928	96,584	561,275
PERCENT	14.6%	16.2%	1.9%	1.5%	35.8%	12.8%	17.2%	100.0%

Source: estimates for the total number of artifacts in each category and their proportion in the rough-sort artifact classes were derived from GCI lab data.

V. DELIVERABLES

Deliverables will include a draft report and a final report that present the results of the entire program of historical research, field investigations and laboratory analysis. In addition to the narrative report, a number of technical appendices will be submitted in a separate volume. These will include artifact summaries, detailed lot histories, and other supporting information. Five copies of the draft report and 25 copies of the final report will be submitted, including appendices. In addition to the technical report and appendices, a brief non-technical summary of the project will be prepared for distribution to the general public; 20 copies of this report will be submitted.

VI. STAFF AND CONSULTANTS

LBA has assembled a highly qualified team of cultural resource management professionals to complete the historical and archaeological investigations at the Assay site. The key personnel include a Project Manager, two co-Principal Investigators, a Laboratory Director, a Floral/Faunal Analyst, and a number of Laboratory Analysts. They will be supported by various research assistants, technicians, and report production personnel.

Dr. John A. Hotopp will serve as Project Manager and will have overall administrative responsibility for the project. Since 1970, Dr. Hotopp has directed archaeological and cultural resource management projects with responsibilities in administration, accounting, and general project coordination. Prior to joining LBA, Dr. Hotopp was Project Director for the Office of the State Archaeologist, Iowa, and Director of Transportation Archaeology for the Iowa Department of Transportation. Since 1981, Dr. Hotopp has directed cultural resource projects for LBA in New York, New Jersey, Massachusetts, Georgia, Iowa, Pennsylvania, Wyoming, North Carolina, Nebraska, Delaware and the District of Columbia.

Mr. Charles LeeDecker will serve as co-Principal Investigator, and he will also have major responsibility for guiding the artifact analyses and writing the archaeological portions of the draft and final reports. Mr. LeeDecker is a member of the Society of Professional Archaeologists, with accreditation in field research and cultural resource management, and he has a broad background in the archaeology of the Southeast and Middle Atlantic States, and has extensive experience involving testing and data recovery for urban sites. These include the testing of the National Photographic Center Addition which led to the identification and mitigation of the Quander Alley site in the Washington, D.C. Navy Yard Annex as well as the testing of a proposed bus garage and maintenance yard in Southeast D.C. Mr. LeeDecker joined LBA's Cultural Resource Group in February 1984 and has been actively involved in several urban and historical archaeological projects. He served as Field Director and co-Principal Investigator for the Christina Gateway project (Wilmington, Delaware), a project that required both testing and data recovery activities within a highly compressed time schedule; the project resulted in an enhanced understanding of nineteenth century household composition, consumer behavior, income strategies, and developmental cycles. Mr. LeeDecker also served as Principal Investigator for the combined historic and prehistoric data recovery at the Howard Road Historic District, a site in the Anacostia section of the District of Columbia that is associated with a planned settlement of emancipated Blacks.

Amy Friedlander will serve as Co-Principal Investigator with direct responsibility for supervising the historical research component of this project and for integrating the results into the final synthesis. Dr. Friedlander has completed many similar projects in New York City, and her experience in cultural resource management projects spans urban and rural projects in nine states and the District of Columbia. In New York City, she participated in the 175 Water Street, Times Square, Telco and Barclays Bank projects. Due to her involvement in other projects in New York State, she is familiar with the research potential of repositories in Albany as well as the various archives in New York City. Other urban experience includes projects in Wilmington, Delaware; Washington, D.C.; Frederick, Maryland; and Charleston, South Carolina.

The laboratory personnel will include Emil Veakis (Laboratory Director), Marian Craig (Assistant Laboratory Director and Laboratory Analyst), Meta Janowitz (Laboratory Analyst), Jay Cohen (Laboratory Analyst), Sue Kahn (Laboratory Analyst), Bill Rosenberg (Laboratory Analyst), and Mallory Gordon (Laboratory Analyst), and a number of laboratory technicians. Dr. Veakis has oversight responsibility for all of LBA's archaeological laboratory operations, and he will have supervisory responsibility for the Assay site laboratory work. Marian Craig is the Assistant Laboratory Director and she will coordinate the laboratory processing and analysis on a daily basis and she will be involved as a Laboratory Analyst as well. All of the individuals identified as Laboratory Analysts have extensive prior experience with historic material in general, and many have worked on other site collections from New York City.

Cheryl A. Holt will serve as the consultant for the floral and faunal analysis. Ms. Holt has extensive experience in the design and execution of research strategies aimed at delineating patterns in historic urban foodways. The major focus of Ms. Holt's doctoral studies was the integration of archaeology and ethno-biological analysis. As a staff archaeologist with Soil Systems, Inc. (Alexandria, Virginia), she was responsible for the floral and faunal analysis for several urban data recovery projects. These include the Quander Alley Archaeological site (Washington, D.C.), the Wilmington Boulevard Mitigation project (Wilmington, Delaware), the 175 Water Street site (New York City), the TELCO block testing (New York City), and the testing along the Carroll Creek Channelization project (Frederick, Maryland). In January 1984, Ms. Holt formed Analytical Services for Archaeologists and has provided floral and faunal analyses to a variety of clients. She has worked closely on several of LBA's urban and historical projects, including the Christina Gateway project (Wilmington, Delaware), the Howard Road project (Washington, D.C.), the Tyndall Farmstead (Trenton, New Jersey), the Shearson-American Express site (New York City), the Barclays Bank site (New York City), and the Thomas Hamlin site (Warren County, New Jersey). She has also completed the floral and faunal analyses for the Baltimore Brewery and the Albemarle Row House sites in Baltimore.

Other consultants will be retained to deal with specialized aspects of the project, including waterfront structures, colonial armaments, naval architecture, and conservation. In addition, Ms. Diana Wall, formerly Co-Principal Investigator for the Assay site with GCI, will provide consultant services to LBA throughout the project.

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CORRESPONDENCE

Friedman, Edwin
August 24, 1984

Letter to Joseph Ketas, Director of Planning and Field Services, indicating satisfactory completion of archaeological field work at the Assay site.

Henn, Roselle and Diana diZerega Wall
April 4, 1984

Letter to Sherene Baugher, New York City Landmarks Preservation Commission, clarifying proposal for backyard testing.

April 6, 1984

Letter to Sherene Baugher, New York City Landmarks Preservation Commission, clarifying proposal for deep testing.

Greenhouse, Barry
December 11, 1985

Letter to Larry Jay Wyman, HRO, International, Ltd., re: Financial Square