DOLORES ARCHAEOLOGICAL PROGRAM TECHNICAL REPORTS

Report Number: DAP-067

# 1980 Laboratory Report

by

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## ABSTRACT

The operations of the Dolores Archaeological Program Field Laboratory from 1 March 1980 through 28 February 1981 are reported. During this period, plans were made for processing materials from the 1980 fieldwork, and those materials were received and processed. The processed materials included 27,811 bags of material and 5,715 samples. Changes were made in the laboratory flow system to make the operation of the laboratory more efficient. New forms to document changes in the records and to control the flow of materials were designed and implemented. A description of the laboratory flow system is included as an appendix.

# INTRODUCTION

The DAP (Dolores Archaeological Program) laboratory operations continued through the entire reporting period (1 March 1980-28 February 1981) in support of the DAP fieldwork and report preparation. The laboratory flow system provides the framework for laboratory operations, as outlined in appendix A of this report. For report purposes, the year can be broken into three periods that reflect changes in the emphasis of laboratory activities. These changes in emphasis, occurring in response to the pattern of the fieldwork and report preparation, are discussed in the "Annual Review" section of this report. This section also summarizes the laboratory responsibilities of the reporting year, which were handled by the Contractor's laboratory supervisor and the laboratory crew chief. The "Materials and Samples Summary" section summarizes the materials and samples that were handled by the archaeological field laboratory during the reporting year.

The basic organization of laboratory procedures and responsibilities has been presented in previous reports (Farley 1982a, 1982b). Modifications in those procedures and responsibilities were made during the reporting period and are described in this report.

## ANNUAL REVIEW

For report purposes, the year can be broken into three periods that reflect changes in the emphasis of laboratory activity, as the laboratory flow system responded to the seasonal cycle of the DAP field operations. Each of these three periods will be described in some detail.

1. Planning: 1 March 1980 through 10 May 1980.
2. Processing: Phase 1--11 May 1980 through 17 January 1981.
3. Processing: Phase 2--18 January 1981 through 28 February 1981.

### Planning

During this 10-week period, emphasis was placed on planning for the large-scale field season that was scheduled for the summer. Secondary emphasis was placed on completion of processing of the bulk soil samples that had been collected during 1978 and 1979 fieldwork, coordination of the program's data processing operations, and review of the advanced field forms for the 1978 and 1979 fieldwork.

Completion of the formal revisions of the laboratory flow system, based on the ongoing evaluation of the efficiency of the system, took place in early March 1980. Plans for full implementation of the system were made including staffing, ordering supplies, and allocating space. Fifteen employees were hired to implement those sections of the laboratory flow system that were the responsibility of the DAP. The selection of qualified personnel to fill the available positions began early in April. The task specialists, consultants, and the laboratory supervisor submitted lists of supplies required for the six-month period scheduled

for field operations. Space was allocated to accommodate the additional laboratory personnel who were hired for the summer months.

During the planning period, the DAP operated the laboratory flow system with the laboratory supervisor, the laboratory crew chief, one crew person, and one member of the government's YACC program.

As planning continued, processing of the bulk soil samples collected during the 1978 and 1979 field seasons was completed in order to make all of the materials recovered from the samples available for preliminary analysis. Materials not slated for immediate analysis have been routed to the permanent storage function of the laboratory flow system.

With the selection of a task specialist for the Data Processing Group in April, the laboratory supervisor's role as coordinator of data processing activities drew towards a conclusion. Coordination responsibilities were gradually shifted to the new task specialist during an orientation period of three months.

By the end of April all needed Structure Description, Structure Integration and Inference, Surface Description, Household Cluster, and Activity Recording Forms had been submitted to the laboratory supervisor for review, except those from Sites 5MT2151 and 5MT4475. Review was completed by the middle of May 1980, and copies were returned to the crew chiefs responsible for the forms.

## Processing - Phase 1

During this 36-week period, emphasis was placed on processing the materials and samples collected during the 1980 field season. Incoming materials and samples were handled on a daily basis according to the format of the laboratory flow system.

The laboratory flow system was operated during this period with varying crew levels. For the first three weeks of the period, the system operated with the laboratory supervisor, the laboratory crew chief, two assistant laboratory crew chiefs, and one crew person. These first three weeks were devoted largely to training of the assistant laboratory crew chiefs in preparation for their supervisory roles. The small number of bags of materials and samples received was processed as part of the training.

At the beginning of June 1980, the remaining 13 crew persons and 2 members of the government's YACC program began work. On 16 and 17 June, all program personnel participated in an orientation session held at the Montezuma-Cortez High School. Organized by the laboratory supervisor, the orientation session contained information essential for both field and laboratory operations. Substantial time was spent during June in on-the-job training for the new crew persons. During June one of the assistant laboratory crew chiefs was placed on notice, and when improvement was lacking, was terminated in July. No replacement was chosen, and the laboratory flow system responsibilities of the DAP were thenceforward handled with only one assistant laboratory crew chief.

With the winding down of field operations late in 1980, the laboratory processing crew was reduced in size at the end of October to the laboratory supervisor, the laboratory crew chief, one assistant laboratory crew chief, four crew persons, and two members of the government's YACC program. The four crew persons were laid off in mid-December, and the Contractor operated with this decreased personnel level for the remainder of the processing Phase 1 period.

With the laboratory flow system in operation, the lab personnel identified a built-in lag of approximately four weeks before received materials and samples actually reached the task specialists for preliminary analysis. This lag, greater than that experienced during the 1979 field season, is a factor mainly of the time before receipt of the Field Provenience Description Forms from the field. Coordination with the locality supervisors during future field seasons may provide a remedy for this lag and therefore an increase in the efficiency of laboratory operations.

The processing function of the laboratory flow system was completed for the materials and samples collected during the 1980 field season by 31 October 1980, except for the bulk soil samples. The clearing function of the laboratory flow system was completed for materials and samples collected during the 1980 field season by 17 January 1981.

During the last week in June 1980, new bulk soil sample processing equipment arrived at the Lebanon laboratory facility and was demonstrated in early July. The special processing step for the processing function of the laboratory flow system was initiated during the second week of July and continued until the third week in November; due to inclement weather, processing of bulk soil samples was discontinued until such time as there was internal space in the laboratory building for assembly of the equipment. Processing of bulk soil samples was completed by 17 January 1981.

Throughout the course of the field season, the Contractor's laboratory supervisor participated in weekly crew chief meetings, which included discussions of excavation and survey strategies and discussions of appropriate and consistent recording techniques. This coordination,

coupled with implementation of the Change Form (fig. 1 and table 1), greatly improved field laboratory communications.

## Processing - Phase 2

During this six-week period, emphasis was placed on development of the temporal and spatial recording format for the program. Secondary emphasis was placed on orientation of the Environmental Studies task specialist and crew and completion of previous work.

The laboratory supervisor, in conjunction with the Data Processing task specialist and the Reductive Technology task specialist, developed a format for recording temporal and spatial interpretations, which allows computer linkage with the preliminary analysis data files. The format allows researchers to organize data by interpreted units rather than by administrative units imposed during excavation. Orientation of the crew chiefs to the new recording format took place during the month of February. Substantial time was expended to include the interpretations from the 1978 and 1979 fieldwork as well as those from the most recent field season. The interpretive work continued on into the next reporting year.

The Environmental Studies task specialist and crew arrived to work on project during the third week in January. Allocation of space for their work was made at the expense of processing space. Orientation of the task specialist and crew continued beyond the end of this reporting year.

The laboratory crew chief and assistant laboratory crew chief concentrated on completion of changes and corrections identified by the crew chiefs in provenience information, and the task specialists in catalog information.

# D.A.P. CHANGE FORM

F.S.#(s): ⑤

FROM: ③ SITE: ①

TO: ④ DATE: ②

TYPE OF CHANGE: ⑥

| ORIGINAL PROVENIENCE | CORRECT PROVENIENCE |
|---|---|
| ⑦ | ⑧ |
| | |
| | |
| | |

| MAT/SAMPLE | #of BAGS | BAG DATE(S) | LAB USE ONLY BAG | CR | FS | FI | LOG |
|---|---|---|---|---|---|---|---|
| ⑨ | ⑩ | ⑪ | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |

LAB ONLY: NOTE GENERATED AFTER CLEARING ☐
CHANGE WITHIN SAME F.S.; BAG LABELS HAVE NOT BEEN CHANGED ☐

Figure 1. Change Form.

Table 1. Guidelines for the Change Form

| | | | |
|---|---|---|---|
| Space #1: | This space contains the Smithsonian designation for the site. | | |
| | FORMAT: 05 (state code) 2 digits | MT (county code) 2 digits | 04475 (site number) 5 digits |
| Space #2: | Date on which the form was initiated and sent. | | |
| | FORMAT: 01 (month) 2 digits | 01 (day) 2 digits | 82 (year) 2 digits |
| Space #3: | 4-letter initials for the person sending the note, to whom the note should be returned with appropriate information. | | |
| Space #4: | 4-letter initials for the person to whom the note is being sent, usually the crew chief responsible for the excavation. | | |
| Space #5: | This space contains the FS number for this provenience. FORMAT: 000001 (from the consecutive site series); 6 digits - leading zeros may be omitted. | | |
| Space #6: | This space contains a longhand description of the nature of the problem that has been identified. | | |
| Space #7: | The information that is contained on the original bag label that was received in the laboratory. This may involve transcription of the entire label, or only a portion thereof. | | |
| Space #8: | Left blank by the laboratory crew. The crew chief to whom the note is sent is responsible for completing this section with the correct information. Use parallels the use of space #7. | | |
| Space #9: | Material identification class code or sample type and number, for the bags under question.* | | |
| Space #10: | The number of bags of this material type or sample number which are referred to in this line of the change form. | | |
| Space #11: | Dates from the bag label to which the change form refers. | | |

* Field Provenience Description Form coding format.

NOTE: FS - Field provenience designation.

## OTHER ACTIVITIES

Activity in the Reductive Technology Group, the Additive Technology Group, and the Environmental Studies Group concentrated on preliminary analysis for the entire reporting period; first on the excavated materials from the 1980 field season and then on survey materials collected during early Dolores Project work in 1965-68 and in 1972-73 and some related survey materials from BLM (Bureau of Land Management) survey work in 1974. For further information concerning the studies undertaken by these task specialists, refer to Lucius (1981) and Moore (1980).

The Data Processing task specialist began work in June 1980. The person chosen had been operating as acting Data Processing task specialist since January 1980, so little orientation was needed. Responsibility for coordination of the Contractor's data processing operations was gradually transferred from the Contractor's laboratory supervisor to the new Data Processing task specialist. For further details refer to Ryan and Rohr (1982).

During the 1980 field season, as implemented at the end of the 1979 field season, all Photographic Forms were routed through the laboratory supervisor after completion in the field. This step was designed as a check on the use of provenience variables and values on the Photographic Forms in a manner consistent with their use on the field forms.

Throughout the reporting period, fire drills were held at the Lebanon laboratory facility on a bimonthly basis, in conjunction with safety reviews by the safety responsibility teams. Attendance reports for the fire drills were forwarded to the BOR (Bureau of Reclamation).

In January 1981, the need for a centralized location for status information concerning the progress of work on each site was noted.

Therefore, one wall at the front of the laboratory building was set up as a progress chart. Rows on the chart represent individual reports that are being prepared; columns on the chart represent blocks of laboratory work that must be accomplished in order to finish the reports.

Until January 1981, the only field form that had been submitted for input was the Field Provenience Description Form. During January the Feature Forms, which had been completed for fieldwork in 1978, 1979, and 1980, were submitted for input. The laboratory supervisor is, thus, responsible for the consistency and accuracy of the data contained in these two files.

During February 1981, the Sample Catalog Forms were prepared for input. This input was scheduled to occur early in the next reporting year.

## MATERIALS AND SAMPLES SUMMARY

During the 1980 field season, the DAP collected a variety of materials and samples, as summarized in tables 2 and 3. All of these materials and samples were processed and handled by the archaeological field laboratory within the framework of the laboratory flow system. An outline of the laboratory flow system can be found in appendix A, and the specific procedures used for processing and handling the materials and samples can be found in the laboratory manual (Farley 1982c).

Table 2. Materials and samples summary

| | Materials (bags) |
|---|---|
| Ceramic | 9,662 |
| Flaked lithic | 8,316 |
| Nonflaked lithic | 3,388 |
| Nonhuman bone | 3,190 |
| Human bone | 132 |
| Vegetal | 688 |
| Other inoragnic | 145 |
| Other organic | 138 |
| Historic | 2,152 |
| Total materials | 27,811 |
| | **Samples** |
| Archaeomagenetic | 57 |
| Bulk soil | 2,177 |
| Radiocarbon | 144 |
| Dendrochronological | 613 |
| Material source | 2 |
| Pollen | 2,313 |
| Stratigraphic column | 19 |
| Film | 390 |
| Total samples | 5,715 |

The preliminary analysis function of the laboratory flow system was completed for all materials collected during the 1980 fieldwork. There were 27,811 bags of materials handled and routed to the permanent storage function under the responsibility of the BLM collections manager.

Table 3. Summary of materials (number of bags) and samples (number of samples) processed, by site

| Site | CER | FL | NFL | NHB | HB | VEG | INORG | ORG | BS | CF | DD | PN |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 23 | 1,410 | 1,046 | 330 | 566 | 4 | 157 | 21 | 26 | 268 | 8 | 134 | 298 |
| 2161 | 267 | 241 | 97 | 115 | 0 | 16 | 5 | 7 | 75 | 25 | 23 | 81 |
| 2181 | 27 | 67 | 15 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2182 | 2,043 | 1,385 | 726 | 405 | 18 | 157 | 53 | 9 | 285 | 23 | 78 | 338 |
| 2215 | 1 | 50 | 11 | 0 | 0 | 1 | 0 | 0 | 35 | 1 | 0 | 0 |
| 2241 | 202 | 536 | 57 | 24 | 0 | 0 | 0 | 0 | 19 | 2 | 0 | 23 |
| 2854 | 131 | 96 | 36 | 36 | 0 | 4 | 0 | 1 | 19 | 11 | 0 | 2 |
| 4475 | 932 | 630 | 373 | 464 | 2 | 72 | 13 | 50 | 331 | 0 | 139 | 378 |
| 4477 | 894 | 515 | 285 | 367 | 4 | 95 | 9 | 4 | 353 | 6 | 126 | 444 |
| 4479 | 1,169 | 516 | 337 | 255 | 0 | 33 | 6 | 2 | 225 | 13 | 5 | 307 |
| 4480 | 231 | 178 | 103 | 39 | 2 | 12 | 3 | 0 | 50 | 9 | 15 | 27 |
| 4644 | 188 | 156 | 89 | 80 | 0 | 40 | 0 | 0 | 101 | 0 | 2 | 13 |
| 4650 | 185 | 190 | 53 | 71 | 0 | 7 | 7 | 1 | 35 | 3 | 8 | 38 |
| 4671 | 1,151 | 1,144 | 386 | 529 | 18 | 32 | 14 | 8 | 189 | 18 | 4 | 210 |
| 4684 | 380 | 338 | 155 | 134 | 68 | 37 | 5 | 28 | 153 | 1 | 31 | 174 |
| 4725 | 121 | 77 | 59 | 29 | 1 | 9 | 2 | 0 | 0 | 0 | 30 | 0 |
| 4789 | 8 | 24 | 5 | 8 | 0 | 4 | 1 | 1 | 3 | 5 | 2 | 3 |
| 4797 | 1 | 38 | 10 | 27 | 0 | 1 | 0 | 0 | 14 | 3 | 0 | 0 |
| 5361 | 7 | 65 | 10 | 5 | 0 | 4 | 1 | 0 | 17 | 6 | 1 | 3 |
| Survey | 217 | 733 | 179 | 4 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Testing | 72 | 272 | 65 | 17 | 12 | 7 | 5 | 1 | 5 | 0 | 15 | 4 |
| Misc | 25 | 19 | 7 | 15 | 0 | 0 | 0 | 0 | 0 | 10 | 0 | 0 |
| Totals | 9,662 | 8,316 | 3,388 | 3,190 | 132 | 688 | 145 | 138 | 2,177 | 144 | 613 | 2,343 |

NOTE: Misc - Miscellaneous.
CER - Ceramic.
FL - Flaked lithic.
NFL - Nonflaked lithic.
NHB - Nonhuman bone.
HB - Human bone.
VEG - Vegetal material.
INORG - Inorganic material.
ORG - Organic material.
BS - Bulk soil sample.
CF - Radiocarbon sample.
DD - Tree-ring sample.
PN - Pollen sample.

All of the archaeomagnetic samples collected were forwarded to the archaeomagnetic consultant at Colorado State University, Ft. Collins, Colorado. All of the dendrochronological samples collected were forwarded to the Laboratory of Tree-ring Research at the University of Arizona, Tucson, Arizona. Four radiocarbon samples collected during the 1980

fieldwork have been submitted for analysis, two to Beta Analytic, Inc., of Coral Gables, Florida, and two to Dicarb Radioisotope, Inc., of Gainesville, Florida.

Selected pollen samples have been submitted to Palynological Consultants, Inc., of Montrose, Colorado, for analysis and interpretation. Other samples, including material source samples, bulk soil samples, and film exposed in the field are handled in-house. Information concerning analysis and interpretation of these samples will be contained in other reports in the program series.

## REVIEW OF CHANGES IN THE LABORATORY FLOW SYSTEM

During the reporting period, 12 changes were made and incorporated into the preceding version of the laboratory flow system (Farley 1982b). Each change is described and the reasons for the changes are outlined. Other changes in the text describing the laboratory flow system are amplifications or details included for the sake of clarity.

### Change 1: Clearing Function, Step 1

Upon review of the laboratory flow system in preparation for the 1980 field season, field and laboratory personnel agreed that improvement was needed in the reciprocal transmission of information between the field and the laboratory. It was decided to design a specific form to handle this transmission of information, resulting in the DAP Change Form (fig. 1). This form can be initiated by either field or laboratory personnel, depending on who first identifies an error or the needed change. This form is used to handle changes on bag labels or on field forms. This mechanism solved the problems of transmitting information between the field and the laboratory, and its use has become an integral part of the laboratory flow system.

### Change 2: Clearing Function, Step 3

Rather than routing materials and samples not slated for immediate preliminary analysis to the permanent storage function, such materials and samples are now held by the Contractor's laboratory processing crew until the preliminary analysis is scheduled. This saves the work of an unnecessary transmission of materials and samples into and out of the permanent storage function.

### Change 3: Permanent Storage Function, Step 2

At the end of the reporting year the government had no design for practical application of the computer storage aspect of step 2, and there was no prospect for such a design in the near future. Therefore, reliance has been placed wholly on the single copy of the Post Preliminary Analysis Inventory Form for inventory security. The laboratory flow system was amended to show that there is a potential for creation of a computer-based system, though none has been created to date.

### Change 4: Permanent Storage Function, Step 3

With the increasing frequency of loans to the Contractor for more detailed phases of analysis, the BLM collections manager identified the need for a more formalized loan procedure. A Request For Materials Form (fig. 2 and table 4) was designed in order to provide a second record of each loan. Since the loan requested may not match the loan actually made (e.g., some of the requested material may be on loan already) the Request For Materials Form records what was requested, and the BLM Loan Form (fig. 3 and table 5) records what materials and samples or paper records were actually loaned. This two-form process for the retrieval of requested materials and samples solved the problem of recording loans and has become an integral part of the laboratory flow system.

### Change 5: Permanent Storage Function, Step 5

In conjunction with change 3, this step has been eliminated from the laboratory flow system. Since the BLM has no computer-based inventory, there is no work to perform in updating such an inventory when loans are made.

Table 4. Guidelines for the Request for Materials Form

| | |
|---|---|
| Space #1: | A checkmark or longhand note will indicate the section(s) of the collection from which this request is to be retrieved. |
| Space #2: | 4-letter initials of the person making the request. |
| Space #3:<br>Space #4:<br>Space #5: | Date for each of the specified stages of the retrieval process.<br>FORMAT: 01 (Month) 2 digits; 01 (Day) 2 digits; 82 (Year) 2 digits |
| Space #6: | Detail of the materials and/or samples for which this request is being made. If materials are being requested, the catalog item number(s), and FS number(s), material identification class(es), and site number(s) must be specified. If samples are being requested, the sample type(s), sample number(s), FS number(s), and site number(s) must be specified. |

NOTE: FS - Field provenience designation.

Change 6: Field Forms, Step 2

Midway in the reporting year the Contractor was informed that BOR could not continue to provide keypunching services. An outside keypunching service was chosen to input field forms for the program. The Data Processing Group had the responsibility for transmitting forms to the service.

Change 7: Field Forms, Step 4

With the advent of major editing and verification changes in the computer data files for field forms, the Contractor's laboratory supervisor and the Data Processing task specialist identified the need for formal procedures to initiate and document corrective changes made in the files. A Computer Change Form (fig. 4 and table 6) was designed and implemented to record these changes. This form has become an integral part of the laboratory flow system.

REQUEST FOR MATERIALS

What type: (1)
__ paper records
__ photos
__ artifacts
__ samples
__ other_____

Requested by: (2)_____
Date requested: (3)_____
Date needed: (4)_____
Date filled: (5)_____

(6) See attached list

__ Materials listed below (include site #, FS, material type, catalog item # sample type and #, form type and #, roll #, etc., as necessary):

Figure 2. Request for Materials Form.

BLM LOAN

Page__of__ ①

Site 05_____Type_____

Dead__ ②

To: ③ ___ ___ ___

Name/
Institution ④_____

Address/
Affiliation_____

| Site 05 ⑤ | FS ⑥ | SS/Mat Type ⑦ | SS/CI # ⑧ | Date Out ⑨ | Date In ⑩ | Remarks |
|---|---|---|---|---|---|---|
| | | | | | | |
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Figure 3. BLM Loan Form.

Table 5. Guidelines for the BLM Loan Form

Space #1: Consecutive page number within this loan of materials and/or samples.

Space #2: When the loan has been returned intact to the permanent storage area, a checkmark is placed here.

Space #3: 4-letter initials of the person who is accepting responsibility for the materials and/or samples listed on the form.

Space #4: Longhand description of the name and address of the person or institution to whom the loan is being made.

Space #5: This space contains the Smithsonian designation for the site.

| FORMAT: | 05 | MT | 04475 |
|---|---|---|---|
| | (state code) | (county code) | (site number) |
| | 2 digits | 2 letters | 5 digits |

Space #6: This space contains the FS number for the materials or samples listed on this line of the form.

Space #7: Material identification class or sample type.
FORMAT: as abbreviated below

| Material identification class | | Sample type | |
|---|---|---|---|
| CER | Ceramics | AM | Archaeomagnetic |
| NHB | Nonhuman bone | BS | Bulk |
| FL | Flaked lithics | CF | Radiocarbon |
| NFL | Nonflaked lithics | DD | Dendrochronological |
| VEG | Vegetal | MS | Material source |
| HB | Human bone | PN | Pollen |
| INORG | Other inorganic | SC | Stratigraphic column |
| ORG | Other organic | FM | Film |
| OTHER | Other | | |

Space #8: Sample number or catalog item number.
FORMAT: 0001
(from the consecutive site series for the sample type or from the consecutive series within the material identification class within the FS number for the catalog item number)
4 digits

Space #9: Date on which the loan was removed from the permanent storage area.

| FORMAT: | 01 | 01 | 82 |
|---|---|---|---|
| | (month) | (day) | (year) |
| | 2 digits | 2 digits | 2 digits |

Space #10: Date on which the loan was returned to the permanent storage area. Format same as space 9.

NOTE: FS - Field sample designation.

CHANGES WHICH NEED TO BE MADE IN THE COMPUTER FILES

File needing change: ① _____ F.S. #: ② _____

Variable which needs to be changed: ③ _____

Original Value: ④ _____

New Value: ⑤ _____

Date: ⑥ _____ Initials: ⑦ _____

Form Changed: ⑧ _____ File Changed: ⑨ _____

Comments:

Figure 4. Computer Change Form.

Table 6. Guidelines for the Computer Change Form

| | |
|---|---|
| Space #1: | Longhand name for the computer file in which the change is requested. Include site number where needed. |
| Space #2: | This space contains the FS number that needs the change. |
| Space #3: | Longhand name for the variable that needs to be changed. |
| Space #4: | The incorrect value for the variable, as it currently exists in the computer file. |
| Space #5: | The correct value for the variable, as the computer file should read. |
| Space #6: | Date on which the need for a change was identified.<br>FORMAT: 01 (month) 2 digits; 01 (day) 2 digits; 82 (year) 2 digits |
| Space #7: | 4-letter initials of the person responsible for changing the computer file. |
| Space #8: | Checkmark to show that the form has been changed. |
| Space #9: | Checkmark to show that the file has been changed. |

NOTE: FS - Field specimen designation.

## Change 8: Maps, Step 1

With the increasing volume of field maps generated by the Contractor, the BLM collections manager and the DAP drafting crew chief identified the need for a more formalized map inventory procedure. A more formal inventory procedure was designed in order to provide a specific record of every field map that the Contractor produces. The formality of this mechanism seems to have solved the problems that were originally identified and this has become an integral part of the laboratory flow system.

## Change 9: Maps, Step 2

Institution of a formal map inventory according to map reference numbers aided in the solution of the problem discussed in change 8.

Retrieval and inventory have been aided by directly labeling each map with the appropriate number.

### Change 10: Computer Printouts, Steps 1 and 2

As the Contractor began to complete fieldwork reports, printouts that had been used as the basis for completion of the reports were received in the laboratory. A formal procedure to inventory and archive such printouts was designed and has been added to the laboratory flow system in this report.

### Change 11: Preliminary Analysis Forms, Step 1

Midway in the reporting year the Contractor was informed that BOR could not continue to provide keypunching services. An outside keypunching service was chosen to input the field analysis forms for the Program, with the Data Processing Group having the responsibility for transmitting the forms to the service.

### Change 12: Preliminary Analysis Forms, Step 2

With the advent of major editing and verification changes in the computer data files for preliminary analysis forms, the task specialists identified the need for formal procedures to initiate and document changes and corrections made in the files. The task specialists decided to use the same form that was used in making changes in the computer data file for the field forms (fig. 4). This procedure has become an integral part of the laboratory flow system.

# SUMMARY AND CONCLUSIONS

Throughout the reporting period the DAP laboratory work proceeded in support of the fieldwork. All materials and samples collected during the 1980 fieldwork were processed, prepared for analysis, analyzed, and passed to the BLM Curator for inclusion in the permanent storage function of the laboratory flow system.

Throughout the entire reporting period the laboratory flow system was refined, as discussed in this report. The laboratory flow system, as outlined in appendix A, will serve as the basis for operation of the DAP field laboratory for the following reporting period. Refinements in the system will continue as they are needed.

# APPENDIX A

## LABORATORY FLOW SYSTEM

## Laboratory Flow System: Materials and Samples

The laboratory flow system for handling materials and samples collected during DAP field operations is jointly implemented by the DAP laboratory supervisor and the BLM collections manager. The structure for this joint implementation is outlined in the Memorandum of Understanding between the Bureau of Reclamation and the Bureau of Land Management. A diagram of the laboratory flow system for materials and samples can be found in figure A.1. The shading on the diagram illustrates the division of responsibilities between the Contractor and the government.

### Receiving Function

Step 1: Check of field inventory forms. The Contractor's laboratory processing crew receives the materials and samples accompanied by a Field Inventory Form (fig. A.2 and table A.1) completed by the field personnel. The labels on the materials and samples that are received are checked against the Field Inventory Form. Any discrepancies noted are corrected before proceeding to the next step. A copy of the Field Inventory Form is immediately returned to the field personnel.

Step 2: Input. The Field Inventory Form is used for direct, in-house, computer input on a daily basis. The Field Inventory Form data file is the initial laboratory inventory.

Step 3: Routing. All materials and samples are routed through the laboratory to either the conservation, washing, special processing, or special handling step (fig. A.1).

### Processing Function

Step 1: Conservation. After appropriate evaluation and treatment by

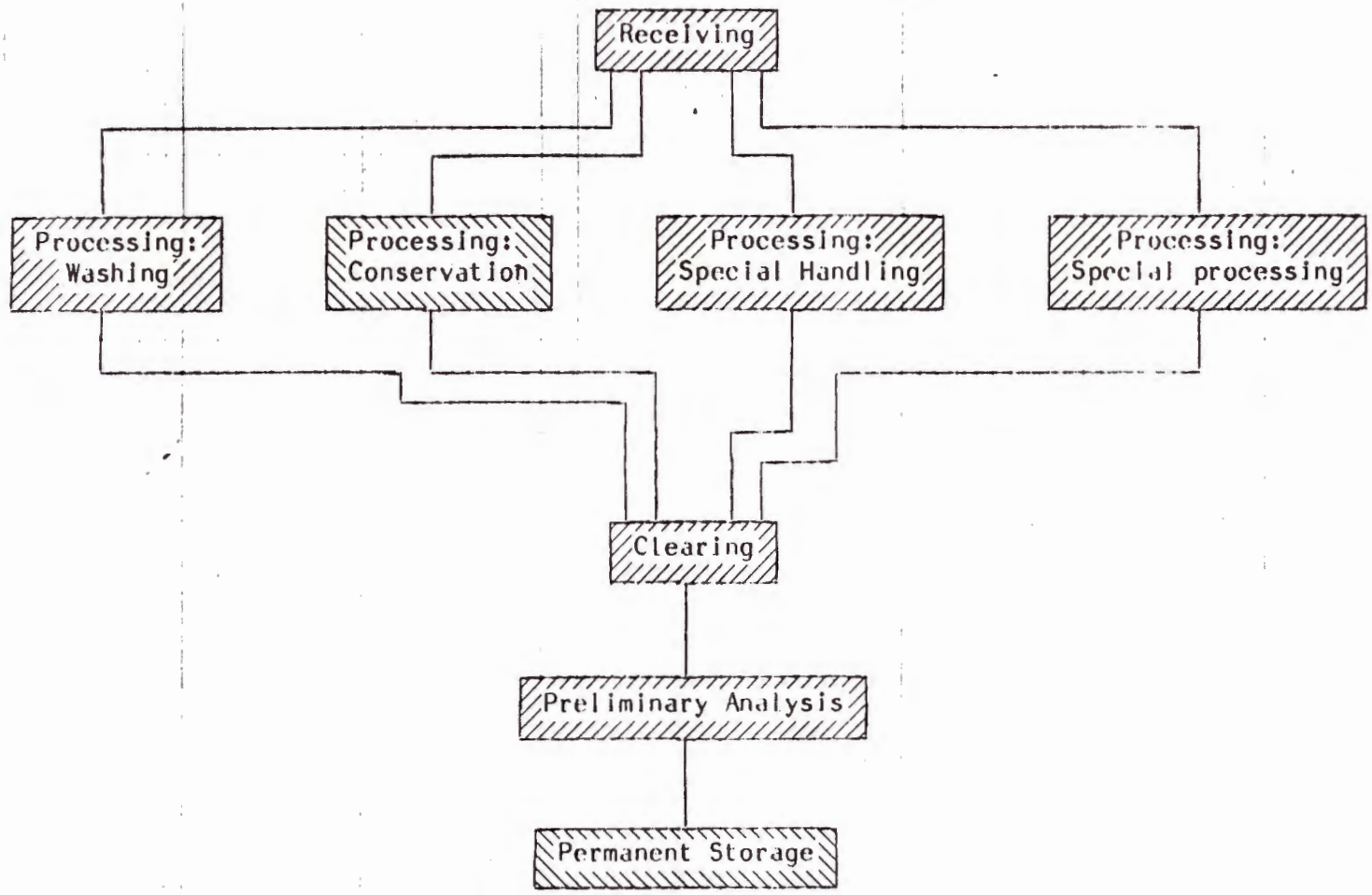


Figure A.1. The Laboratory Flow System for materials and samples.

DOLORES ARCHAEOLOGICAL PROGRAM
FIELD INVENTORY

Site #: #1

Date: #2

Initials: #3

| Site | F.S. | MAT/SAMPLE | # of Bags | Site | F.S. | MAT/SAMPLE | # of Bags |
|---|---|---|---|---|---|---|---|
| #4 | | #5 | #6 | | | | |
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Lab use only:

Checked in by:_____ Input by:_____ Ok'd by:_____

Figure A.2 Field Inventory Form.

Table A.1 Guidelines for the Field Inventory Form

A Field Inventory Form must accompany all materials and samples turned in to the laboratory. Materials and samples should be listed on the *Field Inventory Form* in numerical order by FS number.

Space #1: This space contains the Smithsonian designation for the site.

| FORMAT: | 05 | MT | 04475 |
|---|---|---|---|
| | (state code) | (county code) | (site number) |
| | 2 digits | 2 letters | 5 digits |

Space #2: Date.

| FORMAT: | 01 | 01 | 82 |
|---|---|---|---|
| | (month) | (day) | (year) |
| | 2 digits | 2 digits | 2 digits |

Space #3: 4-letter initials for the crew chief responsible for excavation of the site.

Space #4: This space contains the FS number for this provenience.
FORMAT: 000001
(from the consecutive site series)
6 digits - leading zeros may be omitted

Space #5: Material identification class or sample type and number.
FORMAT: as abbreviated for material identification class and sample type.
Sample number from the consecutive site series for the sample type

| Material identification class | | Sample type | |
|---|---|---|---|
| CER | Ceramics | AM | Archaeomagnetic |
| NHB | Nonhuman bone | BS | Bulk soil |
| FL | Flaked lithics | CF | Radiocarbon |
| NFL | Nonflaked lithics | DD | Dendrochronological |
| VEG | Vegetal | MS | Material source |
| HB | Human bone | PN | Pollen |
| INORG | Other inorganic | SC | Stratigraphic column |
| ORG | Other organic | FM | Film |
| OTHER | Other | | |

(If the bag being submitted to the laboratory contains a point-located item, the point location number that has been assigned to the item should appear following the material identification class abbreviation in space 5.)

Space #6: Number of bags of materials or sample that is recorded on this line.

the BLM staff, materials are routed to the special handling step or directly to the permanent storage function.

Step 2: Washing. The original labels are removed from the paper bags and permanently remain with the materials. The laboratory crew washes all lithic and ceramic materials after a cursory examination. When materials are thoroughly dry, they are transferred into plastic bags with the original label. All bags are routed to the clearing function.

Step 3: Special processing. All bulk soil samples are processed through the appropriate sample processing system (Litzinger 1980). The resulting light and heavy fractions are routed to the special handling step. Dendrochronological samples are thoroughly dried and are routed to the special handling step.

Step 4: Special handling. Any cleaning and packaging requirements are accomplished before proceeding to the clearing function. All bags are sorted and organized by material type or sample type and by FS (field provenience) number and then routed to the clearing function.

### *Clearing Function*

*Step 1: Check of field labels.* The Field Provenience Description Forms completed in the field are compared with the bag labels of the materials and samples from each FS number. Any discrepancies between the field forms and the bag labels are resolved.

Step 2: Inventory check. The inventory listing at the base of the Field Provenience Description Form and the initial laboratory inventory are compared with the bags of materials and samples that are present. Discrepancies are resolved in cases where extra bags are present or bags are missing.

Step 3: Combining bags. In cases where more than one bag of non-point-located material exists for one Material Identification Class within

an FS number, the bags are combined into a single bag. The initial laboratory inventory is amended to show the combination, and all original labels are included in the final bag.

Step 4: Laboratory labeling. A final label is provided for every bag of material and every sample. The label, or an index card, is identical in format to the original bag label, but all information is corrected into its most accurate form.

Step 5: Routing. All materials and samples are routed appropriately for analysis, accompanied by copies of the amended initial laboratory inventory. If materials or samples are not slated for analysis immediately, they may be held in a temporary storage location, under the responsibility of the laboratory crew chief, until preliminary analysis is initiated.

## Preliminary Analysis Function

Step 1: Check of initial laboratory inventory. Upon receipt of the materials or samples from the clearing function, the analyst checks the initial laboratory inventory to ensure that all of the bags have been received. Any discrepancies are solved immediately.

Step 2: Observation and measurement. Every piece of material is examined for a series of characteristics based on observation or measurement.

Step 3: Recording. Each item or lot of identical items is assigned a catalog item number. The observations and measurements from step 2 are recorded with the catalog item numbers.

Step 4: Input. The preliminary analysis forms completed in step 3 are dispatched for input into the preliminary analysis data files.

Step 5: Final laboratory inventory. All catalog item numbers are listed on a Post Preliminary Analysis Inventory Form to create the final laboratory inventory.

Step 6: Routing. Upon completion of the steps above, all materials and samples are routed to the permanent storage function accompanied by the appropriate Post Preliminary Analysis Inventory Forms.

## Permanent Storage Function

Step 1: Check of final laboratory inventory. Upon receipt of the materials or samples from the preliminary analysis function, the government's collections manager checks the final laboratory inventory to ensure that the contents of all of the bags correspond with bag labels and forms. Any discrepancies are solved immediately.

Step 2: Assignment of storage location. A location in the permanent storage area is assigned to the item(s) that belongs to each Catalog Item Number. A record of the assigned storage location is made on the appropriate Post-Preliminary Analysis Inventory Form.

Step 3: Secure storage. Items that require controlled conditions or special security are placed in one of two fire-proof safes.

Step 4: Retrieval. When presented with a Request For Materials Form, the BLM collections manager retrieves materials or samples from their storage locations.

Step 5: Loans. When materials or samples are needed for further analysis, the BLM collections manager will complete a BLM Loan Form. One copy of the form will accompany the materials or samples on loan and the original will remain on file until the loan is returned to the permanent storage area.

## Laboratory Flow System: Paper Records

The laboratory flow system for handling paper records generated during the Contractor's field and laboratory operations has been jointly implemented by the contractor's laboratory supervisor and the BLM collections manager, as outlined in the Memorandum of Understanding between the Bureau of Reclamation and the Bureau of Land Management. A diagram of the laboratory flow system for paper records can be found in figure A.3. The shading on the diagram illustrates the division of responsibilites between the Contractor and the government.

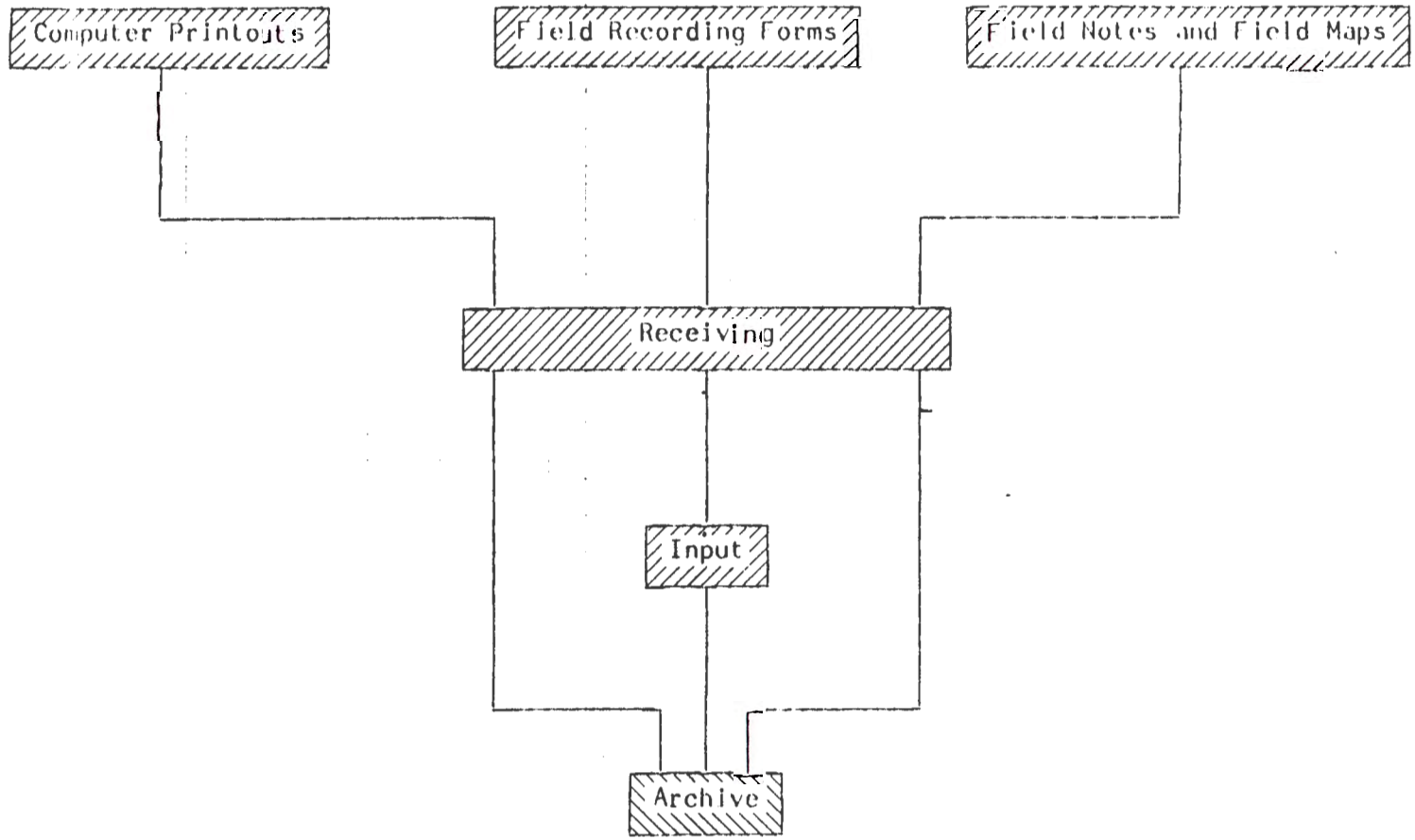
## Field Recording Forms

Step 1: Receiving. All field recording forms are reviewed in the field by the data coordinator for consistency and accuracy. The forms receive a second review for consistency and accuracy in the laboratory by the Contractor's laboratory supervisor. An inventory record is established when the forms are received in the laboratory.

Step 2: Routing. The Field Provenience Description Forms are routed to the clearing function of the laboratory flow system for materials and samples. All other field recording forms are routed to the Data Processing Section for input. The field provenience description forms are routed to the Data Processing Section for input only after the clearing function has been completed for those FS numbers.

Step 3: Input. A computer data file is created for each of the field recording forms.

Step 4: Archive. All originals of the field recording forms are routed to the government's archive.




- Contractor's responsibility.
- Government's responsibility.

Figure A.3 The Laboratory Flow System for paper records.

## Field Notes

Step 1: Receiving. Each crew chief submits his/her field notes to the laboratory on a biweekly basis during active fieldwork. The notes are photocopied and the originals are returned to the crew chief. The originals of the field notes are received in the laboratory upon completion of the fieldwork report for a site.

Step 2: Archive. The photocopies of the field notes are maintained for security purposes in the program archive. When the originals of the field notes are received in the laboratory they replace the photocopies. Two microfilm copies are made of the original field notes.

## Maps

Step 1: Receiving. Each crew chief submits his maps to the laboratory upon completion of the active fieldwork for a site. The maps are inventoried and immediately returned to the crew chief. Upon completion of the fieldwork report for a site, the maps are submitted to the laboratory for inclusion in the program archive.

Step 2: Archive. Maps are permanently maintained in the program archive and stored in a flat position. Two microfilm copies are made of the original maps.

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