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# WORK PROGRAM FOR RELOCATION OF FEDERAL AMERICAN PARTNERS' HOUSING VILLAGE, GAS HILLS, WYOMING

GIBBS & HILL, INC.
Subsidiary of Dravo Corporation

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## INTRODUCTION

At the request of Federal American Partners (FAP), the Planning Department of Gibbs & Hill, Inc., a subsidiary of Dravo Corporation located in Denver, Colorado, performed a preliminary background study and analysis of the efforts required to relocate FAP's existing housing village at the Gas Hills Uranium Mine to a location on Bureau of Land Management (BLM) land within 5 to 10 miles of the mine.

This initial investigation indicates that relocation of the village would be a major undertaking with potentially far-reaching implications. Major efforts would be required on the part of FAP, government agencies at all levels, and independent consultants and contractors to develop a program of requirements, identify an appropriate site, prepare a master plan and detailed design development plans, undertake construction, implement an orderly transition to the new village, and establish operating and maintenance programs for running the relocated housing village.

In addition to expenses in the millions of dollars, 2 to 3 years, at the minimum, would be required to plan and implement the relocation. The following work program identifies the major work tasks which would be involved in the relocation. The work program assumes that, although there are known conflicts with existing land use in the area, adequate suitable land would be made available by BLM for the relocated village.

The work program consists of five parts comprising a logical succession of tasks leading to relocation and occupation of the housing village. These tasks are summarized as follows.

1. Program development would be the study of FAP's basic housing and amenities needs, review of existing solutions to problems similar to those faced by FAP, discussions with government agencies, and determination of gross area requirements for master planning.

2. Site selection would involve working with the BLM and local planning agencies to identify available land, investigating available sites to identify development constraints, agreeing on site selection criteria, performing a comparative evaluation of candidate sites, and selecting the optimum site.

3. Master plan preparation would include programmatic analysis, preparation of conceptual designs for land use allocation, roads and sidewalks, water and sewer service, electrical and communications services, and a staging plan for construction.

4. Detailed design development would be the preparation of final engineering and site plans, construction documents, cost estimates, and permit applications required for site development and housing, community support facilities, and infrastructure installation.

5. Implementation would include all efforts required to bring the village plans to physical reality, relocate existing village residents, absorb new construction and operation personnel, and establish village operations and maintenance programs.

## 1.0 PROGRAM DEVELOPMENT

It is no longer sufficient or acceptable to establish a housing village by arbitrarily selecting an available site, grading a line of mobile home pads, laying an above-ground water line, and running a sewer line to an open lagoon in an adjacent field. The social problems associated with such developments, most notoriously in Wyoming, are well known, and recent legislation and awareness will ensure that such conditions are not fostered in future developments designed to provide housing for the mining and energy industries.

Instead, exhaustive preparation and planning is required to clearly identify the needs which must be met by such problems, and to develop appropriate solutions. The initial analysis of needs and development of a set of planning requirements which are used to guide the relocation of a housing village is the process known as *program development*.

### 1.1 Identify FAP Needs

The essential first step is to examine the housing needs of FAP, presently being met by the existing housing village. FAP would be consulted to define its housing policy on which program requirements would be based.

The total number of employees to be housed must be projected for major worker categories. Based on records of the existing camp and an examination of statistics for similar settlements, the approximate number of dependents which would be expected would be projected. Informal surveys of present employees in FAP and similar companies should be carried out to ascertain housing type and lifestyle preferences, and the kinds of social and recreational amenities which would help to keep labor turnover to a minimum and fulfill living requirements in a more gracious manner than the existing village.

## 1.2 Review Successful Developments for Similar Conditions

There are important lessons to be learned from existing housing villages for mining projects in remote areas of the Rocky Mountain and southwest regions. A few of the more successful examples, such as Anaconda's Blue Water town in New Mexico, Union Carbide's Uravan in Colorado, and the town of Wright in Wyoming, and others selected by FAP should be studied to obtain insight into planning, construction, and operation.

Some of the areas where special insight can be gained include, but may not be limited to, the following.

- Segregation or integration of housing types
- Recreational amenities
- Housing types
- Water and waste treatment
- Commercial facilities
- Road standards and layouts
- Treatment of open spaces and landscaping
- Parking standards
- Operation and maintenance
- Funding, taxation, and costs and benefits to local government

## 1.3 Program Preparation

Based on the preceding determination of FAP needs for housing and facilities, and using the insights gained from review of related projects, a program of requirements for land, housing, recreational amenities, and infrastructure must be prepared. This program would quantify these requirements insofar as it is possible, to provide the dimension required for preparation of conceptual master plans.

## 1.4 Governmental and Regulatory Review and Identification of Applicable Standards and Regulations

Preliminary discussions with the appropriate public authorities should then be held to notify them of the scope and extent of the project. These agencies would include the Fremont County Planning Commission, the Wyoming Industrial Siting Commission, the Nuclear Regulatory Commission, and the Bureau of Land Management. At this time, any applicable state, county, or local building codes, zoning ordinances, and other regulations would be obtained and reviewed.

## 1.5 Exploration of Available Funding Mechanisms

The financial impact of a multi-million dollar capital expenditure on the return on investment of FAP's operations would be significant. It must be recognized that outside financing could be required to preserve the viability of present operations and future development plans.

Certain major policy decisions concerning development of the relocated village would therefore depend on the availability and extent of external financing or funding. Potential sources of such funding, including monies made available through the Coal Conversion Act of 1978, will be investigated, along with the expected impacts of such assistance on overall project finance, scheduling, and cash flow.

## 1.6 Formulation of Project Goals and Objectives

On the basis of the above pre-planning investigations and activities, a set of overall goals and objectives for the project should be formulated, including a statement of policies on the desired level of amenity to be provided, social objectives, and the like, which would serve as a guiding framework in site selection, detailed program development, and master planning.

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## 2.0 SITE SELECTION

Virtually all land within a rea onable radius of the FAP mine is administered by the BLM. Grazing rights are presently being exercised for this property and the present use would pose a direct conflict with use as a village site. Because of the potential for delays in obtaining clear title to available land for a village site, given this condition, timely acquisition of a suitable site cannot be assumed. In fact, even ultimate availability is not assured. Should clearance be obtained from BLM to investigate potential sites on BLM lands, a study area would be defined within which to concentrate efforts on selecting a specific new community site.

### 2.1 Identify Exclusion Areas

The study area should be narrowed down by eliminating from further investigation areas which are clearly unsuitable for the proposed development. Typica' reasons for excluding areas would be as follows:

- existence of potential mineral resources,
- excessive slope,
- lack of on-site water or excessive distance to water supply,
- poor or unstable soils,
- unfavorable subsurface conditions,
- lack of sufficient expansion area,
- ecological/environmental constraints, such as potential for damage to unique or endangered plant or animal species, and
- inaccessibility during severe winter conditions.

### 2.2 Identify Selection Criteria and Methodology

In order to make as objective an evaluation of potential sites as possible, a consistent set of site selection criteria and a methodology for weighting them according to their relative importance should be developed; each site

would then be scored and ranked on this basis. Criteria would include, but not necessarily be limited to, the following:

- sufficiency of contiguous land for the housing village plus future expansion,
- proximity to electrical supply tap,
- proximity and accessibility to mine/mill site, especially during winter,
- cost of land,
- development costs, including grading, roads, water supply, and other utilities,
- ease of construction,
- design factors, and
- socioeconomic factors.

## 2.3 Selection of New Village Site

Using the criteria and methodology developed in the prior task, all potential sites would be evaluated and one which best meets the stated objectives would be selected for development. The proposed site would be reviewed by appropriate public agencies to assure conformance to their requirements.

## 3.0 MASTER PLAN DEVELOPMENT

This element of the work program is divided into five parts:

(1) analysis of planning determinants (physical and programmatic);
(2) development of alternative concept plans;
(3) unit cost estimates;
(4) evaluation and selection of preferred concept; and
(5) elaboration of chosen concept plan into a final master plan.

### 3.1 Analysis of Planning Determinants

This consists of detailed reconnaissance and analysis of the site's physical features, including more detailed inventory of physical features (natural and man-made) of the study area and site. These features would include:

- regional and sub-regional transportation and infrastructure networks;
- site topography and slope analysis;
- surficial and bedrock geology;
- soils, vegetation, and revegetation potential;
- climate and microclimate;
- surface and subsurface hydrology; and
- archaeological and cultural features.

In addition, program studies would be required to develop detailed area requirements and support service demand calculations as a basis for further design development.

More detailed projections of the population's characteristics over time would be required in order to forecast more precisely the need for different types and sizes of housing units, recreation facilities, and other support facilities.

Through an analysis of case studies of similar nearby support housing villages, housing and lifestyle preferences of present employees, and cost availability of housing systems (mobile homes, pre-fab units, modulars, conventional) must be analyzed to develop recommendations for the most appropriate housing system or combination of systems for the development.

Finally, detailed engineering estimates would be required to determine, on the basis of the population studies, the demand at various stages of the project for potable water, electricity, sewage and solid waste disposal, and telecommunications.

The total demands for all of these facilities and services would be identified at fixed time intervals so that the construction pahsing of the community can be keyed to actual demand.

## 3.2 Development of Alternative Concept Plans

On the basis of the physical and programmatic analyses, a minimum of three alternative conceptual site plans should be developed to explore different approaches to siting and mixing of housing units, treatment of circulation and open space, street-cross sections, design of utilities systems, overall land use and facility location, and development phasing.

## 3.3 Unit Cost Estimation

Approximate unit costs must be developed for various housing types and systems, support facilities, administrative and maintenance facilities, firehouse, utility networks, water, sewage and solid waste treatment facilities, road construction and landscaping. Preliminary comparative cost estimates of each of the three alternative site plans would be required.

## 3.4 Evaluation of Alternatives and Selection of Preferred Concept

An evaluation methodology and criteria for assisting in the selection of one concept for further development should be formulated. Using this as a decision tool, the concept plans would be evaluated and one plan selected for detailed development.

## 3.5 Elaboration of Chosen Concept Plan into a Final Master Plan

In order to prepare detailed design drawings for construction of the relocated village, it would be necessary to first prepare a Master Plan for development. The Master Plan would consist of a number of elements, as follows.

- Land Use Master Plan - allocates actual land areas for specific land uses, such as housing of varying densities, recreation, open space, and support facilities including firehouse-corporation yard and sewage treatment.
- Circulation Master Plan - shows vehicular and pedestrian circulation systems, and specifies rights-of-way and pavement widths.
- Utilities Master Plan - shows conceptual layout of water supply, sanitary sewerage, electrical, communications (telephone and cable television, fire alarm) and storm drainage systems.
- Staging Plan - describes construction of housing and facilities, roads and sidewalks, and utilities by phase.

## 4.0 DETAILED DESIGN DEVELOPMENT AND PRE-CONSTRUCTION PLANNING

Following FAP and public agency review and approval of the Master Plan, detailed design and preparation of construction documents would commence.

### 4.1 Surveys and Geophysical Investigations

Datum and horizontal and vertical control points would be established by field survey to prepare a legal site boundary description and to confirm topographic information for detailed engineering design.

On the basis of the Master Plan layout, a soil borings map would be prepared, and a subcontract let for soil borings and laboratory analysis under the consultant's supervision.

### 4.2 Site Plan

Engineering working documents would be prepared including detailed, dimensioned location plans for all housing and community facilities including rough grading, utility trench layouts, and foundation regrading, with cut-and-fill computations, surface drainage engineering, and subdivision of the site into appropriate parcels according to the Master Plan and Phasing Plan.

### 4.3 Circulation Plan

Geometric standards for road design would be established based on pertinent government standards. Engineering design and construction drawings would be prepared for main access roads, secondary roads, and local access roads and parking areas, with horizontal and vertical alignments and cross-sections.

### 4.4 Water Supply System

Design demands and supply would be established for temporary water supply and treatment during initial construction phases. Design engineering

and preparation of performance specifications would be undertaken for a permanent system including well locations, raw water intake, packaged treatment plant if required, potable water distribution network, potable and fire protection elevated storage tanks or reservoirs, and pumping stations.

## 4.5 Sanitary Sewerage System

The optimum sewerage disposal method would be determined, and sanitary and storm sewerage systems designed, including a package treatment plant if necessary, and plans and performance specifications for construction bid documents showing pipe sizing, declination, manhole locations, and invert elevations Storm sewerage design would be based on detailed confirmation of studies of rainfall intensity, flood potential, and discharge points carried out in prior site investigation phases.

## 4.6 Solid Waste Disposal System

A site would be chosen for sanitary landfill and a detailed plan prepared including any fencing, etc. The required permits would have to be applied for and obtained from the Wyoming Department of Environmental Quality (WDEQ), Solid Waste Program.

## 4.7 Electric Distribution System

Design and engineering of the electric distribution system would include layout and specification of the underground conduits, locations of the main transformer and substations, street and open space lighting. Installation would have to be coordinated with the local utility as required.

## 4.8 Telecommunications Systems

Based on projected needs of the population, the distribution network for telephone and cable television would be designed and laid out, including

routing of cable ducts, location of the television receiving station and required feeder lines. Work would require coordination of installation wit local authority and subcontractors.

## 4.9 Landscape Plan

Appropriate locally available plant materials would be identified and detailed landscape and planting plans prepared for residential, public open space and recreational areas, including specification of paving and other materials, signs, special equipment for children's play and special lighting requirements. Sources of plant materials would be identified and performance specifications and bid documents prepared.

## 4.10 Operations Plan

Operations policies and procedures would have to be developed to guide the day-to-day operation and maintenance of the village. These would focus on such considerations as:

- occupancy,
- operation of services,
- operation of recreational facilities,
- maintenance of company-owned housing, and
- maintenance of roads and utilities.

## 4.11 Reclamation Plan

Since the reason for the existence of the village would disappear with the cessation of mining, it would be necessary to plan for the eventual abandonment of the village and restoration of the land to its former (or higher) capability.

## 4.12 Preparation and Submittal of Permit Applications

All required permits from regulatory agencies must be identified and verified, and the applications prepared and submitted.

## 4.13 Detailed Construction Cost Estimates

On the basis of the detailed land use, circulation, landscaping, housing, community facilities, open space and infrastructure plans, a detailed construction cost estimate would be prepared, supported by a procedure to assure the accuracy of claimed quantities by construction contractors. Procedures would have to be developed to provide for easy modification and up-dating of costs and quantities to provide a continuously useful management tool. Cost estimates would have to be integrated within a project cash-flow analysis to assist FAP in its financial planning.

## 4.14 Construction Schedule

A comprehensive Project Master Schedule and CPM Schedule must be developed, showing all activities leading to successful completion of the new community, and identifying milestones during project planning and development to ensure that subtasks, particularly those falling on the "critical path," are completed on schedule.

## 5.0 IMPLEMENTATION

This phase of the work involves all construction management activities, monitoring and supervision of actual construction, and implementation of the relocation of company personnel to the new site.

### 5.1 Construction Contracts Administration

This task includes the soliciting of construction bids, evaluation of bids, and awarding of construction contracts, and on-going monitoring of contractor performance and compliance regarding cost, schedule, and quantity/quality.

### 5.2 Construction Monitoring and Inspection

The activities of all construction contractors and suppliers would have to be continuously monitored and inspected to ensure compliance with technical requirements of the construction documents and the intent of the design, or any changes thereto. Similarly, the detailed CPM Schedule would be continuously monitored to ensure timely completion of each stage of work.

### 5.3 Relocation of Personnel

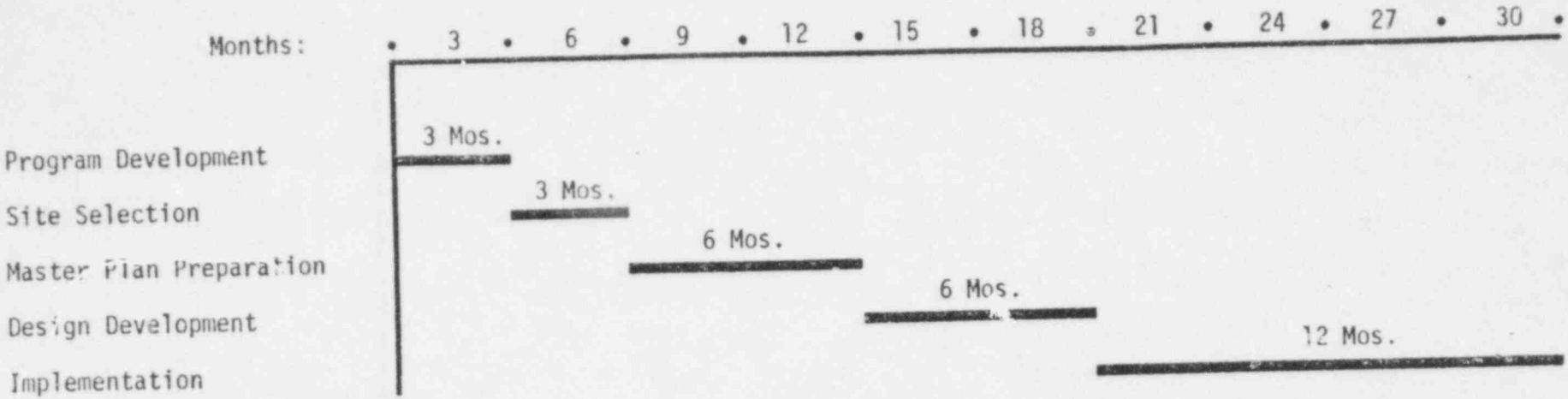
A phased relocation plan would be required to guide the transition of personnel from the existing village to the new development and to minimize any disruption or delays in on-going mining and processing activities.

## 6.0 SCHEDULE

It is anticipated that a period of 2 to 3 years (see following schedule) would be required to plan and implement the relocation. This would depend, of course, on receiving maximum cooperation from the BLM in obtaining clear title to necessary land for the relocated village, minimum requirements for development permits, and availability of housing components and construction labor.

FEDERAL AMERICAN PARTNERS' HOUSING VILLAGE RELOCATION

SCHEDULE FOR MAJOR TASKS OF WORK PLAN

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