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STATEMENT-OF-WORK

BASELINE VEGETATION STUDY
GETTY OIL COMPANY
PROPOSED HARDROCK MINE
NEAR TOOELE, UTAH

Prepared For
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Englewood, Colorado

By
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1.0 INTRODUCTION

The following statement of work has been prepared in response to Getty Oil Company's request for assistance in performing baseline vegetation studies commensurate with the most recent State of Utah Regulations on a proposed hardrock mine site near Tooele, Utah.

The field sampling program described below is designed to provide data on species composition and cover for each vegetation type included within the study area. The development of the technical approach and associated sampling design follows Wyoming Department of Environmental Quality (DEQ) guideline #2 "Premining and Postmining Vegetation Inventory for Coal, Uranium and Trona Mines"; March 1, 1979.

Existing vegetation data for vegetation types similar to those encountered in the study area were used to estimate the sampling intensity required to meet desired confidence levels for cover data.

2.0 TECHNICAL APPROACH

2.1 DATA COLLECTION

The following procedures will be used to provide vegetation baseline data for this project:

- delineate sampling units within the affected areas (area to be mined) and determine and locate the number of required reference or control sites
- map and describe sampling units
- determine cover sample site locations
- determine species composition and prepare voucher collection
- estimate cover at all sites
- photograph all vegetation types
- map all vegetation type delineations within the project area

2.1.1. Delineation of Sampling Units

A field reconnaissance will be conducted in early July, 1980 to delineate natural plant communities within the affected area on a preliminary vegetation map and to locate permanent reference plots in areas that will not be disturbed by future mining activities.

Information gathered during previous field trips to the project area indicates that four vegetation communities will require sampling.

- mountain brush
- bottomland greasewood-sagebrush
- pinyon-juniper woodland
- upland sagebrush

A control area, approximately 3 acres in size, will be located in each of the four vegetation types in areas not to be disturbed by mining activities.

2.1.2. Mapping

The distribution of vegetation types on the entire project area will be delineated on clear plastic reproducible mylar images of recent aerial photographs (scale: 1"=500'). The location of each cover transect and all reference areas will be plotted as well. Each sample point represents a ground truth location thereby allowing efficient and accurate ground truthing of sample type delineations during field sampling.

2.1.3. Sample Site Locations

Cover transects are located on affected areas using a random sampling technique. The method entails overlaying a grid system on the aerial photograph displaying vegetation types within the affected area. A random numbers table is used to determine grid coordinates and thus sampling points.

Each point randomly located by this technique on the aerial photograph is located in the field by pacing from recognizable landmarks. All randomly located sample points are marked with a wooden stake which identifies the sample number, vegetation type and cover transect direction. All points are flagged to allow easy relocation.

All control sites are systematically sampled to obtain cover data.

The estimated number of cover transects to be sampled in each vegetation type on affected and control areas is provided in Table 2.1.

All sample sizes were estimated by applying existing vegetation data for similar vegetation types to the DEQ sample adequacy formula (DEQ Guideline #2, March 1979) at the following data confidence levels:

- All cover data - 90% confidence level

Table 2.1 Sample sizes required to meet Desired Statistical Confidence Levels.

Vegetation Type	Cover Transects Affected	Cover Transects Control
Upland sagebrush	40	25
Bottomland greasewood-sagebrush	40	25
Pinyon-juniper woodland	50	30
Mountain brush	30	15
TOTALS	160	95

2.1.4. Cover Estimates

Transects, each 50m in length, are used to collect cover data on affected and control areas. Cover data are gathered as recommended in Wyoming DEQ Guideline #2 at each 5m (paced) interval along the transect. A mark on the tip of the observer's boot is used to denote hits on vegetation, litter and rock and bare ground.

All cover data are gathered during the period of July 1 through October. All data are recorded on specially-developed field forms.

2.1.5. Vegetation Species Composition

Reconnaissance type surveys are conducted within each sampling unit and control area to obtain a complete listing of vegetation species for the study area. Surveys are conducted by a plant taxonomist during one day each month throughout the growing season (early June through September). A plant voucher collection is prepared for all plants identified during the study. For each plant collected, date, habitat, elevation and associated species are recorded. Questionable plant species are returned to the Rocky Mountain Herbarium for positive identification.

2.2 DATA ANALYSIS

A comprehensive data base management and analysis system has been developed in a CYBER 730 computer to analyze vegetation baseline data

collected according to Wyoming DEQ Guideline #2. Data are input to the system by key-punched cards that have been double-punched and verified for accuracy. A permanent record of all field and analyzed data is provided on computer magnetic tape. Print-outs of field and analyzed data are formatted in a fashion that permits easy interpretation and evaluation of baseline results. Cover data are analyzed first by transect, then all data are summarized to provide summary vegetation cover results by vegetation type. Data are reported in terms of percent cover of vegetation litter and rock. Percent bare ground is also calculated, vegetative cover data are reported by vegetative species and life form for grass-forb and shrub strata.