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MARIAH ASSOCIATES

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August 18, 1981

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DIVISION OF
OIL, GAS & MINING

Mr. Lynn M. Kunzler
Reclamation Biologist
Utah Division of Oil, Gas, and Mining
1588 West North Temple
Salt Lake City, Utah 84116

Dear Lynn,

Thank you for reviewing the vegetation study and reference areas for Price River Coal Company's Mine Area with me last week. Please pass on my thanks to Mary Ann and Sue as well.

Outlined below are the major points we covered. As we discussed during the meeting, I would appreciate your review and comment to assure that the study provides the necessary information.

Maps:

1. The overall mine plan area map will be at a scale of 1" to 1000', therefore, a 1:24,000 scale map will not be required.

2. Vegetation in areas covered by the mine plan that have been or will be disturbed will be mapped on the 1" - 400' contour maps.

3. Final maps will be essentially the same as the preliminary maps we used during the field reconnaissance except for corrections made during ground truthing.

Report:

1. Formulae for all calculations will be given in the methods section.

2. Vegetation species composition will be provided for each vegetation type for which we have a reference type as well as for the overall mine plan area.

Reference Areas:

1. Estimates of vegetation production will be obtained from the Soil Conservation Service (SCS).

2. The small leach field area in Crandall Canyon can be represented by existing mixed-brush and/or grass-sage reference areas.

3. The reference areas for vegetation, which we toured on Friday, appear to be suitable representatives for purposes of this study.

Other:

1. If baseline studies of additional areas (such as Barn Canyon) are conducted this season, the following will be required:

   1.1 Sampling of vegetation types in the affected area for vegetation cover, shrub and tree density, and species composition

   1.2 Establishment of reference areas for vegetation types which do not presently have a reference area

   1.3 SCS productivity estimates for types on the affected area and new reference areas will be sufficient for the requirements on productivity information

   1.4 Affected and reference area comparisons will be done with a t-test and similarity index.

2. Since all field data are listed on the computer print-outs, field data sheets will not have to be submitted.

Enclosed is a short summary of the method we used for cover data on the area. The only change from the original Scope-of-Work you reviewed was the increase from 10 to 50 sampling points along the transect. Also enclosed is a description of the method we used in Wyoming this past year. Would the later method be suitable for future studies in Utah?

Thank you for your attention to this request. Please call if you need additional information.

Sincerely,
MARIAH ASSOCIATES

Craig

Craig L. Kling
Project Manager

CLK/emm
Attachments (2)

METHOD FOR OBTAINING VEGETATION COVER DATA
ON PRICE RIVER COAL COMPANY'S MINE AREA

Cover data were obtained along 50 m transects that had randomly located starting points as well as randomly oriented directions to ensure unbiased sampling. A point-frequency frame (Mueller-Dombois, D. and H. Ellenberg, 1974, Aims and Methods of Vegetation Ecology, John Wiley and Sons, New York) was used to indicate vertical hits on vegetation, litter-rock, or bareground at each 1 m interval along the transect. Crown or shoot cover was measured by counting only the first interception of the pin with the plant part. Overhead canopy cover was determined by recording the plant species hit when the vertical line of the pin was projected upward above the frame. Where crowns overlapped in layered vegetation, the uppermost layer was considered the primary vegetation hit and subsequent hits on lower vegetation were recorded separately. Percent cover of vegetation, litter-rock, and bare ground was calculated by dividing the number of hits in the respective classes by the total number of possible hits (50). Each transect of 50 points was considered one sample unit. A minimum of 15 transects was run in each reference area type prior to sample adequacy calculations. Cover transects were sampled in each area until the desired level ($\pm$10% $\bar{x}$ with 90% confidence) was achieved.

METHOD FOR OBTAINING VEGETATION COVER DATA ON MINE SITES IN WYOMING, 1981

Cover data were obtained along 50 m transects that had randomly located starting point as well as randomly oriented direction to ensure unbiased sampling. A 50 m rope that was marked at 1 m intervals was positioned over the transect. Vegetation, litter-rock, or bareground hits were recorded at each mark along the rope. Cover was determined by recording the plant species, litter-rock, or bareground hit by the mark (or hit by a vertical line projected toward the ground if the rope was positioned in such a manner that the mark did not hit anything). Overhead canopy cover was determined by recording the plant species hit when a vertical line was projected above the mark. Crown or shoot cover was measured by counting only the first vertical hit of a plant part. Where crowns overlapped in layered vegetation, the uppermost layer was considered the primary vegetation hit and subsequent hits on lower vegetation were recorded separately. Percent cover of vegetation, litter-rock, and bareground was calculated by dividing the number of hits in the respective classes by the total number of possible hits (50). Each transect of 50 points was considered one sample unit.