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OFFICE MEMORANDUM

TO : M. L. Wheeler

DATE: May 4, 1977

FROM : Margaret Anne Rogers MAR

SUBJECT : ACTIVITIES DURING APRIL 1977

SYMBOL : H8-77-174

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April 9-14 was spent participating in a symposium on ash flows. Most of the time was spent in field discussion with one day devoted to more "formal" presentation of information. During the more "formal" discussions I presented an overview of past and present waste management practices, studies and monitoring. The talk was slanted toward showing the development of our present geologic studies for waste management.

A good bit of time during the last two months has been devoted to reading articles and books listed by Group G-6 as informative. Some of the articles listed were ones I had already read. Two of the articles have not been located since the library informs me that the references are inaccurate. I have spoken to G-6 about this and am waiting to hear from them.

The "History and Environmental Setting of LASL Radioactive Waste Disposal Areas: (Areas A, B, C, D, E, F, G, and T) has been proofed for typographical errors. Appendix G, a listing of disposals in Area G shafts, is the only section of the report which has been text-corrected by me and had all errors corrected in the computer tapes. I am waiting for the typographically corrected copy of the rest of the report so that I can begin proofing it for errors in text paste-up.

The geologic mapping project on the Pajarito Plateau continues. Knowledge of the geology to date includes recognition of the following:

1. The two members of the Bandelier Tuff, the Otowi and the Tshirege, are different in lithologic character and separated by an erosional unconformity. The Otowi has volume significant ashfalls whereas the Tshirege is principally composed of ash flows. Paleosoils have been observed at the contact between the Otowi and Tshirege (opinion of myself and Jack Nyhan, H-8 yet to be confirmed by laboratory analysis) at various places on the plateau. A paleosoil can also be observed beneath the Otowi. These soils are the most time-significant depositional breaks identified yet. Other depositional breaks do occur in both the Otowi and the Tshirege. It is difficult to say at this time whether the other depositional breaks represent unrecorded time intervals of minutes, hours, days, months or years. The length of the unrecorded time intervals may always remain a question of opinion since time cannot be inferred through evidence of weathering prior to continued deposition (in this case since it doesn't appear to exist) nor can it be measured reliably for short intervals by radiometric age dating. Depositional breaks are inferred at the contact between an ashfall and an ashflow and

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where cross-bedding occurs. Cross-bedding may be the result of air-current or water-current deposition. Both types of cross-bedding may be present in the Bandelier Tuff. Cross-bedding has been observed to vary from a thickness of a few millimeters to four feet. Even in well-exposed outcrops many cross-bedded layers appear to be discontinuous along an horizon. At certain outcrops the appearance of the cross-bedding suggests cut-and-fill as a result of water action. At one outcrop a paleosoil seems to be developed at the top of cross-bedding which is beneath a welded tuff. If the interpretation of a paleosoil is correct this could be the first indication of a time-significant depositional break within the Tshirege. Determination of whether cross-bedding occurred as a result of air-current or water-current deposition can be made by a statistical approach based upon measuring angles between cross-bedded laminae and the plane representing the original depositional surface.

2. The Otowi is principally exposed in the northern part of the map area. At present one outcrop has been found in the southern part of the map area. The Guaje pumice bed has only been observed in the northern part of the map area.

3. Both the Otowi and the Tshirege appear to thin across a basalt high in the White Rock vicinity. An erosional remnant of the Tsankawi pumice bed, the basal airfall pumice of the Tshirege, may have been found in Overlook Park. If so, this confirms deposition on the basalt high followed by erosional stripping of the Bandelier Tuff units.

4. In the southeastern part of the map area near TA-33 is a small strombolian type volcanic cone. The cone is older than the Tshirege but may be younger than the Otowi. Tshirege deposition was definitely influenced in this area by this topographic high.

5. Three paleocanyons have been observed. One near TA-33 is subparallel to the present Rio Grande and may represent a prehistoric Rio Grande. It is cut in the Cerros del Rio basalts and filled with Bandelier Tuff. The second canyon, which can be seen from the front hill road east of Philomena's, appears to trend east-west instead of north-south as the first one does. It is cut in the Otowi and filled by the Tshirege. The third canyon is at Area T, TA-21. It is cut in the Tshirege, has boulders from the Tschicoma Formation (probably) at its bottom, and is possibly filled with El Cajete pumice. It has an east-west trend also.

6. The subunits of the Tshirege Member of the Bandelier Tuff show variations in thickness in directions other than the expected east-west. Units 1b and 2b show the least variation in thickness of any of the units across the plateau. For Units 1b and 2b there is slight thinning to the east but to a lesser degree than the thinning to the east shown by Units 1a and 2a. Unit 2a appears to have the greatest variations in thickness. It thickens strikingly to the north and south of the basalt

high at White Rock as well as to the west. Unit 1a also thickens north and south of White Rock.

7. Welding of Tshirege subunits decreases from west to east.

8. At this time, a depositional break is inferred at the Unit 2a-2b contact. A similar depositional break is thought to occur between Units 3a and 3b. These depositional breaks are thin layers of laminated and cross-bedded sand.

9. Units 1a, 2a, and 3a are soft layers which tend to form slopes but do have enough rigidity to form vertical faces in some places. Units 1b, 2b, and 3b are hard relative to Units 1a, 2a, and 3a. They are bench formers. Degree of welding is an important factor in the topographic expression of all these units.

Gross alpha and gross beta analytical results were received on all samples from the five horizontal holes beneath Pit 3, Area G. The results were uniformably low. Gross alpha ranged from 1.6 ± 0.4 pCi/g to 13.0 ± 3.0 pCi/g. Gross beta ranged from 1.0 ± 0.3 pCi/g to 30.0 ± 3.0 pCi/g.

Prior to excavation of Pit 18, Area G, its proposed location was reviewed for conformance with the Guidelines for Pit Construction.

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