Summary of Purpose for X-ray and Paleo Labs and their Capacities

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Purpose of X-ray Lab

The x-ray lab is used to prepare and analyze samples by x-ray diffraction and to prepare samples for ICP analysis. Diffraction data is converted to diffractograms using MacDiff software and stored on the shipboard database for the scientific party to use. Prepared ICP samples are handed over to chemistry lab technicians who conduct the actual ICP analysis and data reduction process.

Purpose of Paleo Lab

The paleo lab is primarily utilized by the paleo scientists to process, make slides of and examine paleo samples. Its specific purpose is variable, depending on the scientific objectives of a Leg. Several instruments used in the ICP preparation process are located in the lab. The x-ray technician is available to answer questions, track down necessary supplies, and generally facilitate science objectives relating to the lab.

Capabilities and Capacity

The capabilities and capacities of the x-ray and paleo labs are highly variable depending on the number of x-ray techicians available, the number of scientists in the paleo and chem labs, and the type of rock being sampled. The x-ray technician works a 12 hour shift each day and without assistance from other technicians or scientists, this is the amount of time available for sample processing each 24 hour period. Since the x-ray technician prepares both ICP and XRD samples, decisions sometimes have to be made as to which, and how many samples are analyzed. For example, the ability to run more ICP samples requires that fewer XRD samples be analysed and vice versa. It should also be remembered that the x-ray technician also has corelab duties that include receiving core every time it is called.

ICP It is reasonable to analyse ICP samples at a rate of 10-12 samples per day. The process takes approximately 4 days to complete, starting and finishing 10-12 samples each day. With other technicians or scientists assisting, preparation can continue around the clock and higher capacity can be expected. Harder rocks take more time to prepare for analysis than sediments. The x-ray technician is responsible for preparation of ICP samples. Contact the chemistry lab technicians for specifics on the analysis process and the ICP-AES machine.

XRD Samples must first be dried and then individually hand or machine powdered. The drying process typically takes 24 hours per batch of samples. Samples are

then powdered individually. Harder samples require more time to powder. The XRD cassette can be pre-loaded with up to 35 powdered samples, each sample taking approximately 50 minutes to run a full scan. Clay separations can also be conducted. However, as with ICP preparation, clay separations take additional time and may affect the number of regular XRD samples that can be analyzed. A full cassette of hard rock samples will take approximately 8-10 hours to prepare and another 36-48 hours to scan and conduct file conversions. The diffractometer is a Philips PW 1710/00 acquired by ODP in 1984. It is run by a DOS program on a PC.

ODP instruments and technical support is for use in obtaining data to be used in ODP Leg publications only. Any samples whose data will be used for non-ODP publications must be taken home as personal samples for analysis after the Leg's completion.