GOLD BASIN: OVERLAPPING STREWN FIELDS OR HETEROGENEOUS METEOROID? R. S. Verish, Meteorite-Recovery Foundation, P.O. Box 237, Sunland, CA 91040.

Introduction: Gold Basin is a large L4 chondrite shower that was discovered in 1995 in Mohave County, Arizona [1]. The extent of this strewn field is still being determined, but it has already exceeded 200 sq. km [2]. The pre-atmospheric radius for the meteoroid that produced this shower has been estimated to be 3-4 meters [3]. Additional studies suggest a two-stage exposure history for this meteoroid [4].

The Hualapai Wash stone was "recognized" by this writer, but only after the stone had been cut and polished as a favor to the finder, Mr. Donald C. O'Keeffe.

Results and Discussion: A program was initiated that endeavored to purposely recognize or recover more stones like Hualapai Wash, a meteorite from the Gold Basin area, but unrelated to the Gold Basin L4 shower. In all, 140 fragments/individual stones, totaling ~2kg (avg. wt. per stone ~15grams) were evaluated. Cutting and closer inspection was conducted on 58 stones. Total of five candidate stones were submitted for classification:

Table 1.

Field/Sample ID#	Fa (mol.wt.)	Classification
MRF-RSV-01a	24.1+/-0.4%	L6 S5 W3
MRF-DCO-02a	24.0+/-0.4%	L5 S4 W2
MRF-DCO-03a	24.7+/-0.3%	L5 S3 W2
MRF-RSV-21.8	24.5+/-0.6%	L6 S3 W2
MRF-RSV-02.1	24.5+/-0.4%	L6 S4 W2
Hualapai Wash	24.6+/-0.1%	L6 S4 W3

Alan Rubin characterized all five of the stones as being something other than L4. These five stones, totaling 200 grams, represent ~10% of the sample population of finds inspected. This begs the question, are these stones from overlapping strewn fields or did these stones originate from a single meteoroid composed of chondritic material comprising several petrologic grades and shock stages?

It would be a convenient explanation to say that all these stones come from a genomict brecciated meteoroid, but there has been no evidence shown to date that suggests the Gold Basin L4 meteorite is brecciated. Problematic is that the majority of "Gold Basin" stones are of a size that would not exhibit anymore than one petrologic grade or shock stage, were the transition gradational. Of interest would be individual stones that, within, exhibit a variation of petrologic grade or shock stage. These would be excellent candidate specimens for further study.

Inspection of cut surfaces on several of the sampled stones have shown a fabric of uniformly disseminated metal grains in an even groundmass that transitions to a fractured groundmass with deformation of metal grains forming thin veins of metal trending several centimeters in length, corroborating observations by other researchers. This deformation occurs in the two "L5" samples listed in Table 1. This could be interpreted as evidence that a range of petrologic grades and shock stages exist for the "Gold Basin" meteorite, at least ranging up to L5 and S4. No evidence of a transition was observed in the "L6" samples.

Conclusions: A sampling of meteorite finds from the Gold Basin area has produced stones with classifications that are different from the type specimen of the Gold Basin L4 shower. This can best be explained as, partly the result of overlapping strewn fields, as well as, partly the result of a shower from a heterogeneous meteoroid. The occurrence of chondritic stones which exhibit a transition from uniform to deformed metal grains, coupled with an increase in petrologic grade, is the best evidence that a range of petrologic grades and shock stages might exist for stones from the Gold Basin L4 shower. Although an effort should be made to find additional "transitional" stones in order to better characterize this "heterogeneous meteoroid", the more conventional explanation of "overlapping strewn fields" should be initially invoked in order to explain these non-L4 meteorites.

Even after a liberal adjustment for ablation of mass during atmospheric entry, the present Total Known Weight (TKW) for the "Gold Basin L4 shower" cannot account for a 3-4 meter wide pre-atmospheric meteoroid. By necessity, the strewn field for this shower will continue to enlarge, and as a result, will encompass even more overlapping strewn fields. This should not be unexpected, since similar areas with intense meteorite recovery (i.e., Lucerne Dry Lake) have resulted in a high ratio of unpaired meteorites [5]. Given the similar conditions of sparse vegetation and broad areas that are dominantly erosive, the recovery of numerous meteorites should be occurring at Gold Basin, as it is occurring elsewhere in the Mojave Desert [6]. If the Gold Basin L4 shower were absent from the area, there would still be many unpaired meteorite specimens.

References: [1] Kring D. A. et al. (1998) *LPS XXIX*, Abstract #1526. [2] Kring D. A. et al. (2000) *LPI Contrib. No. 997, 44*, Houston, TX. [3] Kring D. A. et al. (2001) *MAPS 3*6 (submitted). [4] Welten K. C. et al. (2001) *LPS XXXII*, Abstract #2110. [5] Verish R. S. et al. (1999) *LPI Contrib. No. 997, 74*, Houston, TX. [6] Rubin A.E. et al. (2000) *MAPS, 35*, A183.