IMILAC STREWNFIELD, CHILE, REVISITED: B.M.Killgore,
Southwest Meteorite Laboratory, P.O. Box 95, Payson AZ 85547.

Pallasite meteorite fragments have been known in the remote Atacama desert of Chile since at least the year 1822 [1]. Although the Imilac strewnfield has been visited many times since its discovery, accurate reports of materials recovered, or their precise locations, were rarely recorded. Based on his visual observations during a 1973 expedition, Buchwald [2] published an accurate location and a sketch map of the main Imilac strewnfield. Pallasite meteorites were recovered from the surface of a 200 m by 400 m area elongated roughly along a northwest to southeast axis. A concentration of irons toward the northern, uphill margin, and sparcely distributed pieces detected well to the east of the main field he attributed to erosional residual deposits and to the trajectory of a projectile arriving from the northeast , respectively. An 8 m wide steep-walled hole at the northwest edge of the field was reported as an old excavation from early mining efforts. No impact related crater was detected.

Since discovered, the Imilac strewnfield has been the focus of intense metal collecting efforts which continue even today. In spite of all this attention, meteorites and orininal surfaces are well preserved in this most arid desert environment. In early 1996 another expedition arrived on site and, equiped with modern navigation and metal detecting instruments, set out to verify and expand Buchwald's [2] earlier work.

Systematic metal detector sweeps revealed that remaining abundant meteorite fragments are not randomly distributed. Rather, they are mixed within the soil, from the surface to a depth of about 20 cm, and occur along linear or ray like bands. One set of rays are associated with the hole formerly identified only as a man made excavation pit. At least four rays, up to 80 m in length, radiate outward from the central pit, in the directions of northeast, east-northeast, east-southeast, and southeast. At a radius of 40 meters from the center, these bands of meteoritic fragments are about 3 m across. At shorter distances, as they converge, they become progressively wider and eventually merge along the eastern rim of hole. Regions immediately west of the pit are essentially barren of meteoritic rays. This radiating pattern suggests strongly that the hole is, in fact, the site of an impact pit excavated by a single meteorite body. Its oblique trajectory from the west-southwest, splashed particle rays and target ejecta downrange and along its flightline bearing of about 74° magnetic.

At a distance of about 200 meters uprange (154° mag.) from this first crater there is a well preserved and previously unreported circular depression 2 m wide and about 0.8 m deep. The feature is surrounded by a nearly intact raised rim and strata underlying the inner walls are tilted gently outward. Sediments within the east-northeast wall, closest to the first crater, are more strongly tilted and are overlain by a partial ring of ejected debris. Although the depression shows evidence of excavation, meteorite fragments occur within the debris.

A second undescribed depression is located another 500 m uprange and on a direct line with the first two holes. This smallest feature is only 1.5 by 1 m wide and is elongated in the direction of the flightline. As with the first undescribed depression, a partial ring of meteorite-rich ejected debris is deposited only outside its downrange (east-northeast) and uplifted rim.

Conclusions: Three separate topograhic depressions are alligned within the Imalac meteorite strewnfield and are here interpreted as natural primary meteorite impact pits. All three features are characterised with assymetrically distributed debris and meteoritic products which were ejected along the same east-northeast downrange direction. The largest feature, formerly identified as an 8 m wide man made excavation, is centered at the apex of a series of converging rays of meteorite fragments. Two additional depressions are located along a west-southwest to east-northeast bearing and on a direct line with the first site

References: [1] Graham, A.L. et al, (1985) *Catalog of Meteorites*, Univ. Ariz. Press, Tucson, 460 pp. [2] Buchwald, V.F., (1975) *Handbook of iron meteorites,their history, distribution, composition, and structure* ,Univ. Calif. Press, see pp 1,393-1,397.