

# **I. History of Carbonine**

## **The Meteor**

In Year 129, a large meteor was discovered by the Planetary Defense Satellites (PDS) heading toward the planet. Astronomers calculated the planet's path and the meteor's trajectory and discovered that the meteor would hit the planet in two years. The size of the meteor was not large enough to cause global changes, but it would cause area wide issues with dust and possible earth tremors.

The meteor entered the atmosphere over the equator and traveled 2400 miles northward. It exploded 5 miles above the surface and broke into 27 fragments. These fragments traveled another 150 miles before hitting the ground.

Seventeen fragments penetrated into the Cinian Mountains and these crash sites have not been located. Three fragments crashed into the Silver Forest Wildlife Preserve and were recovered. The last seven fragments penetrated into the Matu Land Plain Aquifer. The latter impact sites created an oval pattern with the locus at 35°N and 115°W. The extreme measurements are 120 miles by 70 miles. [Fig.1]

## **Growth of the Ridges**

The aquifer landing sites were immediately isolated to prevent the sites from being destroyed by the public. Within weeks, black water was oozing from the impact areas and saturating the ground. These ooze areas soon hardened. The hardened areas began growing vertically. Five years later, the growth created a column forty feet tall. [Fig. 2] In the next seven years several more columns formed next to the initial column with shorter columns around the perimeter. [Fig.3] The growth rate was accelerating. New column growth followed the pattern of the initial ooze locations.

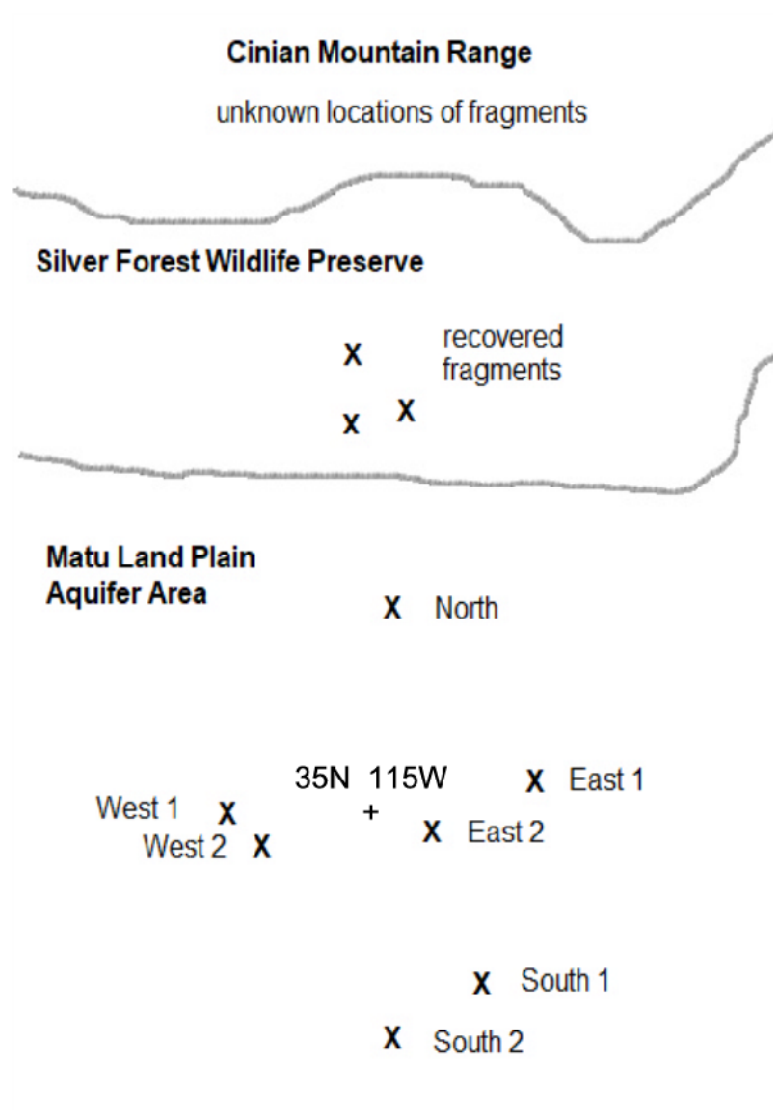


Fig. 1  
Fragment Crash Sites



Fig. 2  
The first stem at site East 2

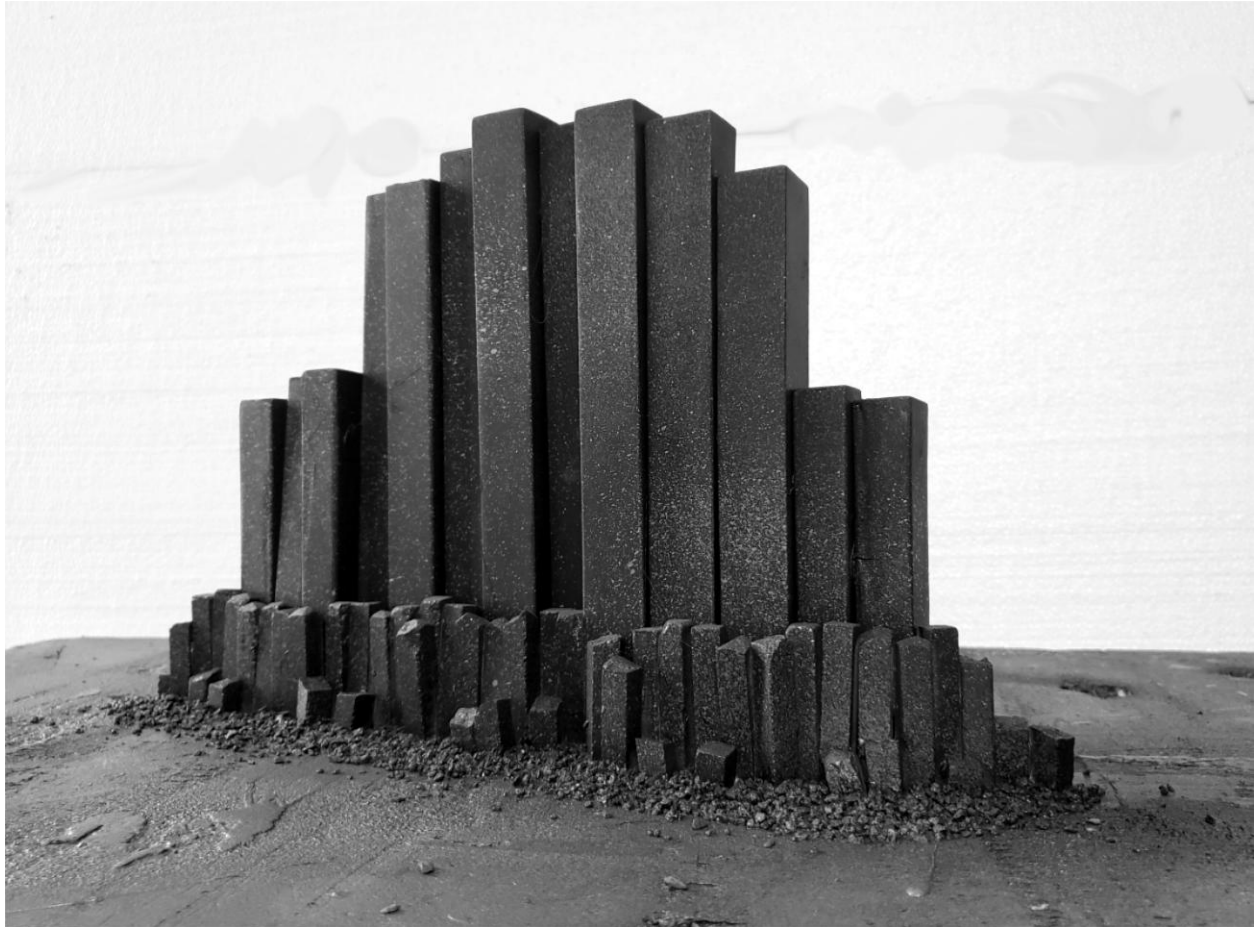


Fig. 3  
Stem growth at East 2 in year 142  
[photo by News 23 Skyreporter]



Fig. 4  
Ridge growth at East 2 in year 178  
[photo by News 23 Skyreporter]

The initial columns were now over one hundred feet high. Thirty five years later the interior columns began fusing into a solid formation and columns were only found on the perimeter. This new formation became known as a ridge. [Fig. 4]

### **Meteor Fragment Analysis**

Fragments from the Silver Forest were compared to samples taken from the growing columns and it was discovered they were not identical. The SF samples had hardened and were more like rock, whereas the Matu samples contained small amounts of organic material and had a bluish tint. [Fig. 5]

The Matu samples burned very well and gave off very small amounts of pollutants. Further research revealed that they could be converted into a liquid form

and used in internal combustion engines. More research lead to space-plane fuel additives, Enclosed Atmosphere Oxygen Scrubbers (EAOS), and converted into a material called "crisp" and used in power plants.

### Early Extraction

The extreme growth of the ridges caused alarm as it was thought they would continue growing until they became a mountain range and would move into populated areas.

Extraction began by the use of pneumatic hammers mounted on tracked vehicles. [Fig. 6] Extracted pieces were scooped up by front loaders and loaded into off highway road trains which drove to collection hoppers. From there, highway trucks carried the material to processing plants. This method was slow and produced a low yield. [Fig.7]



Fig. 5  
Early carbonine samples from Matu Land Plain



Fig. 6  
Track mounted pneumatic extraction hammer



Fig.7  
Early off highway road train south of West 1

### **Current Extraction**

The RLS made a request of the local office of the Empire to establish a rail system to connect all of the columns sites. This system included a track plan for each site, which includes two or more field sizers; a system of track to connect all the sites, and two processing plants to prepare the material for the various manufacturing plants. [Fig. 8]

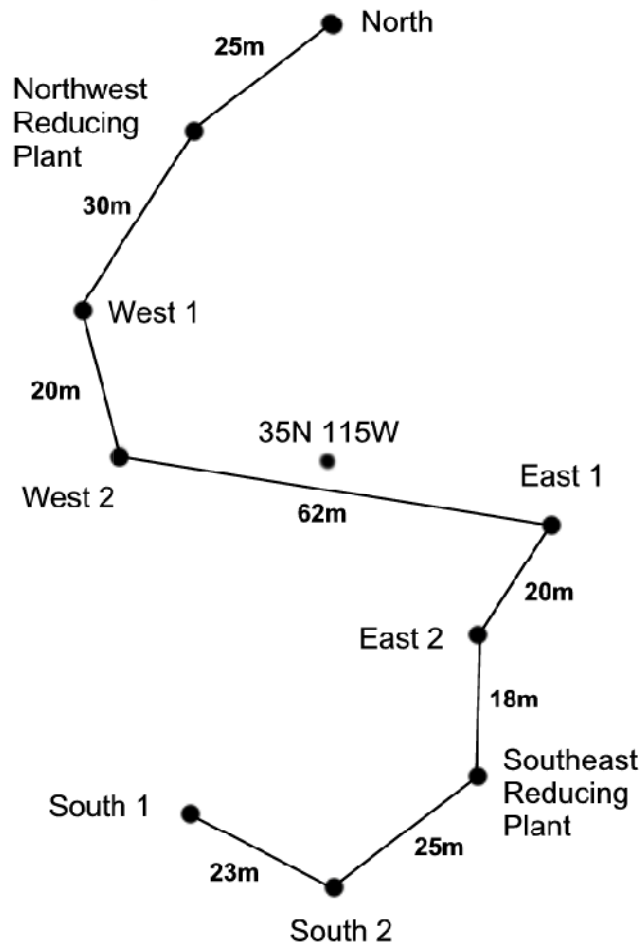


Fig. 8  
Rail System at Fragment Sites

### Track Mileage Between Ridge Sites and Processing Plants

	North	NWP	West 1	West 2	East 1	East 2	SEP	South 2	South 1
North	--	25	55	75	137	157	175	200	223
NWP	25	--	30	50	112	132	150	175	198
W 1	55	30	--	20	82	102	120	145	167
W 2	75	50	20	--	62	82	100	125	148
E 1	137	112	82	62	--	20	38	63	86
E 2	157	132	102	82	20	--	18	43	66
SEP	175	150	120	100	38	18	--	25	48
S 2	200	175	145	125	63	43	25	--	23
S 1	223	198	167	148	86	66	48	23	--

## Data

Carbonine Properties	Chip Size and Weight
Hardness: 1.4 to 2.0 Color: black, blue, brown Streak: same as the color Texture: smooth Luster: sub metallic Cleavage and Fracture: cuboidal Flame: pale blue to purple BTU / LB: 16,500	Field Chip Size: 2.0 - 3.0 in <sup>3</sup> Field Weight: 5.6 - 18.9 oz  Production Chip Size: .25 in <sup>3</sup> Production Weight: .01 oz  Weight per in <sup>3</sup> : 0.7 oz Weight per ft <sup>3</sup> : 76 lbs

## Timeline

Year	Event
129	Meteor detected in space
131	Meteor enters the planet's atmosphere and crashes
132	Black water discovered
135	Out-cropping formations
136	First column (over 40' tall) at East 2
142-146	Collections of columns
177	Early ridge formation
179	Earliest extraction operations (land trains)
183	Formal ridge formation (at all sites)
186	Rail operations started
189	Formation of extraction seasons, regulation, licensing; This is called "Season 1"

## Dictionary

**Aquifer** -- water contained in between layers of bedrock or soil

**Carbonine** -- a coal like rock grown from the Rhos/Thooms meteor in the Matu Plain

**Chip** -- carbonine which has been removed from a column or ridge and is in an unprocessed condition

**Chipping** -- see "Extraction"

**Column** -- a stand alone vertical growth of carbonine

**Crisp** -- production sized carbonine baked at high temperature and high pressure to form a hard brittle state

**Extraction** -- the removal of carbonine from a column or ridge

**Field** -- relating to the chip extraction site

**Field Size** -- the size of chip after it has been ran through a field crushing machine (also known as a "sizer"); approximately 2 to 3 in<sup>3</sup>

**Meteor** -- refers to the astronomical body discovered by Charles Rhos and Beverly Thooms in year 129 at the Regency of Land Science Southern Astronomical Observatory in Glanlan Province, Varauntia

**Planetary Defense Satellites (PDS)** -- a series of thirty two satellites orbiting the planet which provide information about activity in space surrounding the planet

**Production (Processing) Plant** -- any of the numerous collections of machinery and structures which reduce field chip into production size and sort out any other materials which may have been accidentally included

**Production Size** -- the size of chip after it has been processed through a reduction plant; the size of chip sent to production facilities; usually .25 in<sup>3</sup>

**Regency of Land Science (RLS)** -- the department of the Empire which oversees management of land, resources, and ecosystems

**Ridge** -- a series of carbonine columns which have grown together to create a single formation

**Stem** -- the original column of a ridge

## **II. Contractor Requirements**

### **General**

Hire and supervise all sub contractors  
See that all legal requirements are followed  
Meet all requirements for Extraction Permit  
Display Extraction Permit at extraction site

### **Site Management**

Manage the physical aspects of the site  
Inspect and insure the safety of all operations  
Co-ordinate with RLS inspectors for onsite inspections  
Insure all sub contractors are fulfilling their responsibilities

### **Reports**

File quarterly quota reports  
File yearly progress reports  
File end of season historical report  
File accident and hazard reports  
End of season status and turnover reports

### **Beginning and Ending of Permit**

The mining period is given in terms of 2 years per permit. 30 days are allowed previous to the beginning of the mining period for set up and 30 days allowed after the end of the mining period for cleanup of the site. Once the Authority has been notified (the permit turned in) the site will be inspected. Any violations have 7 days to get settled or fines will be issued.

### **Recommended Equipment**

#### **Mining Equipment**

- 1 Chipper
- 2 Front Loaders (2 backups)
- 2 Field Crushers (installed at site)
- 4 Dump Trucks (2 backups)

### Railroad Equipment

- 2 Locomotives (1 backup)
- 40 Ore Cars
- Support Cars/Functions (any of these may be replaced by structures)
  - Operation Office
  - Mining Office
  - Medical Office
  - Bunks (capacity 20)
  - Water (Showers/Laundry) (capacity 5)
  - Dining
  - Fuel Tank Car
  - Generator
  - 3-8 Flatcars for Equipment
  - Crane
  - Sand Car

### Vehicles

- 2 Fuel Trucks
- 5 Off-Road Vehicles (pickups or utility trucks)
- Bus (22 seats)

### **III. Mining Operations**

#### **Days of Operations**

Operations can continue 24/7 as long as there is enough equipment (rail and other) so that equipment can be inspected and/or repaired.

#### **Hours of Operations**

Operations must begin and end at twilight, these hours set by the RLS which vary by day and global season. Operations refer to actual removal of chip and not the hauling.

Extended operations can be extended by the use of site lighting. Extended hours and the lighting set up must be approved by the RLS before the season starts.

#### **Mining Season**

Mining season is from March to October involving 8 months time. The season cannot be split; once mining starts mining must be continued until the season ends. Each mining permit states length of mining season for individual stem sites. The season is not year round due to the extreme temperatures and weather during the winter months.

#### **Extraction**

Extraction is done on the expanding ends of the ridge and not at the location of the stem. New columns can be removed whole. Chip cannot be left on the ground at the end of the season or if operations are halted for more than two days.

## IV. Railroad Operations

Railroad operations are authorized for 8 months ~~March to October~~ at 12 hours per day, with no mandated shut down days for any other instructions.

Loading Tracks  
(min. 2 train lengths each)

The mining season cannot be split. Mining of site must be contiguous throughout the stated mining season. Exemptions are holidays or other government days. 3 days a month are allowed for equipment exchange or repair. These days cannot be accumulated. They cannot be used in any manner during the month.

### Rolling Stock Limitations

All railroad equipment must have an identifying number and the reporting marks of the operating railroad.

Equipment which will be carried over mainline railroads must comply with all requirements as far as type of trucks/wheels, safety appliances, markings, and weight limits, coupler types. See *Major Railroad Carriers Rolling Stock Compliance Manual* (current issue) for information.

Mainline railroads are not allowed to use chipping locomotives as the lead locomotive of a consist but can be used in the total power make up of a train. In the event of a change of direction, the chipping locomotive cannot be in the lead.