MINING

Here is the beginning of my dissertation on mining as a profession, not as an annoyance that people have to do to pay for fighting ALA EVE, but as an activity that people choose to do as their primary function in the game world. So the system needs to be established in such a way that people can have fun either touching on it lightly with full automation, or diving into it deeply with a lot of hand on work. If a player chooses to invest his time into "mining" full time, he should gain a higher reward than someone who just wants to drop some equipment, and have it do the work for you.

The overall goal of this paper is to discuss the occupation of "Mining" as it should be in a perfect world "as it should be," outside of developmental time constraints. Discussions about balancing or time constraints are

The way I see it is there are 3 Primary sides to the "Mining" Profession, each with its own subset of activities more or less flowing from one to the next. The concern of a "Miner" ends with trading as that is when his product leaves his control. Other occupations will share the same activities as the beginning of their activity chain, being concerned with getting resources from miners to perform some other operation whatever that is, however this paper is concerned with the "Mining" profession so its scope ends with trading.

1) Prospecting
    a. Scanning
    b. Analysis
    c. Mapping
2) Collection
    a. Mine Setup
    b. Excavating
    c. Processing
    d. Packaging
3) Selling / Transporting
    a. Hauling
    b. Warehousing
    c. Trading

Each of these activities can be automated for ease or manned for greater efficiency / benefit. Some can be omitted completely for small operations. As the operation grows however each separate activity will have to be addressed by the group. Initially several or all of the activities can be performed by a single person depending on the scope of the operation, however larger and larger operations will have individual players specializing into individual "Jobs" for the benefit of the overall operation..

A Drone as discussed in the paper is described as an automated ship of some size and capacity not directly piloted by an active player. They can range in size from 1 meter micro craft to as large a ship as the developers see fit to allow to be piloted by a player directable AI construct.

PROSPECTING

The main goal of this side of mining is the finding of resources. This means going out and doing a lot of foot work to locate the best veins of mineral. There should be a high degree of human judgment and interactivity in gaining the best/fastest results.

Scanning – The scanning itself will be done either by the players ship itself or by sensor drones, under direct control of the player or drone control towers. The player's ship will have higher resolution / more powerful / greater range sensor capability than a sensor drone of similar size. Sets of drones can be directed to fly formation search patterns like a staggered line, grid, or radiating circle. The deeper the scan is set to be performed the longer it will take to scan a given area by requiring the ships move more slowly over the terrain during the scanning. The resolution of the scanner is based on distance to the target. In a radial fashion the closer a deposit is to the scanner receiver, the more degrees of sweep the scanner has to resolve the contact… such that farther away it is just a blob and close in it has a discernable shape. If you want to improve the resolution of the farther / deeper deposit, you will have to order multiple scan passes, or find a way of getting the scanner closer to the target.

The image returned in its raw form should look like current day ground penetrating radars, with the strata layers (as a noise function based on the topography of the terrain above) shown. As the ships move over the area the subsurface makeup is revealed in bands as the ships scan. Once there is data in about the makeup (relatively quickly after the beginning of the scan. a 3D map is built up of the subsurface. The player can then "sort" the map for specific mass densities, and have only those layers visible with the rest fading out completely. Once the total shape of the deposit is known, the player will better know how to layout the mining structures to maximize the yield rate.

If the player places his structures at the far end of a deposit it will take far longer to chew through the deposit because of the much longer round trips for the mining drones to the far side of the field, this also applies to very deep deposits. However the player knowing the total of the deposit may very well choose to place his structures like that depending on the other deposits in the area. to prevent him having to setup a second site to exploit other deposits.

http://www.woodrell.com/joe/mineral_scan2.avi
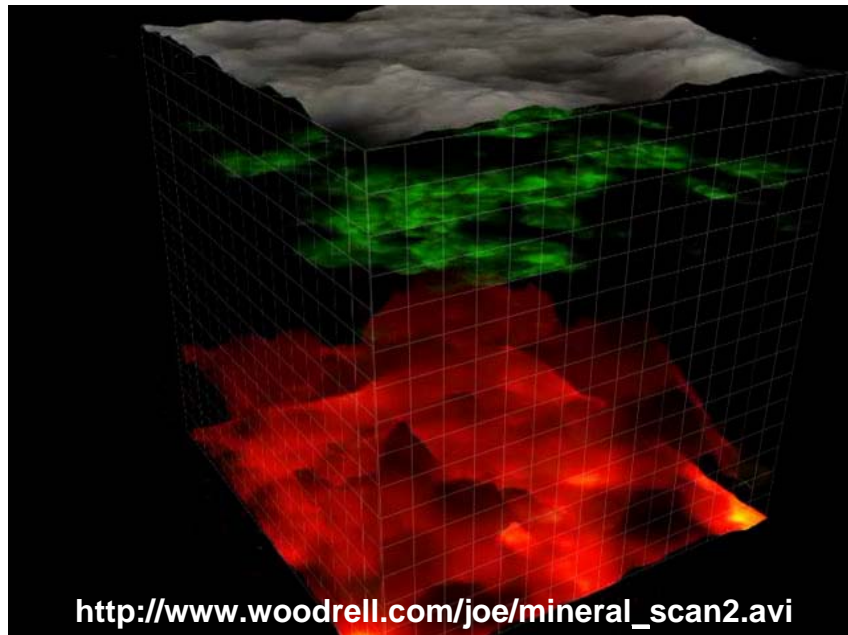
If the player is seeking a more automated scan procedure. He will drop a drone control tower and then order the tower to conduct scans within its control range, at which point the tower will direct the drones around within its sphere of control scanning the planet and logging the data. The player can then come back at a later date and collect the data that the tower has compiled. However the disadvantage of using an automated control tower is the amount of wasted time it ends up with because it is just blindly scanning a given area rather than focusing on deposits as they are found., given it will end up scanning all terrain within its sphere of influence, but a lot of that terrain will not have useful deposits.

Now a player can set up a mining operation anywhere he wants; however there will be little pure ore at "non-hotspot" sites. However they can extract the raw mass from the site, it being just dirt and rock, but not much useable ore. There will be some, maybe 5%-10% of the production rate of what is at a hot spot site, but these ores will be locked up in oxides and other combinations of mineral that require additional energy to extract. These can then be placed into a mass reactor to reform the atoms into the more useful ores and metals. The enormous power required for this however makes it very prohibitive compared to mining the ore in its natural state. However if there is no natural ore availably locally, or supplies are otherwise cutoff. This will be discussed in greater detail in the "Collection" section of the paper.

In non planetary prospecting ventures, the procedure is similar. The player will be able to do basic scans from much further out because of the lack of interference in the mass scanners by the gravity well of the planet.

Analysis – Once the player selects a specific mass density on the 3d map, he will send out a pilot hole drone that will then drill down into that specific sub cube of the strata layer and return with samples of the minerals it contains. These will be analyzed to determine the exact mineral composition of the selected strata layer. As a semi automated method he can just set out a grid pattern and target depth, and have the drones tap at each point and return what they find. This will take longer both to drill all the holes and analyze all the results. As a fully automated version you just set down a mining drone control tower, and it will go about pilot drilling and analyzing the material within its range. You can limit the depth it will pilot drill to, maybe because of the limitations of your drones heat resistance, or some other reason. You can also control how fine a grid it will drill in to take samples.

Mapping – As the results from the analysis come back, a 3D map will be built up of the area based on those results. Once the map is complete enough to the players satisfaction, he can save a copy of the map as it stands to be used for reference later by the collections operation. This map can also be sold later to other players for some amount of credits. the selling operation should be contained within the map viewer and should proceed like this. The buyer should be able to see the map results completely and unhindered, however the information on the location of the site will be withheld by the map, however a rough distance, location (down to the system maybe) to the site, and time since the data was collected will be displayed, so people cannot scam with maps from the other side the galaxy, or within hostile space. If the buyer wants to purchase the information contained on the map, there will be a "buy" button on the map viewer and a

dialog will open between the buyer and seller. Once a price is agreed upon the seller gets his full map and the seller's copy of the data is earmarked to have been sold to XYZ on XYZ date, to keep the seller from scamming people with an old map that has long since been mined out.