



Volumetrics

Accurate Reserves Reporting

Gemcom GEMS – Collaborative geology and mine planning supporting cross-functional teams.

Give your project an immediate advantage with Gemcom GEMS™ volumetric tools. By specifying the accuracy of the calculations, the data elements, and how you want the results broken out and organised in the report, GEMS generates a detailed report accounting for all the intricacies of a complex design containing multiple geology and excavation solids. If you are assessing various options, you can quickly test them and create the report you need to plan your next revision.

You can incorporate block models by evaluating only the portion of a block contained within a lithological unit, and obtain grade and density values from either block models or solids. If you prefer to work in 2D you can also use extruded polygons to represent geological solids.

GEMS easily handles complex orebodies with multiple triangulated solids. Once you specify which solid takes precedence in regions of overlap, GEMS will resolve conflicts and give a complete breakdown of the volumes and grades. The system also gives you the power to distinguish between mined and filled volumes, assign default values to uncharacterized rock, and restrict volumetric analysis to an irregularly shaped region.

The key to volumetric calculation in GEMS is the needling process, whereby thousands of 3D vectors are passed through each active solid, surface, and block data. Precise measurement of entrance and exit points yields length information, which is multiplied by area to yield a series of incremental volumes for each needle. By summing the results for all needles, GEMS can yield detailed volume, grade, and density estimates with unprecedented accuracy and speed. The number of needles to be used, as well as their pattern and orientation, is entirely up to you.

By combining block models, surfaces, and multiple geology and excavation solids or polygons, you can report the following types of reserves, and more:

Ore Extraction Tools:

Volume Depletion and Ore Reserve Update

- Volume Depletion reports the block-by-block volumes for your model using surfaces, solids and/or excavation solids. Output is to an Ascii file, block model or database table.
- Ore Reserve Update calculates the delta volume on a block-by-block basis for a change in a geological contact from one time period to another. Output is also to an Ascii file, block model or database table.

Group-Related Rock Codes And Grade Ranges

- Create rock groups to treat several rock codes as one for reporting purposes.
- Create grade groups to link grade ranges for up to three elements in categories, such as “waste” or “high”.
- Link grade groups to rock groups.

Solid Precedence Assignment

- Overlapping solid volumes accounted for only once.
- User ranks order of precedence to resolve overlaps.

Needle Parameter Definition

- Choose the grid location, cell size, and needle orientation that best fits your orebody, manually or automatically.
- Employ a regular, irregular, or gaussian needle pattern.
- Choose more needles per cell to increase accuracy, fewer to accelerate processing.

Needle Accuracy Checking

- Compare geometrically derived solid volume with integrated needle volume to confirm adequate integration level.

Volumetric Region Restriction

- Use a clipping polygon to limit reserves reporting to any region of the site

Report Content Definitions

- Get rock code and grade data from block models or geology solids.
- Get density data from block models or rock codes.
- Include active excavation solids, surfaces, and/or SEGs, if desired.
- Include information from an economic block model, if desired.
- Report reserves by plan view, vertical section, and/or inclined section.
- Issue report as a text file and/or a spreadsheet file.
- Issue detailed or simple report.

Report Options

- Specify default rock code, density, grade for uncharacterised regions, such as within an excavation.
- Report incremental or cumulative totals.
- Suppress reporting of zero value categories.

Format Of Reported Values Control

- Units.
- Scale factors.
- Number of digits before and after the decimal point.
- Comma placement.

Definition Of Reserves Report Structure

- Issue up to three simultaneous reports, individually sorted.
- Sort each report by up to four levels—by excavation, by plane, by rock group, and/or by grade group.

Reserves Reports

- Save configuration.
- Load previously defined configuration.
- If using surfaces, specify top and bottom surface limits.
- If sorting by planes, indicate planes to use.
- Issue report to printer, file, or screen.

Processing Parameters Verification

- Status report identifies plane or solid overlap errors.

- Discrepancies between status report totals and values in the reserves report can indicate missing rock codes or grade ranges leading to unreported volumes.

Polygon Report Issuance

- Model lithology exclusively via extruded polygons.
- Sort by up to four polygon attributes of your choosing.

Quick Cut Evaluation Of Polygons

- Issue volumetric report based on polygons in conjunction with block models and surfaces.
- Evaluate all active polygons or selected polygons.

Interactive Data Queries

- Report size and volume of any active solid(s).
- Report solid volume, grades, and density using block model data.

Data Objects Updates

- Update solid grades from block models.
- Update polygon attributes from volumetric data.

For more information email gems@gemcomsoftware.com

Disclaimer and copyrights

This document gives only a general description of products and services and except where expressly provided otherwise shall not form part of any contract. Changes may be made in products or services at any time without notice. Copyright 2008, Gemcom Software International Inc. Gemcom, the Gemcom logo, combinations thereof, and GEMS are trademarks of Gemcom Software International Inc. All other names are trademarks, registered trademarks, or service marks of their respective owners.