

Capability Statement 2011

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CONTENTS PAGE

1.	About Gemcom	4
2.	Software Range	5
3.	Gemcom Services	6
4.	Technical Support	8
5.	Product Training	9
6.	System Configuration	10
7.	Gemcom Locations	11
8.	The Services Team	12
9.	Case Study: Mikhailovsky Gok	14
10.	Case Study: Northland Resources Inc	18
11.	Case Study: Rheinkalk GmbH	22
12.	Contact Details	26

ABOUT GEMCOM

Introduction to Gemcom

When mining companies seek to increase mine productivity, they turn to Gemcom for technology and services.

The Company is home to world renowned and award winning mining solutions and to industry thought leaders who are pushing the boundaries of what's possible in mining.

Gemcom has a global reach, delivering comprehensive solutions in all major mining centres in more than 130 countries. Every major mining company, including BHP Billiton, Codelco, De Beers, Newmont, and Vale, is a Gemcom client. Through a combination of organic growth and strategic acquisitions, it has become the largest global supplier of mining software solutions.

Why Mining Companies Rely on Gemcom

Gemcom works in partnership with its clients to address their business goals and unique mining challenges. Through a combination of software and professional services it delivers compelling solutions that leverage mining, business and IT expertise to answer key industry issues such as:

- Maintaining profits when dealing with variability in commodity demand and production costs.
- Increasing mining and processing efficiency.
- Solving the data chaos problem that negatively impacts decision making.
- Addressing industry skills shortages.

Mining companies rely on Gemcom to drive efficiency and profitability in their mining operations because we partner

with them to develop a framework that optimises their entire mining value chain. This framework is comprised of software and services:

- Exploration, geology, mine planning, and production scheduling.
- Mine plan economic optimisation and analysis.
- Data integration and data management.
- Business process analysis and engineering.
- Mine production management from the mine to final product.

Why Mining Companies Choose Gemcom

- Unique focus on relationship between people and mining information maximises profits by driving productivity and efficiency.
- Collaborative geology, mine planning, and mine production management software connects mining teams to improve decision making.
- Support for company specific mining and business processes with configurable solutions.

What Clients Say About Gemcom

"We now have a solution [Gemcom InSite] that systematically identifies where our processes vary from what's optimal, and a simple, auditable method of identifying process exceptions. The system allows our engineers to raise and track follow-up actions to ensure it does not happen again, and to assign root causes for later analysis. We have avoided substantial production losses since we put the system in and continue to improve the sustainability of reliable and safe production."

– John O'Callaghan, Group Technical Manager, Minara Resources

"Gemcom is a strong software partner. Gemcom Surpac provides a wide range of content, flexibility and functionality, allowing us to increase the quality of our work."

– Rainer Westermann, Manager of the Geology Mining Team, Rheinkalk GmbH

"The increase in productivity, quality and performance that we have gained by doing our jobs in GEMS paid for our software investment. We want to continue taking advantage of what the Gemcom solution offers."

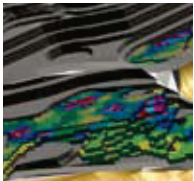
– Renaud Adams, Vice President and General Manager, IAMGOLD



SOFTWARE RANGE

GEOLOGY AND MINE PLANNING

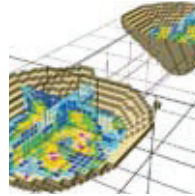
GEMCOM SURPAC™



Gemcom Surpac is the world's most popular geology and mine planning software. It delivers efficiency and accuracy through ease-of-use, powerful 3D graphics and workflow automation.

STRATEGIC MINE PLANNING

GEMCOM WHITTLE™



Gemcom Whittle is the world's most trusted strategic mine planning software used to determine and optimise the economics of open pit mining projects.

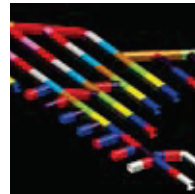
GEMCOM GEMS™



Gemcom GEMS provides collaborative geology and mine planning capabilities that support cross-functional teams involved in exploration, modelling, mine design, long-term planning and production scheduling.

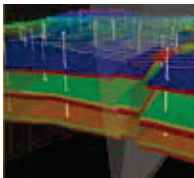
SCHEDULING

GEMCOM MINESCHED™



Gemcom MineSched provides long- and short-term scheduling for surface and underground mines of all sizes and types, improving productivity and profits beyond what's possible in manual scheduling.

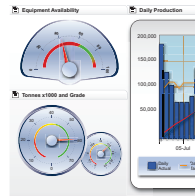
GEMCOM MINEX™



Gemcom Minex provides the best geology and mine planning tools for coal and other stratified deposits, ensuring resources are evaluated accurately and mined efficiently.

MINE PRODUCTION MANAGEMENT

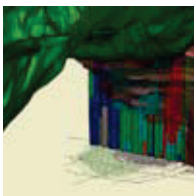
GEMCOM INSITE™



Gemcom InSite provides tools and real-time data to improve efficiency, cost control, and the performance of processes, activities and equipment from mine to final product.

BLOCK CAVING

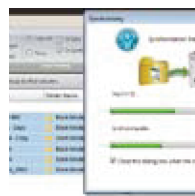
GEMCOM PCBC™



Gemcom PCBC is used by virtually every major mining company involved in block caving, who rely on its comprehensive functionality to assist with feasibility studies, design and production management.

DATA MANAGEMENT FOR EXPLORATION AND PRODUCTION

GEMCOM HUB™



Gemcom Hub provides data management optimised for exploration and production, bringing centralisation and security to stored data, and rapidly delivering information over intermittent, low-bandwidth connections.

GEMCOM SERVICES

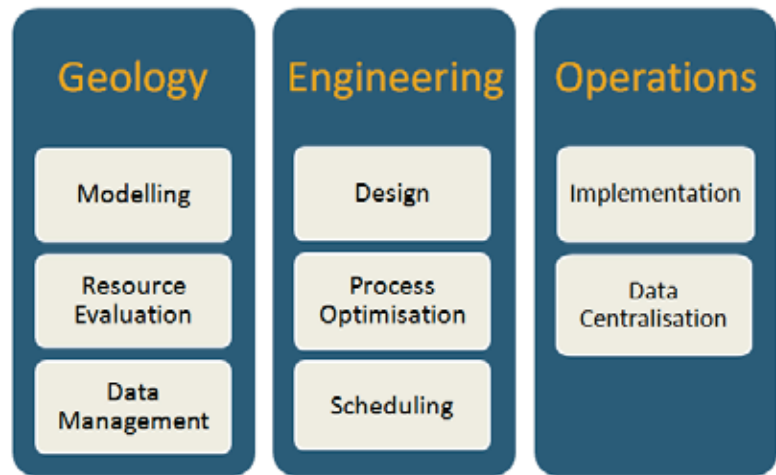
About Gemcom Services

The Gemcom Services Division helps clients drive productivity, improve efficiencies and control costs.

With Gemcom's global reach and local presence, our highly-skilled mining and IT professionals work with clients all over the world. We offer a wide range of services designed to provide practical and cost effective solutions.

Gemcom's services are generally arranged into three areas of specialism to reflect key stages of the mining cycle and the focus of products offered:

- Geology Services,
- Engineering Services
- Operations Consulting



Gemcom Services

Product Centric Approach

Gemcom Software Europe Limited is one of five regional business units that work together to provide products and services on behalf of Gemcom International Inc to meet the requirements of clients in the minerals sector and related industries. We achieve this by using a product centric approach that is designed to support our clients at every stage of the mining cycle

Gemcom has in excess of 100 highly qualified professionals in a wide range of disciplines to deliver its service capability. Professional experience spans a whole range of commodities including metals, stratified deposits, industrial minerals and others.



Experienced Staff

Our staff have worked with a wide spectrum of clients involved in the minerals sector including funding organisations (International Finance Corporation, European Bank for Reconstruction and Development, Etc), exploration companies, mine operators, local and regional governments as well as consulting organisations and private individuals. Project teams will typically draw on the skills of geologists, engineers and analysts as well as others.

Services assignments can range from ad hoc client support of a few days to long term engagements to the value of up to US\$ 2.5 million.

Key Services

Modelling:

Geological modelling can be carried out in any one of Gemcom's three main modelling packages, principally GEMS, Surpac or Minex. These are fully capable through expansive functionality to model any deposit – key features include 3D visualisation, wireframe and solid modelling, drillhole, resource and infrastructure planning.

Resource Estimation:

Within the Services Division there is extensive knowledge and practical experience in producing high quality resource estimations. These typically include data formatting, geological modelling and block model creation. All resource estimations are fully customised to the client's needs and are delivered in a professional report compliant with all recognised reporting codes (NI 43-101, JORC, etc).

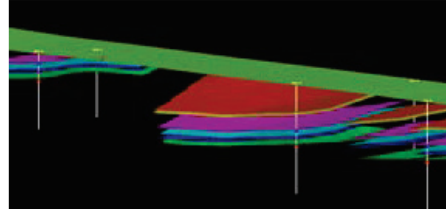
Data Management:

Gemcom Services professionals specialise in data capture and management. Using Gemcom software data can be drawn into singular databases containing multiple types of data, such as drillhole and survey data, organised for subsequent modelling and statistical data analysis.

Engineering Services

Design:

With Gemcom's software packages a mine design can be easily created, whether it is an underground or an open pit operation. With expansive functionality and editing options, manipulation of plans and schedules is easy and user friendly.



3D Visualisation of Coal Seam Models (Minex)

Process Optimisation:

Once designs have been created Optimisation packages such as Gemcom Whittle™ or Minex's Pit Optimiser, will aid the user in using real 3D geological data to optimize the design. Exploration and mining activities can also be rationalised using Gemcom's Mining Process Framework™ approach to define individual processes and groups.

Scheduling:

Gemcom's main scheduling solution is Gemcom MineSched™, which links directly to other Gemcom packages. This is very useful in short and long scheduling; for example it can provide weekly, monthly, quarterly and yearly reports based on production and material movement.

Operational Services



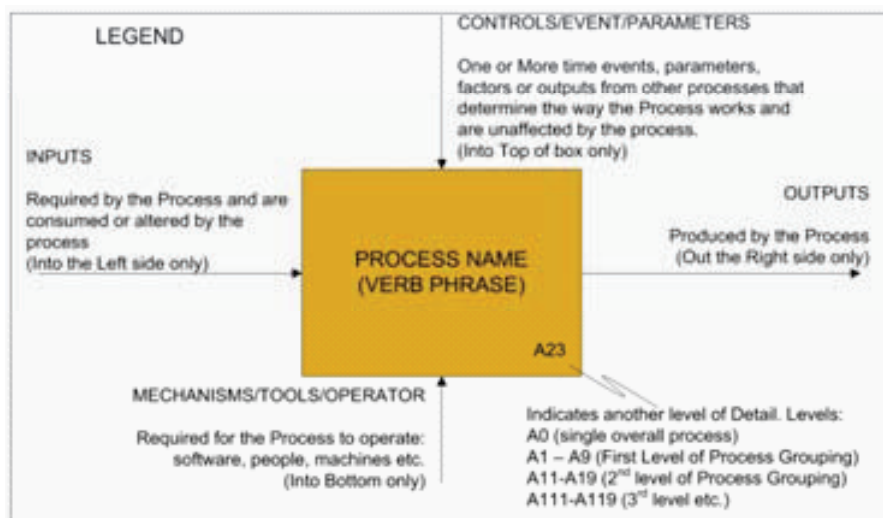
Operational Assistance - Egypt

Implementation:

Gemcom Services can provide onsite assistance to help clients achieve their solutions. The implementation of geological and grade control procedures, workflow management and the supervision of exploration and sampling programmes are typical functions carried out by Gemcom services professionals.

Data Centralisation:

In any mine operation data management is one of the most important tasks to the operational success of the whole company. Through Gemcom packages such as Gemcom Hub, data can be centralised into one location and accessed by multiple users who can then work on the same files. This increases efficiency and data awareness, while also allowing multiple users through relatively easy tasks to control data.



Gemcom MPF Approach

TECHNICAL SUPPORT

DEDICATED SUPPORT SERVICES

Gemcom Expertise When You Need It, When It's Vital to Your Business

Gemcom's services team is your partner in productivity, ensuring that you get the most out of your investment in our technology. They are there to answer your support questions, train your staff, and to assist with your geology, mine planning and scheduling projects when you don't have the time or in-house staff available. You have already selected Gemcom's software as a vital solution in driving your business and its profitability. To help you be even more effective, Gemcom offers you a range of Dedicated Support Services to ensure you have access to the right resources when needed.

New Release System Upgrades

Get the full benefit of the latest versions of Gemcom's software while minimising disruptions to your team. Our services team will upgrade all user systems (and servers if deployed) and will test all workflows before transferring users over to the latest version of the software.

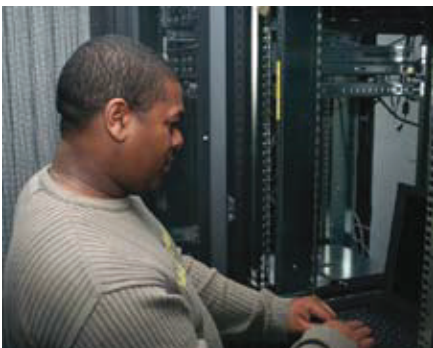
Plus Plan Services

Having a Gemcom Plus Plan Services contract guarantees you multiple days of training and project assistance services that can be used at agreed upon times during the year. As a Plus Plan client, you can even request the same people work on your projects throughout the year.

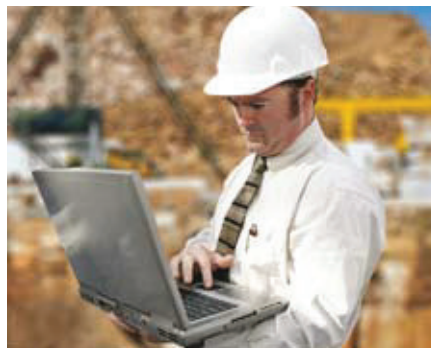
Onsite Gemcom Support Engineer

When you have a large number of users, or are just starting out with a new Gemcom system, having an Onsite Gemcom Support Engineer means that your team is as productive and efficient as they can be. Your team will benefit from quick answers to their questions and by having someone onsite who can show them how to use the software to its full potential. Your Gemcom Support Engineer will work at your site for an assigned duration to help you with all training, support and project assistance needs.

Gemcom's services help you drive productivity, improve efficiencies and control costs. With Gemcom's global reach and local presence, our highly-skilled mining and IT professionals work with clients worldwide, delivering training, project assistance, system configuration and dedicated services onsite and at corporate offices.



We keep you running at optimal performance.



Onsite support when you need it.

PRODUCT TRAINING

TRAINING SERVICES

Build Your Skills. Improve Your Productivity. Drive Company Efficiency.

Helping you get the most out of your investment in our mining software is the top priority at Gemcom. We have been training mining professionals on the usage of our software for more than 25 years and offer introductory through advanced training classes for all of our products. Every year Gemcom trains thousands of users all over the world. By taking Gemcom training you will discover new techniques and optimal software workflows that will enable you to work smarter to increase your productivity while improving company efficiency.

Standard Classroom Training

Choose from a wide variety of regularly scheduled beginner through advanced courses held at your local Gemcom office.

Customised Classroom Training

Courses are taught using client data sets and tailored to the specific learning needs

of individuals or companies. Training can be held at your location or at your local Gemcom office.

Online Workshop Training

Continue your skills development when it's convenient for you without having to leave the office or incur flight and accommodation costs. These short one-on-one 2 – 3 hour sessions can be focused on specific areas of our software as they relate to your learning needs.

Executive Training

This one-day session is for busy mining and exploration executives, managers and IT professionals who want a high-level overview of the software their teams use and how it can best be used to drive productivity, increase efficiency and control costs at their operations.

Gemcom's services help you drive productivity, improve efficiencies and control costs. With Gemcom's global reach and local presence, our highly-skilled mining and IT professionals work with clients worldwide, delivering training, project assistance, system configuration and dedicated services onsite and at corporate offices.



Training can be tailored to your needs.



Expert training by highly-skilled Gemcom professionals.

SYSTEM CONFIGURATION

Optimise System Performance to Maximise Productivity

A Gemcom system running at its peak performance enables your team to work more productively, which increases your operation's efficiency. Take your business to the next level with Gemcom's System Configuration Services. Our services team will optimise your systems and can even improve and automate workflows to save you even more time, reduce costs and drive standardisation and best practices across your organisation.

System Health Check and Skills Audit

Boost user productivity by ensuring your Gemcom software can be used to its full potential. Our services team will go through all aspects of your Gemcom systems to find efficiency improvements. They will then align them to our recommended standards for data management, assess the hardware to make sure it complies with the software's system requirements, and configure the right system permissions. Then, they will help you maximise your personal productivity and operational efficiency by identifying, planning and prioritising areas for staff training.



We get you up and running quickly.

Data Preparation and Conversion

If you need to run an old project or are upgrading to a newer version of Gemcom's software, our services team will reconstruct the data model and convert your data. They will establish best practice data storage methods and logical data naming conventions.

Automation Services

Gemcom's services team can help you get more done in less time to improve efficiencies and reduce costs, even when you have fewer staff. By analysing workflows and data flows, they will implement improvements to how data is stored, managed and shared within and across departments. To increase personal and operational efficiency, they can develop and implement scripts that automate routine and repetitive tasks while ensuring best practices.

System Upgrades

Get the full benefit of the latest versions of Gemcom's software while minimising disruptions to your staff. Our services team will upgrade all user systems (and servers if employed) and will test all workflows before transferring users over to the new software version.



A healthy system makes you more productive.

Gemcom's services help you drive productivity, improve efficiencies and control costs. With Gemcom's global reach and local presence, our highly-skilled mining and IT professionals work with clients worldwide, delivering training, project assistance, system configuration and dedicated services onsite and at corporate offices.

For more information

Contact info@gemcomsoftware.com to learn more about Gemcom's System Configuration Services or to schedule a consultation to find out how we can help you with your specific needs.

Microsoft
GOLD CERTIFIED
Partner

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GEMCOM LOCATIONS

Global Reach, Local Presence - 300 staff in 16 locations and distributors in another 13 locations



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GEMCOM CUSTOMER CASE STUDY



Mikhailovsky GOK uses Gemcom Surpac to simplify complex grade control challenges



Russian iron ore producer boosts the quality of
planning work and assessments

Countries: Russia

Objective:

Support engineering activities for iron ore mining.

Approach:

Implement the Gemcom Surpac mining software system to increase mine production and overcome technical issues.

IT Improvements:

- Automation of routine tasks via macros.
- Easy data access at all management levels.
- Availability of technical support and training expertise locally.
- Reduced complexity derived from Surpac's interfaces with third-party software.

Business Benefits:

- Sharing of information and project knowledge.
- More reliable projections and decisions.
- Higher staff efficiency.
- Reduction in time spent on labour-intensive projects.
- Improvement in the quality of planning.
- Consolidation of process steps for engineering support.
- Gemcom software updates, maintenance and future development, ensuring investment is never out of date.

“Our geologists and engineers are able to increase mining efficiency and iron ore production by using world-class Surpac software.”

— Jury Rudskoy, General Engineer, Mikhailovsky Mining and Processing Integrated Works



Panorama of the Mikhailovsky pit.

The world's largest iron ore reserves

At more than 11 billion tonnes, Mikhailovsky Mining and Processing Integrated Works (Mikhailovsky GOK) has the world's largest iron ore reserves. Founded in 1957, Mikhailovsky GOK (www.metinvest.com) annually produces more than 19 million tonnes of iron ore and exports its high-quality products to Austria, the Czech Republic, Slovakia, Poland, Romania, Ukraine and China. The company is headquartered in Zheleznogorsk Town in the Kurskay Region of Russia and is owned by Metallinvest.

The Kurskaya magnetic anomaly is Mikhailovsky's main iron ore source. Its depth in the closed outlines is 320 metres, its surface length is 5.8 kilometres and its width is 2.6 kilometres. Iron content in high-grade ore reaches 54 percent, while low-grade iron ore content averages 40 percent, including 21 percent of magnetic iron. This large-scale mine has 69 years of life in the projected outlines of the primary ore. Its size presents grade control challenges, and with up to 40 ore faces being mined simultaneously, it is a fairly complicated operation.

Years ago, Mikhailovsky staff used in-house software to manage mining data and plan ore production quality and surveying. They also used a competitor's software to complete their resource models and track blasthole sampling data. As Mikhailovsky's operations expanded over time, the competitor's software could not keep up with increasingly complex challenges. The company needed a solution to help estimate the granulometric composition of the blasted ore, control blasting quality and even better, to increase mine production and investments.

Value-oriented, first-rate software

Those objectives were difficult to achieve with the software they were using, including an antiquated survey module that had no function for modelling solids. In addition, the sub-blocking feature was limited: if the block model had a different size, it was impossible to produce the calculation or optimisation. The time came for Mikhailovsky to find another solution.

"We required value-oriented, first-rate software capable of helping us increase production and resolve routine mining issues. We also considered the software company's pricing policy, technical support and attitude towards their clients. At the top of our list was to partner with a company that had a Russian office and Russian-speaking personnel," explains Tsukerman, Chief Miner of the company.

Mikhailovsky chose the Surpac software as Gemcom has expertise, training and top-notch technical support in the country. Of particular benefit to Mikhailovsky was the fact that Gemcom's Russian distributor provided training and implemented the Russian-language version of the software (which is also available in English, Chinese, French, German and Spanish).

"Gemcom's Russian-speaking personnel give us outstanding technical support, and it is great to know that Gemcom invests in product updates and improvements. We enjoy working with their staff; they have such positive attitudes and are extremely responsive to our inquiries. Plus, they let us know about how other companies are successfully using Gemcom solutions and the future direction for Surpac. In turn, we give them feedback about new features we would like to see in the software," Tsukerman says.



View at the central part of the Mikhailovsky pit – the biggest in Eurasia.



Surveyors at work.



Drillrig operator receives instructions.

“In making our buying decision, we considered the price of other software and the availability of the necessary geology and engineering modules. All other vendor products did not satisfy our needs compared to Gemcom and its Surpac solution, which met all of our rigorous criteria.”

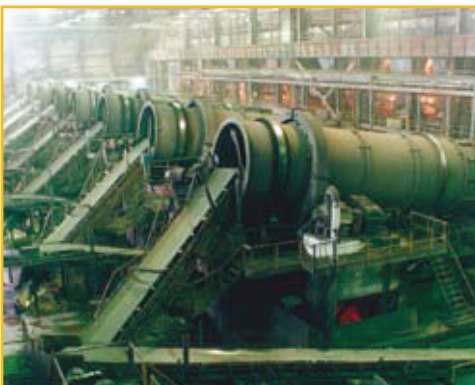
Text — Alexander Tsukerman, Chief Miner, Mikhailovsky Mining and Processing Integrated Works



Truck being loaded.



Rehandling of ore – a temporary stockpile is made.



Pellet production facilities – the best in the Russian Federation.

Smoother, faster work flow

Before adopting Surpac, Mikhailovsky personnel accomplished open pit designs and mine plans manually. Even when the paper copies were uploaded to a digital format for processing and printing, the company still experienced accuracy and validation issues. Limited data access restricted the company’s ability to generate reports promptly or lengthened the time in providing comprehensive information to outside project design/planning companies.

Instead of trying to locate data residing in numerous silos, databases or individual computers across the enterprise, employees now go to a single resource. The Surpac solution aggregates data about all company departments into an all-inclusive information system for quick access and reference. The system can retrieve archived information about production parameters and analytical data, which saves staff time.

In the years before Surpac, the staff stored database entries in Paradox, FoxPro and other formats. The lack of uniformity caused ambiguity, risk and confusion regarding information management. “Now Mikhailovsky geologists, engineers and surveyors exchange data and share project knowledge in standard Surpac formats,” Tsukerman says. “Consequently, we have a great environment for our professionals to collaborate together efficiently and establishing Surpac as our standard planning tool makes it easier to transfer skills between departments or across our operations when necessary.”

Fast-tracking analysis and auditing

Since 2004, this iron ore producer has relied on Surpac to assemble 3-D models of oxidised quartzites and carbonaceous ore. In addition, Surpac supports long-term and routine mine planning, allowing the staff to create reliable calculations for ramp designs, rock excavations, bench slopes, and cut and fills. Surpac is a strong aid in plotting transportation routes, pre-stripping, ore mining and dump designs. To overcome their grade control issues, company geologists use Surpac block models to estimate quality parameters in outlined ore bodies.

“Within our one, well-integrated software package resides a huge amount of useful information to conduct complex analyses,” Tsukerman comments.

Surpac’s 3-D imagery – linked with the software’s design, modelling and database components – underpins these analyses by conveying mining illustrations in an easy-to-understand format that even non-technical persons can grasp. Another helpful advantage of the software is its integration with a number of third-party programs, such as AutoCAD. “This aspect makes data importing or exporting less cumbersome and simplifies survey work,” according to Tsukerman.

GEMCOM CUSTOMER CASE STUDY



Safety for sizable data volumes

Only a powerful software package can handle the vast amount of data and drillhole statistics that Mikhailovsky maintains. The company processes thousands of grade control holes, which are entered in a database for future reference. Surpac links to a Microsoft SQL Server database comprising approximately 3,000 exploration, development and 120,000 blast drillholes. Mikhailovsky's development drillholes identify some 40 qualitative variables, mineralogical groups and rock titles. The company drills 25,000 holes annually for blasting, but samples every third hole. Every month geologists incorporate newly acquired data from blasthole sampling into the upgraded block model.

With so much critical information at stake, the company can't afford to have any of it compromised or lost. Surpac provides a means of safely preserving massive volumes of data and the scalability to accommodate even more. Just as importantly, the information is readily available for reconciliation and audits.

"Surpac helps us quickly and easily carry out internal auditing work in accordance with planning directions, ore production volumes and grade control. If there is an information request from an external auditor, we provide it in a Surpac format. Our general planning contractor even purchased Surpac after learning about our positive experiences," Tsukerman says.

Macros automate tasks

Mikhailovsky utilises Surpac's macro scripting features to speed up data processing. They wrote macros to automate diagram maps, display additional attributes to a block model and reveal cross-sections in real linear parameters. They organised a planning macro that allows low-grade ore calculations along horizons to evaluate losses and ore dilution. Geologists create and compute blasthole sampling charts with a special macro. Another macro was developed to automate printing projects.

"Surpac provides a variety of tools which enable us to automate planning and production control. We've consolidated a wide range of process steps for engineering support of pit operations. We are very pleased with Surpac's features and results," Tsukerman concludes.

Mikhailovsky GOK Solutions at a Glance

Primary Applications:

- ⇨ Gemcom Surpac
- ⇨ Microsoft SQL Server
- ⇨ AutoCAD

Gemcom Services:

- ⇨ Software implementation
- ⇨ Training
- ⇨ Technical support

GEMCOM CUSTOMER CASE STUDY



Northland Resources improves efficiency and optimises project economics with Gemcom solution

Engineering staff uses Gemcom Surpac, Whittle and MineSched to reduce consulting costs and defer CAPEX spending

Countries: Finland, Sweden

Objective:

Obtain a solution to aid engineering studies and metallurgical testing and accelerate mineral ore production.

Approach:

Adopt Surpac, Whittle and MineSched software to gain efficiencies and lower costs.

IT Improvements:

- ⇨ Synergistic tools merging block modelling, pit optimisation and scheduling results.
- ⇨ Interfaces with third-party software, eliminating file conversions and saving a workday.
- ⇨ Automated workflows, saving several weeks of manual input.
- ⇨ Faster estimation of multiple block modelling routines (15 minutes vs 2 hours).
- ⇨ Quick report generation in standard formats.

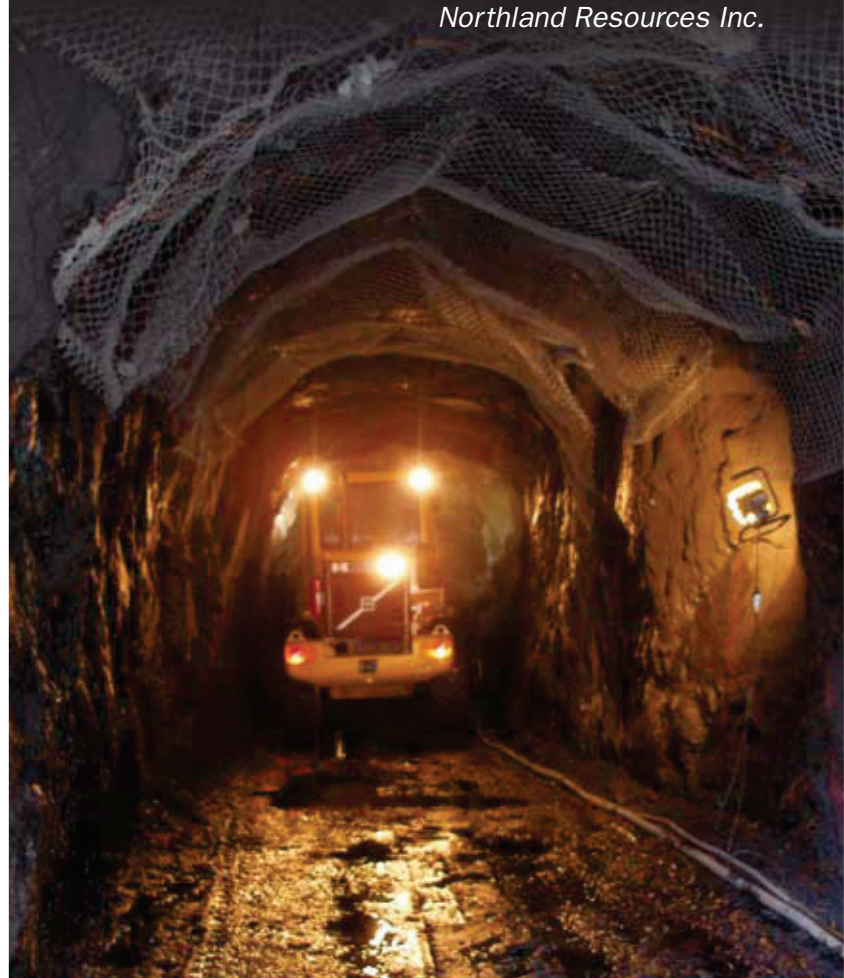
Business Benefits:

- ⇨ Cost savings by hiring fewer consultants.
- ⇨ Up to \$1 million deferred in upfront capital expenditures.
- ⇨ Greater ability to address skills shortage.
- ⇨ More time spent on geological interpretations.
- ⇨ Higher staff productivity.

NORTHLAND RESOURCES INC.

“We deferred a bulk sampling expenditure of \$500,000 to \$1 million by applying drillhole data and conducting statistical analysis using the Surpac database. We obtained much of the same information as if we had completed a bulk sample, so there was no immediate need to excavate, build a dike or obtain environmental permits.”

— Matt Blattman, Senior Manager of Engineering, Northland Resources Inc.



Portal of the bulk sample drift at Stora Sahavaara, Sweden.

Fast-tracking mine production

In Sweden and Finland, Northland Resources Inc. (TSX: NAU; Oslo: NAUR) controls one of the continent's last major undeveloped iron ore provinces, where it is advancing its goal to become Europe's largest independent, domestic iron ore producer. In northern Sweden, Northland Resources (www.northlandresourcesinc.com) is implementing a staged development of its Tapuli iron ore project.

The company began detailed engineering studies to generate technical data and accelerate the key property to production. Tapuli has the potential to produce up to 3 million tonnes per annum of high-grade iron concentrate and fuel other key company projects.

Along with the Tapuli studies, Northland completed basic exploration on two other magnetite projects – Stora Sahavaraa in Pajala, Sweden, and Hannukainen in Kolari, Finland – and is performing preliminary engineering to acquire environmental permits for all three mines. One mine contains mainly iron; another has iron and gold; and a third comprises iron, gold and copper. Northland relies on the Surpac, Whittle and MineSched software to support these efforts and future mineral production.

The company selected Gemcom's software over MineSight, which it had purchased sometime ago for geological modelling because few staff members were skilled in using MineSight. When the main user left the company, management decided to evaluate other solutions. They wanted the software to fit certain criteria: outstanding functionality, superior interfaces with third-party software, strong technical support and an extensive global user network. The company also required access to support personnel in the same time zone.

"Gemcom met all of the company's requirements and provided a Finnish distributor. I am delighted that we chose Gemcom because I have used Surpac for nearly 15 years," says Matt Blattman, Senior Manager of Engineering, who recently joined the company and conducted the software implementation.

Gemcom distributor WSP Finland provided training for Northland geologists. "We were pleased with the on-site Surpac training, and our staff found the software easy to learn," Blattman says. "We believe that software with widespread usage helps our company overcome skill shortages. It reduces our dependence on consultants and enables us to compete for skilled mining professionals in a tight labour market."

Strong justification for decisions

The geology department primarily uses Surpac for block modelling, geological interpretations and plotting drillhole maps. Blattman finds Surpac helpful for initial resource calculations and for viewing data from various sources. Surpac is powerful in these areas, because it interfaces with third-party software and communicates across systems. This is key during engineering planning whereby outside consultants are handling the bulk of Northland's work. Although they provide reports and maps in various GIS and AutoCAD formats, the Northland staff encounters no file conversion issues.

"Being able to read almost any data format the consultants generate makes my job a lot easier," Blattman affirms.

If the company decides to pursue another option, the staff uses the consultants' data integrated into Surpac for more analyses – omitting the need for another consultant. "Being able to process other people's data quickly and make my own assumptions, greatly improves our efficiency," Blattman says.



Portal preparations for the bulk sample drift at Stora Sahavaraa, Sweden.



Bulk sample development drilling at Stora Sahavaraa, Sweden.



Logging Northland's drill core at facilities in Finland.

“For each project I work on, Surpac probably saves a full day of work in being able to immediately work with the consultant’s data.”

— Matt Blattman, Senior Manager of Engineering, Northland Resources Inc.



Image created in Surpac showing historic workings at Hannukainen, Finland using laser scanned DTM and orthophotos.

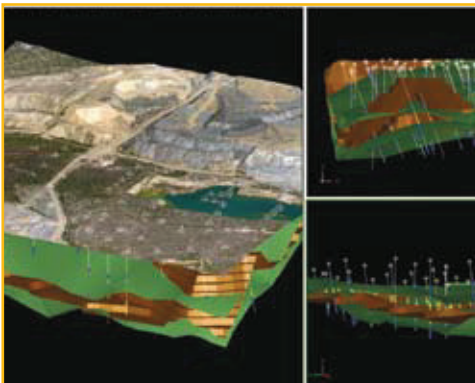


Image shows exploration drilling, surface topography and orthophotos, and generalised mineralised zones for the deposit in Hannukainen, Finland.

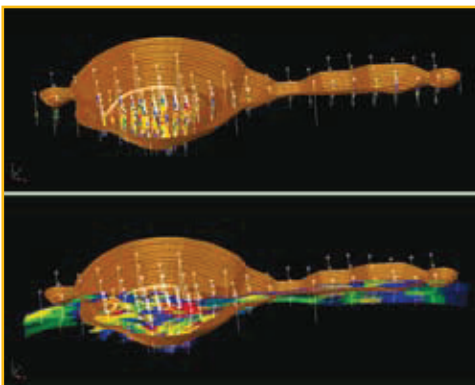


Image showing the Tapuli, Sweden drillholes, grade domains and conceptual pit design.

Excellent visualisation tools clarify assumptions

The software helps to crystallise facts and assumptions that may be unclear to others in the organisation. An example is when the staff was determining the right place to test a bulk sample at Hannukainen and process the material. The company hired one consultant to identify the sample area and a second consultant to figure out the best way to excavate it. Both consultants delivered their reports in different formats, which made it difficult to understand how the reports interfaced. As a result, there were questions about the sample environment and excavation.

Blattman tells how he resolved the issue. “In 30 minutes I combined the photos of the surface with the digital terrain model from another consultant and the mine designs from a third consultant to get a comprehensive 3-D picture. We obtained consensus within an hour because management could visualise and understand the excavation method. There were no more competing ideas because the facts were visible in Surpac,” he says.

Lower operational costs and CAPEX requirements

When access to capital is difficult or limited, companies must seek ways to lower their upfront capital expenditures (CAPEX). Publicly traded Northland Resources is reducing initial CAPEX outlays through improved engineering design and prudent planning. For example, after a consultant drilled underneath a swamp in the Tapuli mine to collect samples and determine water quality, Blattman found a cost-effective use for the same data.

“I turned the consultant’s report into 3-D renderings in Surpac to determine the groundwater impact, created a feasible mine design and calculated the amount of material to be removed during mining. By using the same data in a different way, we didn’t need to hire another consultant,” he states.

On another occasion, the team deferred a large bulk sampling expenditure of up to \$1 million by applying Surpac drillhole data to determine there was no immediate need to excavate, build a dike or obtain permits.

Streamlined, automated workflows

Automation capabilities in Surpac drive higher staff productivity, freeing Northland Resources personnel to concentrate more on their interpretations and less on keying in repetitive data. For example, Blattman created macros that ease the plotting of drillhole cross-section maps and organise them into standard report formats. Advanced scripts accelerate multiple estimation routines in block modelling and eliminate the need to enter each command manually. “By writing a Surpac script, I’ve turned a two-hour process into a 15-minute exercise,” Blattman says.

One of the customised macros enables block models to be coded according to geology types. This script helps geologists modify, change or reinterpret complex polygons and allows them to be reproduced almost instantaneously in a standard reporting format.

GEMCOM CUSTOMER CASE STUDY



“We have drawn approximately 2,000 polygons and to create a lot of detail manually would bring logic issues into play and cause confusion. One misstep or typing error along the way and we wouldn’t know about it until it’s too late. Through automation, we can manipulate the data the way we want to handle it. This macro saves several weeks’ worth of work,” Blattman says.

Merging operations through a comprehensive software suite

Northland pairs Surpac with the Whittle pit optimisation system to understand and verify the consultants’ results. “We make decisions from the Whittle optimisations and incorporate the data into reserve statements to inform shareholders of the potential value of the company’s mines,” Blattman explains.

When mining ramps up and data accumulates, the planning team will merge the Surpac and Whittle results into Gemcom’s MineSched scheduling software. MineSched will afford proven tools to achieve precise blending targets on multiple elements and to meet processing specifications. The planning staff will be able to schedule from the models that originated in Surpac, thus saving time and preventing data input errors.

“Our idea was to bring in MineSched to automate some of the target blending, perform alternative ‘what-ifs’ to achieve a specific goal, and easily validate the schedules,” Blattman says.

As Northland prepares to supply iron, gold and copper to Europe’s demanding metal markets, it has comprehensive Gemcom tools that work together optimally and promote high productivity. “We implemented a superior suite of Gemcom solutions at the very start, which will take us from engineering planning to mining. Based on their performance to date, we are confident the software will deliver even greater value during production,” Blattman concludes.

Northland Resources Inc. Solutions at a Glance

Primary Applications:

- Gemcom Surpac
- Gemcom Whittle
- Gemcom MineSched

Gemcom Services:

- Training
- Technical support

GEMCOM CUSTOMER CASE STUDY



Rheinkalk GmbH drives productivity in its lime operations by adopting Gemcom Surpac



Software automates more than 200 functions for large quarry operator

Countries:

Belgium, Brazil, China, Czech Republic, France, Germany, Poland and Russia

Objective:

Select a comprehensive system for geological and geochemical block modelling and automating routine mine planning tasks.

Approach:

Acquire the Gemcom Surpac software to automate workflows across the company's global operations.

IT Improvements:

- Enhanced data accuracy, consistency and protection.
- Access to geological and deposit data in standard file formats.
- Presentation of short-term data in a standardised manner.
- Software in German and local technical support.

Business Benefits:

- Automation of more than 200 routine and special tasks for greater productivity.
- 50% reduction in number of surveys.
- Efficient sharing of data, skills and project knowledge.
- Faster, more precise estimation of block models.

"Gemcom is a strong software partner. Gemcom Surpac provides a wide range of content, flexibility and functionality, allowing us to increase the quality of our work."

— Rainer Westermann, Manager of the Geology Mining Team, Rheinkalk GmbH



Aerial view of the Asbeck quarry at the Menden-Hönnetal property.

Technology applied to improve workflows

The German market requires around 7 million tonnes of lime annually, and Rheinkalk GmbH meets the major share of the demand. Headquartered in Wülfrath, Germany, Rheinkalk (www.rheinkalk.de) is a subsidiary of Lhoist Group, which owns 90 plants and leads the market in providing products derived from limestone calcinations.

With more than 105 years of experience in lime production, Rheinkalk itself has 10 sites that supply the chemical, steel, environmental protection and building material industries with lime and dolomite domestically and internationally. Its product sales amount to approximately 2.9 million tonnes annually. The manufacturer's two largest production sites are its Wülfrath-Flandersbach and Menden-Hönnetal properties.

Over the last 10 years, Germany's leading lime producer has applied technology to improve workflows. The staff counts the Surpac software as an integral part of their day-to-day operations. Parent company Lhoist also has a number of Surpac licenses that approximately 40 company geologists, engineers and surveyors use at the head office in Belgium and at operating properties in France, Poland, China, Brazil, Russia and Czech Republic. In Surpac, they create block models and open pit mine designs. They also perform short-, mid- and long-term planning.

"We use Surpac all over the world," says Rainer Westermann, Manager of the Geology Mining Team at Rheinkalk. "It provides important capabilities for organising and maintaining our data sets so that our teams can easily access and utilise them."

Superior tool improves work quality

For corporate teams working across Lhoist business units, Surpac is their main productivity tool. Whether they model geology at headquarters or create a monthly mine plan onsite, collaboration is smoother and easier for all groups involved. They all have access to the same, up-to-the-minute data; consequently, the opportunities for synergy are considerable.

Productivity has increased since Rheinkalk's global adoption of Surpac. That is because Surpac enhances data accuracy, consistency and protection by storing geology, planning and drilling data in one system for use across business units. Westermann recalls how Rheinkalk handled block modelling before acquiring the Gemcom software. The company outsourced those activities to an outside company; however, management sought to bring that responsibility back under the company's supervision because some data was lost or compromised as it moved between the contractor and company personnel.

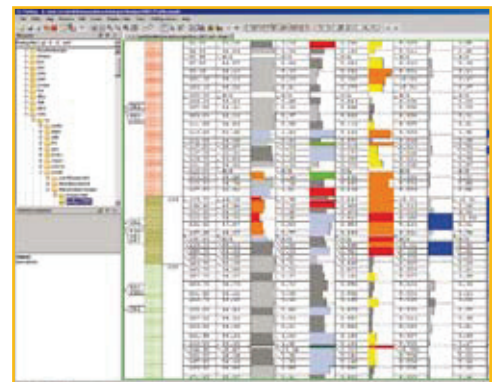
"We selected Surpac because we needed to improve the quality of the work," explains Westermann. "We also wanted to implement a digital mine planning system and provide common tools to communicate about geological block models within our department and across business units."

Gemcom excels over industry counterparts

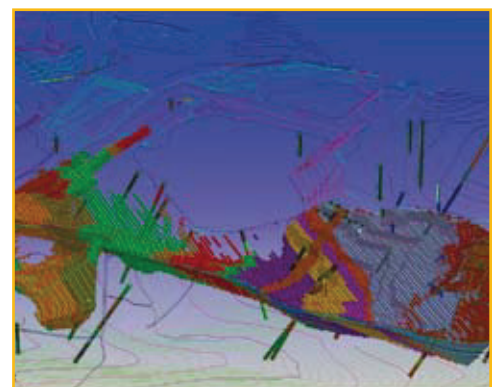
Westermann and his team also evaluated Datamine in their quest for a superior mine planning system, but Gemcom's software contained more flexibility and functionality. In addition, Gemcom had dependable, knowledgeable resources in Germany. Therefore, Rheinkalk found it advantageous to hire a Gemcom distributor to spearhead the software implementation and provide



Geologist Markus Oehmen views a fault at the Salzhemmendorf property.



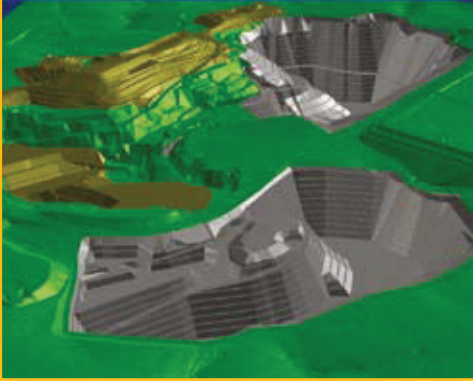
Surpac's Graphical Log feature summarising down-hole drill data.



Quarry block model developed with Surpac.

“Surpac’s automation capabilities save tremendous time and effort and give our users and departments access to geological and deposit data in standard file formats.”

— Markus Oehmen, Geologist, Rheinkalk GmbH



Quarry design constructed with Surpac.



Conveyor belt between the Rohdenhaus crusher and washing plant.



Pre-screening at the Wülfrath-Flandersbach plant.

training and technical assistance in the German language. Gemcom also commits to ongoing research and development with regular product updates and enhancements. These were important considerations in Rheinkalk’s purchasing decision.

Since the implementation, Rheinkalk personnel have participated in Gemcom training classes to upgrade their skills. Rheinkalk Geologist Markus Oehmen attended a Gemcom-sponsored seminar recently. “I learned to master the latest geostatistical tools in Surpac,” he says. “This training will help me estimate block models faster and more precisely.”

One tool, multiples uses

Rheinkalk staff has marked success using Surpac at the Wülfrath-Flandersbach plant, which has a quarry production of 10 million tonnes of limestone annually, in addition to approximately 3 million tonnes of overburden per year.

Plant personnel manufacture various types of lime in different furnaces or kilns according to customer specifications. Westermann notes that limestone rock from the quarry is a chemically composed product derived from calcinations. From exploration work and core drilling, the staff creates Surpac geological and geochemical models that genuinely exemplify the chemical composition and main structural elements of the limestone deposits. Quarry employees enter the drillhole and borehole data from the quarry operation and update it in Surpac. They distribute that data to the geologists, who conduct their grade control work. From there, the data goes to the purchasing engineers for equipment budgeting, procurement and materials management.

Surpac automates nearly 200 tasks

The automation of various routine and special tasks enables staff to work faster and more proficiently. Oehmen has spearheaded the creation of nearly 200 customised Surpac macros to automate input functions, plan updates, interrogate maps by date, count volumes, and design forms. In addition, there are macros to calculate cut-off curves and cycle times for mobile equipment on block models.

Oehmen explains, “We developed our own macro-based user interface under Surpac and embedded Surpac functions within those macros. We standardised file naming and colourations for different chemical content, block models, line sequences and maps for our 10 deposits in Germany. The result is that various users and departments have access to geological and deposit data in standard file formats.”

Another reason for establishing macros was to present short-term data in a standardised manner. This is a useful capability at the Wülfrath-Flandersbach plant, where daily blasts change the pit shape from week to week. The location of the blastholes are used to update the pit topography weekly, and then, the most recent topography is needed for reserve calculations.

GEMCOM CUSTOMER CASE STUDY



“We developed a system whereby we can fill in short-term data based on the coordinates of the blastholes. In addition to that, analysis of these blastholes allow us to fill in a short-term block model and organise weekly or monthly plans,” Oehmen says.

Operating the macro-based system reduces the number of surveys. In the past, the company surveyed its open pit mines twice yearly, but by applying information generated automatically, they need only survey once a year.

Working faster and more efficiently

In addition to financial savings regarding surveying, the Surpac macro language saves time. Oehmen cites the integration of a standardised plotting feature to produce quarry maps with German cliff symbols and standard legends and colours for block models. “I can produce a plot of regions, topography, a drillhole map and block model slides by simply clicking a button. The macro produces my selection, sends it to the plotter, and I get it in a defined scale – without added work,” Oehmen says.

Some of the Surpac macros work optimally with the Gemcom MineSched software, which Rheinkalk uses to produce mining schedules and sequences. Applying the Surpac cycles macro in MineSched, the staff calculates the total distances hauled by truck and visualises the behaviour of the transport vehicles during stages. All schedule details are viewed in 3-D, providing visual corroboration and easy communication of activity sequences. In fact, MineSched’s scheduling functionality, along with its simulation capabilities, helped Rheinkalk open a new extension a few years ago.

“We needed to investigate whether the timing and dynamics were right, so we simulated a lot of processes with diverse constraints in MineSched and came up with a proposal for opening the new quarry. Over the years, Surpac and MineSched both have played a major role in our operations. Without Surpac, we would have more repetitive work to do, possibly make more procedural errors and need to add more personnel, which would impede our main objectives to operate efficiently and economically. Instead, Surpac enables our teams to execute their work skillfully and in significantly shorter time, so we’re driving productivity and cost efficiencies in our operations. We are delighted to have these Gemcom tools to aid our progress,” Westermann concludes.

Rheinkalk GmbH Solutions at a Glance

Primary Applications:

- Gemcom Surpac
- Gemcom MineSched

Gemcom Services:

- Software implementation
- Training
- Technical support

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