

# Capability Statement



# Capability Statement

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We are mining and plant specialists

We are mining and plant specialists with **extensive experience in the design and operation of the entire spectrum of mining activities** - from exploration through to full production - we **cover all aspects of access to the ore-body**.



Leading Consulting Engineers & Programme Managers  
to the mining industry since 1991

RSV, founded in 1991, through its specialised linked enterprise companies, is a **leading engineering and project management group** of companies serving the **mining, metallurgical and industrial markets**. The company grew out of Read Engineering Projects, founded in 1986.

RSV is Consulting Engineers and Project Managers with extensive **experience of mining projects in Africa and internationally**. During the first **25 years** of its existence RSV has undertaken engineering and project management assignments on projects with a combined value in excess of US\$ 16 billion.

RSV is a group of well reputed South African **project management and design (PM&D) firms specialising in the minerals and mining sectors**. Operating in a **cluster of linked enterprises** we service the broad mining sector from juniors to global mining houses.

adding experience to ideas



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# Our Approach

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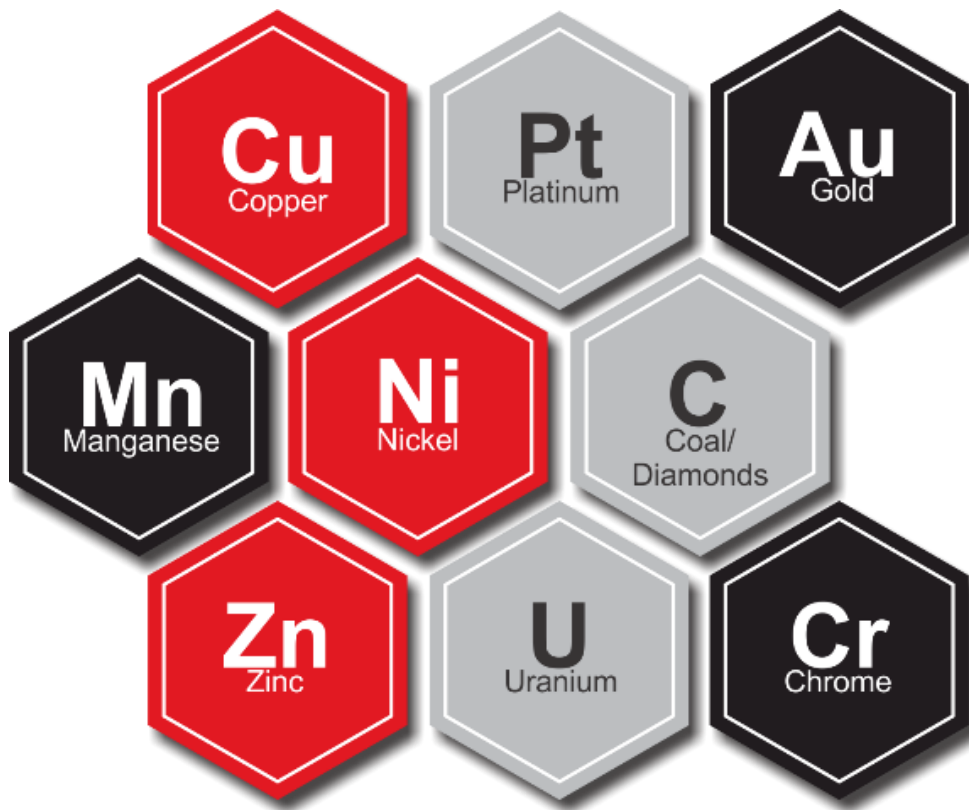


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# Commodities

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Our expertise applies to **platinum, gold, coal, copper, diamonds, chromium, iron ore, nickel, zinc, cobalt, uranium, manganese and mineral sands.**



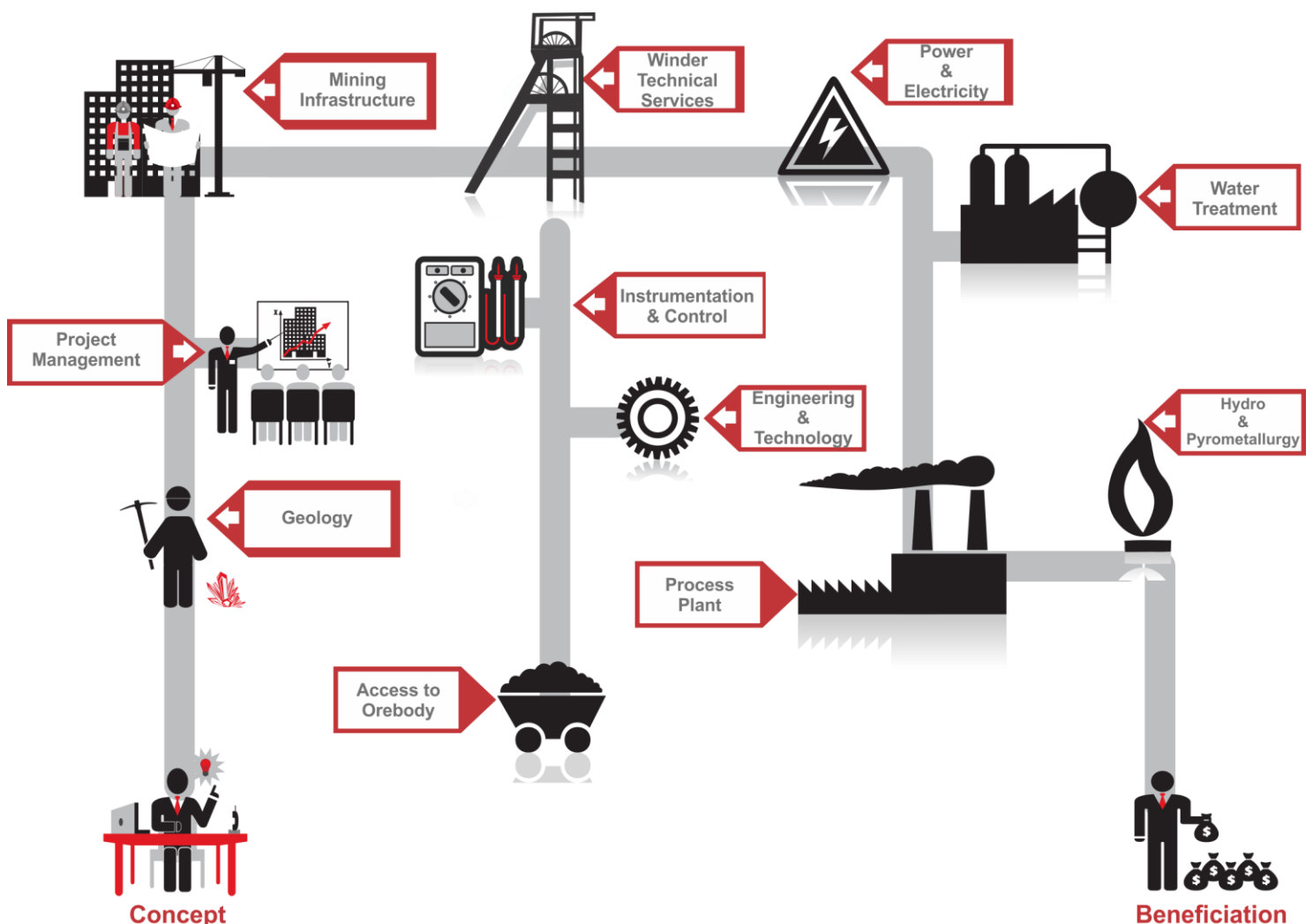
# Capabilities

## From concept to beneficiation

We **specialise** in all aspects of access to the ore body, from **open pit to deep shaft mining** including:

- mine design;
- mining infrastructure, including railway systems;
- materials handling;
- hydro-metallurgical, pyro metallurgical, mineral processing;
- effluent water treatment services;
- renewable energy;
- certain environmental services.

The RSV Group provides a **complete project management and design service across the full project lifecycle** from anthracite to zinc and from concept to final beneficiation.



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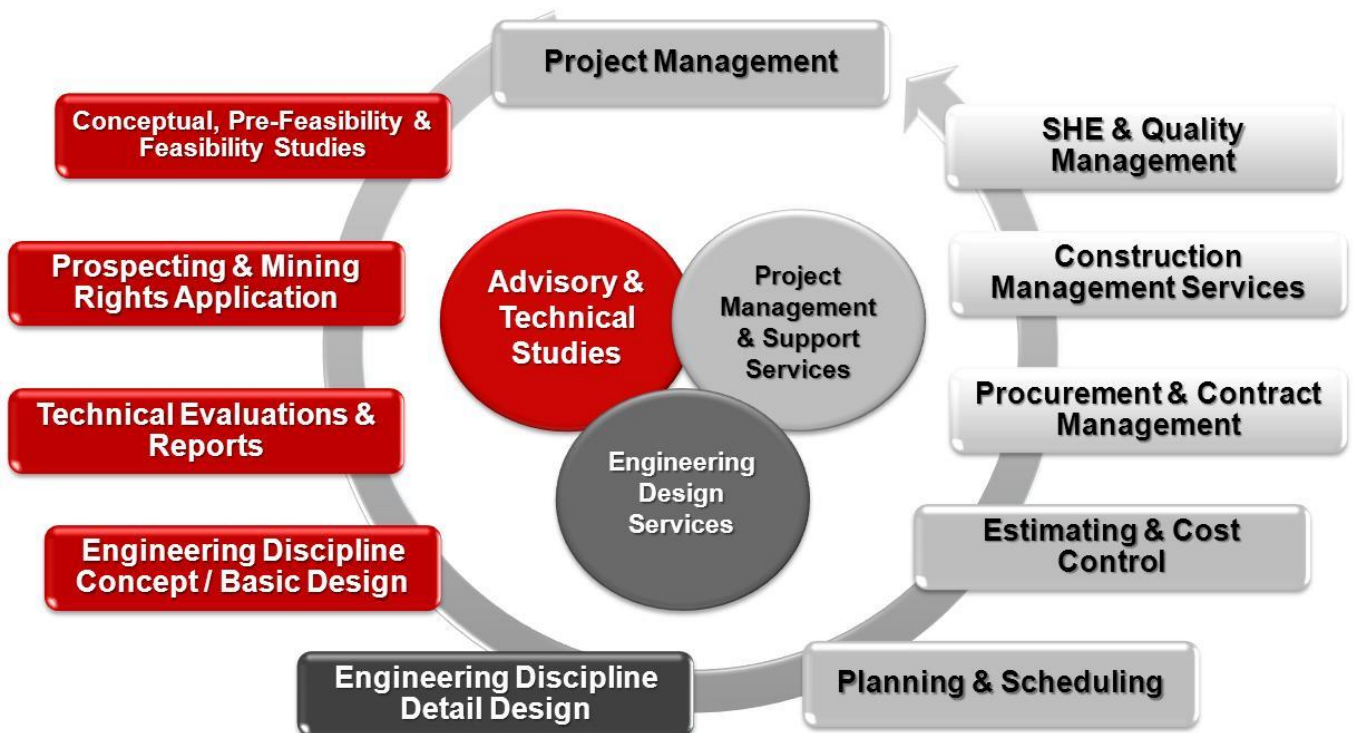


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**Our capabilities** across our linked enterprises include:

- PM&D services specialising in all aspects of hard rock narrow tabular reef mining;
- capability in massive ore body mineral winning such as copper, zinc, iron ore, uranium, manganese and diamonds;
- PM&D services in the energy and coal sectors with capability in both open cut / pit and underground mining;
- PM&D in the process sector offering full hydro-metallurgical, pyro-metallurgical and mineral processing;
- mine closure management including mine water management and end of pipe treatment solution, water effluent treatment capability across most commodities in the mining sector
- materials handling capability across most commodities in the mining sector;
- the interpretation of geological exploration data through an ore body modelling process to deliver optimal mine design and mining models;
- specialist energy, electrical and control & instrumentation engineering capability across multiple sectors including the built environment;
- as part of our PM&D capability we are skilled and experienced in large long lifecycle, health, safety & environmental management, project planning and scheduling, cost management, change management, procurement, contracts administration, construction, expediting and quality & risk management.



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# Client Base & Experience

The RSV Group boasts a **client base** that includes most mining houses, **locally and of internationally.**



RioTinto



















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RSV has **vast experience and a comprehensive resource base** to undertake study and design work as well as Engineering, Procurement and Construction Management (EPCM) work. Listed below are a selected few projects from our Client base (Road and railways systems involvement indicate in red):

															
<b>Bathopele Phase 4 - EPCM</b>	<b>Brakfontein Project - EPCM</b>	<b>Impala 16 Shaft – Study Phase to EPCM</b>	<b>Karee 3 Shaft UG2 Sub-decline. Feasibility Study &amp; EPCM</b>	Thubelisha Coal Mine Project – EPCM & Electrical infrastructure, bulk power supply EPCM	Oyu Tolgoi No 2 Shaft – Production, man and material shaft – Design headframe	No 10 Shaft Headframe and Foundation Design & Headframe construction	Palabora Lift II Project - Feasibility Study	Tanami TEP2 Stage 2A Study	Mbali Coal Washing Plant Project	<b>Styldrift No 2 Shaft Merensky and UG 2 &amp; Electrical Design, specifications, construction &amp; commissioning</b>	Dorstfontein East Coal Mine - EPCM	Middelplaats Manganese Underground Mine Project	Engineering Services on the Odysseus Shaft Pre-Feasibility Study project	Boikarabelo Power Station	Kansanshi Dewatering Shaft Equipping Project Zambia
<b>Bathopele Phase 5 – Study Phase to EPCM</b>	<b>Turffontein Decline Project – Feasibility Study to EPCM</b>	Impala Flash Dryer Plant	<b>Karee 4 Shaft – ORD Execution Project</b>	Impumelelo Coal Mine Project – Techno economic study	Oyu Tolgoi No 4 Shaft – Ventilation shaft – Design sinking headframe	No 10 Shaft Double Drum Auxiliary Hoist Civil Design	Palabora Lift II Project – EPCM & Electrical specifications, construction & commissioning	Tanami TEP2 Shaft Scoping Study	Palesa Coal Washing Plant Project	<b>BRPM North Shaft Phase 2 Expansion EPCM &amp; Electrical and instrumentation design, specifications, procurement, construction &amp; commissioning</b>	Dorstfontein Coal Mine - West Mine	Leandra North Project – Study and design work	Odysseus Shaft - Feasibility Study	Boikarabelo Coal Project – Feasibility Study	
Waterval Tailings Project	<b>Middelpunt Hill Underground 2 Project - EPCM</b>	Impala Tailings Expansion II - EPCM	<b>Akanani Infrastructure &amp; Feasibility Project</b>	Impumelelo Coal Mine Project – EPCM	Oyu Tolgoi No 5 Shaft – Ventilation shaft – Design sinking headframe	No 10 Shaft Double Drum Axillary Hoist Civil Design		Tanami Expansion Project (TEP) – Feasibility Stage 3 – Budget Proposal – Bulk Air Coolers / Refrigeration (P003), 6 MW Cooling at VR3		<b>BRPM South Shaft Phase Expansion EPCM &amp; Electrical and instrumentation design, specifications, procurement, construction &amp; commissioning</b>	Eloff Coal Mine Project	Design and Build of a Water Treatment Facility for the Van Dyks Drift Central (VDDC) Project	Detailed Design for Odysseus Shaft and Materials Handling System and 12 North Asset Upliftment	<b>Boikarabelo Coal Project – EPCM</b>	
<b>Siphumelele No 1 Shaft UG 2</b>	<b>Frank Underground 2 Project Concept Phase to EPCM</b>	R8 Conveyor Crusher Circuit EPMC to Upgrade R6	<b>Hossy Shaft Execution Project</b>		Oyu Tolgoi No 3 and 4 Shaft – Feasibility Study	LOM Dewatering Study , Compressed Air and Hoisting Study Update				<b>BRPM Phase 3 Feasibility Study</b>					
<b>Amandelbult UG2 Expansion Project – EPCM</b>	<b>Khuseleka Mine (Townlands) Ore Replacement Project – Design and KORP Project</b>	9 Shaft Lower UG 2 Decline - CBE & Study work	<b>Rowland Middelkraal – Feasibility Study &amp; Design</b>		Oyu Tolgoi No 4 Shaft – Early Sinking	Shaft ore handling system – Shaft No 9 and 10				<b>BRPM Phase 3 EPCM</b>					
Emergency Power Supply Systems Project	Khomanani – Merensky Concept Study	12 Shaft Lower UG 2 Decline - CBE & Study work	<b>Rowland Merensky Sub Decline Shaft</b>			Ventilation and refrigeration design – No 10 Shaft Project				Styldrift No 2 Shaft Feasibility Study					
<b>Waterval Project - EPCM</b>	Boschfontein Shaft – Study work	Marula Tailings Flotation Plant	Pandora Project – Study work			Design , engineering and implementation of dewatering of Magma Mine works									



# Health, Safety & Environment

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## Zero Harm

The single most important responsibility we have is the preservation of a **Zero Harm environment** in our workplace.

From conceptual design to sustainable client operations, our greatest responsibility lies in the facilitation and supervision of safe projects. We promote a **culture of Health, Safety and Environment (HSE)** as the fundamental factor on all projects.

Our **objectives** are:

- **Leading the way** to a sustainable world-class HSE practice;
- **Implementing an HSE management system** that supports the fundamentals of our strategic commitment;
- Ensuring that our Occupational Health and Safety Management system, makes available simple non-negotiable standards that will sustain our objectives



### RSV Group HSE Management System.

RSV Group **HSE Management System**, is **ISO 45001:2018 certified** by Dekra Certification and is applied on all current and new projects.



## **Systems and Recognition**

RSV has developed a HSE management system which is based on the principals of BS ISO 45001:2018 (ISO 45001 from 2020), the international standard against which occupational health and safety management systems are developed, implemented, maintained and revised and audited, to ensure continual improvement in HSE performance. This system is certified annually by Dekra Certification, as compliant with the standard.

## **Usage and Availability**

The RSV Safety Management System forms part of this tender and will be used as the HSE Management System for the duration of the Project.

## **RSV HSEMS Continuity regarding the “Project Life Cycle”**

The RSV Safety Management System is structured to cater for the entire project life cycle from concept to execution, hand over and close out.

## **Reinforcement of Health Safety and Environmental Accountability**

RSV is committed to the highest standards of health, safety and environmental practices and expects its Contractors to be similarly focussed.

RSV will seek to establish a relationship with Contractors that can demonstrate it has the appropriate health, safety and environmental objectives and has the management systems in place to deliver on these objectives.

Our ultimate aim of “no harm to people” impels RSV to ensure the safety and welfare of all personnel and the preservation of the environment is of prime importance. Our Health, Safety and Environment Management (HSE) values, systems and procedures are based on our exposure to the construction and mining industries spanning many years.

Our deep understanding of the inherent hazards and risks associated with construction, the experience base of our employees and our commitment to our continuous improvement and best practices programme has enabled us to embrace and embed the principles of behavioural-based-safety in our drive towards HSE excellence. Our commitment is to develop and sustain the principles of interdependency in all of the projects under our control.

RSV supports and implements the principle of zero tolerance in all aspects of our HSE practices.

Safety Objectives are set out for all projects. As part of RSV’s accountability towards Health and Safety, audits will be done to determine how the system absorbs these objectives.

Visible felt leadership and over-inspections will contribute to the reinforcement of the Safety system.

Continuous measurement of Safety performance and analysis of leading and lagging indicators are tools used to “predict” the Safety level on a project.

## **Risk Management**

RSV also developed a risk management system whereby HSE risks are not only identified and ranked, but also identifies, through a mitigation process, the control measures which need to be put in place to lower identified hazards to an acceptable level. It is a total HSE risk management system comprised of the following modules:

- Risk profile
- Risk Register
- Action Register

## **Risk Assessments**

### **Baseline Risk Assessment**

A baseline risk assessment will be done by all contractors to list all risks that may occur during the project and their employees will be trained on these risks.

### **Issue Based Risk Assessments**

Over inspections by RSV will ensure that contractors will have Issue Based Risk Assessments and working methods to be used in place as per the Mine Health and Safety Act.

### **Process of Transition**

In order to take over a project in as far as Health and Safety is concerned, the following will be considered:

- **Gap Analysis Audit**  
A gap analysis audit will be done during the first month to determine the system(s) in place and how it complies with Gear Up and ISO 45001:2018.
- **Baseline Risk Assessment**  
The current Baseline Risk Assessment will be integrated to ensure that it covers all risks and aspects with regards to the whole project.
- **Issue Based Risk Assessments**  
The Issue Based Risk Assessments of the contractors and sub-contractors will be integrated to ensure that it covers all risks and aspects with regards to the portion of the project the contractor is responsible for.
- **Continuous Risk Assessments**  
All Continuous Risk Assessments done by the contractors will be audited to ensure that they cover the aspects that were intended to be captured.
- **Documents/Registers**  
All the available HSE documents/register will be listed during the Gap Analysis Audit.

RSV Safety Personnel will take over the site as soon as they are placed on site to start with the above mentioned process and is satisfied that he/she can take over the responsibilities.

# Quality Assurance & Control

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## ISO 9001 compliant

We have developed a suite of project procedures which received **ISO 9001:2008** compliant.

Our **Quality Management System (QMS)** has been designed to ensure compliance not only with the stringent requirements of the **ISO standards** but also embraces the principles of Project Management Body of Knowledge (**PMBOK**) for project management and the South African National Standard (SANS) or equivalent recognised **international best practice standards** for construction and fabrication.

Our Quality Assurance (QA) and Quality Control (QC) processes are **managed by our Project Quality Management (PQM) team**. Their responsibility lies in implementing the QMS from early engineering right through to final commissioning and handover to the client.

### Primary focus areas

- **ISO Compliance** – maintenance and updating of the ISO requirements as determined by annual audits and assessment;
- **All aspects of QA**, including the development and maintenance of the QMS and its associated workflows, standards and work instructions;
- **All aspects of QC**, including audits and planned remediation on projects as well as all aspects of inspection and approvals on fabrication and construction sites.

### Project management

Operating from a Microsoft platform the QMS is a tool that is available to all project professionals in our organisation. Our primary business processes are broken down into a number of principal streams embracing the primary PMBOK areas. Workflows describe the approach recommended for core activities and these are supported by standards, templates and work instructions as necessary. Compliance auditing is carried out regularly on all projects and the QMS standards are the basis of the audit.

### Fabrication and construction

The link between the functions of engineering design, procurement, expediting and quality control is inextricable. Vendor specifications along with design standards and the associated fabrication and construction standards form the basis of our QC inspections and approvals. These are dynamic business processes carried out on site by a highly experienced team of inspectors. Our inspectors are all well versed fabrication and construction specialists who are tasked with maintaining the high standards demanded both by our clients and our design teams.

# Systems and Controls

The RSV Group utilises the services of our Group **Project Support Office** Subject Matter Experts (SME's) to provide **functional support** to the project teams during setup and execution of all projects undertaken.



Various **Project Management tools** and **software systems** are utilised to facilitate efficient project control during execution of our projects. At present the RSV Group is considered one of the mining industry's **leading practitioners in the use of the Prism Suite of Project Management Tools.**

Our selection of the Prism suite of project management tools has been largely influenced by the interoperability of these tools with most of the commonly used financial administration packages such as **SAP** as well as the project scheduling packages **Microsoft Project** and **Primavera.**

The **integration** of the main areas of project control i.e. cost, schedule and procurement within the Prism Project Manager system allows calculation of **Earned Value** within the system and also provide the Project Team and our Clients direct access to **live project data** and reports in the **Prism Project Manager Data base** via internet. Project Management Systems and Reporting Framework:

Furthermore, we recognise the importance of **document management and archiving** of project data and have therefore selected **ProjectWise** as the RSV document management system. ProjectWise features a **secure storage environment, extensive referencing and search facilities, version control, tracking of document history and a flexible filing structure.**

The project WBS structure is fundamental for the successful **integration and operational management of data** within the various systems and disciplines of project controls i.e. project cost control, scheduling, procurement and document control. Our focus is on a **deliverable based management system** approach to projects - through the use of **SmartProjects** and **Resource Loaded Scheduling** using MSP.

RSV is **well versed** and **practiced** in the utilisation of these project management tools and software systems and has **successfully delivered** a substantial number of engineering and construction projects in this manner.



# Our People

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**Our people** and values that we uphold are the **foundations of our success**. Our ability to meet and exceed the expectations of our clients is directly linked to the expertise, experience, responsiveness and dedication of our staff.

RSV's staff consists of individuals with a **wealth of engineering and management experience** obtained from involvement with very prominent mining projects both locally and internationally, many of these using innovative new ground breaking technologies. Our team of mining specialists has **extensive experience** in the design and operation of the **entire spectrum of mining activities** from exploration through to full production.

RSV has an extensive **staff complement of around 90 technical and support staff** in a variety of focus areas available for project execution, which include the following **industry (mining and plant) specialists**:

- Project Leaders
- Discipline Engineers
- Designers
- Geologists
- Cost Engineers
- Expeditors
- Project Administrators
- Contracts Managers/Administrators
- Construction Managers
- Project Superintendents
- Planning Champions
- Technologists
- Procurement Managers/Officers
- Commercial Managers
- Financial Analysts
- Project Accountants
- Health, Safety and Environmental Managers
- Quality and Assurance Managers
- Support Staff
- Site Staff



# Innovation & Ethics

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The **innovation and quality** of our engineering is demonstrated in the following **awards**:



*Fulton Award for Excellence (Design) for excellence in the use of concrete 2001 for the Nchwaneng # 3 Shaft Decline*



*The South African Steel Institute Award (Design) 2004 for the Impala 12 North Shaft Headgear*



Our **core values** include:



Believing **good ethics equal good business**

# Mining

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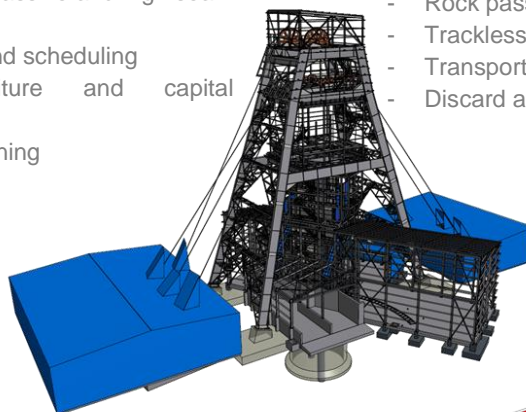
## Mining Engineering

We are mining specialists with extensive experience in the design and operation of the entire spectrum of mining activities. **From exploration through to full production, RSV covers all aspects of access to the orebody.**

Our project management and design service range from open pit, tabular and massive underground to deep shaft mining in hard and soft rock.

### Our areas of expertise are:

- **Resources**
  - Resource assessment
  - Resource to reserve conversion
  - Exploration methodology
- **Prospecting and Mining Right applications**
- **Ore reserve Optimisation**
  - Production planning and scheduling
  - Development planning and scheduling
  - Dredge path planning
- **Mine design**
  - Mine layouts and mining methods
  - Open pit mine design
  - Open cut design with draglines
  - Drill and blast design
  - Life of mine optimisation studies
  - Overall mine safety
  - Surface and underground infrastructure
  - Legal and permitting: EIA's, EMPR's and logistics
  - Backfill systems
  - Tabular, greenstone, massive and high seam deposits
  - Equipment selection and scheduling
  - Operational expenditure and capital expenditure estimation
  - Human resources planning
- **Engineering design**
  - Vertical, incline, sub-vertical, sub-incline and audit shaft systems
  - Permanent and sinking headgear designs
  - Winder and rope systems
  - Shaft equipping layouts and procedures
  - Sinking and equipping stages
  - Mine ventilation
  - Refrigeration and mine cooling
  - Shaft and underground piping
  - Automatic skip hoisting systems
  - Skip loading and tipping systems
  - Shaft sinking services and contracts; preparation, management and administration
  - Project supporting infrastructure design; earthworks and civil works design, haul roads, provincial roads & bridges, bulk water supply & storage dams, stockpiles, discard dumps, electrical HV supply & distribution, communication network
- **Surface and underground infrastructure**
  - **Mine surface infrastructure, inclusive of office, workshop and industrial buildings**
  - **Mine access and haul roads and rail load-out facilities**
- **Electrical reticulation for underground and surface distribution**
  - Materials handling infrastructure and coal stockyards
  - Mine and power station earthworks and terracing
  - Storm water and polluted water management and control systems
  - Services, inclusive of water and sewer reticulation tank and treatment plants
  - Crushing
  - Rock pass systems, tips and silos
  - Trackless mining systems
  - Transport logistics
  - Discard and waste dumps



# Mining Infrastructure

RSV has an **integrated approach** to delivering infrastructure for mining projects. From mine concept to execution and mine closure, our mining and **infrastructure teams work closely with the Client** to provide an extensive range of services.

RSV **understands the business and technical challenges involved** in delivering optimum project outcome and the capability and commitment to assist the Client to successfully and profitably develop the infrastructure for the mining prospect, operation or expansion plans.

Our approach to infrastructure development considers the **integration of the geological and mine planning, with the environmental and geotechnical aspects**, all with an appreciation for safety and capital and operational cost optimisation.

RSV's **mining infrastructure capabilities include:**

- **Mining Development**
  - Conventional
  - Bord and Pillar
  - Cave Mining, et cetera
- **Access to Ore body**
  - Vertical and sub vertical shafts
  - Raise boring
  - Incline and sub-incline shafts
  - Audit shaft systems
  - Shaft stations
- **Material handling**
  - Rock
    - Conveying - underground, overland, trippers etc.
    - Crushing
    - Hoisting
    - Storage - silos, bins, ore passes, stockpiles etc.
    - Trackless mining systems - low profile, ultra-low profile
    - Loading and off-loading facilities
  - People
    - Hoisting
    - Chair lifts
    - Trackless
    - Access systems
    - Logistics

- Materials
  - Hoisting
  - Overland conveyor systems, storage bunkers, stockpile loading and reclaim, rail spur and rapid rail load out systems
  - Trackless
  - Transport logistics

- **Infrastructure**

- Water handling - dirty, clean, potable and fire
  - Sewage systems
  - Storm water management
  - Dams
- Compressed air
- Office facilities
- Workshops
- Ventilation, cooling and ventilation
- Firefighting systems
- **Road and rail systems inclusive of rail bound system design, gradients, track, loco, hopper car, operator, signalling and safety equipment and protocols, material specification and selection, maintenance and operations. The rail loading, unloading, signalling and safety system arrangements complete the underground rock handling infrastructure, applicable to both vertical and decline shafts for coal and hard rock mine**
- Earthworks and terracing
- Surface hydrological studies
- River diversions and attenuation dam designs



# Engineering & Technology

RSV's Engineering and Technology (E&T) cluster is a **consolidated group of specialist engineers** who solve various challenging mining and process technical problems through the practical application of mathematical and scientific principles.

With specialist skills in both engineering and technology, E&T **creates better ways of getting the desired outcome** across the project lifecycle. From concept design and application to implementation, E&T engineers determine optimal solutions while considering the conflicting issues of constraint, constructability, safety, operability, manufacturing and logistics when doing engineering design.

E&T's expertise covers the mining, civil, structural, mechanical, piping, electrical and instrumentation disciplines. RSV have won numerous design and quality awards.

RSV operates within a '**virtual office**' using the latest software tools and systems to **communicate with our teams globally**. This gives us a universal platform from where RSV can launch our pool of skills on a global level.

RSV specialises in mining design with the **focus on total shaft projects**. From the choice of headgear to the selection of winders and lifting equipment, collars and linings, we constantly develop and apply new methods to maximise productivity and minimise cost.

RSV's knowledge area extends further to the design of **total surface and underground infrastructure systems** covering conveying, **transportation (including railway systems)** crushing, water-handling, workshops, ventilation and cooling, as well as logistics





# Processing

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## Mineral Processing & Hydro-metallurgy

The Process division's focus areas include providing engineering and management services to the **Hydro-Metallurgical, Mineral Processing and Chemical Industries**, in which a team of qualified and experienced engineers and project managers provide a high quality, high value yet cost effective service. Our industry **experience in process plants** extends across the following sectors: platinum, copper, fluorspar, coal, chrome, manganese, mineral sands, diamonds, gold and uranium, **industrial plant and commercial buildings, and water treatment plants.**

RSV works closely with our Clients to develop the project to their satisfaction and to ensure cost savings where possible. We are **flexible in our approach** to contracts and will offer EPCM, EPC or turnkey solutions for our Clients to meet the ever changing demands of the industry. From production planning and forecasts to plant equipment, sizing and determining the energy needs to the support of process control strategies, testing and operational training, the process division offers the **full range of services:**



- **Metallurgical test-work** development and management
- **Metallurgical engineering in the hydro-metallurgical** and mineral processing fields
- **Chemical engineering**
- **Mechanical engineering** in the mechanical, piping and materials handling sectors
- **Civil & Structural engineering**
- **Electrical engineering**
- **Process control and automation** engineering
- **Project management** of all elements including conceptual studies, pre-feasibility studies, project implementation, construction management and commissioning
- **Planning and scheduling**
- **Capital and Operating cost estimating**
- **Procurement**
- **Project cost control and accounting.**

Using the **latest software to implement our engineering designs**, our dynamic systems simulate all aspects of the plant including the physical process, equipment, the control system, the operation strategy and interactions of these systems (e.g. scheduled maintenance, shipping schedules, planned new material feeds, etc). The benefits to our Clients in using the latest software are: **improved safety** through control strategies and operator training, shortening of the planned development time, **reducing the process risks, improving efficiencies, energy usage** and maximised throughput.

RSV uses the **distinct benefits of modular plants to achieve cost savings** for our Clients. Modular plants offer a number of significant advantages for Clients including the fact that the structural design of the plant lends itself to easy disassembly and reassembly on different sites.



# Electricity, Power & Energy

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## Electricity

RSV offers a **full range of EPCM skills within the electrical engineering discipline**. We operate throughout Africa, **servicing the industrial, commercial and mining sectors**.

Our specific expertise lies in gold, platinum, chrome, copper and coal mining with the prime focus on process plants, vertical and decline shafts, power reticulation, winder projects, furnaces, associated data communication networks and project management.

Our services include conceptual studies, pre-feasibility and feasibility studies, project execution and infrastructure upgrades.

Our **expertise** extends to:

- **System studies and single line development** - the basis of a sound design in electrical systems
- **Trade-off studies** to determine the balance between the latest technologies and economic considerations
- Specifications: liaising with clients and industry in order to **generate equipment specifications** for projects
- **Detailed engineering and design** of overhead power lines, main-intake substations, distribution substations, motor control centres, distribution networks, underground distribution networks and underground substations
- **Detailed engineering and design of the electrical elements** for processing plants, smelting furnaces, refineries, decline mining shafts, vertical shafts, pump stations, surface ventilation fans, compressors for mining, refrigeration plants, winders and mining infrastructure
- **Construction monitoring** of projects to ensure compliance to specifications and designs
- **Commissioning and handover** of delivered solutions
- The provision of energy efficiency **compliance certificate**.



# Power Systems

RSV's **Power Systems Analysis** Department provides solutions in terms of **power system modelling and analysis**, from concept phase through to implementation of projects. RSV also provide solutions for **protection relay coordination, fault level analysis and load flow for existing installations**; and offer Service Level Agreements to maintain protection settings and single line diagrams.



RSV's **comprehensive experience** includes:

- Load Flow Analysis
- Fault Level Analysis
- Protection Device Co-ordination Analysis
- Static and Dynamic Motor Starting Analysis
- ARC Flash Analysis
- Harmonic Analysis
- Transient Stability Analysis
- Protection Grading Reports
- Assistance with implementation of Protection Settings

## Earthing and Lightning Protection

RSV's Earthing & Lightning Protection department takes **earthing protection** to a new level through integration with Power Systems Analysis **to determine the prospective fault current** and taking into consideration lightning conditions specific to the site being designed. RSV will provide a design report on the **earthing requirements based on SANS and IEC procedures** including number of electrodes and conductors required and the resulting surface, step and touch potentials of the design.

The **service offering includes:**

- Site resistivity testing
- Earthing & Lightning Risk Assessments
- Earthing simulation in SafeGrid software
- Earthing layout Designs in Autocad
- Lightning arrestor designs
- On site verification of earthing installations

RSV ensures effective service delivery by utilising the latest AutoCAD technology and an 'in-house' developed **document control package** – crucial elements which ensure an efficient 'hours per drawing' ratio.

RSV has established and maintains ISO 9001:2008 **certified** Quality Management Systems. We are **members** of the Consulting Engineers of South Africa (CESA), the South African Flameproof Association (SAFA) and are a corporate member of the Southern African Association for Energy Efficiency (SAAEE).

# Control and Instrumentation

RSV is a **leader in the field of instrumentation and control**. From engineering, design and project construction management to commissioning, we form the single point of responsibility for the installed services for existing and new operations.

Professional Engineers & Technologists provide **comprehensive Control and Instrumentation (C&I) consulting**, engineering and design services from concept through feasibility, construction and commissioning to handover.

Just some of the **expert C&I services** RSV's C&I department offers:

- Concept and feasibility studies
- Drafting of PFDs and P&IDs
- Instrumentation designs in F-Des, InTools and AutoCAD
- Process automation and optimisation
- Equipment specification & procurement
- Field & control system network specification and design
- Control and equipment room designs
- Project management services
- QA inspection & audit services
- System integration of all major control systems



# Energy



Our specific expertise lies in **energy provision and generation, energy related negotiations and interfacing, energy management and project management** as well as studies and project execution for brown and green field projects.

We **specialise** in the following:

- **Electrical Power Generation**
  - Selection and sizing of technology
  - Negotiate Generator licensing, IPP and PPA
  - Sourcing of new or second hand equipment
  - Generator purchasing or rental contracts
  - Service Level Agreement contracts

- **Utility Authority Interfacing**
  - Negotiating new or increases in existing supplies
  - Applications for energy
  - Assisting client and Utility Authority with quotations
  
- **Renewable Energy Generation**
  - Carbon Credits from Utility Authority
  - Solar PV and CSP
  - Wind
  - Hydro
  - Bio-fuel
  
- **Energy Audits and Improvements**
  - Energy efficiency and demand side management
  - Energy supply and risk management
  - Utility bill audit and refund recovery
  - Utility tariff analysis and rate optimization
  
- **Measurement and Verification**
  - Verify the results and impact from implementation of the energy efficiency measures or management standards
  - Quantify energy savings from specific measures or projects
  - Track changes over time for the overall plant
  
- **Specialist Services**
  - Optimization of combustion airflow
  - Coal quality impact studies on coal fired power stations
  - Generator protection and control
  - Power station commissioning
  - Power station optimization, maintenance and expansion
  - Generator fault finding and failure analysis



# Project Management

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Our **project implementation procedures and methodologies** are based on and aligned to Project Management institute's (PMI) Project Management Body of Knowledge (PMBOK 5<sup>th</sup> Edition) techniques. In addition, Engineering Management, Construction Management and Environment, Health and Safety Management have been added to our procedures.

From **concept to implementation, our methodology is determined by the project lifecycle**. This is divided into **three phases: project start-up; project implementation; and project close-out**.

Critical to the success of every project is the **integration process of all the management areas or responsibilities**. These are:

- **Project Quality Management:** policies, objectives and responsibilities of the team involved on the project to ensure a successful implementation
- **Project Cost Management:** planning, controlling and management of the cost to ensure the project will be completed within the approved budget • **Communication Management:** the core focus of the communication strategy is the dissemination of project information to the relevant stakeholders
- **Project Scope Management:** involves the processes of planning, monitoring and implementation of the full scope of work required on the project
- **Time and Progress Management:** the systems required to accomplish timely completion of the project
- **Project Risk Management:** the conducting of risk management identification and planning, analysis response and control on a project
- **Human Resources Management:** the operation required to effectively organise and manage the project team
- **Project Procurement Management:** this defines the processes of purchasing material, products, goods and services needed to perform the work outside the project team
- **Engineering Management:** this is an integral part of attaining project success. There are three areas critical to the success of the project: establishment of the design criteria; management of the design office man hours; and the control of design, engineering and procurement by the lead engineer
- **Construction Management:** in essence construction management is an extension of the project management activity but on site and with a specific focus on contractor management and safety
- **Environment, Health and Safety Management:** our 'Gear-up' programme is a behavioural safety based administration model that facilitates proactive robust safety strategy. The tool has been successfully implemented across all our projects
- **Communication / Stakeholder Management.**

The principal effort in **project controls** is the delivery of accurate and up to date information that details the status and progress of all aspects of the project. This information is not only required to inform the client, but is an essential tool in guiding the actions of the project management team going forward.





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