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Serbian Geological Society

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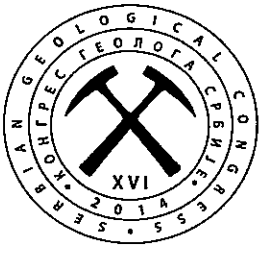
XVI Конгреса геолога Србије



Programme
of the XVI Serbian Geological Congress

ОПТИМАЛНО ИСТРАЖИВАЊЕ И ОДРЖИВО КОРИШЋЕЊЕ ГЕОЛОШКИХ РЕСУРСА

OPTIMAL RESEARCH AND SUSTAINABLE USAGE OF THE GEOLOGICAL RESOURCES

XVI КОНГРЕС ГЕОЛОГА СРБИЈЕ

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22 Maj / 22 May 2014

Регистрација / Registration	09.00-11.00
Свечано отварање и поздравни говори / Opening ceremony – welcome addresses Председавајући / Chairs: Aleksandar Grubić, Marko Komac, Vladica Cvetković, Aleksey A. Vashkevich, Zoran Stevanović Uvodni referat / Introductory speech: Zoran Stevanović	11.00-12.00
Коктел добродошлице, ручак / Cocktail, Lunch	12.00-14.00
Plenarni referati – Sala I (do recepcije) **Plenary reports – Hall I (next to reception desk)**	
SKETCH OF THE ĐERDAP'S AREA GEOLOGY Aleksandar Grubić	14.00-14.30
ONEGEOLOGY – GEOSCIENCE DATA AT THE TOUCH OF A BUTTON Marko Komac, Francois Robida, Tim Duffy	14.30-15.00
STANJE I POTENCIJALI MINERALNIH RESURSA ISTOČNE SRBIJE STATUS AND POTENTIAL OF MINERAL RESOURCES OF EASTERN SERBIA Rade Jelenković	15.00-15.30
O KENOZOJSKOM MAGMATIZMU SRBIJE – REČIMA KOJE RAZUME SVAKI GEOLOG ABOUT CENOZOIC MAGMATISM IN SERBIA – BY WORDS UNDERSTANDABLE TO EVERY GEOLOGIST Vladica Cvetković	15.30-16.00
	pauza
СТРАТИГРАФИЈА, ПАЛЕОНТОЛОГИЈА И ТЕКТОНИКА **STRATIGRAPHY, PALAEONTOLOGY AND TECTONICS** **– Sala I (do recepcije)** **Hall I (next to reception desk)**	
Председавајући / Chairs: Tudor Berza, Nenad Banjac	
RHODOPE EVOLUTION IN THE HEART OF BALKAN GEOLOGY Ivan S. Zagorchev	16.30-17.00
THE LAKE PANNON – SERBIAN SIDE OF THE STORY Dejan Radivojević, Imre Magyar, Marten ter Borgh, Ljupko Rundić	17.00-17.15
STABLE ADRIA AND THE EXTERNAL DINARIDES: TECTONIC MODELS IN THE CONTEXT OF JURASSIC-CRETACEOUS PALEOMAGNETIC RESULTS Emő Márton, Vlasta Ćosović, Alan Moro	17.15-17.30
MAJOR PHASES OF NEOGENE-QUATERNARY TECTONIC EVOLUTION OF THE SOUTH-EASTERN PART OF PANNONIAN BASIN Ivan Dulić, Snežana Marjanović, Vladislav Gajić, Goran Bogicević	17.30-17.45
ПРЕЛИМИНАРНИ РЕЗУЛТАТИ О РЕЦЕНТНОЈ ТЕКТОНСКОЈ АКТИВНОСТИ ИНТЕРНИХ ДИНАРИДА НА ОСНОВУ ФОКАЛНИХ МЕХАНИЗАМА ЗЕМЉОТРЕСА PRELIMINARY RESULTS ON RECENT TECTONIC ACTIVITY OF THE INTERNAL DINARIDES BASED ON FOCAL MECHANISMS OF EARTHQUAKES Ana Mladenović, Branislav Trivić, Vladica Cvetković, Radmila Pavlović	17.45-18.00
RAZVOJ ASIMETRIČNIH BASENA: JARANDOLSKI BASEN ARCHITECTURE OF ASYMMETRICAL SEDIMENTARY BASINS: JARANDO BASIN Nevena Andrić, Vladimir Simić, Dragana Životić	18.00-18.15
ПАЛЕОМАГНЕТСКИ РЕЗУЛТАТИ И РЕЗУЛТАТИ МЕРЕЊА АНИЗОТРОПИЈЕ МАГНЕТСКЕ СУСЦЕПТИБИЛНОСТИ МИОЦЕНСКИХ СЕДИМЕНАТА ЦЕНТРАЛНЕ И ЗАПАДНЕ СРБИЈЕ PALEOMAGNETIC AND MAGNETIC ANISOTROPY RESULTS FROM MIOCENE SEDIMENTS OF CENTRAL AND WESTERN SERBIA Vesna Lesić, Emő Márton, Vesna Cvetkov, Slobodan Knežević, Dragana Tomić	18.15-18.30
RETSKI KAT GORNJE JABLANICE NA ZLATIBORU (JZ SRBIJA) THE RETIAN OF GORNJA JABLANICA (ZLATIBOR Mt., SW SERBIA) Darivojka Ljubović-Obradović, Divna Jovanović, Rodoljub Gajić	18.30-18.45

ХИДРОГЕОЛОГИЈА **HYDROGEOLOGY** **Sala II – sprat iznad recepcije** **Hall II – floor above reception**	
Председавајући / Chairs: Petar Milanović, János Szanyi	
О ПОТРЕБИ ФОРМИРАЊА НОВЕ НАЦИОНАЛНЕ МРЕЖЕ ЗА МОНИТОРИНГ ПОДЗЕМНИХ ВОДА У СРБИЈИ ON THE NEED TO SET UP A NEW NATIONAL GROUNDWATER MONITORING NETWORK IN SERBIA Zoran Stevanović, Vesna Ristić Vakanjac, Saša Milanović	16.20-16.45
HIDROGEOLOŠKE SPECIFIČNOSTI KARSTA I NJIHOVE POSLEDICE CONSEQUENCES OF HYDROGEOLOGICAL PARTICULARITIES IN KARST Petar Milanović	16.45-17.00
THE SUSTAINABLE USE OF GEOTHERMAL ENERGY AT UNIVERSITY OF SZEGED János Szanyi, Balázs Kóbor, Tamás Medgyes	17.00-17.15
ODREĐIVANJE GARANTOVANOG PROTICAJA NA KARSTNIM VRELIMA SA VELIKIM SEZONSKIM OSCILACIJAMA / DETERMINATION OF GUARANTEED DISCHARGE (FLOW) AT KARST SPRINGS WITH LARGE SEASONAL FLUCTUATIONS Saša Milanović, Ljiljana Vasić, Tina Dašić	17.15-17.30
KARAKTERIZACIJA KARSTNE IZDANI NA OSNOVU REZULTATA VREMENSKIH SERIJA – NA PRIMERU IZVORIŠTA NEMANJA I SVETA PETKA KARST AQUIFERS CHARACTERISATION ON THE RESULTS OF TIME SERIES – CASE EXAMPLES OF NEMANJA AND SVETA PETKA SOURCES Igor Jemcov	17.30-17.45
INTEGRISANO KORIŠĆENJE HIDROGEOTERMALNIH RESURSA U OBJEKTIMA INDUSTRIJSKE NAMENE-PRIMER OBJEKAT KOMPANIJE „DOKA SERB" U ŠIMANOVCIMA INTEGRATED USE OF HYDROGEOTHERMAL RESOURCES IN THE INDUSTRIAL FACILITIES- CASE STUDY "DOKA SERB" COMPANY IN SIMANOVCI Dejan Milenić, Đuro Milanković, Ana Vranješ	17.45-18.00
ХИДРОГЕОЛОШКИ ИСТРАЖУВАЊА ЗА ОБЕЗБЕДУВАЊЕ НА ПОДЗЕМНА ВОДА ЗА ПОТРЕБИТЕ НА „СКИ ЦЕНТАР ВОДНО" HYDROGEOLOGICAL INVESTIGATIONS FOR THE PROVISION OF GROUNDWATER AT THE SKI RESORT OF MAVROVO Nikola Dimov, Marko Markov, Elizabeta Raleva, Stojan Mihailovski, Vladimir Kostovski	18.00-18.15
МЕЛИОРАТИВНА ХИДРОГЕОЛОШКА ИСТРАЖИВАЊА ЈУЖНЕ ВАРДАРСКЕ ДОЛИНЕ MELIORATIVE HYDROGEOLOGIC INVESTIGATIONS OF THE SOUTH VARDAR VALLEY Zlatko Ilijovski, Stojan Mihailovski, Marko Markov, Nikola Dimov	18.15-18.30
SANACIJA I ZATVARANJE HAVARISANE BUŠOTINE D-7 LOKALITET KREMENICA-MEDŽITLIJA (BITOLJ – MAKEDONIJA) REMEDYING AND PLUGGING OF BLOWN-OUT WELL D-7 IN THE KREMENICA-MEDŽITLIJA AREA (BITOLA, MACEDONIA) Dimitar Petrov, Silvana Pesovska, Marinko Eftimov	18.30-18.45
HIDROGEOLOŠKE KARAKTERISTIKE, REŽIM ISTICANJA I BILANS VODA BELOG VRELA (VRELO TOLIŠNICE, SRBIJA) / HYDROGEOLOGICAL CHARACTERISTICS AND DISCHARGE REGIME OF WHITE SPRING (SOURCE OF THE TOLISNICA RIVER, SERBIA) Marina Čokorilo Ilić, Vesna Ristić Vakanjac, Sibela Oudech, Dušan Polomčić, Dragoljub Bajić	18.45-19.00
OSNOVNE KARAKTERISTIKE IZDANSKOG TOKA KARSTNIH VODA SVRLJIŠKIH PLANINA I SUVE PLANINE / GENERAL CHARACTERISTICS OF KARST GROUNDWATER FLOW OF SVRLJIŠKE PLANINE MT. AND SUVA PLANINA MT. Branislav Petrović	19.00-19.15
HIDROGEOLOŠKE STRUKTURE KOSTOLAČKOG UGLJONOSNOG BASENA HYDROGEOLOGICAL STRUCTURE OF COAL BASIN IN KOSTOLAC Željko Kljajić, Branimir Lazić, Milojko Lazić, Olivera Krunić	19.15-19.30
POTENCIJAL ZA EKSPLOATACIJU PODZEMNIH VODA DIJELA KAPINA POLJA-NIKŠIĆ POTENTIALITY FOR GROUNDWATER EXPLOITATION OF THE KAPINA POLJA PART– NIKŠIĆ Slavko Hrvačević	19.30-19.45

23 Maj / 23 May	
НАФТНА ГЕОЛОГИЈА И ГЕОФИЗИКА **PETROLEUM GEOLOGY AND GEOPHYSICS** **– Sala I (do recepcije)** **Hall I (next to reception desk)**	
Председавајући / Chairs: Ivan Dulić, V.A. Kosmynin	
KOLGAN TERRIGENOUS FORMATION OF RUSSIAN PLATFORM: SEDIMENTATION PRECONDITIONS OF HYDROCARBON POTENTIAL Kosmynin V.A., Kuzmin D.A	9.00-9.30
SPECIAL ASPECTS OF SEISMIC FACIES ANALYSIS IN CLINOFORM'S COMPLEX Yr.Filippovich, O.Zaharova, V. Ananiev, T.Olneva	9.30-9.45
PRIMENA TEHNOLOGIJE BUŠENJA MALIM PREČNIKOM (SLIM HOLE) ZA ISTRAŽIVANJE KOMPLEKSNIH LEŽIŠTA UGLJOVODONIKA APPLICATION SLIM HOLE DRILING TEHNOLOGY (SLIM HOL) RESEARCH COMPLEX LOCKS OF HYDROCARBONS Milan Lončarević, Zoran Rakić	9.45-10.00
EXPERIENCE IN APPLICATION OF THE CONCEPTUAL MODELS OF THE FIELDS DEVELOPED BY THE COMPANY GAZPROM NEFT Redina S.A., Kurmanov P.U	10.00-10.15
UNCONVENTIONAL OIL AND GAS – EFFICIENT WORKFLOWS FOR EXPLORATION RISK AND RESOURCE ASSESSMENTS, AN EXAMPLE FROM ALASKA (USA) Darko Spahić, Bjorn Wygrala	10.15-10.30
RESERVOIR CHARACTERIZATION USING STOCHASTIC AND DETERMINISTIC SEISMIC INVERSION Shestakova G.M., Zakharova O.A., Timoshenko A.A	10.30-10.45
PROSPECTIVE RESOURCES AS A CENTRAL IMPORTANCE REPLACEMENT OF RESOURCE POTENTIAL РЕСУРСЫ С3 – ПЕРВООЧЕРЕДНАЯ ВОЗМОЖНОСТЬ ВОСПОЛНЕНИЯ РЕСУРСНОЙ БАЗЫ Ekaterina Egorova	10.45-11.00
СЕЙСМОРАЗВЕДКА И ЭЛЕКТРОРАЗВЕДКА В 3D: КОМПЛЕКСИРОВАНИЕ ГЕОФИЗИЧЕСКИХ МЕТОДОВ ДЛЯ ПОВЫШЕНИЯ ЭФФЕКТИВНОСТИ ПРОГНОЗА КОЛЛЕКТОРОВ Kubishta I.I. Pavlovskiy J.V	11.00-11.15
ANALIZA I OBRADA KAROTAŽNIH MERENJA ZA POTREBE IZRADE SEIZMIČKE INVERZIJE I PROGNOZE PETROFIZIČKIH PARAMETARA NA OSNOVU 3D SEIZMIČKIH PODATAKA WELL LOG PROCESSING AND ANALYSIS FOR SEISMIC INVERSION AND PREDICTING OF PETROPHYSICAL PARAMETERS DISTRIBUTION Stevan Doroškov, Aleksandar Ristović	11.15-11.30
	pauza
Председавајући / Chairs: Miroslav Starčević, Aleksandar Ristović	
GEOMAGNETIC INVESTIGATIONS OF THE ORE DEPOSITS AT LOCATION PRIJEPOLJE, SERBIA Spomenko J. Mihajlović, Miroslav Starčević	12.00-12.15
PRIMENA GEOELEKTRIČNIH ATRIBUTA I PSEUDO 3D INTERPRETACIJA PODATAKA DOBIJENIH UKRŠTENIM KVADRATNIM RASPOREDOM U KLASTIČNOM DEPOZICIONOM SISTEMU THE APPLICATION OF GEOELECTRICAL ATTRIBUTES AND PSEUDO 3D INTERPRETATIONS OF DATA OBTAINED BY CROSS-SQUARE DISTRIBUTION IN A CLASTIC DEPOSITIONAL SYSTEM Branislav Sretenović, Ivana Vasiljević, Vesna Cvetkov, Bojan Brodić	12.15-12.30
СТАНДАРДИЗАЦИЈА ПОПРАВКИ ПРИ РАЧУНАЊУ ГРАВИМЕТРИЈСКИХ АНОМАЛИЈА У СРБИЈИ STANDARDIZATION IN REDUCTION FOR CALCULATION OF GRAVITY ANOMALIES IN SERBIA Ivana Vasiljević, Snežana Ignjatović, Branislav Sretenović, Oleg Odalović	12.30-12.45
ГЕОМАГНЕТСКИ ПРЕМЕР НА ТАЧКАМА ДРУГОГ РЕДА РЕПУБЛИКЕ СРБИЈЕ GEOMAGNETIC SECOND ORDER SURVEYS AT SERBIA D.Andrejić, D. Popeskov, M. Mihajlčić	12.45-13.00
PRAĆENJE PROMENA GEOMAGNETSKOG POLJA, PARAMETARA ATMOSFERE I ZEMLJOTRESA U PROJEKTU FP7 BLACKSEAHAZNET	

MONITORING OF EARTHQUAKES, GEOMAGNETIC FIELD AND ATMOSPHERE PARAMETER IN FP7 BLACKSEAHAZNET PROJECT Milena Cukavac, Strachimir Cht. Mavrodiev, Lazo Pekevski, Spomenko J. Mihajlovic	13.00-13.15
PRIMENA SEIZMIČKE INVERZIJE I MULTIATRIBUTIVNE ANALIZE PRI INTERPRETACIJI 3D SEIZMIČKIH PODATAKA KIKINDE 2013 THE APPLICATION OF SEISMIC INVERSION AND MULTIATTRIBUTE ANALYSIS FOR INTERPRETATION OF 3D SEISMIC DATA KIKINDA 2013 Janko Sovilj	13.15-13.30
ЕКОНОМСКА ГЕОЛОГИЈА И РУДНА ЛЕЖИШТА **ECONOMIC GEOLOGY AND ORE DEPOSITS** **– Sala I (do recepcije)** **Hall I (next to reception desk)**	
Председавајући / Chairs: Rade Jelenković, Vladimir Simić	
GEOLOGY AND MINERALIZATION OF THE NEW COOPER AND GOLD DISCOVERY SOUTH OF BOR – TIMOK MAGMATIC COMPLEX Miodrag Banješević, Duncan Large	16.30-17.00
GENERALNI OSVRT NA MINERALNU EKONOMIJU U SAVREMENIM USLOVIMA ODRŽIVOG RAZVOJA GENERAL REVIEW OF MINERAL ECONOMY IN MODERN CONDITIONS OF SUSTAINABLE DEVELOPMENT Radule Tošović	17.00-17.15
ZNAČAJ PRIMENE MODERNOG I EFIKASNOG MENADŽMENTA LJUDSKIH RESURSA U MINERALNOM SEKTORU THE IMPORTANCE OF MODERN AND EFFECTIVE HUMAN RESOURCE MANAGEMENT IN THE MINERAL SECTOR Radule Tošović	17.15-17.30
ОДРЖИВО ПЛАНИРАЊЕ АГРЕГАТА У ЈУГОИСТОЧНОЈ ЕВРОПИ - ЗАШТО И КАКО SUSTAINABLE AGGREGATES PLANNING IN SOUTHEAST EUROPE – WHY AND HOW? Vladimir Simić, Dragana Životić, Nevena Andrić, Zoran Miladinović	17.30-17.45
GEOLOŠKE KARTE KAO PODLOGE ZA ODRŽIVO PLANIRANJE SNABDEVANJA AGREGATIMA (NA PRIMERU REPUBLIKE HRVATSKE) GEOLOGICAL MAPS AS BACKGROUND FOR SUSTAINABLE AGGREGATE SUPPLY PLANNING (EXAMPLE OF THE REPUBLIC OF CROATIA) Vladimir Simić, Slobodan Miko, Boris Kruk, Željko Dedić, Dragana Životić, Nevena Andrić, Zoran Miladinović	17.45-18.00
МИНЕРАЛОГИЈА, КРИСТАЛОГРАФИЈА, ПЕТРОЛОГИЈА И ГЕОХЕМИЈА **MINERALOGY, CRYSTALLOGRAPHY, PETROLOGY AND GEOCHEMISTRY** **Sala II – sprat iznad recepcije** **Hall II – floor above reception**	
Председавајући / Chairs: Vesna Matović, Suzana Erić	
THE ORIGIN OF VOLCANIC SECTION OF THE VARDAR OPHIOLITIC ZONE: A COMPARATIVE PETROLOGICAL AND GEOCHEMICAL STUDY OF LATE-CRETACEOUS VOLCANICS FROM MACEDONIA WITH THEIR JURASSIC COUNTERPARTS FROM BALKANS Prelević Dejan, Simon Wehrheim, Božović Milica, Rolf Romer, Blažo Boev	9.00-9.30
СТАРОСТ ВАРИСЦИЈСКИХ ГРАНИТОИДА ИСТОЧНЕ СРБИЈЕ ОДРЕЂЕНА LA ICP-MS U-Pb МЕТОДОМ НА ЦИРКОНИМА LA ICP-MS U-Pb ZIRCON DATING OF VARISCAN GRANITOIDS IN EASTERN SERBIA Kristina Šarić, Suzana Erić, Vladica Cvetković, Irena Peytcheva, Dragan Jovanović, Aleksandar Pačevski	9.30-9.45
MINERAL BEJKERIT KAO CEMENT U RASEDNOJ BREČI U DIJABAZIMA (MRČIĆI,DIVČIBARE) MINERAL BAKERITE AS A CEMENT IN FAULT BRECCIA IN DIABASE (MRČIĆI, DIVČIBARE) Nebojša Vasić, Đorđe Simić, Vladimir Simić, Predrag Dabić, Suzana Erić, Ilija Brčeski, Violeta Gajić, Predrag Vulić	9.45-10.00
KARAKTERISTIKE SUBKONTINENTALNOG OMOTAČA ISPOD JUGOISTOČNOG DELA LIBIJE CHARACTERISTICS OF THE SUBCONTINENTAL MANTLE BENEATH SOUTHEASTERN LIBYA Maša Radivojević, Suzana Erić, Salah M. Turki, Marinko Toljić, Vladica Cvetković	10.00-10.15
GEOHEMIJA SAVREMENIH SEDIMENATA TISE I ĐERDAPSKOG JEZERA GEOCHEMICAL CHARACTERISTICS OF SURFACE SEDIMENTS FROM TISZA RIVER AND DJERDAP LAKE Milica Kašanin-Grubin, Nebojša Vasić, Snežana Štrbac, Dragoman Rabrenović, Vidojko Jović, Ilija Brčeski	10.15-10.30

PALEOZOIC OPHIOLITES OF THE DELI JOVAN MTS. (EASTERN SERBIA) Dragan Milovanović, Dušan Bjelotomić, Emin Memović	10.30-10.45
COMPOSITION OF ZONAL GARNETS FROM THE GARNETITE EXOSKARN OF THE ORE FIELD ROGOZNA (ROGOZNA MTS, SOUTHERN SERBIA) Danica Srećković-Batoćanin, Nada Vasković, Stanoje Milutinović, Veroljub Ilić, Zoran Nikić	10.45-11.00
МИНЕРАЛОШКЕ, ПЕТРОЛОШКЕ И ГЕОХЕМИЈСКЕ КАРАКТЕРИСТИКЕ ЛИГНИТА ПОЉА РАДЉЕВО У КОЛУБАРСКОМ БАСЕНУ MINERALOGY, PETROLOGY AND GEOCHEMISTRY OF LIGNITE IN THE RADLJEVO FIELD, THE KOLUBARA BASIN (SERBIA) Adam Dangić, Branislav Simonović, Dimitrije Dimitrijević, Spasenka Gajinov, Marko Babović, Jelena Milošević	11.00-11.15
CRNI KREČNJACI SA CRNIM ROŽNACIMA DONJE KREDE U SEVERNOM DELU KARPATO-BALKANIDA ISTOČNE SRBIJE (IZMEĐU ŽAGUBICE I MALOG KRŠA) BLACK LIMESTONE WITH BLACK CHERTS OF LOWER CRETACEOUS AGE IN NORTHERN CARPATHO-BALKANIDES (EAST SERBIA, BETWEEN ŽAGUBICA AND MALI KRŠ) Nebojša Vasić, Darivojka Ljubović-Obradović, Jastin Van der Torn, Danica Srećković-Batoćanin, Dragana Davidović, Branislav Avramović	11.15-11.30
	pauza
ХИДРОГЕОЛОГИЈА **HYDROGEOLOGY** **Sala II – sprat iznad recepcije** **Hall II – floor above reception**	
Председавајући / Chairs: Veselin Dragišić, Ferid Skopljak	
GEOLOŠKO-HIDROGEOLOŠKE KARAKTERISTIKE LAJTOVAČKIH KREČNJAKA NA LOKALITETIMA "KREČANSKE JAME" I "PUARIŠTE" KOD LEŽIMIR GEOLOGICAL-HYDROGEOLOGICAL CHARACTERISTICS OF THE LEITHA LIMESTONE ON THE "KREČANSKE JAME" AND "PUARIŠTE" SITES, NEAR LEŽIMIR Milovan Rakijaš, Ljupko Rundić, Slobodan Knežević, Marija Kukavica	12.00-12.15
ПРИМЕНА ГЕОГРАФСКОГ ИНФОРМАЦИОНОГ СИСТЕМА У ИЗРАДИ КАРТЕ РИЗИКА ОД ЗАГАЂИВАЊА ПОДЗЕМНИХ ВОДА НА ПРИМЕРУ НАЦИОНАЛНОГ ПАРКА ЂЕРДАП USE OF GIS IN ASSESSMENT OF GROUNDWATER CONTAMINATION RISK MAP– CASE EXAMPLE OF NATIONAL PARK DJERDAP Vladimir Živanović, Veselin, Dragišić, Nebojša, Atanacković, Sunčica Ninković, Dejan Nešković	12.15-12.30
ANALIZA PROMENE KVALITETA PODZEMNIH VODA U PROCESU PRIHRANJIVANJA ALUVIJALNOG IZVORIŠTA "MORAVA-BRZAN" ANALYSIS OF CHANGES OF QUALITY OF GROUNDWATER DURING RECHARGE PROCESS OF ALLUVIAL SOURCE "MORAVA-BRZAN" Branislav Petrović, Vladimir Živanović	12.30-12.45
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SMISAO FUZZY LOGIKE U HIDROGEOLOŠKOJ PRAKSI / THE PURPOSE OF FUZZY LOGIC IN HYDROGEOLOGICAL PRACTICE Dragoljub Bajić, Dušan Polomčić, Igor Jemcov	13.15-13.30
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Председавајући / Chairs: Mile Bugarin, Novica Stolić	
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QUALITATIVE-QUANTITATIVE FEATURES OF CLAY FROM THE SITE BAZERNIK (WESTERN MACEDONIA) Orce Spasovski, Daniel Spasovski	17.15-17.30
КВАРЦНИ ПЕСАК И ПЕСКОВИТА ГЛИНА ЛЕЖИШТА БОШЊАНЕ КАО СИРОВИНА ЗА ЦЕМЕНТНУ ИНДУСТРИЈУ QUARTZ SAND AND SANDY CLAY FROM THE BOŠNJANE DEPOSIT AS RAW MATERIAL FOR CEMENT INDUSTRY Miroslava Maksimović, Milenko Jovanović, Slađana Krstić, Goran Pačkovski, Marinko Pavlović	17.30-17.45
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Председавајући / Chairs: Aleksandra Maran Stevanović, Ljupko Rundić	
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НЕОГЕН ИСТОЧНЕ СРБИЈЕ: ПОТЕНЦИЈАЛНИ ОБЈЕКТИ ГЕОНАСЛЕЂА THE NEOGENE OF THE EASTERN SERBIA: POTENTIAL GEOHERITAGE SITES Meri Ganić, Slobodan Knežević and Ljupko Rundić	10.45-11.00
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POTENCIJALNO TOKSIČNI MIKROELEMENTI U MRKIM UGLJEVIMA SRBIJE POTENTIALLY TOXIC TRACE ELEMENTS IN SERBIAN BROWN COALS Dragana Životić, Vladimir Simić, Ivan Gržetić	12.00-12.15
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ГЕОМИТОЛОГИЈА И ОБЈЕКТИ ГЕОНАСЛЕЂА У СРБИЈИ GEOMITOLOGY AND GEOHERITAGE OBJECTS IN SERBIA Mališa Mladenović, Srdjan Belij	12.45-13.00
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ПОТЕНЦИЈАЛ САМОНИКЛИХ БИЉНИХ ВРСТА У РЕМЕДИЈАЦИЈИ ОТКРИВКЕ РУДНИКА БАКРА У БОРУ, СРБИЈА POTENTIAL OF NATURALLY GROWING PLANT SPECIES FOR REMEDIATION OF MINE WASTES IN BOR, SERBIA Dragana Randelović, Slobodan Jovanović, Robert Šajn, Nevena Mihailović, Vladica Cvetković	13.30-13.45
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РАНИЈИ СТРАТИГРАФСКИ МОДЕЛИ КВАРТАРА СРБИЈЕ – ОБЈАВЉЕНИ НА СРПСКОМ ЈЕЗИКУ THE PAST QUATERNARY STRATIGRAPHICAL MODELS FOR SERBIA – PUBLISHED IN SERBIAN LANGUAGE Tivadar Gaudenyi, Mladjen Jovanović	17.45-18.00
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СЕДИМЕНТОЛОГИЈА И БИОСТРАТИГРАФИЈА САНТОНСКО-КАМПАНСКИХ КРЕЧЊАКА ОКОЛИНЕ БРЕЖЂА (ЦЕНТРАЛНИ ДЕО ВАРДАРСКЕ ЗОНЕ) SEDIMENTOLOGY AND BIOSTRATIGRAFY OF SANTONIAN-CAMPANIAN LIMESTONE FROM BREŽĐE VICINITY (CENTRAL PART OF THE VARDAR ZONE) Violeta Gajić, Milena Dunčić, Vladislav Gajić, Nebojša Vasić	
BADENSKI MEKUŠCI RAKOVIČKOG POTOKA (BEOGRAD) THE BADENIAN MOLLUSKS FROM THE RAKOVICA STREAM (BELGRADE) Meri Ganić, Katarina Bradić, Stefan Vlastić, Slobodan Knežević, Ljupko Rundić	
MESSINIAN EVAPORITIC CRISIS ON THE PRE-ADRIATIC BASIN, ALBANIA Pandeli Pashko, Ibrahim Milushi, Vesel Hoxha	
MIDDLE JURASSIC RADIOLARIANS FROM OPHIOLITIC MÉLANGE OF DINARIDE OPHIOLITE ZONE (DOZ) - AGE AND GEODYNAMIC SIGNIFICANCE (PAPRATNICA RIVER, NORTHERN BOSNIA AND HERZEGOVINA) Branimir Šegvić, Alan Vranjković, Duje Kukoč, Vlatko Brčić, Špela Goričan, Elvir Babajić, Hazim Hrvatović, Ivan Dragičević, Majda Pađen	
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OKRUGLI STO: Zakonska regulativa i licenciranje geologa **ROUND TABLE: Legislation and licencing of geologists** **Sala I (do recepcije) / Hall I (next to reception desk)**	18.00-19.30

PROCEDURE FOR MARBLE CLASSIFICATION FROM BOREHOLES WITH PARTICULAR REFERENCES TO THE SIVEC MINE

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Key words: boreholes, marble, planning, reserves, resources, software

Abstract: Marble reserves are the most valuable asset of every marble company. That is why it is very important evaluation of the reserves to be undertaken in such a manner that will gave as full and precise picture of them. The Geological Department in AD Mermeren Kombina Prilep is implementing quantitative evaluation of marble according to the existing law regulations in the country and also to be compliant with the International standards for reporting on mineral resources and reserves. That's why we have established this Procedure for marble characterization.

INTRODUCTION

The ultimate aim of the quantitative evaluation of marble resources and reserves that is implemented by the Geological Department is to define new reserves and to achieve a better quantitative evaluation of the existing quarries and reserves. The area for investigation, the network, the depth as well as the technical characteristics of the planned drilling holes (DH) are defined according to the state-of-the-art principles of the geological science and taking into consideration all the geological data of the areas and needs for planning the mining operations in the quarry.

The data out of the DH are very important, since they provide as with fundamental input to define the economic feasibility of the exploitation of the marble areas and define strategic decisions for the company (profitability, needs for investments, production capacity etc).

In any case, marble reserves are the most important asset of the marble companies. Consequently, is of crucial importance to know in the most accurate way the total reserves that are related directly with the technical, economic and financial sustainability of the company.

To achieve the above aimed goals the following requirements have been set, namely:

1. The Geological department is regarded as an important link in the organizational structure of the AD Mermeren Kombinat Prilep.

2. To accomplish the tasks and the goals that are related with the Geological Department, all the necessary funds and tools are timely provided to the department and all the professional

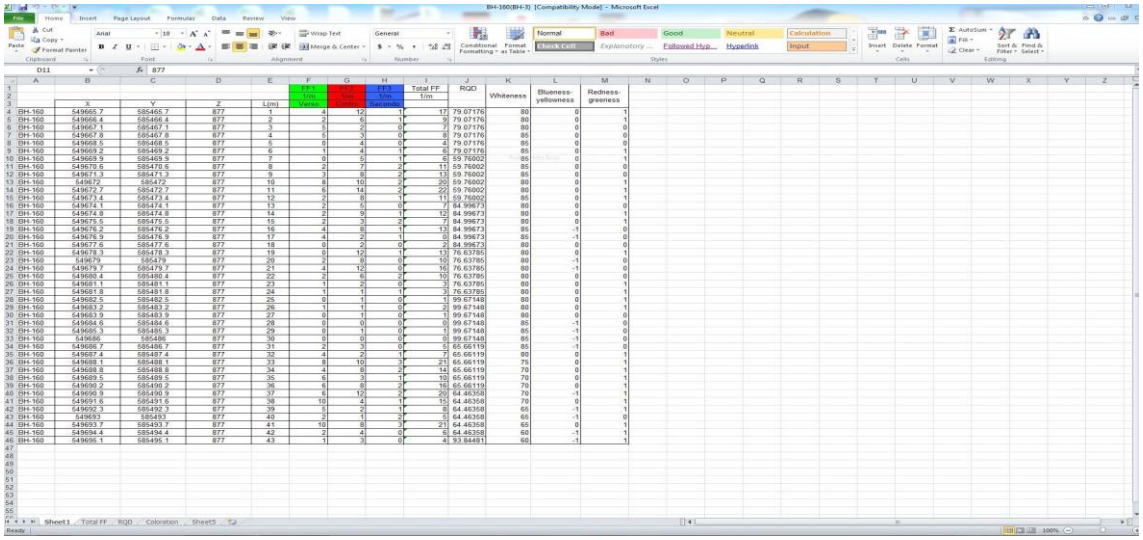
tools are top of the class (GPS device, geological compass, mining and geological software and etc.).

3. The Geological Department has a very active role in the necessary decisions that are connected or directly refer to its work goals and tasks as well as with those directly related to the Department for Planning and Development.

METHODS

At the end of the year, Head of the Geological Department, for the next year, prepares plan for the geological research of the quarry. This research program is planned based on the observations in the field, geological maps and existing DH in the quarry. This plan includes maps of all the areas that are going to be explored, also includes total numbers of the boreholes with depths and locations, and also other methods of geological research like laboratory tests or use of geophysical methods and other Each DH has a unique code of the type borehole number/ number of the quarry/ year when was drilled (exam. DH102/5/13). The Surveying Department puts on the field the position that the DH should be implemented based on the map position. When the borehole is finished than the Head of Geological Department informs the surveyors to measure again the final exact position of that borehole. These are the coordinates that are final and this coordinates are putted in the excel file that is characteristic for each DH.

In order to be more easy to implement the data of each borehole in the geological software, that we use to prepare block model, in which we will calculate the potentials reserves of marble and to find the zones with the quality marble within the quarry the Head of Geological Department fills the script with geological description of every borehole in an appropriate excel format for subsequent use as an input file to the block model programme (pic.1).



Picture 1

The necessary experience and knowledge possessed by Head of the Geological Department that has been acquired through many years of experience in marble panel extraction and characterization, allows the appropriate characterization of the drill cores regarding the commercial quality of the marble and geological criteria. (Appleyard G.R. 2001)

For better differentiation of the main joints in this procedure we map them with different color. For so called „VERSO”-joints or bedding joints we use green color marker; for „CONTRO”-joints or joints that are perpendicular to the bedding we use red color marker and for the „SECONDO”-joints which are sub-vertical or vertical joints we use blue color marker (Picture 2).

Picture 2

All the recovered cores from the borehole are kept in wooden boxes with a length of 2 m that allow 3 samples (6 meters in total). Each of these boxes is put in a certain area and a photo is taken by the Head of Geological Department. The photos are kept in a folder in company’s P/C. The boxes are kept in an area and they are never disposed.Upon finalization of the methodology used to characterize the marble cores extracted from boreholes that are properly and safely preserved and their subsequent insertion into excel file format, then this characterization should not change, because any alteration of the results can affect the model calculation of the estimated marble resources. These calculations are used as the fundamental tool for the mid and long term strategies of the Company. Consequently, any changes can potentially mislead the management to take wrong decisions and create big financial losses to the Company. In any case the need even for minor changes must be reported immediately to higher responsible managers in order to align the strategies accordingly.

RESULTS AND DISCUSIONS

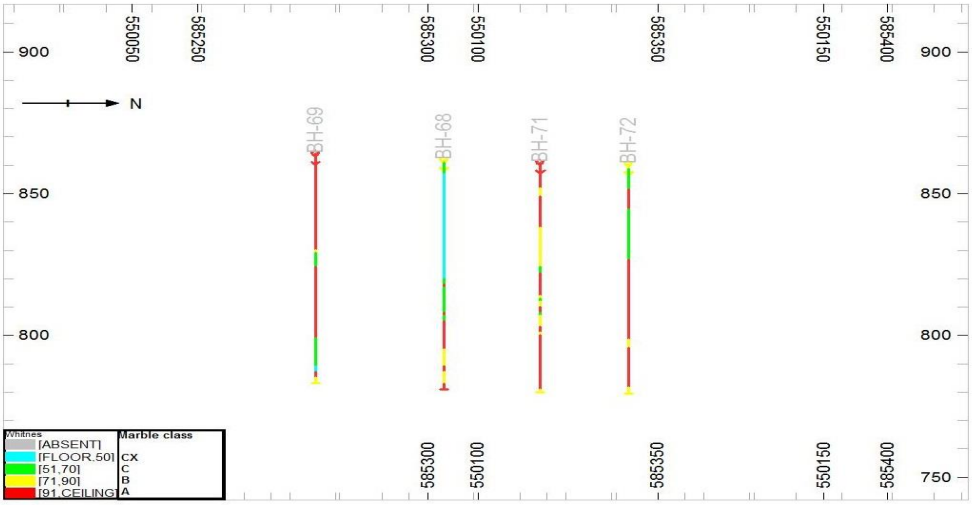
The two most important parameters for the classification of the marble included in this Procedure for marble, classification are:

1. Coloration is the main parameter for the classification of the marble, since this defines whether a material is commercial or not, and if the material is white than selling price is much higher. Therefore, the proper description of the colour of the DH is essential for the future strategic plans for the quarry development as it is also and for the company, and any mistakes or modifications of the data can lead the management to make wrong business decisions that will cost financially the company. (Петрушев Е.,Столиќ Н.2012)

The coloration of the marble from the boreholes are classified in four (4) basic colours categories (as shown in Picture 3) which are based on commercial categories of marble that are sold in AD Mermeren Kombinat Prilep as following:

1. A - white, high quality marble
2. B - white marble with rare coloring and veins
3. C- blurred marble with strong coloring veins
4. CX – colored marble

A and B classes are commercial material which are high quality material and are top selling products, C class is commercial material with very small value and CX category is not an commercial material and can be considered as waste.



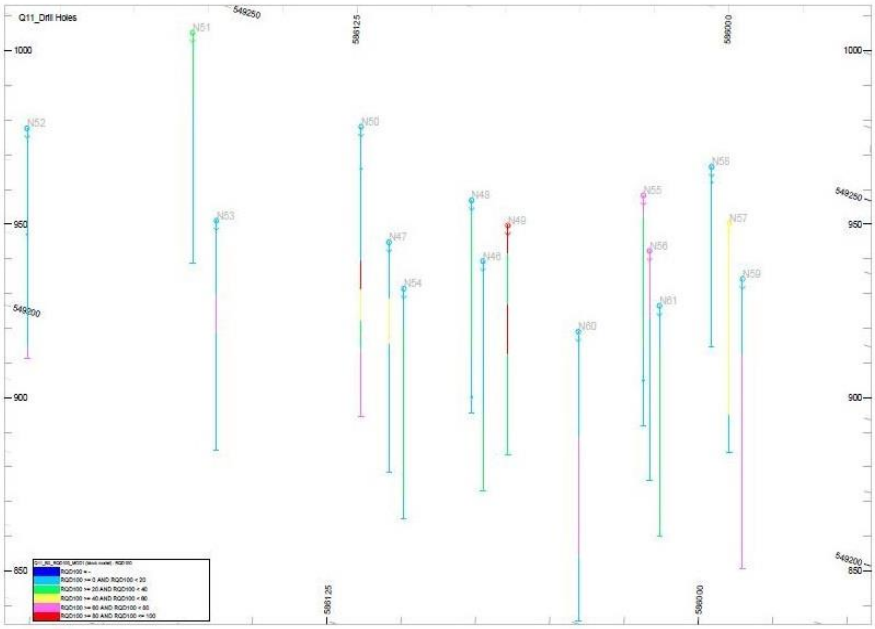
Picture 3

2. Second very important parameter that is used for description of the boreholes in this Procedure is Rock Quality Designation (RQD). (Deere, D.U. and Deere, D.W. 1988)

The RQD (Picture 4) provides a subjective estimate of rock mass quality based on a modified core recovery percentage from a double or triple tube diamond core barrel. The RQD is found by integrating all spacing values above 0.1 m and expressing the resultant value as a proportion of the summed length of all spacing values, in the following manner:

RQD (%) *= 100 x Length of Core in pieces > 10cm / Length of Core Barrel*

Mechanical breaks caused by drilling or handling of cores should not be included in the RQD calculation.



Picture 4

Based on the values of RQD we have distinguished five categories of marble from the boreholes drilled:

1. Very poor (RQD 0-25%)
2. Poor (RQD (25-50%)
3. Fair (RQD 50-75%)
4. Good (RQD 75-90%)
5. Excellent (RQD 90-100%)

The first two categories with RQD between 0 and 50 % are with no commercial value for producing marble blocks of any size, and so they are considered as a waste, although they can be used for producing crashed aggregates. From the third category with RQD between 50 and 75 % we can have only small size blocks with little commercial value. Commercial blocks

with medium or large sizes are excavated from the other two categories with RQD from 75 to 100 %.(Deere D.U. 1989)

In any case the norms for the description of the boreholes are established as above and then should be applied with transparency, materiality, and competence. Transparency in a way to be explicit, concise and without any kind of ambiguity. Materiality in order to be applied to relevant, fundamental and essential aspects associated with the definition and certification of Mineral Prospects, Resources and Reserves. Competence, because they must be prepared by qualified and competent professional who is subjected and ruled by Ethical and Professional Codes of Conduct. That's way there is no space for any data manipulation or alteration to be done since they are against the main principles described above and can lead to that we will have unreliable results, and they can mislead the future planning and strategic decision of the company.(JORC code 2012 edition)

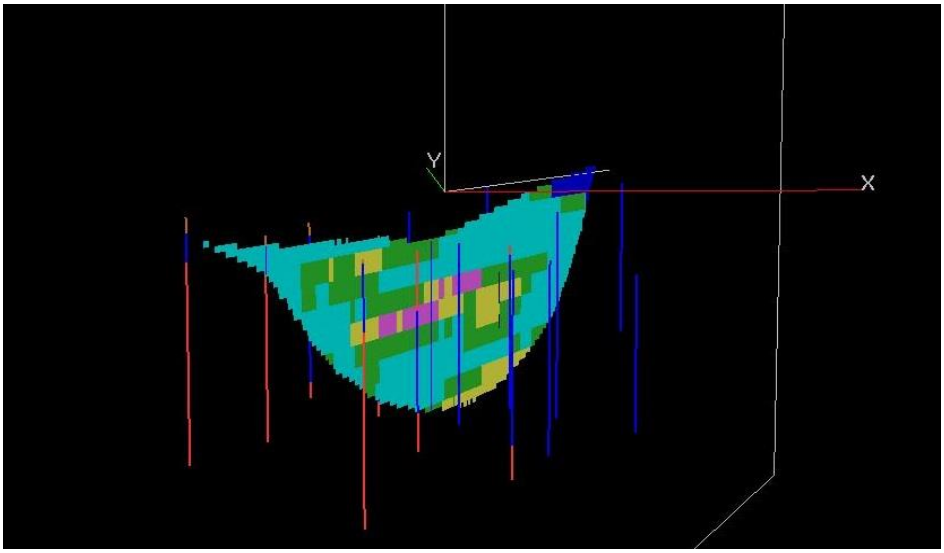
-RESOURCES MODELLING

All the above procedures are designed to be able to implement them in Datamine™ software (CAE Mining,Canada) that will help in the strategic planning of the excavation in the future. From the geological data collected and implemented in the software we will prepare a block model for calculating the reserves by colour and RQD. From this block model we can give directions for the mining operations and to optimize the production of marble blocks with high quality.

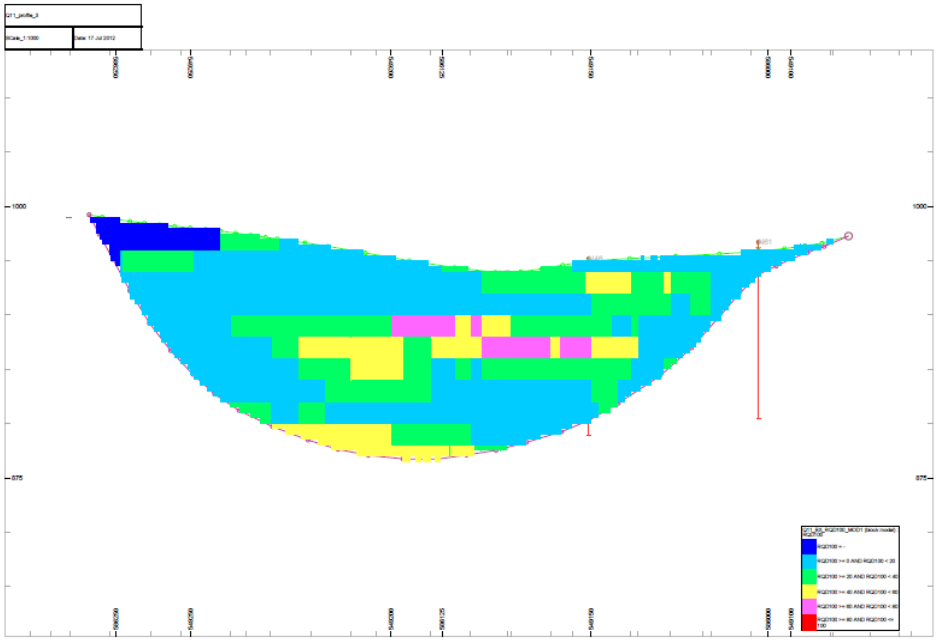
A block model is a small-scale representation of a real situation. These models must be prepared and designed in a way to be easily understandable for any one who will make decisions based on them.

Block models represent three-dimensional shapes, volumes, tonnages and grades of solids such as yield zones, waste zones and other volumes of geological or mineralogical interest. Block models consist of blocks, which are cubes or cuboids, stacked together to fill the defined volume as closely as the block sizing criteria will allow.

This software gives as many options for interpretation of the geological data collected both from the boreholes and other geological field work like measuring the joints and implementing them in the software so we can have more better picture in 3-d of the quarry. Also there possibilities that based on the block model that we have, we can predict monthly production and also qualities of the marble that we will have that month. Wealth of options is allowed by the software when it comes to formatting the display of geological block model data. The **VR** window (Picture 5) provides its own set of unique visualization options. Two such options are the ability to view a block model as a quick section or an intersection (Pictures 5 and 6).(Datamine Studio 3D User Guide, 2010)

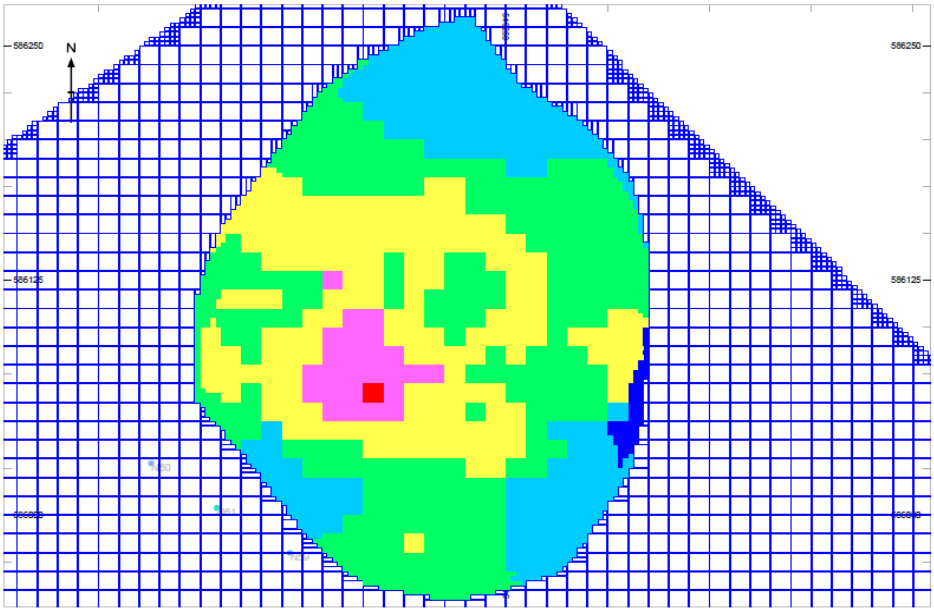


Picture 5



Picture 6

Different colors represent different classified qualities based on the description of the boreholes. Consequently, any non-properly recorder data and much more any reclassifications done in the records of the boreholes can mislead the companymanagement and result to a non-economic basis operations of the Company. For example, the technical feasibility and economic viability study of an area that has been defined based on the descriptions of the color of boreholes and the contributions margins of each category, can be totally altered in cases of reclassification from one commercial category to another or even more from a commercial to a non- commercial category.



Picture 7

In the picture 7 we have presented plan view of the block model of the certain area, and we can see how well and clearly the different zones of qualities of marble are represented. These possibilities and also the other additional futures of the software like pit optimization, designing the open pit in such manner to have optimum recovery of the material, when you have proper data inputted makes this tool very important.

CONCLUSIONS

Having a top of the class geological software itself does not means that it will gave us the desired results. For me it's the quality of the data entered in the software what matters most.

This procedure described above and going by the directions that are included in her, gives as very large certainty that data entered in the software will be without errors that can lead as to make wrong decisions that eventually will cost us financially.

Having a procedure for geological data for me it's one of the crucial things in every company that works with minerals and ores. However, this procedure must be adjusted to the mineral resource that is investigated or mined, because of the different parameters that are important for every mineral deposit.

The above described procedures give us very good base for categorization of the architectural stones like marble, because in this area main criteria for determining the quality of the deposit are coloration and compactness of the material in that deposit.

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