

**Economic Impact of the Excelsior Mining Corporation on Cochise
County and the State of Arizona**

September 2014

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1. Introduction

This report summarizes the economic impact analysis of a new copper mining business, operated by the Excelsior Mining Corporation. The mine is to be located in Cochise County in southeast Arizona and operate during the time period 2017-2041.

Excelsior is developing a low cost copper project in Southeast Arizona. The oxide resource in this area has the potential to be mined using in-situ recovery methods, which results in much lower cost and environmental impact than conventional mining methods. Pre-production activities will start in 2014, and consist of for carrying out feasibility studies, obtaining permits and performing basic engineering work, followed by construction. Production starts in 2017 and lasts 20 years (2017-2036), and is followed by the post-production/ closure phase, which lasts 5 years (2037-2041). All economic activity associated with the mine will cease by the end of 2041.

When a business decides to locate in Arizona there is a resulting increase in capital expenditures as new buildings are constructed and/or old buildings are remodeled. Also, industry specific expenditures may be required to ensure the facility is fit-for-purpose. These initial expenditures create and support jobs in the construction industry as well as other sectors of the local economy such as finance, real estate, and government. Further capital investment follows as the business grows.

Coupled with this initial capital investment there are new jobs created once the business hires workers and begins operation. Unlike in the construction phase, these subsequent jobs will continue as on-going during the life of the business.

What are described above are the direct impacts on the Arizona economy from a new business locating within Arizona's borders. These direct impacts are generally relatively easy to identify and calculate. Indeed, Excelsior, as a part of the consideration for establishing mining operations in Arizona, has calculated these direct effects.

However, there are additional, 2nd order, expenditures and jobs created as a result of the initial “injection” of expenditures and on-going jobs. For example, a driller hired at the mine would represent a direct job. The income that this driller receives and thus spends in the local economy will in turn create revenues/income for a gamut of different businesses.

These rounds of expenditures are not self-perpetuating, instead through time the rounds of expenditures become smaller as more of the income/expenditures “leaks” out of the local economy. These leakages may be due to purchases outside the region or additions to savings that are withdrawn from the spending stream.

The cumulative impacts of these rounds of expenditures or “ripple effects” are known as the multiplier effect within economics. Importantly, there is no one “magic” multiplier number for every conceivable scenario. Due to the inter-linked nature of the Arizona economy within itself and its connections to the rest of the US (and world) the eventual ripple effects depend on numerous different factors. What matters is the size of the initial direct impact, the geography where it occurs (which county), and in which sector of the economy (manufacturing, mining, finance, etc.). To measure cumulative effects over time, it is necessary to estimate how many years these annual direct impacts will continue.

Therefore to fully understand the total impact that a new business will have on the Arizona economy is rather more complex than just an extrapolation of direct impacts and is thus the reason for this study.

The methodology set out and followed below has its basis in the pioneer work of Wassily Leontief, who was awarded the Nobel Prize in 1973 for development of input-output analysis as a means to understanding the workings of the interconnected sectors of the economy. The methodology was soon extended from the national macro economy to the study of inter-industry relationships underlying regional economic growth and development by scholars such as Walter Isard (*Methods of Regional Analysis: An Introduction to Regional Science*, New York, Technology Press of MIT) and William Miernyk (*Regional Analysis and Regional Policy*, Cambridge, Oelgeschlager, Gunn & Hain).

2. Study Method and Scenario Examined

Below is a brief description of the study method adopted and scenario examined to estimate the impact of a new business locating in Arizona.

2.1. Study Method

This study makes use of an Arizona-specific version of the REMI regional forecasting model to produce numeric estimates of the impact on the Arizona economy of a new business locating in Arizona. The REMI model has been used and tested by national researchers for many years, over a wide range of projects, and the model is well known in Arizona, where it has been in use since 2003.

Arizona public sector users of the REMI model include the Arizona Department of Commerce, the Arizona Joint Legislative Budget Committee, the Arizona Department of Housing, and Arizona State University.

The REMI model is especially useful when examining the economic impact associated with businesses expanding or relocating to a particular region, state or country. Through its dynamic modeling, REMI assists with fully demonstrating how the economic impact of a business will vary as it moves from the establishment to operations phase, as well how estimates may vary through time within a particular phase of the project. The estimated impacts are the difference between the baseline economy and the baseline economy augmented with the new enterprise. The simulations are designed in the current application to measure the Arizona economy over the production life of Excelsior's copper project with and without the project in place. The changes in key measures of economic activity are known as the economic impacts.

Using a county level model enables a more detailed disaggregation of results to occur such that economic impacts that "leak" into other counties of Arizona are also estimated.

Finally, given its overall flexibility REMI allows a whole host of different scenarios – such as a scenario with and another one without an acid plant– to be examined but at that same time providing estimates that are consistent across projects.

The method for estimating the macroeconomic impact involves four fundamental steps:

- 1. Preparation of a baseline forecast for the state economy:** This baseline scenario provides a forecast of the future path of the Arizona economy based on a combination of the extrapolation of historic economic conditions and an exogenous forecast of relevant national economic variables – this is often referred to as the regional control scenario.
- 2. Development of a policy scenario:** This policy scenario describes the *direct* impacts that a new business locating in Arizona will generate. The inputs in terms of planned direct hiring and planned purchases of supplies and equipment were provided by Excelsior.
- 3. Preparation of a forecast of the state economy based on the policy scenario:** This alternative forecast provides a simulation of the future path of the Arizona economy, incorporating the effects of the changes specified in the policy scenario.
- 4. Comparison of the baseline and policy scenario forecasts:** The differences between the future values of each variable in the forecast results provide numeric estimates of the nature and magnitude that a new business locating in Arizona would have on the Arizona economy, relative to the baseline.

2.2. Caveats in Input-Output Modeling

The results of REMI or any economic impact model should be interpreted with care and with attention to factors outside the scope of the model.

In the case of the Excelsior’s copper project, the new capital investment will take place in Cochise County which is far less developed today than other Arizona counties, such as Maricopa and Pima. REMI is based on establishing a baseline growth trajectory for the State and will implicitly assume that all segments of the State will grow commensurately. Hence it is, a priori, unable to recognize any disproportional growth tendencies that may or may not occur in Cochise County.

REMI uses reported census data to estimate fiscal impact of a particular capital investment and formulates projections of new taxes paid based upon the new Gross State Product and employment dollars injected into the economy. In the case of a new mining operation, this approach fails to recognize the disproportionate contributions that the mining industry makes to Arizona. The actual tax obligations that will be paid directly by Excelsior will depend on the net revenue produced by the mining operations. Hence, the assessment of fiscal impact undertaken in the analysis relies on REMI for estimates of taxes paid by workers employed by Excelsior and relies on estimates obtained directly from Excelsior to estimate taxes paid directly by the company.

Considerations for recent tax rate changes, e.g. the significant corporate tax rate reductions incorporated in the recently passed jobs bill were also considered in the analysis since they are beyond the scope of the base REMI simulation.

3. Simulation Results

To model the economic impact of Excelsior's copper project, the effects were broken down into three distinct phases: (1) the pre-production/construction phase, (2) the operations (production) phase and (3) the reclamation/ closure phase. The timelines for these phases were provided by Excelsior. The study period was over the timeframe 2015-2041.

The pre-production/construction phase has a duration of two years¹ (2015 - 2016), with feasibility studies being done during the first year and construction taking place during the second year. During this time there will also be initial hiring and training of personnel for the later operations phase, but most of the expenditures and employment will be related to testing, analysis, and preparation of the site, obtaining permits and performing basic engineering work.

The operations phase extends for a 20 year period, 2017 - 2036. This is the period of greatest economic impact, not only because of its duration, but because it includes the peak employment, income and tax revenue generation periods.

¹ 2014 is not included because little economic activity takes place and no data on expenditures is available

The reclamation/closure period lasts 5 years, from 2037 – 2041. Mineral recovery employment at the site winds down, but economic activity continues due to reclamation and restoration of the site for future uses. All economic activity directly associated with Excelsior’s copper project ceases by the end of 2041.

Also, two separate scenarios were modeled, based on data provided by Excelsior: the first one is the “Non-Acid Plant” scenario (Scenario A), where no acid plant is built, and the second one is the “Acid Plant” scenario (Scenario B), where Excelsior invests more capital in building an acid plant, which in turn leads to smaller operating costs.

Using REMI the results provided below incorporate the direct economic impacts associated with the establishment and operations of Excelsior’s copper project as well as any potential indirect impacts that may occur due to the increased economic activity associated with the newly established business.

Again, it is important to note that all figures presented below are relative to the baseline forecast of no mining operations being started by Excelsior in southeast Arizona. For instance, if gross state product is estimated to be “x” dollars higher than the baseline case, this does not mean it is x dollars higher than what gross state product is today but it is x dollars higher than what gross state product is forecast to be in that given year if the new business had not located in Arizona.

The fundamental inputs for the simulation were provided by Excelsior; these inputs are based on the “Gunnison Copper Project” Prefeasibility Study² completed in February 2014. We received detailed annual capital expenditures, operating expenditures including both labor and purchases, estimated operating revenue and estimates for employee deployment by type of occupational category, as well as estimated tax payments. The data are confidential and will not be reproduced in this report.

² http://www.excelsiormining.com/images/Projects/GunnisonProject/PFS_2_14_14.pdf

The tables below set out the economic impact of Excelsior's copper project, by phase, and by key economic activity measures. Results are presented for the host county as well as Arizona overall, separately for the two alternative scenarios. Results are presented as averages by project phase as well as the cumulative impacts by project phase and for the life of the project. All dollar amounts are measured in 2014 dollars.

3.1. Employment Impacts

During the two years of the pre-production phase, Arizona employment will average 654 workers greater annually than without the project in both scenarios (with and without the acid plant); Cochise County employment will be greater by 235 workers in both scenarios (see Table 1A and Table 1B).

The pre-production phase will create mainly direct construction jobs, and as these workers spend their incomes, other jobs are created in professional and technical services, retail, health care, finance, and other industries of the general economy (see Table 2A and Table 2B).

During the 20 years of the production phase, average annual employment in Arizona will be increased by 1,034 jobs in the "Non-Acid Plant" scenario and 996 jobs in the "Acid Plant" scenario, while Cochise County employment will be up an average of 364 jobs in the "Non-Acid Plant" scenario, and 351 jobs in the "Acid Plant" scenario. It is likely that most of the Arizona jobs not created in Cochise county will be in neighboring Pima, Pinal, Graham and Santa Cruz counties.

In the reclamation/closure phase, annual average employment becomes smaller, increasing by 183 Arizona jobs in the "Non-Acid Plant" scenario and 178 jobs in the "Acid Plant" scenario. Cochise County jobs increase by an average of 36 jobs in the "Non-Acid Plant" scenario and 30 jobs in the "Acid Plant" scenario over the five year period.

The fourth columns of Tables 1A and 1B show annual average job creation over the combined three phases of the project. On average, during the lifetime of the project, Arizona jobs are greater by 848 in the "Non-Acid Plant" scenario and by 819 in the "Acid Plant" scenario.

Cochise County jobs are increased by 287 in the “Non-Acid Plant” scenario and by 283 in the “Acid Plant” scenario.

Tables 2A and 2B provide a summary of the distribution of jobs predicted by REMI as a result of Excelsior’s copper project. These tables predict unsurprisingly that a considerable number of jobs will be generated in mining but substantial job creation will also occur in professional, technical and administrative services. All sectors of the economy will see job growth but the new job creation is not dominated by growth in retail, trade and construction – the sectors that have seen the most job creation historically in Arizona.

Tables 3A and 3B combine jobs over the years into “worker-years,” a measure of years of employment created by Excelsior’s copper project. For Arizona, Excelsior’s copper project creates 22,895 worker-years in the “Non-Acid Plant” scenario and 22,116 worker-years in the “Acid Plant” scenario. For Cochise County, Excelsior’s copper project creates 7,935 worker-years in the “Non-Acid Plant” scenario and 7,632 worker-years in the “Acid Plant” scenario.

It is typical within economic impact assessment reports to disaggregate employment into direct and indirect/induced jobs. Tables 4A and 4B provide estimates for total jobs throughout the lifetime of the project. The jobs multiplier- calculated as the percentage increase represented by indirect and induced jobs compared to direct jobs- is approximately 720% during the life of the mine (somewhat higher in the “Non-Acid Plant” scenario and lower in the “Acid Plant” scenario). Thus, each direct job created by Excelsior creates 7.2 other jobs in other sectors of Arizona’s economy.

3.2. Gross State Product

Gross State Product (GSP) represents new production, sometimes called “value added.” GSP for Arizona is the contribution of Arizona to Gross Domestic Product (GDP) for the nation, the measure of the country’s annual output of goods and services. Cochise County GSP is the contribution of Cochise County activity to Arizona GSP, and hence to U. S. GDP.

The annual average addition to Gross State Product over the duration of the project for Arizona is \$110.3 million in the “Non-Acid Plant” scenario and \$109.0 million in the “Acid Plant” scenario. For Cochise County, it is \$28.2 million in the “Non-Acid Plant” scenario and \$28.0 million in the “Acid Plant” scenario (see fourth column of Table 1A and Table 1B).

The Gross State Product section of Tables 3A and 3B show the total impact of Excelsior’s copper project on Arizona and Cochise County GSP over the 27 year life of the project.

Over its life, Excelsior’s copper project contributes \$2.979 billion additional value added to Arizona GSP in the “Non-Acid Plant” scenario and \$2.943 billion in the “Acid Plant” scenario. Cochise County activity contributes \$760.7 million in the “Non-Acid Plant” scenario and \$756.8 million in the “Acid Plant” scenario.

Considering annual average contributions for the “Non-Acid Plant” scenario in Table 1A, GSP increases in Arizona by \$71.3 million in the pre-production phase, then the impact of the mine almost doubles during the production phase (\$135.7 million annual average.) The impact of the mine on Cochise County GSP also doubles from the pre-production to the production phase, rising from an annual average GSP of \$17.2 million to \$35.9 million during each of the 20 years of the production phase.

Examining the “Acid Plant” scenario results displayed in Table 1B, incremental GSP increases in Arizona by \$71.3 million in the pre-production phase, and by \$134.1 million during the production phase. Similarly the impact on Cochise County GSP rises from an annual average GSP of \$17.2 million during the pre-production phase to \$35.8 million during each of the 20 years of the production phase.

The contribution of the production phase is \$2.71 billion additional GSP to Arizona GSP in the “Non-Acid Plant” scenario and \$2.68 billion in the “Acid Plant” scenario (Tables 3A and 3B). For Cochise County the contributions are \$717.0 million additional GSP in the “Non-Acid Plant” scenario and \$716.1 million additional GSP in the “Acid Plant” scenario.

In the reclamation phase, the project still contributes \$122.5 million to Arizona GSP in the “Non-Acid Plant” case scenario and \$118.3 million additional GSP in the “Acid Plant” scenario. The project contributes \$9.2 million to GSP in Cochise County in the “Non-Acid Plant” scenario and \$6.2 million additional GSP in the “Acid Plant” scenario. (Tables 3A and 3B).

3.3. Personal Income

The components of personal income include not only wages and salaries of workers, but also the contributions by employers to worker social security and benefit accounts. Proprietor’s earnings by owners of small business are included in personal income, as well as rental and interest income. The REMI model provides estimates of each of these components that are related to the presence and operation of Excelsior’s copper project over the 27 year life of the project.

From Tables 1A and 1B, it can be seen that the annual average additional personal income in Arizona during the two year pre-production phase is \$33.3 million in both scenarios. During the production phase, the contributions are \$76.7 million in the “Non-Acid Plant” scenario and \$75.8 million in the “Acid Plant” scenario. During the reclamation/closure phase of the project average annual personal income in the state increases by \$32.3 million in the “Non-Acid Plant” scenario and by \$32.8 million in the “Acid Plant” scenario. The overall annual average addition in personal income state-wide over the 27 year period is \$65.2 million in the “Non-Acid Plant” scenario and \$64.7 million in the “Acid Plant” scenario.

Statewide personal income during the life of the mine is increased by \$1.76 billion in the “Non-Acid Plant” and \$1.75 billion in the “Acid Plant” scenario. Cochise County personal income rises by \$416.6 million in the “Non-Acid Plant” scenario and \$387.5 million in the “Acid Plant” scenario over the lifetime of the project (fourth column of Tables 3A and 3B).

The 20-year production phase accounts for the largest proportion of the increase in Arizona personal income due to Excelsior’s copper project.

3.4. State Revenues

The REMI model predicts that Excelsior’s copper project will add \$305.7 million additional revenue to the state in the form of additional tax and fee collections in the “Non-Acid Plant” scenario and \$294.7 million in the “Acid Plant” scenario (Tables 5A and 5B). Cochise County’s revenue over the life of the mine will rise by \$111.0 million in the “Non-Acid Plant” scenario and \$98.4 million in the “Acid Plant” scenario.

The annual average impact on Arizona government revenues is \$11.3 million in the “Non-Acid Plant” scenario and 10.9 million in the “Acid Plant” scenario (Tables 1A and 1B), with Cochise County activity accounting for \$4.1 million and \$3.6 million on average each year.

3.5. A Closer Look at Fiscal Impacts Phase

Tables 5A and 5B depict a detailed summary of state revenue flows predicted in the REMI simulation. The simulation assumes static tax rates and takes account of revenues compiled in the census tabulations of state and local government finances in comparison with the size of the economy. As the economy grows as a result of any particular new operation (in this case the Excelsior Copper Project) REMI assumes that revenues will flow commensurately. Some of this revenue will come from traditional tax sources, e.g. sales and income taxes while the remainder will be comprised of new revenues that flow as a result of greater populations and incomes. Some of this will be in the form of intergovernmental transfers from the Federal Government, some will come from fees, from utility assessments, etc. Arguably the Excelsior mining operation provides the catalyst for these new revenue flows and the project will support the flow of funds from the Federal government through Excelsior’s federal taxes paid as a result of the company’s mining operations in southeast Arizona.

At the same time it is important to drill down to the components of the new taxes generated because REMIs averaging method may not adequately capture the nuances of the Arizona tax

code like severance tax assessments and mining royalty payments. Moreover, REMI assumes static tax rates based on historical census data and this will not allow it to account for the corporate tax rate changes that have started in 2014 as a result of the “jobs bill” legislation passed during the spring 2011 legislative session. Using an analysis of financial data on operations received directly from Excelsior combined with an analysis that properly accounts for the tax rates that are currently in statute, the fiscal impacts can be refined.

Tables 6A and 6B presents a set of refined estimates for the fiscal impact of the Excelsior operations. The table depicts the individual income, sales and selective sales tax estimates forthcoming from REMI. These tax dollars represent the combined tax payments of Excelsior as well as the tax dollars induced by the economy activity that takes place as a result of the direct Excelsior activities. We then combined estimates of severance, property tax and corporate income tax payments that will be generated by the Excelsior operations. The estimates reflect the recent corporate tax rate reductions that have started in 2014.

The estimates of revenue impact that are informed directly by the Excelsior financial statements are higher than those predicted by REMI, and this is especially true in the “Acid Plant” scenario. Based on this refined set of estimates, Excelsior’s copper project will add \$312.1 million additional revenue to the state in the form of additional tax and fee collections in the “Non-Acid Plant” scenario and \$319.9 million in the “Acid Plant” scenario (Tables 6A and 6B).

REMI underestimates the corporate and property tax payments that will come directly from Excelsior so it is reasonable to assume that the annual average impact on Arizona revenues will range from \$10-\$12 million per year depending on whether Excelsior takes on the acid plant investment. Cochise County annual revenues will be about \$4 million in either case as a result of the Excelsior investment.

These estimates depend upon financial statements produced by Excelsior to estimate the expected costs and revenues over the life of the mining investment. Importantly, Excelsior bases these estimates on an ongoing inflation adjusted copper price of \$2.75 per pound. Recently³ the price of copper has averaged about a dollar per pound higher than this long run

³ The average copper price of U.S. producers was \$3.70 per pound between 2010-2013 according to the U.S. Geological Survey

estimate. Should this higher price be maintained over the life of the mine, gross revenues and accompanying tax revenues will be higher commensurately.

Table 1 A
Scenario A (“Non-Acid Plant”)
Annual Average Impact of Excelsior Copper Project By Phase

Impact Category	Pre-Production Phase	Production Phase	Reclamation/ Closure Phase	Project Annual Avg. Impact
	2015 - 2016	2017 - 2036	2037 - 2041	2015 - 2041
Total Employment	Annual Average Employment by Phase			Employment
<i>Arizona</i>	654	1,034	183	848
<i>Cochise County</i>	235	364	36	287
Gross State Product*	Annual Average GSP by Phase			GSP
<i>Arizona</i>	71.3	135.7	24.5	110.3
<i>Cochise County</i>	17.2	35.9	1.9	28.2
Personal Income*	Annual Average Personal Income by Phase			Personal Income
<i>Arizona</i>	33.3	76.7	32.3	65.2
<i>Cochise County</i>	9.4	18.8	4.6	15.4
State Revenue*	Annual Average State Revenue by Phase			State Revenue
<i>From Activity in Arizona</i>	5.2	13.3	6.1	11.3
<i>From Activity in Cochise Co.</i>	2.3	5.0	1.3	4.1
* Values in Millions of 2014 Dollars				
Source: REMI Model of Arizona and Cochise Co. economies				

Table 1 B
Scenario B ("Acid Plant")
Annual Average Impact of Excelsior Copper Project By Phase

Impact Category	Pre-Production Phase	Production Phase	Reclamation/Closure Phase	Project Annual Avg. Impact
	2015 - 2016	2017 - 2036	2037 - 2041	2015 - 2041
Total Employment	Annual Average Employment by Phase			Employment
<i>Arizona</i>	654	996	178	819
<i>Cochise County</i>	235	351	30	283
Gross State Product*	Annual Average GSP by Phase			GSP
<i>Arizona</i>	71.3	134.1	23.7	109.0
<i>Cochise County</i>	17.2	35.8	1.2	28.0
Personal Income*	Annual Average Personal Income by Phase			Personal Income
<i>Arizona</i>	33.3	75.8	32.8	64.7
<i>Cochise County</i>	9.4	17.5	3.6	14.4
State Revenue*	Annual Average State Revenue by Phase			State Revenue
<i>From Activity in Arizona</i>	5.2	12.7	6.0	10.9
<i>From Activity in Cochise Co.</i>	2.3	4.4	1.1	3.6
* Values in Millions of 2014 Dollars				
Source: REMI Model of Arizona and Cochise Co. economies				

Table 2 A
Scenario A (“Non-Acid Plant”)
Annual Average Employment Impact by Sector in Arizona

	Pre-Production Phase	Production Phase	Reclamation/ Closure Phase	Average Employment
Sector	2015 - 2016	2017 - 2036	2037 - 2041	2015 - 2041
Mining	11	141	5	106
Utilities	14	4	0	4
Construction	44	80	2	62
Manufacturing	20	48	8	38
Wholesale Trade	36	44	8	37
Retail Trade	53	127	26	103
Transportation, Warehousing	32	15	2	14
Information	6	7	1	6
Finance and Insurance	53	25	2	23
Real Estate, Rental, Leasing	37	42	8	36
Professional ,Technical Services	97	131	27	109
Management of Companies	17	3	0	4
Admin. and Waste Services	67	71	13	60
Educational Services	5	16	6	13
Health Care and Social Assistance	37	74	25	63
Arts, Entertainment, Recreation	8	15	4	12
Accommodation , Food Services	27	62	19	51
Other Services	29	49	10	40
Government	61	80	17	67
Total By Project Phase	654	1,034	183	848

Source: REMI Model of Arizona and Cochise Co. economies

Table 2 B
Scenario B ("Acid Plant")
Annual Average Employment Impact by Sector in Arizona

	Pre-Production Phase	Production Phase	Reclamation/Closure Phase	Average Employment
Sector	2015 - 2016	2017 - 2036	2037 - 2041	2015 - 2041
Mining	11	141	4	106
Utilities	14	6	0	4
Construction	44	80	0	62
Manufacturing	20	41	4	33
Wholesale Trade	36	40	7	34
Retail Trade	53	118	24	96
Transportation, Warehousing	32	14	1	13
Information	6	6	2	5
Finance and Insurance	53	24	1	22
Real Estate, Rental, Leasing	37	40	9	34
Professional , Technical Services	97	118	22	99
Management of Companies	17	3	0	4
Admin. and Waste Services	67	65	10	55
Educational Services	5	15	10	13
Health Care and Social Assistance	37	73	27	62
Arts, Entertainment, Recreation	8	14	6	12
Accommodation , Food Services	27	59	23	50
Other Services	29	46	11	38
Government	61	93	17	77
Total By Project Phase	654	996	178	819

Source: REMI Model of Arizona and Cochise Co. economies

Table 3 A
Scenario A (“Non-Acid Plant”)
Total Economic Impact of Excelsior Copper Project By Phase

Impact Category	Pre-Production Phase	Production Phase	Reclamation/ Closure Phase	Project Average
	2015 - 2016	2017 - 2036	2037 - 2041	2015 - 2041
Total Employment	Worker-Years of Employment by Phase			Worker-Years
<i>Arizona</i>	1,309	20,671	915	22,895
<i>Cochise County</i>	469	7,286	180	7,935
Gross State Product*	Gross State Product by Phase			GSP
<i>Arizona</i>	142.6	2,713.8	122.5	2,979.0
<i>Cochise County</i>	34.5	717.0	9.2	760.7
Personal Income*	Personal Income by Phase			Personal Income
<i>Arizona</i>	66.6	1,532.9	161.3	1,760.8
<i>Cochise County</i>	18.8	375.0	22.8	416.6
State Revenue*	Annual State Revenue by Phase			State Revenue
<i>From Activity in Arizona</i>	10.3	265.0	30.4	305.7
<i>From Activity in Cochise Co.</i>	4.6	99.8	6.6	111.0
* Values in Millions of 2014 Dollars				
Source: REMI Model of Arizona and Cochise Co. economies				

Table 3 B
Scenario B (“Acid Plant”)
Total Economic Impact of Excelsior Copper Project By Phase

Impact Category	Pre-Production Phase	Production Phase	Reclamation/ Closure Phase	Project Total
	2015 - 2016	2017 - 2036	2037 - 2041	2015 - 2041
Total Employment	Worker-Years of Employment by Phase			Worker-Years
<i>Arizona</i>	1,309	19,917	890	22,116
<i>Cochise County</i>	469	7,011	152	7,632
Gross State Product*	Gross State Product by Phase			GSP
<i>Arizona</i>	142.6	2,682.1	118.3	2,943.0
<i>Cochise County</i>	34.5	716.1	6.2	756.8
Personal Income*	Personal Income by Phase			Personal Income
<i>Arizona</i>	66.6	1,515.6	164.8	1,747.0
<i>Cochise County</i>	18.8	350.6	18.1	387.5
State Revenue*	Annual State Revenue by Phase			State Revenue
<i>From Activity in Arizona</i>	10.3	254.2	30.2	294.7
<i>From Activity in Cochise Co.</i>	4.6	88.2	5.6	98.4
* Values in Millions of 2014 Dollars Source: REMI Model of Arizona and Cochise Co. economies				

Table 4 A
Scenario A (“Non-Acid Plant”)
Average Direct Versus Indirect and Induced Worker-Years in Arizona

	Pre-Production Phase	Production Phase	Reclamation/ Closure Phase	Project Average
	2015 - 2016	2017 - 2036	2037 - 2041	2015 - 2041
Direct Jobs	n/a	125	10	97
Indirect/ Induced Jobs	n/a	909	179	751
Indirect/ Induced Jobs as a percentage of Direct Jobs	n/a	727%	1,790%	774%

Source: REMI Model of Arizona and Cochise Co. economies

Table 4 B
Scenario B (“Acid Plant”)
Average Direct Versus Indirect and Induced Worker-Years in Arizona

	Pre-Production Phase	Production Phase	Reclamation/ Closure Phase	Project Average
	2015 - 2016	2017 - 2036	2037 - 2041	2015 - 2041
Direct Jobs	n/a	141	10	108
Indirect/ Induced Jobs	n/a	855	174	711
Indirect/ Induced Jobs as a percentage of Direct Jobs	n/a	606%	1,740%	658%

Source: REMI Model of Arizona and Cochise Co. economies

Table 5 A
Scenario A (“Non-Acid Plant”)
Baseline Fiscal Impact: State Revenues Created By Project Phase

Baseline Estimates	Pre-Production Phase	Production Phase	Reclamation/ Closure Phase	Cumulative Revenues
Tax Category*	2015 - 2016	2017 - 2036	2037 - 2041	2015 - 2041
Individual Income Tax	1.1	21.5	1.2	23.8
General Sales Tax	3.2	63.8	4.6	71.6
Selective Sales Tax	1.3	25.3	1.8	28.4
Corporate Income Tax	0.3	5.5	0.2	6.0
All Other Categories	4.5	148.9	22.5	175.9
Total By Project Phase	10.4	265.0	30.3	305.7

* Values in Millions of 2014 Dollars

Source: Calculations based on data from Excelsior Corp., W.P Carey School of Business and REMI Model of Arizona and Cochise Co. economies

Table 5 B
Scenario B (“Acid Plant”)
Baseline Fiscal Impact: State Revenues Created By Project Phase

Baseline Estimates	Pre-Production Phase	Production Phase	Reclamation/ Closure Phase	Cumulative Revenues
Tax Category*	2015 - 2016	2017 - 2036	2037 - 2041	2015 - 2041
Individual Income Tax	1.1	21.2	1.3	23.6
General Sales Tax	3.2	58.4	4.6	66.2
Selective Sales Tax	1.3	23.1	1.8	26.2
Corporate Income Tax	0.3	5.5	0.2	6.0
All Other Categories	4.5	146.0	22.3	172.8
Total By Project Phase	10.4	254.2	30.2	294.7

* Values in Millions of 2014 Dollars

Source: Calculations based on data from Excelsior Corp., W.P Carey School of Business and REMI Model of Arizona and Cochise Co. economies

Table 6 A
Scenario A ("Non-Acid Plant")
Adjusted Fiscal Impact: State Revenues Created By Project Phase

Adjusted Estimates	Pre-Production Phase	Production Phase	Reclamation/ Closure Phase	Cumulative Revenues
Tax Category*	2015 - 2016	2017 - 2036	2037 - 2041	2015 - 2041
Individual Income Tax	1.1	21.5	1.2	23.8
General Sales Tax	3.2	63.8	4.6	71.6
Selective Sales Tax	1.3	25.3	1.8	28.4
Adjusted Corporate Taxes**	0.0	188.1	0.2	188.3
Total By Project Phase	5.6	298.7	7.8	312.1

* Values in Millions of 2014 Dollars

** Combined severance, property, corporate, and local mining tax based on confidential estimates

Source: Calculations based on data from Excelsior Corp., W.P Carey School of Business and REMI Model of Arizona and Cochise Co. economies

Table 6 B
Scenario B ("Acid Plant")
Adjusted Fiscal Impact: State Revenues Created By Project Phase

Adjusted Estimates	Pre-Production Phase	Production Phase	Reclamation/ Closure Phase	Cumulative Revenues
Tax Category*	2015 - 2016	2017 - 2036	2037 - 2041	2015 - 2041
Individual Income Tax	1.1	21.2	1.3	23.6
General Sales Tax	3.2	58.4	4.6	66.2
Selective Sales Tax	1.3	23.1	1.8	26.2
Adjusted Corporate Taxes**	0	203.7	0.2	203.9
Total By Project Phase	5.6	306.4	7.9	319.9

* Values in Millions of 2014 Dollars

** Combined severance, property, corporate, and local mining tax based on confidential estimates

Source: Calculations based on data from Excelsior Corp., W.P Carey School of Business and REMI Model of Arizona and Cochise Co. economies

4. Conclusions

The goal of this study is to provide an assessment of how a new mining operation – Excelsior’s copper project, located in Cochise County in southeast Arizona – would impact economic activity in Arizona (with a focus on its host county, Cochise County) assessed by macroeconomic measures such as real gross state product, employment, state tax revenues and personal income.

Overall, Excelsior’s copper project is forecast to cause a significant increase in economic activity within Arizona throughout the life of the mine, with higher impacts during the production phase and smaller impacts during the pre- and post-production phases.

Regional economists would view this as a potential base or export industry investment that is important to the long run prosperity of a region because it results in a net inflow of dollars into the State and Cochise County, not simply a transfer of income from one agent to another within the State.

Appendix

The REMI Model

REMI is an economic-demographic forecasting and simulation model developed by Regional Economic Models, Inc. REMI is designed to forecast the impact of public policies and external events on an economy and its population. The REMI model is recognized by the business and academic community as the leading regional forecast/simulation tool available.

Unlike most other regional economic impact models, REMI is a dynamic model that produces integrated multiyear forecasts and accounts for dynamic feedbacks among its economic and demographic variables. The REMI model is also an "open" model in that it explicitly accounts for trade and migration flows in and out of the state. A complete explanation of the model and

discussion of the empirical estimation of the parameters/equations can be found at www.remi.com.

The operation of the REMI model has been developed to facilitate the simulation of policy changes, such as a tax increase for example, or many other types of events – anything from the opening of a new business to closure of a military base to a natural disaster. The model's construction includes a large set of policy variables that are under the control of the model's operators. To simulate the impact of a policy change or other event, a change in one or more of the policy variables is entered into the model and a new forecast is generated. The REMI model then automatically produces a detailed set of simulation results showing the differences in the values of each economic variable between the control and the alternative forecast.

The specific REMI models used for this analysis were Policy Insight Model PI+ version 1.5.2 of the Arizona state-level economy and version 1.5.2 of the Arizona county-level economy leased from Regional Economic Models Inc. by a consortium of State agencies, including Arizona State University, for economic forecasting and policy analysis.