APPENDIX E

Subsidence Management Plan

General Plan of Operations

Subsidence Management Plan

September 2014

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FIGURES

1. INTRODUCTION

Resolution Copper Mining (Resolution Copper) is planning a panel caving mine near the town of Superior, Arizona. Cave mining is a well-established mining method currently used at over 20 mining operations around the world, many of which have been in continuous operation for decades. The Panel Caving mining method consists of creating a continuous slot, undercut, underneath the orebody to initiate flow and caving of the orebody under gravity. The method has environmental, safety and cost advantages that make it suited to mining large, low-grade deep ore bodies that otherwise would not be feasible to mine. Caving of the ore is sometimes associated with surface subsidence. With the help of powerful computer technology, the geotechnical engineers around the world have developed accurate methods of predicting, measuring and controlling subsidence. Resolution Copper will use these techniques to ensure that the subsidence associated with its underground operations is predicted with a high degree of confidence, is monitored, is controlled, and that a process of continuous improvement is implemented as mining expands and further knowledge is gained.

This Subsidence Management Plan (SMP) is written with a focus on geotechnical issues and is not intended to replace specific related environmental and water management control plans. The view of the project site and mining application area along with significant surface features are shown in ***Figure 1***.

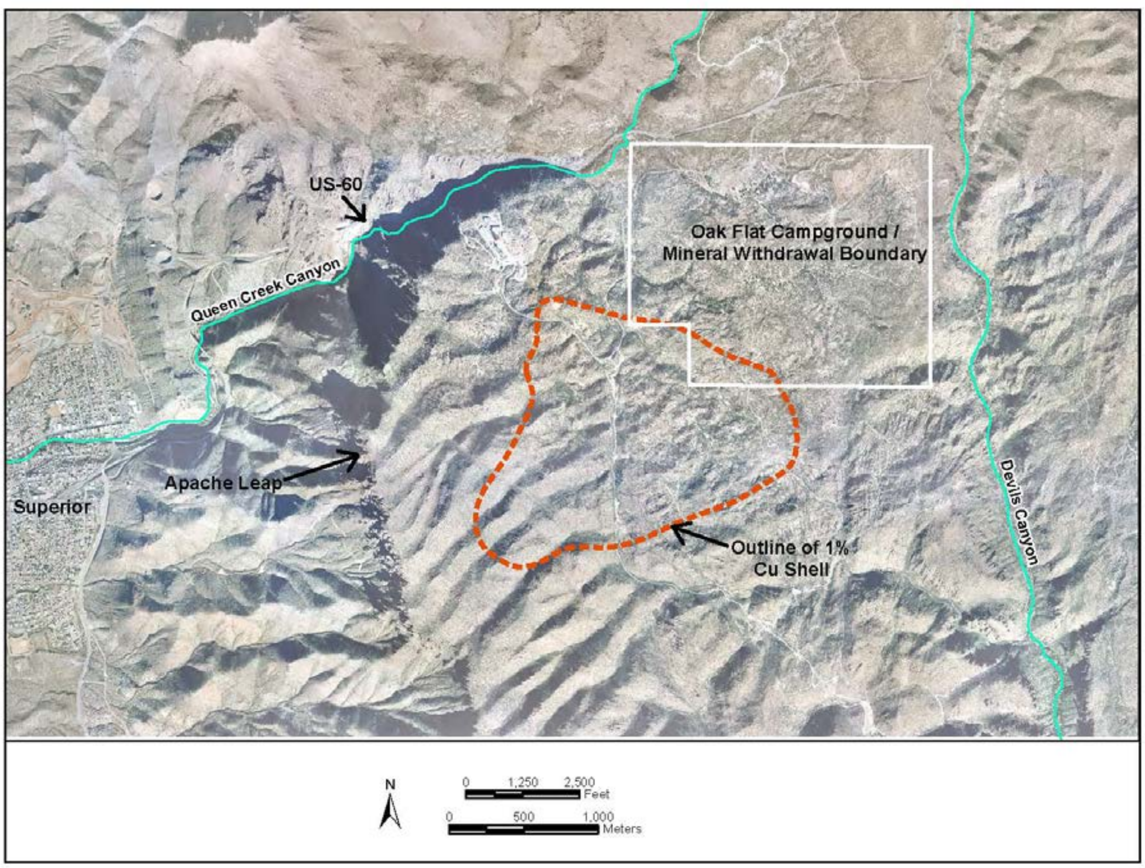

Figure 1. Overview of mining area

2. OBJECTIVES AND SCOPE

Resolution Copper aims to minimize the potential impact that may result from mining undertaken by its operations and to proactively manage subsidence impacts that may result from underground operations. This includes the prediction of subsidence magnitudes, assessment of subsidence impacts, a monitoring plan to control and provide early identification of impacts, as well as actions and contingency plans.

3. DEFINITIONS OF KEY PARAMETERS OF SUBSIDENCE

Key parameters used in the description, prediction and assessment of surface movements resulting from underground mining of the Resolution Copper orebody include subsidence, vertical and horizontal displacements, tilt, strain, caved rock zone, fracture zone, continuous subsidence zone, stable zone, and crater depth. These terms, some of which can vary by geographic region, are defined below. Rio Tinto has developed a common set of terminology that it consistently applies to all of its projects. A schematic showing the various subsidence zones is presented in ***Figure 2***.

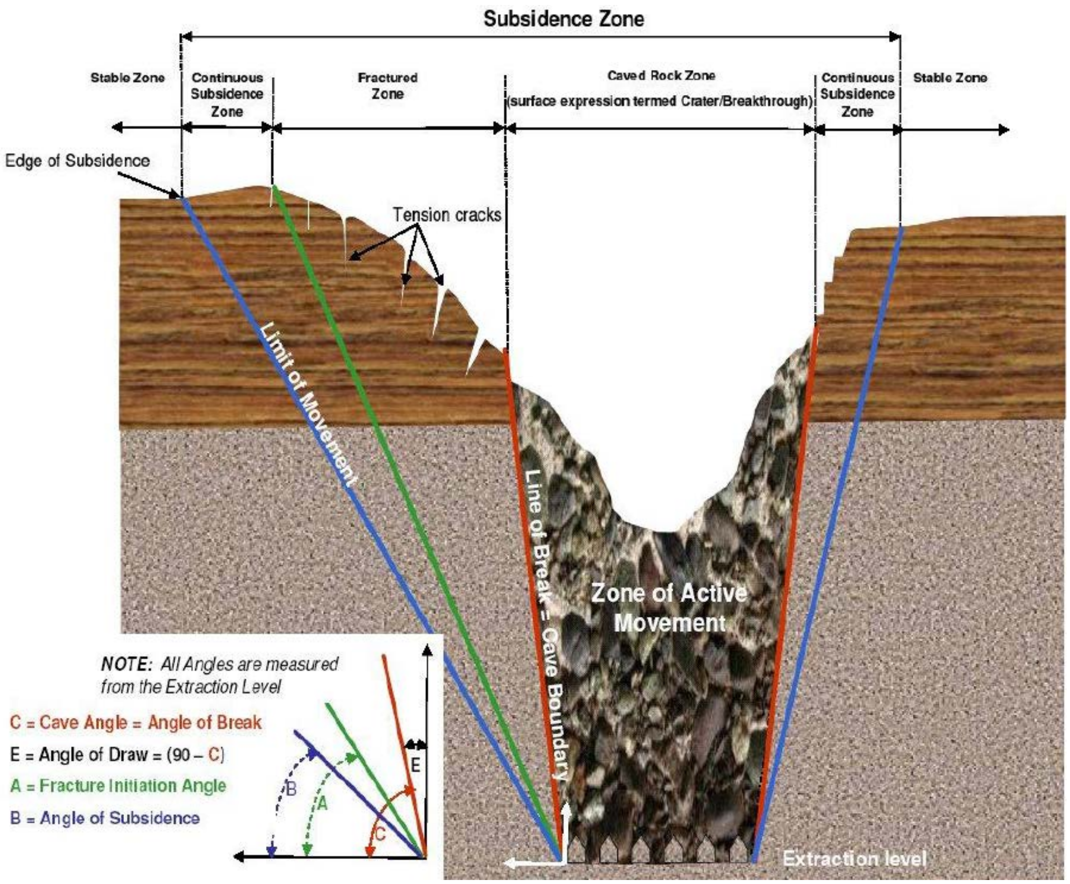

Figure 2. Schematic showing the various subsidence zones

3.1. SUBSIDENCE

The term subsidence typically refers to the deformation of surface and sub-surface geology and topography due to both vertical and horizontal forces and to movement caused by the full or partial removal/mining of the orebody, and the resultant progressive movement of the overlying rock mass downwards.

3.2. TILT

Tilt is the derivative of the vertical displacement with respect to the horizontal displacement. Tilt occurs when a land surface has different levels of vertical subsidence on either end. Surface features most affected by tilt are typically tall structures and structures such as steep slopes, cliffs, and pillars.

3.3. HORIZONTAL STRAIN

Horizontal strain results from horizontal movement in the rock mass. It is determined by calculating the horizontal change in length from two set points on the ground and dividing this by the original horizontal length of that section. If the section has been lengthened, the ground is in tension (being pulled apart), referred to as tensile strain. If the section has been shortened, the ground is in compression (being pushed together), referred to as compressive strain.

3.4. CAVED ROCK ZONE

This is a common feature of many block, panel, and sub-level caves (SLC) and is often termed the zone of active movement, or the mobilized zone. This zone is usually located just above the active cave footprint, and is the zone with the greatest vertical displacement. The zone typically comprises fragmented rocks ranging from large boulders to fine material. ***Figure 3*** shows an example of the caved rock zone.

Each cave produces a unique subsidence impact as a result of its specific size, depth, and geologic setting. The picture below is from the Northparkes underground mine in Australia and shows a subsidence zone that is essentially conical in shape. Resolution Copper's subsidence zone is predicted to be more bowl shaped than cone shaped.

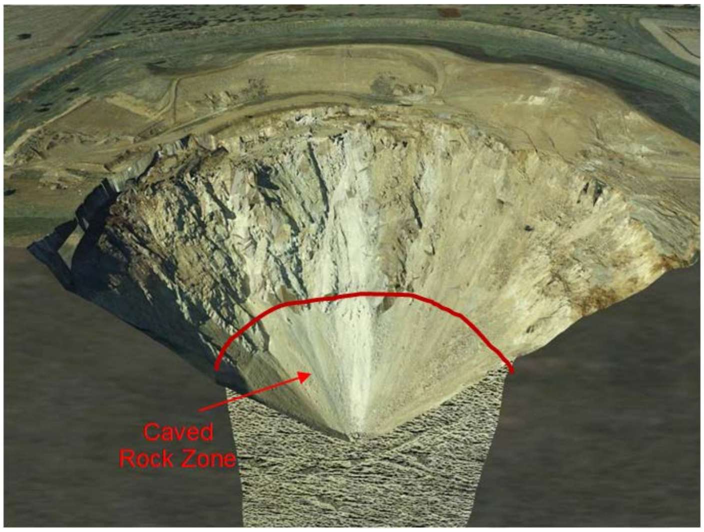

Figure 3. Limit of caved rock zone (red line), E26 Mine at Northparkes (Oblique View)

3.5. FRACTURED ZONE

The fractured zone is the area outside the caved rock zone where visible deformation (cracking and dislocations) can be seen. The fractured zone is also referred to as the surface cracking zone. Adjacent to the caved rock zone, this zone is characterized by radial cracks and typically rotational and toppling mode failures. As in the previous figure, ***Figure 4*** is of a conical shaped subsidence zone, whereas the Resolution Copper subsidence is predicted to be bowl shaped. The surface cracking zone has been outlined in green, and the caved rock zone has been outlined in red in ***Figure 4***.

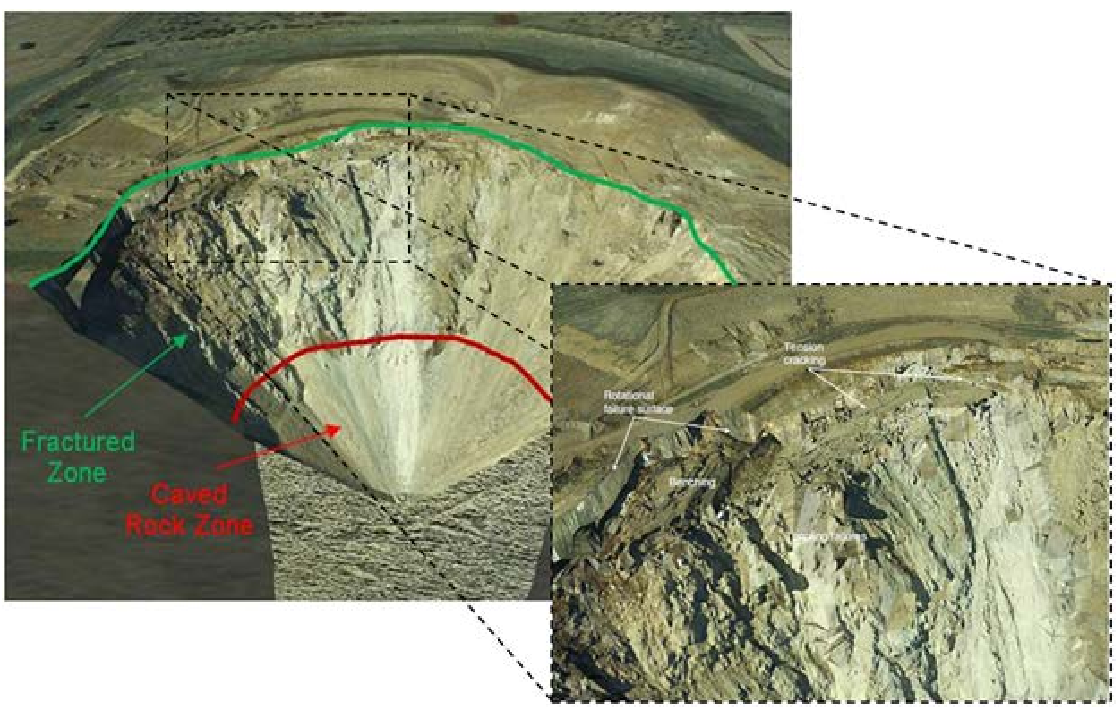

Figure 4. Limits of fractured zone (green line), the E26 Mine at Northparkes (Oblique View)

3.6. CONTINUOUS SUBSIDENCE ZONE AND STABLE ZONE

The area outside of the fractured zone is deemed the continuous subsidence zone. This zone is characterized by extremely small rock deformations that can only be detected using high-resolution monitoring equipment such as extensometers, and tilt meters. If deformations are significant enough, in some cases they can create small hairline cracks in the surface of concrete, but will not be visible in the soil or on the ground. This zone is also commonly referred to as the elastic zone, because the deformations are usually below the damage threshold for rock. ***Figure 5*** below further illustrates the limits of a continuous subsidence zone. The edge of the continuous subsidence zone is deemed the limit of subsidence.

The zone adjacent to the continuous subsidence zone is the stable zone. The stable zone can be characterized as the zone where rock is essentially undisturbed.

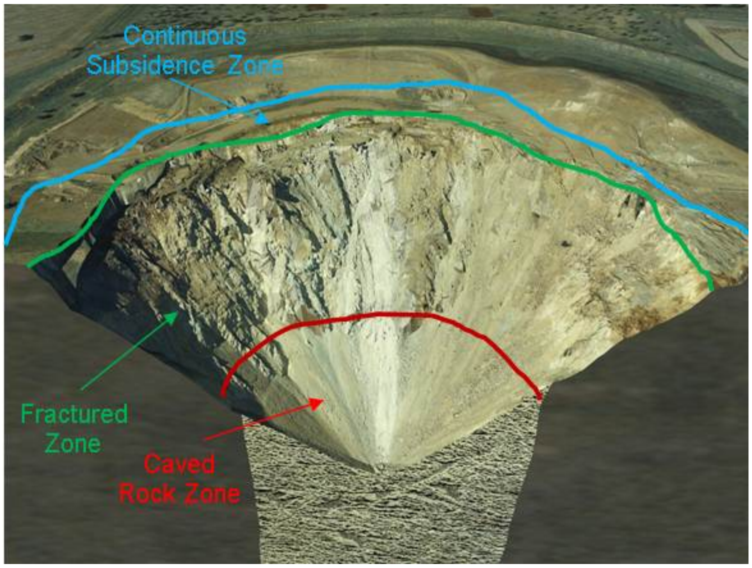

Figure 5. Limit of continuous subsidence zone (blue line), E26 Mine at Northparkes (Oblique View)

3.7. CRATER DEPTH

Due to the removal of material through the caving process, material has to mobilize and bulk to compensate for the voids created during this process. The maximum vertical distance that the surface ground lowers as a result of subsidence and bulking is called the crater depth. The amount of material removed offset by the bulking process controls the ultimate subsidence crater depth. Higher bulking factors result in shallower craters.

4. SUBSIDENCE PREDICTION METHODOLOGY

Resolution Copper has utilized and commissioned various geotechnical experts to conduct a number of empirical and numerical model simulations for the prediction of subsidence. Simulations have been completed using industry standard models that have been well calibrated and tested. The methods used include Itasca's Fast Lagrangian Analysis of Continua (FLAC3D), Beck Engineering's Discontinuum Finite Element (DFE), Newtonian Cellular Automata (NCA), and Laubscher's Empirical Method.

The data inputs for the model were obtained from Resolution Copper's extensive geotechnical testing and analysis program to define the rock characteristics in the orebody and surrounding rock. Each of the models took into account a sensitivity analysis to predict subsidence across a range of potential outcomes, including the maximum reasonable worst case scenario.

4.1. EMPIRICAL SUBSIDENCE ESTIMATES

The empirical method used to estimate subsidence is Laubscher's method (Laubscher 2000), which uses the Mining Rock Mass Rating (MRMR) method.This method estimates the cave angle or angle of break based on the MRMR, the height and density of the caved material, and the cave geometry (depth and span). The premise is that the stronger the rock mass (the higher the MRMR), the steeper the cave angles. Laubscher's MRMR chart is shown in ***Figure 6*** below.

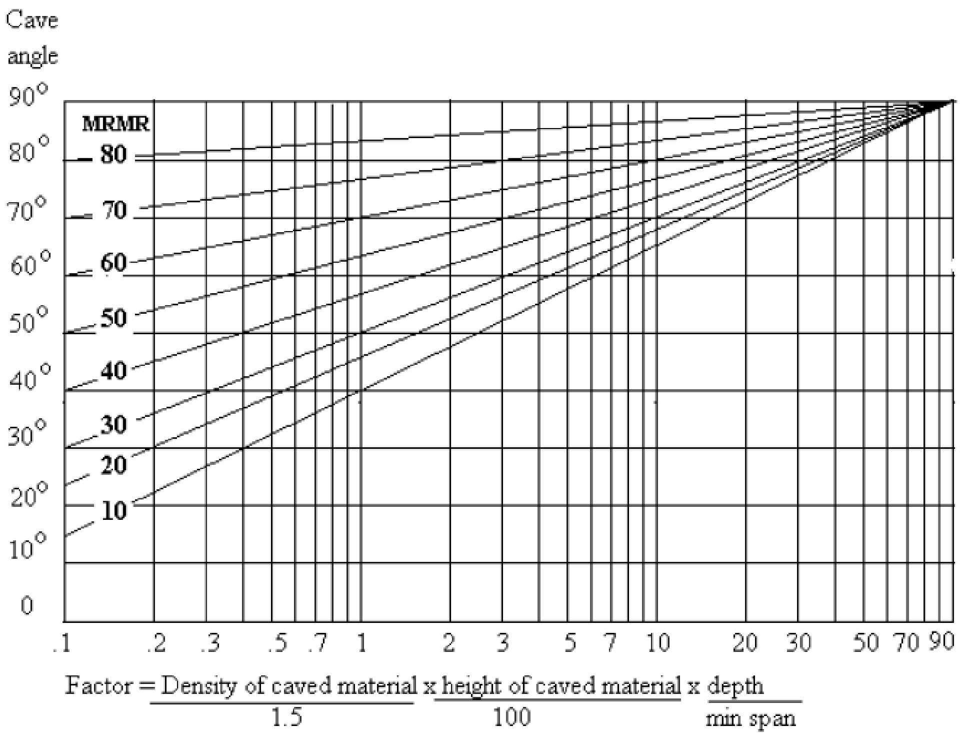

Figure 6. Empirical cave angle chart (Laubscher 2000)

The empirical simulations only provide an estimated cave angle, which is the extent of the cave rock zone. Since the empirical simulations do not provide derived extents of the fractured zone and continuous subsidence zone, there are clearly limitations to using this approach for a comprehensive subsidence analysis. However empirical models do provide a decent first approximation, and can be used as a tool to compare and calibrate against numerical model approaches. The cave angle from the empirical simulations was estimated to range from 72 to 84 degrees with an average value of 76 degrees.

4.2. NUMERICAL SUBSIDENCE ESTIMATES

The initial subsidence statistical analysis completed at Resolution Copper identified stress orientation, stress magnitude, and major structure strength, orientation, and thickness as the main controlling factors of subsidence. Following this initial work, additional study and test work was executed to reduce the uncertainty around each of the controlling parameters as listed above. This work included over-coring measurements, material testing campaigns, structural mapping, and various instrumentation packages for measuring rock mass response; as a result, the uncertainty associated with these parameters has been significantly reduced.

To date, a series of models have been completed by Itasca Consulting Group and Beck Engineering Ltd. to investigate the cave's behavior throughout the life of the mine. The Itasca simulations used FLAC3D as the numerical modeling package, whereas the Beck Engineering simulations used a coupled code that uses a DFE and Newtonian Cellular Automata NCA to simulate the cave's behavior. The biggest difference between the two approaches was Beck's use of a coupled (DFE-NCA) code, which allows the cave to grow without intervention, meaning that the rocks' life cycles are modeled from failure to disintegration. In the Itasca simulations no flow is simulated, and the cave is assumed to be a continuum, which means that caving is induced through physical stresses on nodes at the bottom of the cave. Both approaches are industry accepted.

All models used to date include the regional geological model, the structural model, material properties, regional stresses, and the full development and production schedule. By including all of this information in the simulations, the results are more likely to represent a more probable realization of the true caves behavior.

5. RESULTS OF SUBSIDENCE PREDICTIONS

Figures 7, 8, and 9 show the maximum extent of subsidence for the caved rock zone, the fracture zone and the zone of continuous subsidence based on the Beck Engineering simulations in 10-year increments through 40 years of mine life. The subsidence zone is predicted to remain more than 1,500 ft (457 m) from the Apache Leap after mining has ceased. Resolution Copper plan to locate its surface mining infrastructure within the outer areas of the Zone of Continuous Subsidence, where strains can be measured but no visible evidence of surface subsidence will be evident.

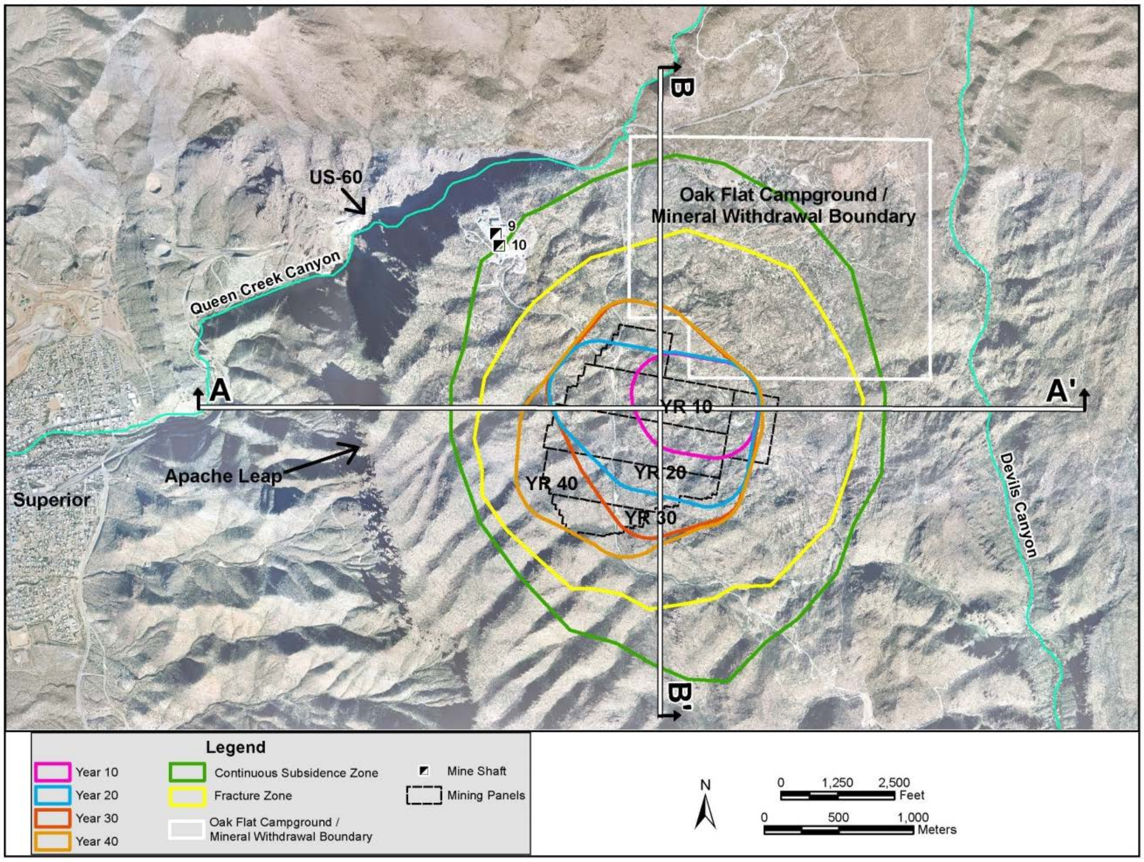

Figure 7. Predicted subsidence limits zones in 10-year increments

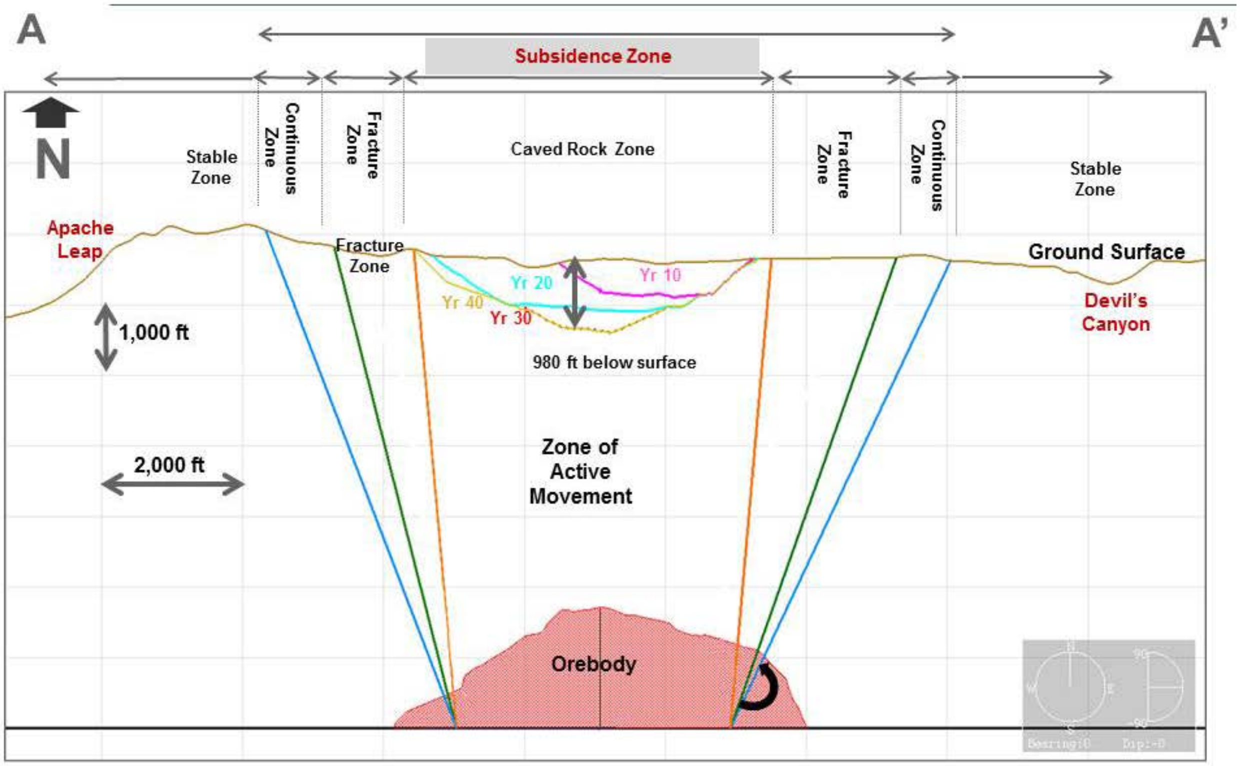

Figure 8. West to east cross section of predicted subsidence limits at 10, 20, 30 and 40 years of mining

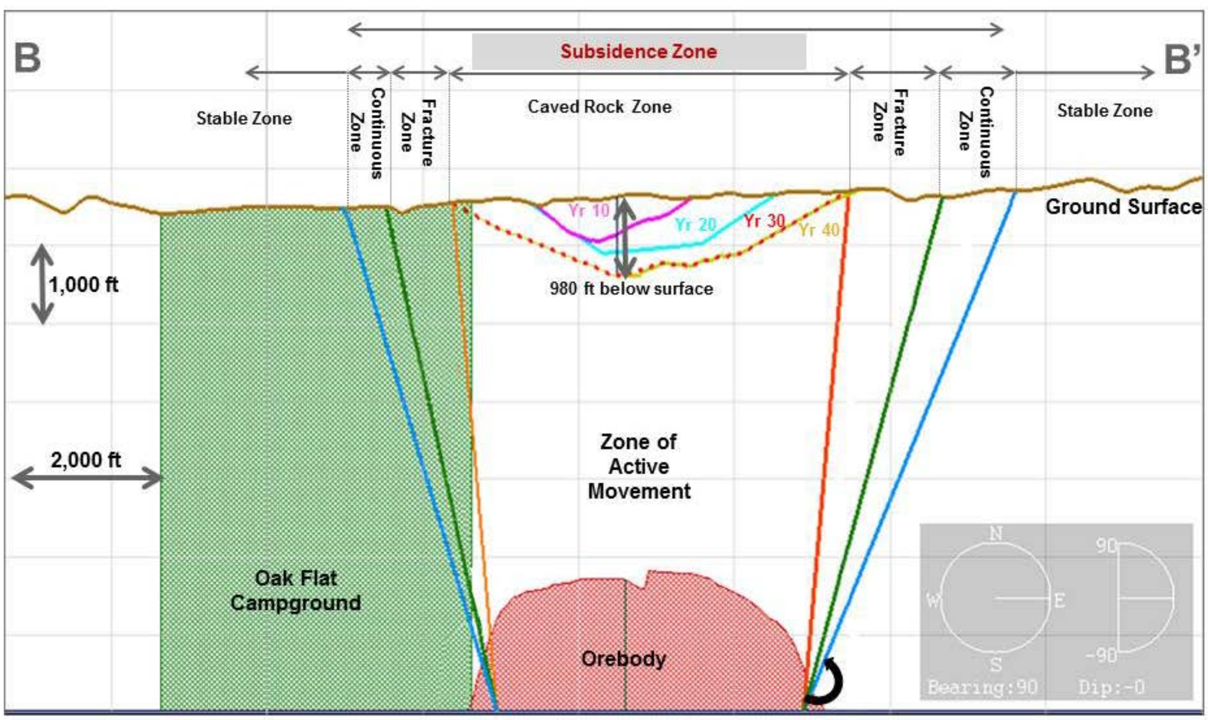

Figure 9. North to south cross section of predicted subsidence limits at 10, 20, 30 and 40 years of mining

5.1. SUBSIDENCE CRATER DEPTH

Based on all the simulations to date, the cave is predicted to breach the surface sometime during its lifetime. Current estimates put break through somewhere between four and eight years after commercial mining starts. Prior to this time measureable displacements are predicted to occur on the surface, but an actual crater is not expected to develop until sometime between the above mentioned periods.

The depth of the crater has been estimated from numerical simulations and also from experience at other operations. As part of the Second International Caving Study a database of bulking factors was developed to assist in the estimation of bulking from the caving process. Based on this work the average life of mine bulking factor for Resolution Copper is expected to range between 8 and 12 percent. If these values are used to estimate the potential crater depth, the maximum depth is projected to range between 656 and 984 ft (200 and 300 m) in depth. Numerical simulations both completed by Beck Engineering and Itasca Consulting also estimate that the crater depth could have a maximum value ranging from 656 to 984 ft (200 to 300 m), with an average depth of roughly 590 ft (180 m).

6. SUBSIDENCE MONITORING

Subsidence is a slow and gradual process that is predicted, closely monitored, and controlled. Mining will start from a point away from Apache Leap, and after 40 years of block-cave mining, the subsidence zone is projected to be at its deepest (984 ft), but is predicted to remain more than 1,500 ft from the Leap after mining has ceased. It is important to note that Resolution Copper's surface mining infrastructure is located between the subsidence zone and Apache leap and would be impacted before any impacts to Apache Leap. Subsidence impacts will also be controlled by limiting the lateral extent of the block caving panels and by not mining some ore to protect key surface features like Apache Leap.

The impact of subsidence will continue to be monitored and managed throughout the life of the mine and thereafter as described below.

6.1. APPROACH TO SUBSIDENCE MONITORING

Resolution Copper has been collecting relevant field and laboratory data to understand and predict the impact of subsidence. Before, during, and after operations Resolution Copper will implement a subsidence monitoring program designed to:

- Provide data that allows validation of mining-related impacts and ongoing model calibrations and refinements.
- Develop threshold and alarm levels for early warning and detection of subsidence impacts before any impacts occur.
- Identify surface movements or impacts due to mining of the Resolution Copper orebody.
- Gain knowledge to support future mining, including refinement of impact predictions.

- Ensure corrective actions and contingency plans are implemented.
- Allow for the inclusion of advances in the science of impact assessment and monitoring as well as changing technology associated with mining.

The Resolution Copper's overall strategy for subsidence monitoring and management is:

- Collect extensive data before mining starts to establish robust baseline and background data for the area above and within a reasonable perimeter around the mine.
- Start mining at a point far away from Apache Leap. The easement will allow many years to gather technical information to reassess the cave and subsidence angles.
- Declare sections of the orebody off limits to mining and leave these sections out of the mining plan to ensure a stable buffer zone of more than 1,500 ft between the subsidence zone (continuous) and Apache Leap after mining has ceased.
- Continuously monitor the effect of mining on key features (Apache Leap, Devils Canyon, Queen Creek Canyon) at key positions relating to the mining front. The early monitoring data will be collected to ensure that the Apache Leap easement is not encroached as mining progresses westwards.
- Regularly assess, analyze, and interpret monitoring data to identify any variations from predictions or unexpected anomalies.
- Supply regular reports to the U.S. Forest Service (FS), along with periodic review meetings. Such updates will review the monitoring data, monitoring, and model results.
- Notable but not specifically part of the strategy is the placement of Resolution Copper's surface mining infrastructure between the subsidence zone and Apache leap so any impacts from subsidence would impact the mine infrastructure before Apache Leap.

6.2. PRE-MINING MONITORING AND BASELINE STUDIES

Apache Leap, Queen Creek Canyon, and the surface area above the planned underground mine are currently monitored using terrestrial LIDAR scans and select rock spires using digital tilt meters. This baseline data is being collected using biannual LIDAR scans of cliff faces and rock formations for future comparisons. Terrestrial LIDAR scans use Maptek's I-Site 8800 scanner to provide the baseline coverage. The digital tilt meters have shown that surface pillars will tilt during strong winds. Experience from the use of tilt meters shows that it is feasible to accurately and remotely monitor pillar deformation on a nearly continual basis.

6.3. DURING MINING MONITORING

During mining, the surface mining area will be subdivided into a no-go zone, consistent with the limit of the fracture zone (where no person may enter) and a restricted public access zone consistent with the zone of continuous subsidence (where Resolution Copper personnel are permitted for geotechnical monitoring and inspections). These zones will be re-assessed periodically based on information collected from cave propagation monitoring, the re-assessment of cave angles and propagation rates, the subsidence monitoring results, and the mining plan. Surface subsidence will be monitored through the use of available industry best practice and demonstrated technology including, but not limited to:

- Extensometers: These are electronic cable devices that will be installed in the rock mass to measure relative displacements in the rock.
- Survey prisms: These prisms will be installed in selected locations and their three dimensional location will be surveyed automatically to provide the relative displacements of the ground.
- Crack Displacement Monitors: These are wire extensometers that will be installed in the ground to will detect crack formation, propagation rate, as well as crack extension.
- Aerial photography: This technique is utilized to take pictures on a quarterly basis and process the pictures to detect relative changes. Digital Terrain Models (DTM) will be generated from aerial photography to calculate the relative displacements of the surface ground.
- Interferometry Synthetic Aperture Radar (INSAR): This is a satellite monitoring technique that will be utilized to monitor surface deformation and relative digital elevation in the subsidence area.
- Microseismic monitoring system: This system consists of an array of seismic sensors and geophones that will be installed in the ground to detect and determine the location and magnitude of seismic events associated with rock deformation and fracturing.

6.4. POST MINING MONITORING

Resolution Copper will continue to monitor the impact of surface subsidence on key infrastructures for at least 15 years after mining. There are no standard criteria that are used to determine how long to monitor subsidence after mining ceases, but 15 years of monitoring is viewed as conservative as the cave should come to equilibrium within 5 years or less. A 15-year monitoring period will provide enough monitoring data to prove that the displacement has not and will not cross the boundary between the continuous subsidence and the stable zones. If the monitoring data are still showing movement, then the monitoring program may be extended accordingly. The post mining monitoring will be done by means of the same techniques used before and during mining. The frequencies as well as the areas of focus are further discussed in Section 7 below.

7. SUBSIDENCE RISK AND IMPACT ASSESSMENT

There are a number of prominent geologic features in and around the proposed mining operation that have been part of Resolution Copper's baseline geotechnical monitoring program and include the Apache Leap Cliff, Queen Creek Canyon, Devils Canyon, US Highway 60 (US 60) and the Oak Flat Campground. Baseline data collection from these areas will help us to understand the results of monitoring of potential impacts during mining.

7.1. APACHE LEAP, CLIFFS AND PILLARS

Apache Leap is an approximately 1-mi long cliff that rises to a height of approximately 4,200 ft above sea level in the town of Superior Arizona. Resolution Copper is committed to preserving the Apache Leap.

Both numerical and empirical subsidence modeling conducted to date indicate that the Apache Leap is predicted to be in the stable zone. In addition, Resolution Copper will initiate mining far away from the Apache Leap and will monitor deformation due to subsidence to ensure that the prediction of subsidence is continuously improved and is in line with the observed and measured subsidence progression.

Pre-mining monitoring of the Apache Leap is being conducted and will continue during and after mining operations. Results obtained from monitoring will be used to determine ongoing monitoring requirements, appropriate controls, and responses to potential surface instability resulting from mining activities. This will contribute to an improved understanding of the effects of mining activities on the Apache Leap and other cliffs.

There are many small cliffs that are present in the area. Numerical modeling was conducted by geotechnical experts targeting stability of individual cliffs. Steep slope cliffs are naturally unstable; however the numerical modeling conducted has shown that these cliffs are stable even when subjected to 5-degree tilts. On the other end, the subsidence modeling conducted indicates that mining activities are predicted to induce tilts of magnitude less than a fraction of a degree indicating that the cliffs should remain stable during and after mining. ***Table 1*** below is a summary of the monitoring plans for the Apache Leap and other cliffs in the area.

Table 1. Apache Leap and Cliffs Monitoring Schedule

Monitoring Period	Monitoring Techniques	Frequency	Trigger
Baseline Studies Pre-Mining	- Aerial Surveys of the area - LIDAR Scans of Apache Leap - Google Earth observation	Twice a year	Observation of changes and rock falls in area, rock movements
	Seismic monitoring	Once every two years (USGS)	Seismic events of large magnitude
	Tiltmeters installed on selected pillars	Continuously	Tilts of more than 3 degrees
During Mining	- Aerial Surveys of the area - LIDAR Scans of Apache Leap - Prisms survey - Extensometers - Google Earth observation	Once a quarter	Observation of changes and rock falls in area, rock movements
	Seismic monitoring	Once every 6 months (USGS)	Seismic events of large magnitude
	INSAR Imaging	Twice a year	Observation of changes, cracking, movement

Monitoring Period	Monitoring Techniques	Frequency	Trigger
	Tiltmeters installed on selected pillars	Continuously	Tilt of more than 3 degrees
	Micro-seismic monitoring	Continuously	Large seismic events
Post-Mining	- Aerial Surveys of the area - LIDAR Scans of Apache Leap - Google Earth observation	Twice a year for 15 years after mining	Observation of changes and rock falls in area, rock movements
	Seismic monitoring	Once every two years (USGS) for 15 years after mining	Seismic events of large magnitude
	Tiltmeters installed on selected pillars	Continuously for 15 years after mining	Tilts of more than 3 degrees

7.2. QUEEN CREEK AND DEVILS CANYONS

The Resolution Copper project area is located within two surface water basins:

- Queen Creek Canyon, which is approximately 3,940 ft (1,200 m) north-northwest of the proposed underground mine. Queen Creek is ephemeral above the town of Superior and it flows west of the town (effluent dependent).
- Devils Canyon, which is approximately 3,940 ft (1,200 m) east of the proposed underground mine. Devils Canyon drains into Mineral Creek approximately 8 km southeast of the proposed panel cave footprint. Devils Canyon has two perennial flow sections approximately 1.92 and 2.88 mi (3.2 and 4.8 km) southeast of the proposed block cave.

Hydrogeological studies conducted at the site have indicated that there are no perennial stretches of surface flow or springs in the area above the Resolution Copper deposit or the currently estimated surface extent of subsidence. The primary surface water related impact is the small percentage of runoff that is predicted to be intercepted during mining due to the caving process. The subsidence modeling conducted to date has shown that both Devils Canyon and Queen Creek Canyon are outside the subsidence. ***Table 2*** summarizes the monitoring techniques and frequencies for the major water features. General locations designated for surface joints mapping are presented in ***Figure 10***.

Table 2. Water Features Monitoring Schedule for Queen Creek and Devils Canyon

Monitoring Period	Monitoring Techniques	Frequency	Trigger
Baseline Studies Pre-Mining	Occurrence surveys & measurement of base flow	Quarterly	Observation of water loss (reduction in seeps and springs outside baseline range)
	Surface joints mapping[1]	Once a year	Enlargement or propagation of joints
During Mining	Occurrence surveys & measurement of base flow in streams and water captured in mine	Quarterly and after precipitation events	Observation of water loss (reduction in seeps or springs outside baseline range)
	Surface joint mapping [1] (length, aperture, spacing)	Quarterly	Enlargement or propagation of joints
	Subsidence Fracturing mapping	Quarterly	Minor cracking, signs of erosion
Post-Mining	Occurrence surveys & measurement of base flow	Quarterly and after precipitation events	Observation of water loss (reduction in seeps and springs outside baseline range) or re-occurrence.
	Surface joints mapping [1]	Once a year for 15 years after mining	Enlargement or propagation of joints

[1]Surface joints mapping general locations are presented in ***Figure 10***.

7.3. US HIGHWAY 60

US 60 constitutes the main man-made feature within the vicinity of the project. The highway cuts through the cliffs and pillars of the Apache Leap and is located north to north-west of the proposed mining operations. Based on the results of subsidence modeling, the highway is in the stable zone.

There will already be monitoring across the subsidence zone and the areas immediately adjacent to it. These areas are closer to the cave zone than US 60 and subsidence impacts would be observed at these areas long before US 60, which is not expected to be impacted by subsidence. If there was an unexpected subsidence response that was detected, the monitoring plan would be adapted to include an expanded monitoring program. Subsidence is a rather slow and continuous process, and as such there would be time to apply an adaptive monitoring plan if required. ***Table 3*** summarizes the techniques and frequencies for monitoring of US 60.

Table 3. US Highway 60 Monitoring Schedule

Monitoring Period	Monitoring Techniques	Frequency	Trigger
Baseline Studies Pre-Mining	Observation of road condition, Google Earth observation, survey marks and prisms	Once prior to mining	Observation of unsafe road conditions
During Mining	Observation of road condition, Google Earth observation		Minor cracking
			Major cracking or traffic impedance
Post-Mining	Observation of road condition, Google Earth observation, survey marks and prisms	Once every two years for 15 years after mining	Observation of unsafe road conditions

7.4. SURFACE SUBSIDENCE AREA AND OAK FLAT CAMPGROUND

Owing to its proximity to the mining footprint, part of the campground is expected to be subject to subsidence. The fracture zone is predicted to extend almost towards the middle of the campground. This is projected to occur towards the end of mine life, or approximately 35 years from start of mining. Based on subsidence predictions, Resolution Copper will establish barricades and/or fences and warning signs to restricted subsidence areas for public safety. The location of warning signs and structures to limit public access will move through time depending on the monitoring results of cave propagation and subsidence initiation. The monitoring techniques and frequencies are summarized in ***Table 4***.

Table 4. Surface Subsidence and Oak Flat Campground Monitoring Schedule

Monitoring Period	Monitoring Techniques	Frequency	Trigger
Baseline Studies Pre-Mining	- Aerial Surveys of the area - Google Earth observation	Twice a year	Observation of changes and rock falls in area, rock movements
	Survey marks, prisms and extensometers	Once prior to mining	Large displacements
	Crack displacement monitors	Once prior to mining	Crack extensions
	Tiltmeters installed on selected pillars	Continuously	Tilt of more than 3 degrees
	Seismic monitoring	Once every two years (USGS)	Seismic events of large magnitude

Monitoring Period	Monitoring Techniques	Frequency	Trigger
During Mining	- Aerial Surveys of the area - Google Earth observation	Once a quarter	Observation of changes and rock falls in area, rock movements
	Survey marks, prisms and extensometers	Monthly	Large displacements
	Crack displacement monitors	Monthly	Crack extensions
	Seismic monitoring	Once every 6 months (USGS)	Seismic events of large magnitude
	INSAR Imaging	Twice a year	Observation of changes, cracking, movement
	Tiltmeters installed on selected pillars	Continuously	Tilt of more than 3 degrees
	Smart Markers, cave trackers and TDR installed before cave initiation	Continuously	Fast cave propagation, cave angle wider than predicted, air gap detected
	Micro-seismic monitoring	Continuously	Large seismic events

8. REPORTING

Resolution Copper will document and store all the results of surface subsidence inspection and monitoring. The performance of the cave and subsidence development will be monitored and tracked and the results compiled into an annual status report that will be issued to the FS. The annual subsidence management status report will include and not be limited to:

- The mining front and location of the current panel.
- A summary of any subsidence management actions undertaken by Resolution Copper in the period subsequent to the last report.
- A summary of any observed and/or reported subsidence impacts, and any other relevant information in the period subsequent to the last status report, and a summary of Resolution Copper's response actions.
- A summary of cave performance and subsidence development based on monitoring information compared with any defined triggers and/or the predicted subsidence to facilitate early detection of any potential subsidence impacts.
- A statement regarding any additional and/or outstanding management actions to be undertaken or the need for early responses or emergency procedures to ensure adequate management of any potential subsidence impacts due to mining.

9. TRAINING

Resolution Copper will ensure that qualified and trained personnel conduct subsidence inspections and monitoring. All personnel who conduct inspections will be trained in the requirements of this Subsidence Management Plan. Training will be conducted at least once a year on the identification of the various subsidence impacts.

10. REVIEWS AND AUDITS

To ensure that the program is adequately and efficiently measuring subsidence parameters, this plan will be reviewed annually and after the completion of each panel. The plan may also be reviewed as needed as a result of changing conditions, an inspection, or if subsidence levels are significantly higher than predicted.

11. RESPONSIBILITIES

Specific roles and responsibilities of key mine personnel in relation to this Subsidence Management Plan (SMP) are outlined below. The roles may be different from the ones that will be effective during operations of the mine and can change to reflect the exact titles at the time.

11.1. MINE MANAGER

- Ensure that this SMP and associated specific management plans are implemented and adhered to
- Ensure that adequate resources are available to Resolution Copper personnel to allow the completion of their responsibilities under this SMP
- Authorize internal and external reporting requirements of this plan
- Approve this plan and its subsequent revisions

11.2. TECHNICAL SERVICES MANAGER

- Ensure that all subsidence monitoring and reporting required under this SMP are carried out within the timeframes specified.
- Ensure Resolution Copper’s provision of subsidence-related information and data.
- Receive technical comments regarding the subsidence impacts on the surface features.
- Ensure that audits and reviews are carried out as detailed in this SMP.

11.3. HEALTH, SAFETY AND ENVIRONMENTAL MANAGER

- Ensure that all environmental monitoring associated with this SMP is carried out within the timeframe specified.

- Ensure that all environmental monitoring results are checked, processed, and filed appropriately so that they can be immediately identified and accessed.

11.4. MINE SURVEYOR

- Ensure that all subsidence surveys are carried out to the accuracy required and within the timeframe specified.
- Ensure that all subsidence survey results are checked, processed, and filed appropriately so that they can be immediately identified and accessed.

11.5. GEOTECHNICAL ENGINEER

- Ensure that all subsidence surveys and inspections are carried out to the accuracy required and within the timeframe specified.
- Ensure that all subsidence monitoring results are checked, processed, and filed appropriately so that they can be immediately identified and accessed.
- Ensure that this SMP is reviewed and audited as specified.
- Ensure that mine personnel are properly trained in the SMP process and reporting.
- Ensure that persons conducting the inspection are appropriately trained and understand their obligations and the specific requirements of this plan.
- Review and assess subsidence monitoring results and inspection checklists.
- Promptly notify the Technical Services Manager of any identified public safety issue.

12. REFERENCES

Laubscher, D.H., 2000. Block Caving Manual, Prepared for International Caving Study. JKMRC and Itasca Consulting Group, Inc. Brisbane.

FIGURE 10

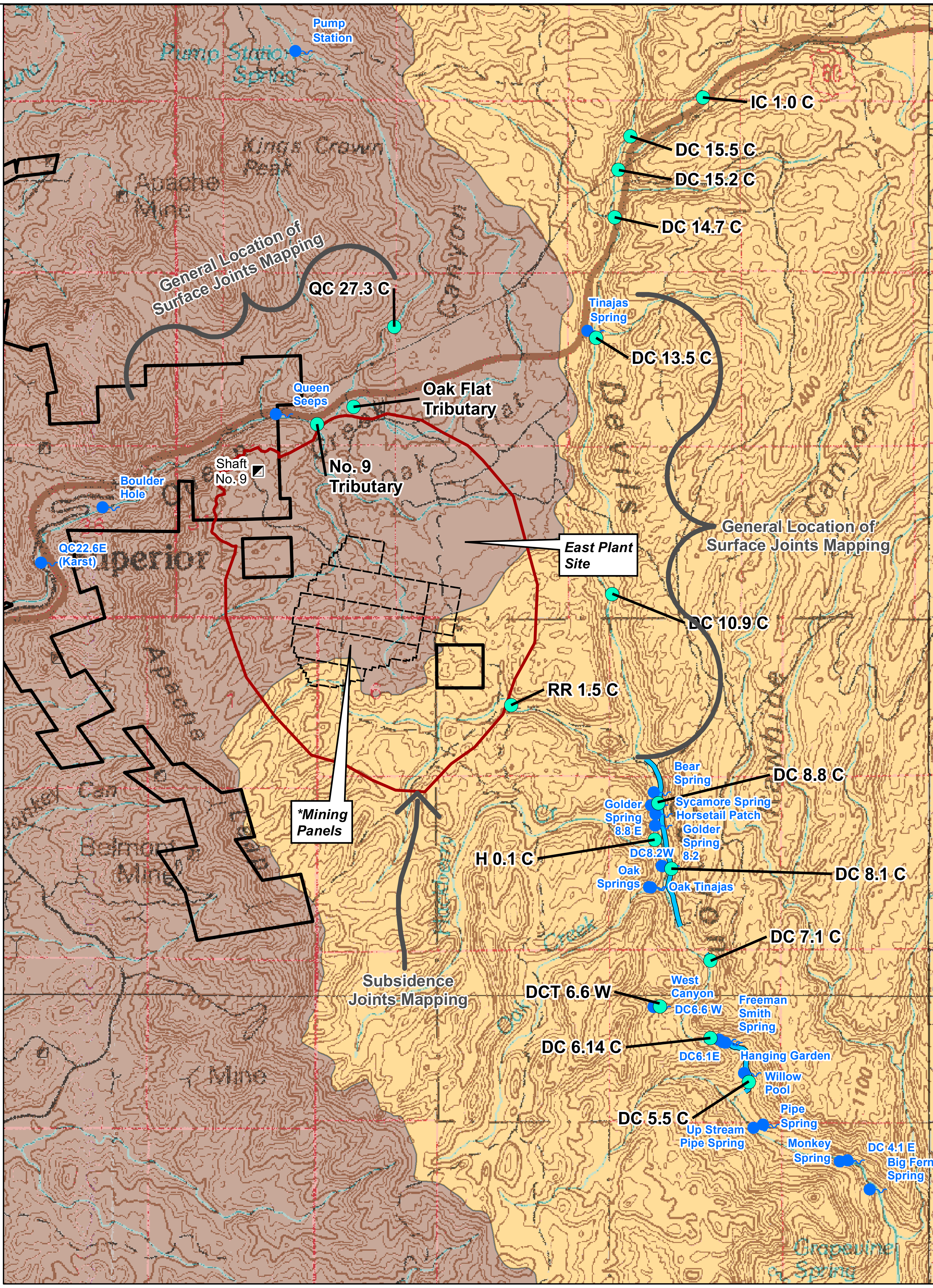

Image Source: Mesa 1:100,000 USGS Quadrangle

Legend

- Resolution Holdings
- Project Area
- Perennial Reach
- Spring Location and ID
- Surface Water Sample Location and ID

Watershed

- Upper Queen Creek
- Devils Canyon

Data Source: Springs, Surface Water, Sample Locations
Perennail Reach Data
Provided by Montgomery & Associates
2012

Additional Spring Data
Provided by WestLand Resources
Wetland Plant Survey of Springs in the
Resolution Project Area.
2012

Watershed Data
Provided by USGS - Hydrologic Unit Code (HUC)
Aquired August 13, 2012

Note: Mine Panel Configuration Subject to Change

N

0 1,500 3,000 Feet

0 500 1,000 Meters

RESOLUTION COPPER
General Plan of Operations

MONITORING LOCATIONS IN
QUEEN CREEK AND DEVIL'S CANYON
Figure 10

General Plan of Operations
Resolution Copper Mining

May 9, 2016