

RECLAMATION PLAN  
RIVER RANCH OPERATION  
HANSON AGGREGATES ARIZONA, INC.  
LITCHFIELD, ARIZONA

OCTOBER 31, 2006



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Reclamation Plan  
Hanson Aggregates – River Ranch Operation  
Litchfield, Arizona

**ADMINISTRATIVE COMPLETENESS CHECKLIST**

Arizona Revised Statutes (A.R.S.) Arizona Administrative Code (A.A.C.) REFERENCE	PLAN REQUIREMENTS	LOCATION WITHIN APPLICATION	COMPLETENESS		
		<i>(Applicant Completes)</i>	YES	NO	N/A
ARS 27-1271.B.1 AAC R11-3-201-B	Owner/Operator Information	Page 2-1			
ARS 27-1271.B.3	Description of Current Operation	Page 2-1			
ARS 27-1271-B.4 AAC R11-3-501-A and R11-3-503	Postaggregate Mining Use	Page 2-4			
ARS 27-1271-B.9.b AAC R11-3-602	Postaggregate Mining Re-grading and Erosion Control	Page 2-5			
ARS 27-1271.B.9.a AAC R11-3-601	Postaggregate Mining Plan for Structures and Equipment	Page 2-6			
ARS 27-1271.B.9.a AAC R11-3-601	Postaggregate Mining Plan for Excavations in the Agua Fria River Floodway	Page 2-7			
ARS 27-1271-B.7 AAC R11-3-603	Postaggregate Mining Road Reclamation	Page 2-7			
ARS 27-1271.B.9c AAC R11-3-Article 7	Soil Conservation and Revegetation	Page 2-8			
ARS 27-1271-B.10	Conceptual Schedule for Disturbance and Reclamation	Page 2-8			
ARS 27-1271-B.11 AAC R11-3-802	Estimated Reclamation Costs	Page 2-9, Appendix B			
ARS 27-1233 AAC R11-3-209	Fees	Page 3-1			
ARS 27-1291 and 27-1292 AAC R11-3-Article 8	Financial Assurance Mechanism	Page 4-1			
ARS 27-1271-B.6 AAC R11-3-501-B.8	Vicinity Map	Figure 1			
ARS 27-1271-B.6 AAC R11-3-501-B.8	Existing Site Conditions	Figure 2			
ARS 27-1271-B.6 AAC R11-3-501-B.1	Postaggregate Mining Contours	Figure 3			
ARS 27-1271-B.6 AAC R11-3-501-B.1,7	Postaggregate Reclamation Plan	Figure 4			

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**LIST OF APPENDICES**

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APPENDIX

- A SLOPE STABILITY ANALYSIS
- B ESTIMATED RECLAMATION COSTS

## 1.0 INTRODUCTION

This Reclamation Plan (Plan) was written for the River Ranch operation (Site) operated by Hanson Aggregates of Arizona, Inc. (Hanson) in Litchfield, Arizona. State law requires a reclamation plan for all aggregate mining operations that are located on private land, create disturbance areas larger than 5 acres, and have continued operations after April 1, 1997 (Aggregate Mined Land Reclamation Act [AMLRA], Arizona Revised Statute [A.R.S.] 27-1202 et. seq.). Plans must be submitted to the Arizona State Mine Inspector (ASMI) before January 1, 2007. Beginning January 1, 2007, all new aggregate mining operations located on private land must have an approved reclamation plan before exceeding a cumulative disturbance area of 5 acres.

The Site requires a plan since it meets the following criteria:

- It is located on private land;
- It has a disturbance area larger than 5 acres; and
- It will continue aggregate mining operations with a disturbance area greater than 5 acres after January 2007.

## 2.0 RECLAMATION PLAN NARRATIVE

### 2.1 OWNER/OPERATOR INFORMATION

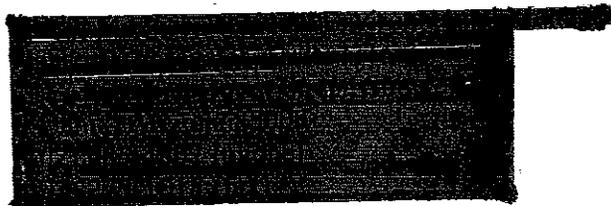
Pursuant to the records of the Maricopa County Tax Assessor, the Site has one owner: Hanson Aggregates Arizona, Inc. Hanson is the responsible party for the reclamation obligations. The required owner and operator information is provided below.

#### 2.1.1 Owner/Operator Name and Address

Owner/Operator: Hanson Aggregates Arizona, Inc.  
4127 East Van Buren Street, Suite 205  
Phoenix, Arizona 85008

#### 2.1.2 Contact Person Name and Address

Operator's contact person (for regulatory contact):



#### 2.1.3 Responsible Party

Hanson Aggregates of Arizona, Inc. is the responsible party for the reclamation described in this Reclamation Plan.

  
\_\_\_\_\_  
Signature  
  
\_\_\_\_\_  
Name

  
\_\_\_\_\_  
Date  
  
\_\_\_\_\_  
Title

### 2.2 CERTIFICATE OF DISCLOSURE

The certificate of disclosure required by A.R.S. 27-1205 was prepared by Hanson Aggregates Arizona, Inc and will be submitted separately.

## 2.3 CURRENT OPERATION

### 2.3.1 Description of Current Operations

The Site location is shown on Figure 1. Features of the Site include:

- Multiple parcels encompassing approximately 569 acres.
- Located northeast of the intersection of Camelback Road and El Mirage Road in Litchfield, Arizona.
- Existing mining operation with a processing plant area, reclaimed areas, and undeveloped land set aside for future mining.
- A portion of the Site is inside the floodplain of the Agua Fria River. The Site is bisected by the Colter Channel.
- Current access is provided by paved roads from the west using El Mirage Road.

Figure 2 shows existing site conditions. The ground surface elevation ranges from approximately 960 feet above mean sea level (amsl) in the southern area of the site to 1,040 feet amsl in the northern area of the Site.

Equipment, structures, and facilities on the Site are utilized for aggregate crushing and screening. Details of the processing area are as follows:

- Located on the west-central section of the property, north of the Colter Channel.
- Approximately 35 acres disturbed in the processing area.
- Equipment and facilities for aggregate mining processing include:
  - Two crushing and screening plants;
  - One wash plant and water reclaim system;
  - One ready-mix concrete batch plant;
  - Site Administration offices;
  - Maintenance shop;
  - Truck scale and scale house;
  - Fueling area with secondary containment; and
  - Portable office/control structures.
- Utilities on the Site include:
  - Water provided by two on-site production wells;
  - Power provided by overhead power lines and portable generators;
  - Sanitary facilities by septic system; and
  - Solid waste disposal provided by licensed solid waste contractor.



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The North mining area is an expansion of the current active pit to include the area north of the processing area. The excavation will have the following characteristics:

- Excavation of one pit area.
- Minimum setback of 100 feet from the property boundary.
- Maximum final depth of mining of approximately 80 feet bls.
- Pit walls will be mined to slope of 1H:1V and will be backfilled with inert material to achieve a final reclaimed slope of 3H:1V.
- Unpaved haul roads that lead to the primary crushing, screening, and stockpile areas (disturbance included in pit disturbance area).

The South mining area is an expansion of the current active pit to include the area south of Colter Channel. The excavation will have the following characteristics:

- Excavation of one pit area.
- Minimum setback of 100 feet from the property boundary.
- Maximum final depth of mining of approximately 80 feet bls.
- Pit walls will be mined to slope of 1H:1V and will be backfilled with inert material to achieve a final reclaimed slope of 3H:1V.
- Unpaved haul roads that lead to the primary crushing, screening, and stockpile areas (disturbance included in pit disturbance area).

The processing area will include the installation of a hot-mix asphalt plant.

## 2.4 POSTAGGREGATE MINING USE

### 2.4.1 Description of Total Future Disturbance

The postaggregate mining land use is designated for naturalized open space with areas of inert material backfill. No part of the reclaimed site will be designated as grazing, fish/wildlife habitat, forestry, or recreation.

## 2.4.2 Surrounding Area Land Use

The Site is located in a commercial and residential portion of Litchfield, Arizona. Surrounding land uses generally consist of:

- Glendale airport located to the east;
- Operating aggregate mines and open space to the north, east, and south; and
- Residential development to the west.

The planned postaggregate mining land use as naturalized open space and inert backfill is consistent with surrounding land uses.

## 2.5 POSTAGGREGATE MINING RE-GRADING AND EROSION CONTROL

### 2.5.1 Description of Final Topography

The final topography for all areas planned to be reclaimed (Figure 4) will include pit wall slopes no steeper than 3H:1V.

Processing plant material stockpiles will be depleted and removed by the end of the mining operations. Fines storage ponds will be allowed to dry and naturally revegetate.

### 2.5.2 Slope Stability Evaluation

Acceptable static and pseudostatic factors of safety were estimated for 3H:1V slopes. The factors of safety for both static and seismic conditions were greater than 1.5. It was assumed that groundwater would be below the bottom of the pit at the end of mining. The complete slope stability evaluation is detailed in Appendix A.

It should be noted the slope stability analyses only considered potential deep seated failure planes. Near surface or localized failures and deformation were not addressed in the stability analyses. The slopes may be susceptible to localized surface slumping and should be periodically inspected as part of the post-closure monitoring plan.

### 2.5.3 Erosion Control Plan

Storm water drainage controls will be established as part of a site SWPPP. Specific erosion control measures include:

- Storm water will be routed into pit areas.
- Rip-rap will be used to line discharge points where erosion control is required. The location and size of rip-rap lined areas is not indicated on a Site map; however, the cost is included in Appendix B to show the appropriate financial assurance;

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- Earthen berms will be used to prevent outfalls and prevent storm water from flowing off site; and
- The SWPPP will be followed in addition to site-specific best management practices.

## **2.6 POSTAGGREGATE MINING PLAN FOR STRUCTURES AND EQUIPMENT**

### **2.6.1 Structures to be Removed**

The Site will have no permanent structures after cessation of mining. Temporary structures currently on site or planned to be on site include:

- Two crushing and screening plants;
- One wash plant and water reclaim system;
- One hot-mix asphalt plant;
- One ready-mix concrete batch plant;
- Site Administration offices;
- Maintenance shop;
- Truck scale and scale house;
- Fueling area with secondary containment; and
- Four portable office/control structures.

### **2.6.2 Unreclaimed Structures**

Once mining on the property has ceased, all structures will be dismantled and removed as part of the postaggregate mining reclamation effort.

### **2.6.3 Facilities, Wells, and Improvements to be Reclaimed**

All improvements, facilities, and aboveground storage tanks (ASTs) planned for removal are located in the processing plant area. Facilities in the processing area include:

- Two on-site production wells
- Above-ground fuel storage tanks;
- Three septic systems;
- Portable bins removed by contract waste removal services; and
- Overhead power lines and three transformers.

All of these items will be dismantled and removed as part of the reclamation efforts. The facilities with concrete pads and/or concrete secondary containment will be removed and the pad will be broken up and buried on site.

#### **2.6.4 Access Restriction/Public Safety**

Fencing already exists around the mining area and will be maintained to restrict public access following closure. Final mining slopes will be backfilled to 3H:1V or flatter to provide an acceptable factor of safety against deep seated failure. Signs will be installed around the site perimeter and maintained to identify potential hazards. Portions of the property are located within the floodway of the Agua Fria River and are subject to modified reclamation efforts which are discussed below.

#### **2.7 POSTAGGREGATE MINING PLAN FOR EXCAVATIONS IN THE AGUA FRIA RIVER FLOODWAY**

Areas within and immediately surrounding the Agua Fria River's floodway will be reclaimed to naturalized, open space. Areas of the Site that fall within the Jurisdictional Waters of the U.S. cannot be graded or backfilled and remain in compliance with section 404 of the Clean Water Act, 33 U.S.C. 1251 et seq.; 40 C.F.R. 230. In such areas, final slopes established during mining are to conform to existing floodway and floodplain topography. Restrictions on public access will be maintained through the use of signs posted along the property boundaries.

#### **2.8 POSTAGGREGATE MINING ROAD RECLAMATION**

##### **2.8.1 Road Description**

The Site currently contains paved and unpaved roads, including:

- 21,400 feet of haul and plant roads;
- 12,100 feet of access roads; and
- 300 feet of asphalt paved access road.

The 21,400 feet of haul and plant roads will be reclaimed. Roads located on pit floors and slopes will be incorporated into the final reclaimed topography. Paved access roads will be broken up and buried on site. The 12,100 feet of unpaved access roads will remain on the Site for site access and inspections. Culverts, if any, will be removed and drainage patterns restored to match reclaimed topography. Compacted road beds will be ripped/scarified to match surface drainage patterns of surrounding reclaimed land.

##### **2.8.2 Reclaimed Road Erosion Control Plan**

The reclamation of compacted road surfaces will eliminate the concentrated and erosive flow patterns associated with typical road runoff. The uneven and loosened surfaces created by scarifying and ripping will facilitate infiltration and generate relatively non-erosive sheet flow under heavy precipitation events.

## 2.9 SOIL CONSERVATION AND REVEGETATION

### 2.9.1 Topsoil Conservation Plan

The topsoil and overburden recovered from mining operations is currently being stored in a berm located along the western edge of the property. The berm has been naturally vegetated, which minimizes fugitive loss or erosion prior to reclamation.

### 2.9.2 Revegetation Plan

Soil placement will not occur at the Site. Natural revegetation is expected to be successful at the Site over time because the naturally occurring geologic materials are sufficiently fine-grained to provide a suitable growth medium for vegetation.

Care and maintenance of the reclamation effort will involve annual inspections of the Site to monitor slope movement, erosion, and vegetation growth. Annual inspection reports will be published on the anniversary date of site closure until the Site is released by the ASMI.

## 2.10 CONCEPTUAL SCHEDULE FOR DISTURBANCE AND RECLAMATION

The conceptual schedule includes:

- Disturbance operations are ongoing;
- Mining operations are anticipated to continue through approximately 2030.
- Reclamation activities will be concurrent with mining activities as conditions allow.
- Reclamation of the final mined areas will be initiated within 12 months of the permanent cessation of mining activities and is anticipated to be completed within 12 months of the start date.
- Reclamation will be deemed complete once the reclaimed surfaces have been regraded to a safe and stable condition, access restriction measures are in place, and the ASMI verifies that the owner or operator has fulfilled the requirements of the approved reclamation plan.

## 2.11 PROBABLE FUTURE CONDITIONS

The profitable operation of a mine is based on a variety of factors including the amount and quality of geologic resources available for extraction, site-specific hydrogeologic conditions, permitting constraints, economic factors affecting the cost of extraction and processing, and market conditions which influence the supply and demand for these materials or finished

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products containing these materials. Changes to any of these factors can have significant impacts to mine profitability and can thus require operators to modify mining, processing, or operational methods or expand or temporarily cease operations.

Further, the means and methods described in this Plan to operate a mining facility and implement reclamation are based on the application of currently-available technologies and practices. These technologies and practices are constantly evolving and the operations described in this Plan may be modified if the currently-specified means and methods become out-dated, obsolete, cost ineffective, or impracticable.

Consequently, factors affecting profitable operation or means and methods are likely to change due to unanticipated or unknown future conditions. Therefore, the operator of the facility described in this Plan reserves the right to adapt their operations or plans to these changing, unanticipated, or unknown future conditions to the extent that these operational changes do not cause substantial non-compliance with existing permits or authorizations.

Probable future development at the Site will include a hot-mix asphalt plant.

## 2.12 ESTIMATED RECLAMATION COSTS

The unit costs developed for this Reclamation Plan are based primarily on two key cost estimating databases (RS Means Facilities Construction Cost Data – 2004, RACER Cost Estimating software version 8.1.2), along with estimated productivity for material movement based primarily on the Caterpillar Handbook (edition 31).

Material volumes and surface areas have been calculated using the topographic base maps provided. Material volumes were calculated using Digital Terrain Model (DTM) surfaces for cuts and fills. Surface areas were defined by plan projection of outlined areas.

Administrative costs were based on Arizona Rock Products Association (ARPA) recommendations.

The estimated costs developed for this Reclamation Plan include:

- Earthwork and re-grading;
- Demolition and removal of structures and improvements;
- Road reclamation;
- Care and maintenance;
- General construction;
- Cost adjustment; and
- Administrative costs.

A summary of the estimated reclamation costs is listed in Table 1 at the end of this section. The sources and calculation of the estimated reclamation costs are detailed in Appendix B.

### **2.12.1 Pit Walls Re-grading Cost**

Pit walls will be backfilled with inert material to the final reclamation slope of 3H:1V, therefore, postaggregate mining re-grading will not be required.

There is no cost for this category.

### **2.12.2 Stockpile, Dumps, and Fines Area Cost**

Aggregate stockpiles are expected to be removed by the end of operations. No permanent rock or overburden dumps are expected on the Site after mining operations cease. The fines storage area reclamation will not require financial assurance.

There is no cost for this category.

### **2.12.3 Structure Demolition Cost**

The reclamation activities detailed in this category include:

- Removal of four portable office/control structures
- Removal of truck scale and scale house;
- Demolition and removal of office facilities;
- Demolition and removal of maintenance facilities;
- Removal of overhead electrical line (approximately 2,600 feet) and three transformers;
- Removal of two water wells;
- Removal of three septic systems;
- Removal of 300 feet of paved roads that will be broken up and buried on site and the underlying roadbed re-graded;
- Demolition and removal of fueling area with secondary containment; and
- Breakup and burial of concrete pads (approximately 42,300 square feet).

The total estimated cost for this category is \$413,000.

### **2.12.4 Road Reclamation Cost**

There is an estimated 21,400 feet of haul and plant roads that will be reclaimed. The cost to remove 300 feet of paved road is included in Section 2.12.3.

The cost of ripping/scarifying the roads is estimated at \$5,000.

#### **2.12.5 Care and Maintenance Cost**

Care and maintenance for the reclamation effort at this operation consists of:

- An annual inspection of the Site;
- Preparation of the required annual report describing the site conditions; and
- Trash removal.

Three annual inspections are anticipated before the Site is released from the ASML.

The cost of care and maintenance is estimated at \$7,000.

#### **2.12.6 Construction Cost**

Construction efforts for reclamation include:

- Installing a rip-rap erosion control lining; and
- Installation of security and restricted access signs.

The cost of construction is estimated at \$18,000.

#### **2.12.7 Plant Removal Cost**

The estimated reclamation costs detailed in this section include the dismantling, loading onto transport, and removal of the following equipment:

- Two crushing and screening plants;
- One wash plant and water reclaim system;
- One hot-mix asphalt plant; and
- One ready-mix concrete batch plant.

The cost of plant removal is estimated at \$242,000.

#### **2.12.8 Cost Adjustment**

A price index factor has been included to adjust from 2004 pricing to estimated 2006 pricing on operating and material costs. The index factor supplied is the Consumer Price Index for the period 2004 through February 2006.

- $CPI = 1.0498$

The basis for adjustment is  $2004 = 1.0000$ . The factor indicates that prices (on average) have increased 4.98% since 2004. The Consumer Price Index adjustment is not applied to the Administrative costs because it is a fixed percentage of the operating and material costs.

The cost adjustment is estimated at \$34,000.

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**2.12.9 Administrative Cost**

The estimated administrative cost includes:

- Contingency;
- Mobilization/demobilization;
- Indirect costs;
- Contractor profit; and
- Contract administrative costs.

The total estimated administrative cost is \$259,000.

**2.12.10 Total Reclamation Cost**

The total estimated reclamation cost for this reclamation plan is \$978,000.

**TABLE 1. ESTIMATED RECLAMATION COST SUMMARY**

SECTION	RECLAMATION ITEM	COST
2.12.1	Pit Walls Re-grading	-
2.12.2	Stockpile, Dumps, and Fines Area	-
2.12.3	Structure Demolition	\$413,000
2.12.4	Road Reclamation	\$5,000
2.12.5	Care and Maintenance	\$7,000
2.12.6	Construction	\$18,000
2.12.7	Plant Removal	\$242,000
2.12.8	Cost Adjustment	\$34,000
2.12.9	Administration	\$259,000
2.12.10	<b>Total Reclamation Cost</b>	<b>\$978,000</b>

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**3.0 FEES**

The Reclamation Plan submittal fee is \$3,800 for an existing aggregate mining unit. A check covering this fee was submitted with this Plan.

#### 4.0 FINANCIAL ASSURANCE

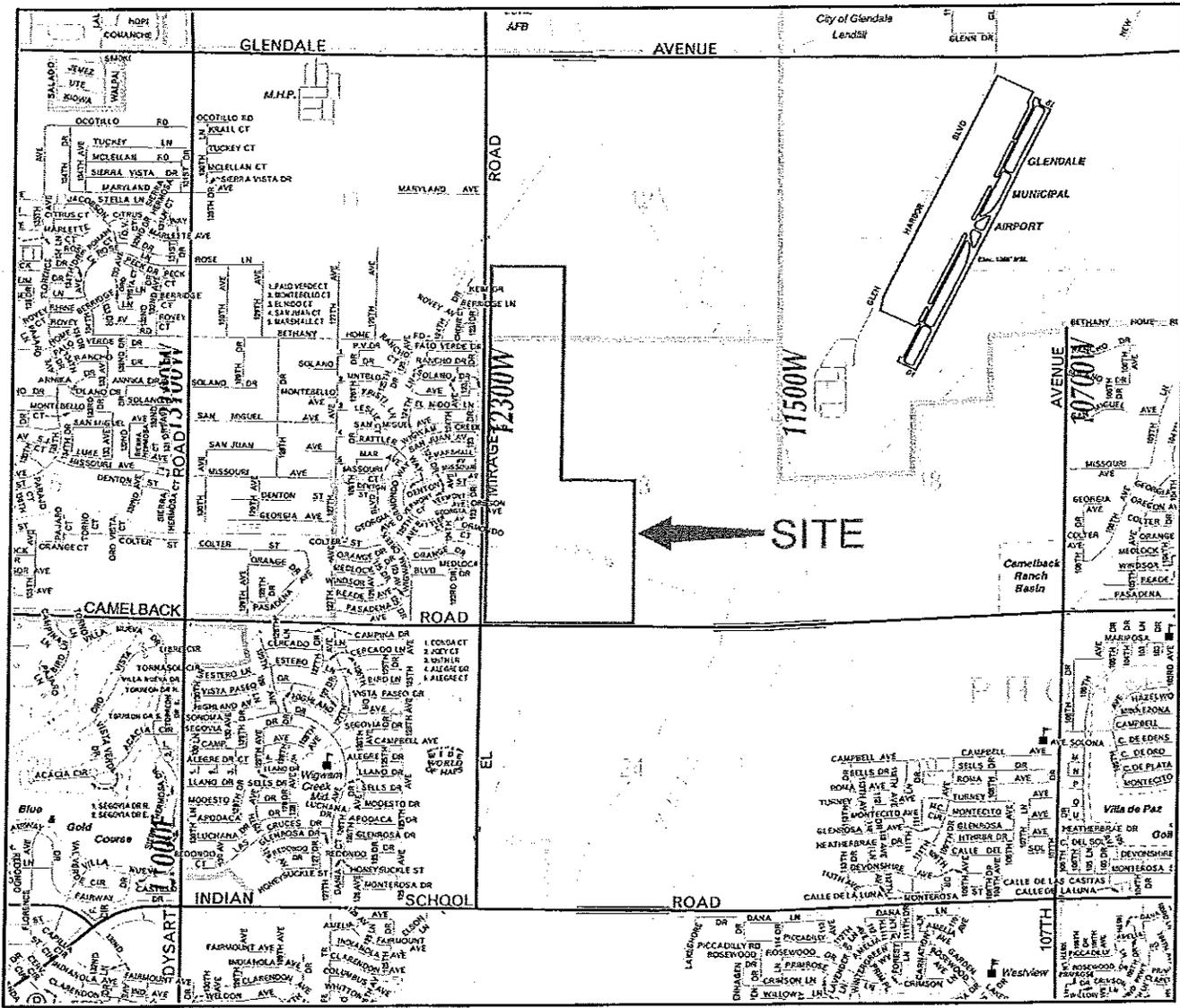
Corporate self-insurance will be the Financial Assurance Mechanism used to cover the estimated reclamation cost. The required corporate information needed to satisfy the corporate financial test requirements of Arizona Administrative Code (A.A.C.) R11-3-809.C will be submitted under separate correspondence within 60 days.

## 5.0 REFERENCES

- Arizona Administrative Code, Title 11 – Mines, Chapter 3. State Mine Inspector Aggregate Mined Land Reclamation, Articles 1-8 (proposed).
- Arizona Department of Water Resources, Ground Water Site Inventory Database, June, 2005.
- Arizona Revised Statutes, Title 27 – Minerals, Oil and Gas, Aggregate Mined Land Reclamation, Articles 1-6.
- Arizona State Mine Inspector Division of Mined Land Reclamation, January, 1997, *Mined Land Reclamation Statutes and Rules*.
- Caterpillar Performance Handbook, Edition 31, Caterpillar Inc., October, 2000.
- RACER Cost Estimating software v. 8.1.2., 2006.
- RS Means, *Facilities Construction Cost Data, 2004*, 19<sup>th</sup> Annual Edition, Reed Construction Data, 2003.



0 1500 3000  
 APPROXIMATE  
 SCALE IN FEET



**Hanson**

Figure 1

**VICINITY MAP  
 RIVER RANCH SITE  
 (PLANT #40)**

**5159 NORTH EL MIRAGE ROAD  
 LITCHFIELD, ARIZONA**

**BROWN AND  
 CALDWELL**



Figure 2

EXISTING SITE CONDITIONS  
RIVER RANCH SITE  
(PLANT #40)

5159 NORTH EL MIRAGE ROAD  
LITCHFIELD, ARIZONA





Figure 3

POSTAGGREGATE MINING CONTOURS  
RIVER RANCH SITE  
(PLANT #40)

5159 NORTH EL MIRAGE ROAD  
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