SAND AND GRAVEL IN THE LAS VEGAS
AND PAHRUMP AREAS:
A PRELIMINARY REPORT

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This information should be considered preliminary. It has not been edited or checked for completeness or accuracy.

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INTRODUCTION

In August 1991 the Nevada Bureau of Mines and Geology (NBMG), Mackay School of Mines, University of Nevada, Reno (UNR), entered into an agreement with the U. S. Geological Survey (USGS) to perform a sand and gravel resource inventory in the Las Vegas and Pahrump areas for the U. S. Bureau of Land Management (BLM). The areas consist of the following lands:

1. Las Vegas study area:
   T. 19-23 S., R. 59-63 E.,
   T. 24 & 25 S., R. 59 & 60 E.

2. Pahrump study area:
   T. 19-21 S., R. 52-54 E.,
   T. 22 S., R. 53 & 54 E.,
   Nevada portions of T. 24 & 25 N., R. 8 E.

This report contains the results of all work done on sand and gravel resources in the above areas by NBMG and UNR Department of Geological Sciences personnel in 1991. In addition, recommendations for further work are included.

WORK PERFORMED

Geologic maps were compiled using facilities of the Geographic Information Systems Office of NBMG. All available 1:24,000-scale geologic maps in the Las Vegas area (Bingler, 1977; Bell and Smith, 1980; Matti and Bachhuber, 1985; Matti and others, 1987; Matti and others, in review; Carr, M., in preparation) were digitized. In addition, the 1:250,000 geologic map of Clark County (Longwell and others, 1965) was digitized and expanded to 1:100,000. On the basis of photogeologic mapping using USGS and BLM aerial photographs at approximate scales of 1:30,000 to 1:40,000, the Clark County geologic map was modified to provide more accurate Quaternary and Quaternary-bedrock contacts. Finally, simplified geologic maps showing grouped lithologic units, and omitting structural features such as faulting, were compiled at a scale of 1:100,000 (Plates 1a and 1b). Some reconnaissance geologic mapping done during the 1991 field work was also incorporated into the final 1:100,000 scale geologic maps.

Mapped geologic units in the Las Vegas area were assigned to the following groups that the authors believe have pertinence to sand and gravel potential:

XP: Precambrian through Mississippian rocks, sedimentary and metamorphic rocks that do not contain gypsum.

PK: Pennsylvanian through Mesozoic rocks, sedimentary units that contain gypsum locally.

KTg: Cretaceous and Tertiary granitic rocks.

Tv: Tertiary volcanic rocks.
Ts: Tertiary sedimentary rocks, with gypsum.
Qg1: Sand and gravel that contains gypsum.
Qg2: Sand and gravel containing volcanic detritus, no gypsum.
Qg3: Sand and gravel, mainly limestone detritus, no gypsum.
Qs: Fine-grained Quaternary sediments
Qa: Modern alluvium
Qm: Man-made deposits.

Detailed preliminary urbanization maps of the Las Vegas and Pahrump areas were compiled using recent large-scale aerial photography (Landiscor, 1991), 1:56,000 (Las Vegas area) and 1:46,000 (Pahrump area) aerial photographs taken for NBMG by the Nevada Air National Guard in 1991, and surface reconnaissance data. Final simplified urbanization maps were produced at a scale of 1:100,000 (Plates 2a and 2b). Maps of current sand and gravel producers in the Las Vegas and Pahrump areas (Plates 3a and 3b) were compiled using data from aerial photographs, surface reconnaissance and a list of Nevada mining operations active in 1990 (Nevada State Mine Inspector, 1991). These producers are listed in Appendix B. Finally, maps showing areas with high, medium, and low sand and gravel potential in the Las Vegas and Pahrump areas (Plates 4a and 4b) were prepared using lithologic data (Plates 1a and 1b) and data on sand and gravel collected during surface reconnaissance in 1991.

A total of 78 sand and gravel exposures in the Las Vegas and Pahrump areas were evaluated during field reconnaissance in 1991 (see Plates 4a and 4b for locations). Data collected during sand and gravel exposure evaluations included lithology, size distribution, thickness and size of the exposure; caliche distribution; presence of deleterious material (such as gypsum); and miscellaneous geologic and production information (Appendix A). Thirty-two bulk samples of sand and gravel were collected as part of these evaluations (see Appendix A, Plates 4a and 4b). The samples were collected by channeling pit or wash walls or were collected from piles of pit-run material judged to be representative of the exposure as a whole. The samples were screened on site through a 3/4-inch screen and both undersize and oversize material was retained. The purpose of the screening was to remove any man-made material and to facilitate examination of the samples. The samples, which range in weight from 40 to 60 pounds, were shipped in 5-gallon plastic buckets to NBMG for storage and possible future use in quality assessment.

Because the presence or absence of caliche (sedimentary deposits cemented by calcium carbonate) is critical to potential for sand and gravel, particular attention was paid to the occurrence of caliche during reconnaissance (see Appendix A). In the absence of active or abandoned pits, examinations of wash walls and fan surface materials were used to determine the extent of caliche formation.
RESULTS

The reconnaissance work has shown that sand and gravel resources in the Las Vegas area are mainly in alluvial fans (Qg1-Qg3, Plate 1a). Mineability of such material is directly related to the absence of thick layers of well-indurated caliche (sedimentary deposits cemented by calcium carbonate). In some areas, such as the Sunset Blvd.-Boulder Highway area (e.g., site 28, Plate 4a), sand and gravel mining was abandoned at a depth of 10 to 20 feet where hard caliche was encountered. In southern Nevada, the development of caliche is generally greatest on fans composed of carbonate and basic igneous rock detritus (Lattman, L. H., 1973), although alluvial fans along the north and east sides of the Las Vegas basin that are predominantly composed of carbonate detritus contain relatively little caliche. According to Weide (1982), older fan deposits in the Las Vegas area are characterized by multiple superimposed caliche layers and are typically very well cemented, whereas younger fan deposits are unconsolidated or contain minor amounts of caliche. Certain fans are composed of sand and gravel that is so thoroughly cemented by caliche that mining for construction aggregate is impractical. Such material occurs in the fan between Flamingo Wash on the north, the floodplain of Cottonwood Valley on the south, Jones Blvd. on the east, and carbonate bedrock on the west (see sand and gravel evaluations 2-5, Appendix A). Because this fan contains so much hard caliche, it is shown as an area of low sand and gravel potential (Plate 4a). Other fans contain hard, thick caliche locally, and may be unmineable in some areas, but generally appear to have good potential. South of the Blue Diamond Road, alluvial fan deposits contain hard caliche deposits up to 30 feet thick places (sand and gravel descriptions 11 and 12, Appendix A), but are shown as having good potential (Plate 4a) because the caliche appears to be localized. In addition, the highly prospective sand and gravel in the alluvial fan south of the Henderson Cutoff Road also has locally extensive caliche (sand and gravel description 38, Appendix A). Past sand and gravel mining in this fan (e.g., sand and gravel description 72, Appendix A) shows that excavations as much as 30 feet deep are feasible.

Modern alluvium (Qa, Plate 1a) in the Las Vegas area is entirely unconsolidated and is generally composed of sand and gravel suitable for high-quality aggregate. Examples include unconsolidated sand and gravel in Red Rock Wash (sand and gravel evaluation 41, Appendix A) near State Highway 159, and modern gravels which were mined on a small scale near Lone Mountain in the 1970s (current operators in that area apparently extended operations into variably cemented older fan gravels in the 1980s). Modern alluvium in the Las Vegas area is generally thin and cannot be mined to depths greater than 5 to 25 feet. Therefore, modern alluvium does not offer the same potential for long-term sand and gravel resource exploitation (with minimal amounts of surface impact) as the alluvial fans. However, many thin deposits of modern alluvium that overlie alluvial fans are mineable because

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mining can be extended into underlying material. In such cases, the quality of material mined may be increased by the presence of modern alluvium which is generally cleaner (with lower amounts of silt and clay) and more easily mined. It is considered to have moderate to high potential where it overlies alluvial fans, but to have low potential where it overlies areas of fine-grained sediments (Plate 4a).

Sandy to clayey calcareous paludal (deposited in marshy environments), eolian, and lacustrine deposits underlie large areas within the Las Vegas basin. Such deposits, which include the Las Vegas Formation (Longwell et al., 1965) are particularly common in the central part of the basin. Material from these fine-grained units is generally not usable except as landscape sand which is produced in adequate amounts as fine reject material by base and concrete aggregate operations. Areas underlain by fine-grained sediments are shown as low potential areas on Plate 4a.

Tertiary sedimentary rocks occur in the east part of the Las Vegas area. These are mainly calcareous shales to sandstones that contain significant amounts of gypsum as cement or interbeds. Some gypsum-bearing gravels, tuffaceous rocks, and limestone beds are also included. Because they are generally fine-grained or gypsiferous, all of the Tertiary sedimentary rocks are considered to have low potential for sand and gravel deposits (compare Plates 1a and 4a).

Utilization of sand and gravel for construction aggregate is dependant on material quality. Large amounts of gypsum, chert, and siliceous volcanic rock (which are all present in the Las Vegas area) in sand and gravel limit its usefulness as construction aggregate because of reactions that weaken concrete. Gypsum is abundant in much of the sand and gravel that comprises alluvial fans on the west flank of Frenchman Mountain (see sand and gravel evaluations 29-33, Appendix A). However, removal of gypsum during processing may bring aggregate products from some sites into conformance with construction specifications. Chert is particularly abundant in some alluvial fan gravel in the southwest part of the Las Vegas basin (see sand and gravel evaluations 2-5, Appendix A), and siliceous volcanic rock occurs in minor amounts as detritus in fans in the Henderson area and that flank the McCullough Range. Although siliceous rock can be deleterious to aggregate quality, its presence is not considered to be grounds for a low potential classification in the Las Vegas and Pahrump areas if the material is otherwise considered to have medium or high potential.

In two parts of the Las Vegas area, alluvial fan material consists mainly of granitic rock detritus that is partially decomposed and may not be usable for some types of construction aggregate. At a site in the Railroad Pass area (sand and gravel evaluation 35, Appendix A), alluvial fan material dominated by sand- to pebble-size granitic detritus contains some friable granitic clasts, and similar material occurs in pits south of Jean Lake (sand and gravel evaluation 75, Appendix A). Although both areas are shown as having high potential for aggregate production
on Plate 4a, the acceptability of such material as aggregate depends on application; it is probably adequate for surfacing gravel roads and in asphalt concrete, but may not meet specifications for portland cement concrete.

On the basis of available geologic mapping and the field reconnaissance done in 1991, alluvial fans in the Las Vegas basin may be subdivided into seven areas listed below which have different lithologic characteristics that bear on sand and gravel potential.

1. Kyle Canyon Road - Flamingo Wash: limestone detritus with rare to moderate chert, locally abundant caliche, little sand-size detritus, and no gypsum.

2. Flamingo Wash - Arden: limestone detritus with moderate to abundant chert, locally abundant hard caliche, little sand-size detritus, and little or no gypsum.

3. Henderson Cutoff: volcanic detritus, moderately abundant caliche, moderately abundant sand, and little or no gypsum.

4. Henderson: volcanic and limestone detritus with very minor chert, little or no caliche, abundant sand-size detritus, and local gypsum.

5. Frenchman Mountain: limestone detritus with minor chert, minor caliche, minor to abundant sand-size detritus, and minor to abundant gypsum.

6. Salt Lake Highway: limestone detritus with minor to moderate chert, minor caliche, little sand, and local gypsum.

7. North Las Vegas: limestone detritus with minor quartzite, little or no caliche, little sand, no gypsum.

In the Las Vegas study area outside the Las Vegas basin, alluvial fans may be grouped into six main areas.

1. Bird Spring-Blue Diamond: limestone ± sandstone detritus, minor to abundant caliche, local gypsum.

2. Sloan: detritus mostly limestone with minor volcanic and metamorphic rocks, locally abundant caliche, no gypsum.

3. Jean: limestone ± chert ± volcanic detritus, minor caliche, no gypsum.


5. Ivanpah Valley: limestone ± metamorphic ± volcanic detritus, minor caliche, no gypsum.
6. Railroad Pass: granitic ± metamorphic and(or) volcanic detritus, no caliche, locally abundant sand-size detritus, no gypsum.

In the Pahrump area, alluvial fan material comprises almost all of the sand and gravel resources. Modern alluvium is present in minor amounts and cannot be considered as a volumetrically important source of aggregate. Fine-grained lacustrine, eolian, and possibly paludal sediments with little potential for aggregate (except as landscaping fill) occupy a large portion of the Pahrump area. These fine-grained sediments are composed mostly of silty calcareous sediments and locally contain gypsum.

Most of the alluvial fan material in the Pahrump area is considered to be a high-quality sand and gravel resource composed predominantly of limestone with minor quartzite. All sand and gravel mining operations that were active during the 1991 reconnaissance were exploiting such material along the east side of Highway 160. Hard quartzite composed most of the material at two locations evaluated (see sand and gravel evaluations 52 and 56, Appendix A).

A small area of sand and gravel in the Pahrump area that contains gypsum has been identified and shown as having moderate sand and gravel potential (Plate 4b). This area contains two small pits (sand and gravel evaluations 47 and 48, Appendix A).

In both the Las Vegas and Pahrump areas, bedrock (including Precambrian to Mesozoic age rocks and Tertiary igneous rocks) has potential for aggregate production. However, ranking the potential of these rocks for aggregate production is beyond the scope of this report. At the present time, bedrock is not used for aggregate production in the Las Vegas and Pahrump areas.

RECOMMENDATIONS

Before specific sand and gravel deposits are developed, detailed geological evaluation and testing work is recommended. For sites which are to be mined only to shallow levels (for instance, on lands that may be used for future residential or commercial development) evaluation and sample collection may be accomplished utilizing surface trenching. However, for sites which are to be mined to depths of more than 20 feet, drilling is recommended. In unconsolidated material, flight auger drilling is probably the most cost-effective method. In addition, auger drilling more-or-less preserves the original size distribution of samples; however, boulder-size clasts may terminate drilling or be forced into hole walls and remain unsampled. Although auger drilling may penetrate friable caliche, deposits that contain well-indurated caliche should be evaluated using another technique, such as air-rotary drilling.

The sand and gravel potential maps of the Las Vegas and Pahrump areas (Plates 4a and 4b) were produced to aid in regional sand and gravel planning. They are highly generalized and do not
reflect local variations in sand and gravel deposits. Further regional work is recommended on sand and gravel in both areas. Areas listed as having unknown potential (Plate 4a) should be evaluated, and more detailed geologic field examinations should be carried out in areas with high sand and gravel potential that are also good candidates for political and environmental reasons. In addition, quality analyses of sand and gravel samples collected during 1991 should be performed. Tests that are considered to be important for the analysis of aggregate in the Las Vegas and Pahrump areas are: 1) sieve analysis; 2) Los Angeles abrasion test; 3) sulfate soundness test; and 4) X-ray diffraction.

Sieve analysis is necessary to determine the proportion of sizes constituting a sand and/or gravel deposit to be evaluated as a source of aggregate. Uniform gradation in size is desirable for an aggregate source for general use. The lack of small or large sizes may necessitate multiple sources of aggregate to compensate for any size deficiency; however, crushing may be used to produce smaller size aggregate when needed. Sieve analysis is essential to determine the fraction of very fine material in a deposit. The use of aggregate having a small fraction (less than 4 to 5 percent) passing the #200 sieve results in longer lasting asphalt concrete pavement.

Los Angeles abrasion testing is performed to determine the hardness or abrasion resistance of aggregate. This test involves the milling of an aggregate sample with metal balls in a drum at a specified constant rate. The weight of the material passing certain sieves before and after the test is used to determine abrasion loss during the test; this loss also incorporates the change in aggregate size due to fracturing. Abrasion resistance is a crucial property of a concrete aggregate because this aggregate must remain intact during the concrete mixing process. Once the concrete has set, the abrasion resistance of the aggregate also governs the long-term durability of the concrete.

Soundness testing simulates the natural weathering of aggregates, and is used to evaluate aggregate response to extreme temperature variations and freeze/thaw cycles. It is performed by immersing sized fractions of an aggregate sample in a saturated solution of sodium or magnesium sulfate followed by oven drying. This process is repeated a specified number of times (usually five) and the sample is resized to determine percentage weight loss.

Finally, X-ray diffraction analysis is performed to determine mineralogic composition of materials. The presence of significant amounts of deleterious minerals in sand and gravel (e.g., gypsum) is important quality information. Knowledge of mineralogic composition is essential to understand or identify potential chemical reactions between aggregate and binder (asphalt or portland cement binders, for example). X-ray diffraction analysis is also useful to determine the composition of surface coatings on aggregate pieces. Surface coatings can affect the bond between aggregate and binder; for asphalt concrete, surface coatings also affect absorbance of the asphalt binder by the aggregate.
REFERENCES


Matti, J. C., and Bachhuber, F. W., 1985, Geologic map of the Las Vegas SW Quadrangle: Nevada Bureau of Mines and Geology Map 3Bb, 1:24,000.


APPENDIX A. SAND AND GRAVEL EVALUATIONS

NOTES:

Section locations are reported, where possible, in quarter quarter sections (for example, the southwest quarter of the southwest quarter of section 10 is listed as SE SE 10).

Quadrangle names listed are for USGS 7.5 minute quadrangles.

Size distributions are mostly volume estimates, ranging from ++ (abundant) to -- (very minor).

Rock types were estimated on the basis of visual examination of pebble size or larger detritus and range from ++ (50% or more), + (10 - 50 %), - (<10%), and -- (trace).
NUMBER 1

NAME   Tropicana Ave. west extension

LOCATION
Section(s)  SE NE 25
Township   21S
Range      59E
Quadrangle Blue Diamond SE

LAND OWNERSHIP  Federal (BLM)

AREA REPRESENTED  200'x300', size of pit oriented E-W

DEPTH EXPOSED  About 10'

SIZE DISTRIBUTION
Clay +
Silt +
Sand -
Pebble ++
Cobble +
Boulder -

ROCK TYPE(S)
Limestone ++ (>90%)
Chert -
Siltstone - ochre colored
Sandstone - white to red-brown
Volcanics
Granitic
Metamorphic
Gypsum
Other

CALICHE
Depth  In pit 8'-10'+, in wash just SW and up to 500' W 3'- 5'.
Thickness  Unknown.

SAMPLE TAKEN  LV-7

REMARKS
NUMBER 2

NAME  Rainbow Blvd. - Maule Ave. area

LOCATION
Section(s)  SW NW 2, SE NE 3
Township  22S
Range  60E
Quadrangle  Las Vegas SW

LAND OWNERSHIP  Mostly private, some federal (BLM)

AREA REPRESENTED  2000’x500’ oriented NE along unnamed wash

DEPTH EXPOSED  Maximum 8’

SIZE DISTRIBUTION
Clay  ?
Silt  ?
Sand  ?
Pebble  ++
Cobble  ++
Boulder  -

ROCK TYPE(S)
Limestone  ++ (65-85%)
Chert  + (15-30%)
Siltstone
Sandstone  - (<5%-10%)
Volcanics
Granitic
Metamorphic
Gypsum
Other

CALICHE
Depth  Surface to 1’
Thickness  8’, all exposures variably cemented, most hard, upper 1’ locally unconsolidated.

SAMPLE TAKEN  No

REMARKS  Low potential for mining due to thick surficial caliche which extends along Rainbow Blvd. at least 4500’ to N and is exposed in Tropicana wash about 2000’ to N. Based on exposures in washes, this caliche is thick and continuous. To south unconsolidated cover of unknown thickness.
NUMBER 3

NAME Burned house garbage pit, Windmill Lane

LOCATION
  Section(s) SE SW 8
  Township 22S
  Range 60E
  Quadrangle Blue Diamond SE

LAND OWNERSHIP Private, surrounded by federal (BLM)

AREA REPRESENTED ca. 10'x30'

DEPTH EXPOSED 6'

SIZE DISTRIBUTION
  Clay ?
  Silt ?
  Sand ?
  Pebble ++
  Cobble ++
  Boulder -

ROCK TYPE(S)
  Limestone ++
  Chert -
  Siltstone
  Sandstone +
  Volcanics
  Granitic
  Metamorphic
  Gypsum
  Other

CALICHE
  Depth Surface to 1'
  Thickness 6'+

SAMPLE TAKEN No

REMARKS Area underlain by caliche as shown by short forays to N and W, may not be suitable for aggregate mining for this reason.
NUMBER 4

NAME   Fort Apache Rd. in wash below gypsum mines

LOCATION
Section(s)  NW SW 8
Township  22S
Range   60E
Quadrangle Blue Diamond SE

LAND  OWNERSHIP  Federal (BLM)

AREA REPRESENTED  Outcrop

DEPTH EXPOSED  7'

SIZE DISTRIBUTION
Clay  
Silt  
Sand  
Pebble ++
Cobble ++
Boulder ++

ROCK TYPE(S)
Limestone ++
Chert +
Siltstone -
Sandstone + light yellow, ocher, & pink
Volcanics
Granitic
Metamorphic
Gypsum --
Other

CALICHE
Depth  Surface to 1'
Thickness  7'+

SAMPLE TAKEN No

REMARKS  Caliche appears to be continuous to N, S, & E. Bedrock is west of wash and consists of limestone with abundant chert, moderately consolidated red bed material (mostly sandstone) and gypsum.
NUMBER 5

NAME Wash NW of Durango-Sunset intersection, just N of gas line

LOCATION
Section(s) SE SE 32
Township 21S
Range 60E
Quadrangle Blue Diamond SE

LAND OWNERSHIP Private

AREA REPRESENTED Outcrop

DEPTH EXPOSED 6'

SIZE DISTRIBUTION
Clay ?
Silt ?
Sand ?
Pebble ++
Cobble ++
Boulder +

ROCK TYPE(S)
Limestone ++
Chert +
Siltstone -
Sandstone + white to reddish brown
Volcanics
Granitic
Metamorphic
Gypsum None
Other

CALICHE
Depth Surface to 1'
Thickness 6'+

SAMPLE TAKEN No

REMARKS Area is underlain by surficial caliche locally to west and east, may be continuous. Aggregate mining potential may be low for this reason.
NUMBER 6

NAME Storm drain, Hacienda Ave. & Buffalo Dr., S edge Spanish Trails Subdivision.

LOCATION
Section(s) SE NE 28
Township 21S
Range 60E
Quadrangle Blue Diamond SE

LAND OWNERSHIP Private

AREA REPRESENTED 100' along drainage ditch

DEPTH EXPOSED 15'

SIZE DISTRIBUTION
Clay ++
Silt ++
Sand +
Pebble ++
Cobble ++
Boulder -

ROCK TYPE(S)
Limestone ++
Chert
Siltstone
Sandstone
Volcanics
Granitic
Metamorphic
Gypsum
Other

CALICHE
Depth 2'-10'
Thickness 2'-5', variable, hard to friable; also in local hard lens-shaped channels 10' below surface.

SAMPLE TAKEN None necessary, too close to development.

REMARKS Interesting locality to study caliche formation.
NUMBER 7

NAME Septic tank pit south of Blue Diamond Road

LOCATION
Section(s) NW NE 34
Township 22S
Range 60E
Quadrangle Sloan

LAND OWNERSHIP Private

AREA REPRESENTED Small pit

DEPTH EXPOSED 7'

SIZE DISTRIBUTION
Clay ?
Silt +
Sand -
Pebble ++
Cobble ++
Boulder -

ROCK TYPE(S)
Limestone ++ some marble
Chert -
Siltstone -
Sandstone --
Volcanics
Granitic
Metamorphic
Gypsum
Other

CALICHE None observed

DEPTH
Thickneess

SAMPLE TAKEN No

REMARKS
NUMBER 8

NAME Exposure in wash

LOCATION
Section(s) SW NE 9
Township 23S
Range 60E
Quadrangle Bird Spring

LAND OWNERSHIP Federal (BLM)

AREA REPRESENTED About 300' along wash

DEPTH EXPOSED 8'-10'

SIZE DISTRIBUTION
Clay
Silt
Sand -
Pebble ++
Cobble ++
Boulder ++

ROCK TYPE(S)
Limestone ++ (95%+)
Chert -
Siltstone - reddish-brown
Sandstone - reddish-brown
Volcanics
Granitic
Metamorphic
Gypsum
Other

CALICHE
Depth At surface
Thickness 8' friable caliche over 2' hard caliche.

SAMPLE TAKEN No

REMARKS Caliche fragments abundant on pediment surface around wash, caliche exposures in roads and washes up to 5' thick extend 2 mi to N and 1/2 mi to E.
NUMBER 9

NAME Bard

LOCATION
   Section(s) NE SW 35
   Township 22S
   Range 60E
   Quadrangle Sloan

LAND OWNERSHIP Federal (BLM), private to E

AREA REPRESENTED About 300' along 100'-wide wash

DEPTH EXPOSED 4'

SIZE DISTRIBUTION
   Clay ?
   Silt +
   Sand +
   Pebble ++
   Cobble ++
   Boulder ++

ROCK TYPE(S)
   Limestone ++
   Chert -
   Siltstone
   Sandstone -- pink to light brown
   Volcanics
   Granitic
   Metamorphic
   Gypsum
   Other

CALICHE
   Depth 2'-3' patchy, in places no caliche to 4'
   Thickness 1'

SAMPLE TAKEN No

REMARKS Similar caliche in wash 2000' to NW.
NUMBER 10

NAME  S. Industrial Road gravel pits

LOCATION
Section(s)  NW NW 29
Township  22S
Range  61E
Quadrangle  Las Vegas SW

LAND OWNERSHIP  Federal (BLM); private with federal minerals to SE, NE

AREA REPRESENTED  Gravel pit about 1500' x 1000'

DEPTH EXPOSED  12'

SIZE DISTRIBUTION
Clay  ?
Silt  ++
Sand  ++, mainly quartz
Pebble  ++
Cobble  ++
Boulder  -

ROCK TYPE(S)
Limestone  ++ ( 90%+)
Chert  - ( < 5%)
Siltstone
Sandstone
Volcanics
Granitic
Metamorphic
Gypsum
Other

CALICHE
Depth  5'
Thickness  3', very rare

SAMPLE TAKEN  LV-24

REMARKS  In places sand + silt > gravel content.
NUMBER 11

NAME Exposure in wash

LOCATION

Section(s) NW SE 1
Township 23S
Range 60E
Quadrangle Sloan

LAND OWNERSHIP Federal (BLM), private land about 1000' NW

AREA REPRESENTED About 100' along 200'-wide wash

DEPTH EXPOSED 15'

SIZE DISTRIBUTION

Clay
Silt
Sand
Pebble ++
Cobble ++
Boulder -

ROCK TYPE(S)

Limestone ++
Chert -
Siltstone
Sandstone
Volcanics
Granitic
Metamorphic
Gypsum
Other

CALICHE

Depth At surface
Thickness 15'

SAMPLE TAKEN No

REMARKS Fan to west has patches of solid caliche on surface, but generally has fragmental caliche on surface. Mostly pebble-cobble gravel in fan, very little unconsolidated gravel.
NUMBER 12

NAME Exposure in wash

LOCATION
Section(s) SE NW 2
Township 23S
Range 60E
Quadrangle Sloan

LAND OWNERSHIP Federal (BLM)

AREA REPRESENTED 2000' along narrow wash

DEPTH EXPOSED 11'

SIZE DISTRIBUTION
Clay
Silt
Sand
Pebble ++
Cobble ++
Boulder ++

ROCK TYPE(S)
Limestone ++
Chert --
Siltstone
Sandstone
Volcanics
Granitic
Metamorphic
Gypsum
Other

CALICHE
Depth At surface
Thickness 11', 30' thick about 2000' to west (down) wash.

SAMPLE TAKEN No

REMARKS Caliche on surface of fan in area. Caliche solid in wash, generally fragmental on fan surface.
NUMBER 13

NAME Sloan NDOT pit

LOCATION
Section(s) SE SW 19, NE NW 30
Township 23S
Range 61E
Quadrangle Sloan

LAND OWNERSHIP Federal (BLM)

AREA REPRESENTED 600' x 1200'

DEPTH EXPOSED 23'

SIZE DISTRIBUTION
Clay
Silt --
Sand +
Pebble ++
Cobble ++
Boulder ++

ROCK TYPE(S)
Limestone ++ (90%+)
Chert --
Siltstone
Sandstone
Volcanics - mostly basic
Granitic
Metamorphic - garnet-biotite-quartz-feldspar gneiss
Gypsum
Other

CALICHE
Depth variable, 1' to 23'
Thickness variable, 3' to 10', ranges from friable to solid

SAMPLE TAKEN LV-32

REMARKS Hard caliche seems to have limited mining, especially along east side of pit. Marked NDOT drill holes.
NUMBER 14

NAME  Gravel pit along Jean-Sloan Rd.

LOCATION
Section(s)  N NW 12, SW SW 1
Township  24S
Range  60E
Quadrangle  Sloan

LAND OWNERSHIP  Federal (BLM)

AREA REPRESENTED  600' x 1500' pit

DEPTH EXPOSED  10'-15'

SIZE DISTRIBUTION
Clay  ?
Silt  -
Sand  ++
Pebble  ++
Cobble  ++
Boulder  +

ROCK TYPE(S)
Limestone
Chert
Siltstone
Sandstone
Volcanics  ++  acid to basic, but mostly intermediate
Granitic
Metamorphic
Gypsum
Other

CALICHE
Depth  Rare caliche, minor friable caliche at SE end of pit.
Thickness

SAMPLE TAKEN LV-31

REMARKS  Clasts along NE side of pit are subrounded, those along SW side are angular. Some beds mostly composed of sand along SW side of pit.
NUMBER 15

NAME Hidden Valley Road pit

LOCATION
Section(s) NE NW 22, SE SW 15
Township 24S
Range 60E
Quadrangle Hidden Valley

LAND OWNERSHIP Federal (BLM)

AREA REPRESENTED 1000' x 2000' pit, partially filled with reject

DEPTH EXPOSED 35'

SIZE DISTRIBUTION
Clay ?
Silt +
Sand ++
Pebble ++
Cobble ++
Boulder ++

ROCK TYPE(S)
Limestone ++
Chert
Siltstone
Sandstone
Volcanics + acid to basic, but mostly intermediate.
Granitic
Metamorphic - pink quartzite
Gypsum
Other

CALICHE
Depth Locally at 8'. Also at 35'
Thickness Shallow zone up to 3' thick on basis of size of blocks in reject pile.

SAMPLE TAKEN LV-30

REMARKS Presently active; product is unwashed 3/8" to 1". Some crushed 3/4" present, but crusher is not on property. Caliche in shallow zone moderately hard and rippable, but caliche at 35' is very hard according to operator.
NUMBER 16

NAME   Nellis N pit

LOCATION
    Section(s)  SE SE 26
    Township  19S
    Range  62E
    Quadrangle  Valley

LAND OWNERSHIP  Private

AREA REPRESENTED  Pit approx 300' diameter

DEPTH EXPOSED  15'

SIZE DISTRIBUTION
    Clay  ?
    Silt  +
    Sand  ++
    Pebble  ++
    Cobble  +
    Boulder  -

ROCK TYPE(S)
    Limestone  ++
    Chert
    Siltstone
    Sandstone
    Volcanics  - (5-10%) mostly basic scoria
    Granitic
    Metamorphic
    Gypsum  -- (less than 0.1% in product)
    Other

CALICHE  None observed

DEPTH

THICKNESS

SAMPLE TAKEN LV-16

NUMBER 17

NAME  Abandoned Las Vegas Blvd. NE pit

LOCATION
Section(s)  NW NW 20
Township  19S
Range  63E
Quadrangle  Apex

LAND OWNERSHIP  Federal (BLM)

AREA REPRESENTED  Pit about 600' along Las Vegas Blvd., 200' wide

DEPTH EXPOSED  15'-20'

SIZE DISTRIBUTION
Clay
Silt +
Sand +
Pebble ++
Cobble ++
Boulder -

ROCK TYPE(S)
Limestone ++
Chert -
Siltstone
Sandstone  -- lt. brown color
Volcanics
Granitic
Metamorphic
Gypsum
Other

CALICHE
Depth  surface (along S edge pit), 8'-12' depth (SE corner pit)
Thickness  @ surface 1'-2', deeper cal. 4'+

SAMPLE TAKEN  LV-15

REMARKS  Material processed was mainly modern alluvium lying on top of caliche cemented gravel. Abandoned equipment mired in mud in flooded pit.
NUMBER 18

NAME Freeway borrow pits at Lovell

LOCATION
Section(s) NW NW 22
Township 19S
Range 62E
Quadrangle Valley

LAND OWNERSHIP Federal (BLM)

AREA REPRESENTED 800' x 800' in west part of borrow pit

DEPTH EXPOSED 16'

SIZE DISTRIBUTION
Clay ?
Silt +
Sand +
Pebble ++
Cobble ++
Boulder --

ROCK TYPE(S)
Limestone ++ (95%+)
Chert -
Siltstone
Sandstone
Volcanics
Granitic
Metamorphic -- pink to purple quartzite
Gypsum
Other

CALICHE
Depth No hard caliche, minor soft calcrete cement locally.
Thickness

SAMPLE TAKEN LV-18

REMARKS Sample from northern pit, just south of railroad.
NUMBER 19

NAME  Wash exposure, N Redrock area

LOCATION  
Section(s)  SW NE 34  
Township  20S  
Range  59 E  
Quadrangle  Blue Diamond NE

LAND OWNERSHIP  Private

AREA REPRESENTED  200' along wash

DEPTH EXPOSED  9'

SIZE DISTRIBUTION
Clay  ?
Silt  ++
Sand  ++
Pebble  ++
Cobble  +
Boulder  -

ROCK TYPE(S)
Limestone  ++
Chert  -
Siltstone  
Sandstone  
Volcanics  
Granitic  
Metamorphic  
Gypsum  
Other

CALICHE
Depth  5'
Thickness  4'

SAMPLE TAKEN  No

REMARKS  Gravel size distribution given is for unconsolidated gravel above caliche.
NUMBER 20

NAME Exposure in wash

LOCATION
Section(s) NE NW 28
Township 20S
Range 59E
Quadrangle La Madre Mountain

LAND OWNERSHIP Private

AREA REPRESENTED About 500' along 100' wide wash.

DEPTH EXPOSED 26'

SIZE DISTRIBUTION
Clay ?
Silt +
Sand +
Pebble ++
Cobble +
Boulder +

ROCK TYPE(S)
Limestone ++ (99%+)
Chert --
Siltstone
Sandstone -- reddish-brown
Volcanics
Granitic
Metamorphic
Gypsum
Other

CALICHE
Depth 3'-4' (upper), 11'-12' (middle), 21'-22' (bottom)
Thickness 2'-3' (upper), 1' (middle), 4'-5' (bottom)

SAMPLE TAKEN No

REMARKS Photos taken of caliche about 0.3 mi downstream.
NUMBER 21

NAME Hualpai Road wash exposure

LOCATION
Section(s) NW SW 31
Township 20S
Range 60E
Quadrangle Blue Diamond NE

LAND OWNERSHIP Private, federal (BLM) minerals

AREA REPRESENTED About 100' along wash

DEPTH EXPOSED About 30'

SIZE DISTRIBUTION
Clay
Silt
Sand
Pebble ++
Cobble ++
Boulder ++

ROCK TYPE(S)
Limestone ++
Chert -
Siltstone
Sandstone -- reddish-brown
Volcanics
Granitic
Metamorphic
Gypsum
Other

CALICHE
Depth Surface
Thickness 30'

SAMPLE TAKEN No

REMARKS Upper 4'-8' and basal 10'-12' hard caliche, intervening material is friable to moderately hard caliche.
NUMBER 22

NAME Wash north of Kyle Canyon Rd

LOCATION
Section(s) NW SE 6
Township 19S
Range 59E
Quadrangle Grapevine Spring

LAND OWNERSHIP Federal (BLM), private to east

AREA REPRESENTED About 200' along wash

DEPTH EXPOSED 5'-8'

SIZE DISTRIBUTION
Clay ?
Silt +
Sand --
Pebble ++
Cobble ++
Boulder -

ROCK TYPE(S)
Limestone ++ (95%+)
Chert -
Siltstone
Sandstone -- reddish-brown
Volcanics
Granitic
Metamorphic
Gypsum
Other

CALICHE
Depth 3'-6'
Thickness up to 3', patchy, none to 8' in places

SAMPLE TAKEN No

REMARKS House located about 300' to NW.
NUMBER 23

NAME  Wash along power line road

LOCATION
Section(s)  NW SW 12
Township  19S
Range  59E
Quadrangle  Tule Springs Park

LAND OWNERSHIP  Federal (BLM)

AREA REPRESENTED  100' along wash

DEPTH EXPOSED  28'

SIZE DISTRIBUTION
Clay  ?
Silt  +
Sand  - but some sandstone layers
Pebble  +
Cobble  +
Boulder  +

ROCK TYPE(S)
Limestone  ++
Chert  -
Siltstone
Sandstone  - (about 3%)
Volcanics
Granitic
Metamorphic
Gypsum
Other

CALICHE
Depth  surface (upper),  7' (bottom)
Thickness  2'-4' (upper),  21' (bottom)

SAMPLE TAKEN  No

REMARKS  Upper caliche zone is hard, bottom caliche zone ranges from soft to hard.
NUMBER 24

NAME  Old community pit north of Lone Mountain

LOCATION
   Section(s)  SW & SE, SW 26; NW NW 35
   Township  19S
   Range  59E
   Quadrangle  Tule Springs Park

LAND OWNERSHIP  Federal (BLM)

AREA REPRESENTED  600' x 200' pit

DEPTH EXPOSED  40'

SIZE DISTRIBUTION
   Clay
   Silt -
   Sand -
   Pebble ++
   Cobble ++
   Boulder -

ROCK TYPE(S)
   Limestone ++ (95%+)
   Chert -
   Siltstone
   Sandstone
   Volcanics
   Granitic
   Metamorphic
   Gypsum
   Other

CALICHE
   Depth  variable, @ SW end pit 5' (upper zone) & 30' (bottom)
   Thickness  variable, 3' (upper), 10' (bottom)

SAMPLE TAKEN LV-21

REMARKS  Abandoned pit. Hard caliche probably limited mining. Lots of friable to
          moderately hard caliche. Some granule to pebble gravel beds with practically no
          fines. Located in relatively narrow and steep fan which may be relatively modern.
NUMBER 25

NAME Wash near Lone Mtn. community pits

LOCATION
Section(s) NE NW 1
Township 20S
Range 59E
Quadrangle Blue Diamond NE

LAND OWNERSHIP Federal (BLM)

AREA REPRESENTED 100' along wash

DEPTH EXPOSED 30'

SIZE DISTRIBUTION
Clay
Silt --
Sand --
Pebble ++
Cobble ++
Boulder -

ROCK TYPE(S)
Limestone ++
Chert
Siltstone
Sandstone
Volcanics
Granitic
Metamorphic
Gypsum
Other

CALICHE
Depth hard below 15'-20', unconsolidated to moderately hard above
Thickness hard caliche 10'-15'

SAMPLE TAKEN No

REMARKS Hard caliche at depth underlain by soft brown gravel with more abundant fines. Community pits just to east (include Quality Sand and Gravel and Ron Williams Constr.) as much as 50' deep.
NUMBER 26

NAME  Lone Mountain Nevada Ready Mix pit (old Stocks pit)

LOCATION
Section(s)  SE SE 34, SW SW 35; N2 NE 3
Township  19S; 20S
Range  59E
Quadrangle  Blue Diamond NE, may extend onto Tule Springs Park

LAND OWNERSHIP  Part private, part federal (BLM)

AREA REPRESENTED  ca. 2500' x 1000' pit, elongated in NE direction

DEPTH EXPOSED  80'

SIZE DISTRIBUTION
Clay
Silt +
Sand -
Pebble ++
Cobble +
Boulder -

ROCK TYPE(S)
Limestone ++
Chert
Siltstone
Sandstone
Volcanics
Granitic
Metamorphic
Gypsum
Other

CALICHE
Depth  Variable, hard with angular limestone boulders in center of pit (may be subcrop - will have to be blasted). Some hard caliche in floor of pit at 80' depth.
Thickness  Variable, thickness unknown in pit bottom.

SAMPLE TAKEN LV-26

REMARKS  Operator is Southern Nevada Paving Corp. Nevada Ready Mix also owns and operates large deep pit about 1 mile to east down same fan. Other operators including Las Vegas Paving Corp. also have pits on this fan about 1/2 mi to east. The fan that includes these operations as well as the abandoned community pit about 1 mi to north is a relatively young, steep fan composed of pebble gravel with minor fines. Caliche distribution is variable; in places near surface, elsewhere deep. Examination of air photos shows that the Stocks pit was originally located in a modern channel incised into the fan (this could explain erratic caliche distribution).
NUMBER 27

NAME   Bonanza Pit

LOCATION
Section(s)  10, 15
Township   22S
Range      62E
Quadrangle Las Vegas SE

LAND OWNERSHIP    Private, Federal minerals

AREA REPRESENTED  Series of pits in 1 mi² area

DEPTH EXPOSED    Maximum at jaw crusher 85'

SIZE DISTRIBUTION
Clay   --
Silt    -
Sand   + mostly quartz, some volcanic detritus is sand size
Pebble +
Cobble +
Boulder +

ROCK TYPE(S)
Limestone
Chert
Siltstone
Sandstone  - ocher to pink color
Volcanics  ++ acid to basic, but mostly intermediate, some scoriaceous
Granitic
Metamorphic
Gypsum
Other

CALICHE  None observed
Depth
Thickness

SAMPLE TAKEN No

REMARKS    Previous operation did not crush large boulders and left considerable amounts of boulders in shallow workings that are now being processed as mining proceeds. Deeper material in pit is composed of more sand and less rock (pebble-boulder clasts appear to comprise 25% or less by volume) than near surface material. Operator (Beazer, Inc.) plans to do a reserve calculation soon in order to determine most economic approach to mining (value of aggregate versus value of land).
NUMBER 28

NAME Old WMK pit

LOCATION
Section(s) S 3
Township 22S
Range 62E
Quadrangle Las Vegas SE

LAND OWNERSHIP Private

AREA REPRESENTED Pit is 1/2 mi²

DEPTH EXPOSED 22' maximum, shallower to W

SIZE DISTRIBUTION
Clay
Silt --
Sand - but abundant granule-size detritus
Pebble +
Cobble +
Boulder +

ROCK TYPE(S)
Limestone --
Chert
Siltstone
Sandstone - volcanogenic
Volcanics ++ acid to basic, but mostly intermediate, some scoriaceous
Granitic
Metamorphic
Gypsum
Other

CALICHE
Depth 15'-22', hard
Thickness Unknown, reported to be a few feet.

SAMPLE TAKEN LV 6

REMARKS Variable size distribution; some beds have abundant boulders, others composed mainly of sand-granule material. Very little silt, material is relatively clean and probably requires little washing. Caliche said to overlie minable material that has low rock content (M. Burbank, personal commun., 1991). Operation was shut down about three years ago.
NUMBER 29

NAME Hollywood-Cheyenne pit

LOCATION
Section(s) SW SW 11
Township 20S
Range 62E
Quadrangle Las Vegas NE

LAND OWNERSHIP Private

AREA REPRESENTED Pit about 500' diameter

DEPTH EXPOSED 32' along south wall

SIZE DISTRIBUTION
Clay
Silt -
Sand ++ mostly quartz, some beds in basal 5'-10' are mostly sand
Pebble +
Cobble +
Boulder -

ROCK TYPE(S)
Limestone ++
Chert -
Siltstone
Sandstone - red-brown to ocher
Volcanics
Granitic
Metamorphic
Gypsum ++ abundant in sandy beds
Other

CALICHE None observed

Depth
Thickness

SAMPLE TAKEN LV-1: sampled from pushed pile near south wall, includes material from sandy beds.

REMARKS Material generally decreases in clast size downward. In floor near center of pit is white limy material with carbon (possibly lacustrine limestone). Present operator is Diamond Construction. Product is crushed and washed -3/4 +3/8 that contains only trace amounts of gypsum.
NUMBER 30

NAME Airway Rock Products pit

LOCATION
Section(s) NE SW 14
Township 20S
Range 62E
Quadrangle Las Vegas SE

LAND OWNERSHIP Federal (BLM)

AREA REPRESENTED Pit approx. 500' x 1500' elongated E-W

DEPTH EXPOSED 110' east end pit

SIZE DISTRIBUTION
Clay
Silt -
Sand ++ mainly quartz
Pebble ++
Cobble ++
Boulder -

ROCK TYPE(S)
Limestone ++
Chert
Siltstone
Sandstone - pink
Volcanics
Granitic
Metamorphic
Gypsum ++ in matrix, particularly in sandy beds
Other

CALICHE None observed
Depth
Thickness

SAMPLE TAKEN No

REMARKS Upper 50' is mainly pebble-cobble gravel with some discontinuous pink sand beds at approx. 20' depth. Between 50' and 60' depth is mainly friable pink sandstone with little rock. Below 60' is gravel similar to that in upper 50'. Operation looks large, has produced some washed product, but pond dry (9-14-91). Said to have sulfate in product by another producer.
NUMBER 31

NAME ISOM Sand and Gravel pit

LOCATION
  Section(s) SW NE 2
  Township 21S
  Range 62E
  Quadrangle Las Vegas NE

LAND OWNERSHIP Federal (BLM)

AREA REPRESENTED Pit about 200’ diameter

DEPTH EXPOSED 25’ maximum

SIZE DISTRIBUTION
  Clay
  Silt +
  Sand ++ mostly quartz
  Pebble +
  Cobble +
  Boulder --

ROCK TYPE(S)
  Limestone ++
  Chert
  Siltstone
  Sandstone
  Volcanics
  Granitic
  Metamorphic - quartzite, probably Tapeats sandstone
  Gypsum + mostly in sandy matrix
  Other

CALICHÉ
  Depth Local, surface to 20’ depth
  Thickness Variable

SAMPLE TAKEN No

REMARKS Mined gravel is mainly in “modern” channel about 200’ wide and up to 20’ deep. This channel is incised into a variably calcite-cemented fan that contains a lot of pink to white sand to sandstone (calcite cemented). Operator produces type II and landscape soil. Experimenting with washing to make cement aggregate - claims washing reduces gypsum content to specifications. Small operation.
NUMBER 32

NAME  Bob's Sand and Gravel pit and small pit to north

LOCATION
  Section(s)  NW SW 2
  Township  21S
  Range  62E
  Quadrangle  Las Vegas NE

LAND OWNERSHIP  Federal (BLM)

AREA REPRESENTED  Active pit about 1000' x 300', north pit about 300' diameter

DEPTH EXPOSED  55' maximum at east end active pit, 20' in north pit

SIZE DISTRIBUTION
  Clay  ?
  Silt  +
  Sand  ++
  Pebble  ++
  Cobble  ++
  Boulder  --

ROCK TYPE(S)
  Limestone  ++
  Chert
  Siltstone
  Sandstone
  Volcanics
  Granitic
  Metamorphic
  Gypsum
  Other

CALICHÉ  None observed
  Depth
  Thickness

SAMPLE TAKEN  LV-2 taken from pushed pile in north pit.

REMARKS  In active pit bottom 5' is very light greenish-gray tuffaceous(?) sandstone. Above that is about 40' of pebbly pink sand. Upper 10' is pebble-cobble gravel. Sample from pit to north represents about 20' of depth.
NUMBER 33

NAME Trench near Las Vegas sewage treatment plant

LOCATION
Section(s) NW NE 23
Township 21S
Range 62 E
Quadrangle Las Vegas SE

LAND OWNERSHIP Private, Federal minerals

AREA REPRESENTED Trench 3' x 12'

DEPTH EXPOSED 8'

SIZE DISTRIBUTION
Clay ?
Silt +
Sand ++
Pebble +
Cobble +
Boulder --

ROCK TYPE(S)
Limestone ++
Chert
Siltstone
Sandstone
Volcanics
Granitic
Metamorphic
Gypsum ++ in sandy matrix and as relatively well-indurated masses
Other

CALICHE None observed

Depth
Thickness

SAMPLE TAKEN No

REMARKS This gravel contains so much gypsum that it is not a good source of building material.
NUMBER 34

NAME Las Vegas Wash Nevada Ready Mix pit

LOCATION
Section(s) 31 and 32, descr. & spl. from SE NE 31
Township 21S
Range 63E
Quadrangle Henderson

LAND OWNERSHIP Private, minerals?

AREA REPRESENTED Pit is approx 1 mi², descr. good for pit wall about 1000’ long

DEPTH EXPOSED ca. 40’

SIZE DISTRIBUTION
Clay
Silt 
Sand ++ mostly coarse, mainly volcanic detritus
Pebble ++
Cobble -
Boulder --

ROCK TYPE(S)
Limestone
Chert
Siltstone
Sandstone
Volcanics ++ mostly intermediate.
Granitic
Metamorphic
Gypsum -- only observed in pink sand
Other

CALICHE None observed
Depth
Thickness

SAMPLE TAKEN LV-3

REMARKS Basal 5’ of pit wall contains about 2’ of brownish-pink sand, mostly quartz, with little rock. Sand is overlain by very light green friable calcareous (?) sandstone. Basal 2’ is pebble gravel. Sample taken from material pushed up to loading chute. No screening or other work done in pit, instead material is trucked about 6 mi along Telephone Line - Hollywood road to Nevada Ready Mix plant in NW Sec 11, T. 21S, R. 62E.
NUMBER 35

NAME Gornowich pit

LOCATION
Section(s) S NE 22
Township 23S
Range 63E
Quadrangle Boulder City NW

LAND OWNERSHIP Private, minerals federal (BLM)

AREA REPRESENTED Active pit 1500' x 300'

DEPTH EXPOSED ca. 50'

SIZE DISTRIBUTION
Clay --
Silt -
Sand ++ mostly medium to granule, quartz, feldspar, lithics
Pebble +
Cobble -
Boulder --

ROCK TYPE(S)
Limestone
Chert
Siltstone
Sandstone
Volcanics - intermediate composition
Granitic ++ fine- to medium-grained, some porphyry, acid to intermediate.
Metamorphic - metasedimentary rock
Gypsum
Other

CALICHÉ Local and friable, not an impediment to mining.
Depth variable
Thickness variable

SAMPLE TAKEN LV-4

REMARKS Clasts mainly angular, some subrounded. Some granitic clasts friable.
NUMBER 36

NAME Las Vegas Wash, lower Basic Rock and Sand (?) pit

LOCATION
Section(s) SE 28
Township 21S
Range 63E
Quadrangle Henderson

LAND OWNERSHIP Federal (BLM, Bur. of Reclamation)

AREA REPRESENTED pit ca. 2000’ x 300’, merges with Basic R & S pit to SE

DEPTH EXPOSED up to 70’

SIZE DISTRIBUTION
Clay
Silt -
Sand ++
Pebble ++
Cobble ++
Boulder +

ROCK TYPE(S)
Limestone --
Chert
Siltstone
Sandstone + friable reddish-brown
Volcanics ++
Granitic
Metamorphic
Gypsum + abundant in matrix, also as clasts
Other

CALICHE None observed

Depth
Thickness

SAMPLE TAKEN No

REMARKS Gravel as channels in gypsum-bearing Tertiary sandstone (Thumb Member of Horse Spring Formation). Product is washed -3/4 +3/8, -3/8 + 1/4, -1/4, has not been produced for a while. No sign of gypsum in product.
NUMBER 37

NAME White Rock pit, Basic Rock and Sand

LOCATION
  Section(s) E NE 33
  Township 21S
  Range 63E
  Quadrangle Henderson

LAND OWNERSHIP Federal (BLM), protective withdrawal

AREA REPRESENTED Pit ca. 2000' x 600'

DEPTH EXPOSED ca. 30'

SIZE DISTRIBUTION
  Clay  
  Silt +
  Sand ++
  Pebble ++
  Cobble --
  Boulder --

ROCK TYPE(S)
  Limestone --
  Chert
  Siltstone
  Sandstone  - friable reddish-brown
  Volcanics ++ mostly intermediate composition
  Granitic
  Metamorphic
  Gypsum  - in matrix and in cemented clasts (rather resistant)
  Other

CALICHE None observed
  Depth
  Thickness

SAMPLE TAKEN LV-5

NUMBER 38

NAME Lamb Blvd. South, exposure in wash

LOCATION
Section(s) NE SW 20
Township 22S
Range 62E
Quadrangle Las Vegas SE

LAND OWNERSHIP Private, other minerals federal (BLM)

AREA REPRESENTED 100' along wash

DEPTH EXPOSED 8'

SIZE DISTRIBUTION
Clay
Silt +
Sand -
Pebble +
Cobble +
Boulder +

ROCK TYPE(S)
Limestone
Chert
Siltstone
Sandstone
Volcanics ++ mostly mafic to intermediate composition
Granitic
Metamorphic
Gypsum
Other

CALICHE
Depth variable, surface to 4'
Thickness up to 8'

SAMPLE TAKEN No

REMARKS Very poor exposures in this area. Caliche may be an impediment to mining. Upper 4' contains friable caliche to unconsolidated gravel. Below 4' depth is patchy moderately hard caliche. Surrounding area generally has broken caliche and boulders on the surface. Roads have solid caliche base locally.
NUMBER 39

NAME Losee Road N pit

LOCATION
   Section(s) NE NE 26
   Township 19S
   Range 61E
   Quadrangle Valley

LAND OWNERSHIP Private

AREA REPRESENTED Pit about 300' diameter

DEPTH EXPOSED 10'

SIZE DISTRIBUTION
   Clay
   Silt --
   Sand -
   Pebble ++
   Cobble ++
   Boulder -

ROCK TYPE(S)
   Limestone ++
   Chert -
   Siltstone
   Sandstone
   Volcanics
   Granitic
   Metamorphic - purple quartzite
   Gypsum
   Other

CALICHE None observed
   Depth
   Thickness

SAMPLE TAKEN No

REMARKS Active pit, possible operator is Southern Nevada Paving.
NUMBER 40

NAME Commerce Road N, exposures along low ridge

LOCATION
Section(s)  NW SE 22
Township  19S
Range  61E
Quadrangle  Gass Peak SW

LAND OWNERSHIP  Federal (BLM), surrounded by private land

AREA REPRESENTED  200' along low hill

DEPTH EXPOSED  ca. 15'

SIZE DISTRIBUTION
Clay +
Silt ++
Sand ++
Pebble -
Cobble -
Boulder

ROCK TYPE(S)
Limestone ++
Chert
Siltstone
Sandstone
Volcanics
Granitic
Metamorphic
Gypsum  ++ as cement in sandy beds
Other

CALICHE  None observed
Depth
Thickness

SAMPLE TAKEN  No

REMARKS  Well rounded to subrounded pebble to cobble gravel is on surface of pediment. Gravel is only about 1' thick and is underlain by white to lt. brown ash(?)-bearing calcareous silt beds of alluvial or lacustrine origin with areas of eolian sands. The fine-grained sediment contains abundant gypsum. Little potential for aggregate production in this area. Fine-grained sediments extend over a large area extending at least 2 miles west and 2 miles south from this location. These fine sediments may be underlain by gravel.
NUMBER 41

NAME  Redrock Wash pit

LOCATION
Section(s)  SE NE 4, SW NW 3
Township  21S
Range  59E
Quadrangle  Blue Diamond NE

LAND OWNERSHIP  Federal (BLM), Sec 4 in protective withdrawal

AREA REPRESENTED  old pit 300' x 600'

DEPTH EXPOSED  25'

SIZE DISTRIBUTION
Clay
Silt --
Sand  + (ca. 20%)
Pebble  ++ (ca. 50%)
Cobble  - (< 10%)
Boulder  -- (< 5%)

ROCK TYPE(S)
Limestone  ++ ca. 90% of clasts
Chert
Siltstone
Sandstone  + Aztec sandstone, ca. 10% of clasts
Volcanics
Granitic
Metamorphic
Gypsum
Other

CALICHE  None observed

Depth
Thickness

SAMPLE TAKEN  LV-8

REMARKS  Active wash material, considerable resource available. Material is relatively clean - may make cement sand without washing. Sandstone clasts are somewhat friable and may lower aggregate quality.
NUMBER 42

NAME  Lone Mountain Las Vegas Paving (Mendenhall) pit

LOCATION
  Section(s)  E SE 35
  Township   19S
  Range      59E
  Quadrangle Tule Springs Park

LAND OWNERSHIP  Federal (BLM)

AREA REPRESENTED  1000' x 1500' pit

DEPTH EXPOSED

SIZE DISTRIBUTION
  Clay ?
  Silt - (5-10%)
  Sand - (5-10%)
  Pebble ++ (75-80%)
  Cobble - (5-10%)
  Boulder - (< 5%)

ROCK TYPE(S)
  Limestone ++
  Chert
  Siltstone
  Sandstone
  Volcanics
  Granitic
  Metamorphic
  Gypsum
  Other

CALICHE
  Depth  variable, observed at ca. 2', 20', and 40' depth in places
  Thickness layers up to 2' thick

SAMPLE TAKEN No

REMARKS  Active pit, crusher in pit, conveyor over 1000' long to screening plant. Production over 2000 tons/hour during peak sales season (summer, fall). Coarser material is near surface; some beds of pea gravel with little or no fine material. Occasional removal of hard caliche by blasting.
NUMBER 43

NAME Redrock Wash

LOCATION
  Section(s) NE NW 3
  Township 21S
  Range 59E
  Quadrangle Blue Diamond NE

LAND OWNERSHIP Private

AREA REPRESENTED 100' along wash

DEPTH EXPOSED 16'

SIZE DISTRIBUTION
  Clay
  Silt -
  Sand +
  Pebble ++
  Cobble ++
  Boulder -

ROCK TYPE(S)
  Limestone ++ (95%)
  Chert
  Siltstone
  Sandstone - white to reddish-brown
  Volcanics
  Granitic
  Metamorphic
  Gypsum
  Other

CALICHE
  Depth 2'-7'
  Thickness 9'+

SAMPLE TAKEN No

REMARKS Caliche is poorly to moderately indurated in wash wall, possibly due to "case-hardening". Site is approximately 0.6 mi downstream from location 41.
NUMBER 44

NAME Turner Rd. W

LOCATION
Section(s) NW NW 26
Township 21S
Range 53E
Quadrangle Mound Spring

LAND OWNERSHIP Federal (BLM)

AREA REPRESENTED about 500' diameter area on side of mesa

DEPTH EXPOSED 30'

SIZE DISTRIBUTION
Clay +
Silt ++
Sand +
Pebble --
Cobble
Boulder

ROCK TYPE(S)
Limestone ++
Chert
Siltstone
Sandstone
Volcanics
Granitic
Metamorphic
Gypsum - in fine sediments
Other

CALICHE
Depth surface
Thickness 1'-2'

SAMPLE TAKEN No

REMARKS Almost completely composed of fine-grained sediments, mostly poorly indurated white to buff siltstone and(or) claystone with carbonate±gypsum cement. No potential for aggregate production.
NUMBER 45

NAME  Pahrump Hwy 160 Pit

LOCATION
Section(s)  SW SE 29
Township  20S
Range  54E
Quadrangle  Pahrump

LAND OWNERSHIP  Federal (BLM)

AREA REPRESENTED  300' x 600' pit

DEPTH EXPOSED  20'

SIZE DISTRIBUTION
Clay
Silt  --
Sand  +
Pebble  ++
Cobble  ++
Boulder  -

ROCK TYPE(S)
Limestone  ++
Chert
Siltstone
Sandstone
Volcanics
Granitic
Metamorphic  - pink quartzite
Gypsum
Other

CALICHE  None observed

REMARKS  Relatively clean sand & gravel (low silt content) relative to Las Vegas pediment material.
NUMBER 46

NAME  Pahrump SE pit

LOCATION
  Section(s)  NW NE 3
  Township  21S
  Range  54E
  Quadrangle  Pahrump

LAND OWNERSHIP  Private

AREA REPRESENTED  100' diameter pit

DEPTH EXPOSED  10'

SIZE DISTRIBUTION
  Clay
  Silt +
  Sand -
  Pebble ++
  Cobble ++
  Boulder --

ROCK TYPE(S)
  Limestone ++
  Chert
  Siltstone
  Sandstone
  Volcanics
  Granitic
  Metamorphic  -- pink quartzite
  Gypsum
  Other

CALICHE  None
  Depth
  Thickness

SAMPLE TAKEN No

REMARKS
NUMBER 47

NAME  Kellogg Rd./Hafen Ranch Rd. pit, Pahrump

LOCATION
  Section(s)  NW NW 22
  Township  21S
  Range  54E
  Quadrangle  Mound Spring

LAND OWNERSHIP  Federal (BLM)

AREA REPRESENTED  100' diameter pit

DEPTH EXPOSED  15'

SIZE DISTRIBUTION
  Clay
  Silt +
  Sand -
  Pebble ++
  Cobble ++
  Boulder --

ROCK TYPE(S)
  Limestone ++
  Chert
  Siltstone -
  Sandstone -
  Volcanics
  Granitic
  Metamorphic
  Gypsum --
  Other

CALICHE  None observed
  Depth
  Thickness

SAMPLE TAKEN  No

REMARKS
NUMBER 48

NAME Pahrump Nye County Road Dept. pit - Turner Rd./Hafen Ranch Rd.

LOCATION
Section(s) SW SE 21
Township 21S
Range 54E
Quadrangle Mound Spring

LAND OWNERSHIP Federal (BLM)

AREA REPRESENTED 600' diameter pit

DEPTH EXPOSED 12'

SIZE DISTRIBUTION
Clay
Silt ++
Sand -
Pebble ++
Cobble +
Boulder --

ROCK TYPE(S)
Limestone ++
Chert
Siltstone
Sandstone --
Volcanics
Granitic
Metamorphic
Gypsum -
Other

CALICHE
Depth variable
Thickness 1'-3'

SAMPLE TAKEN LV-14

REMARKS Caliche very minor and soft.
NUMBER 49

NAME Pahrump E pit

LOCATION
Section(s) NW NE 18
Township 20S
Range 54E
Quadrangle Pahrump

LAND OWNERSHIP Federal (BLM)

AREA REPRESENTED 150' diameter pit

DEPTH EXPOSED 15'

SIZE DISTRIBUTION
Clay
Silt ++
Sand -
Pebble ++
Cobble ++
Boulder --

ROCK TYPE(S)
Limestone ++
Chert
Siltstone
Sandstone -
Volcanics
Granitic
Metamorphic
Gypsum
Other

CALICHE None observed
Depth
Thickness

SAMPLE TAKEN No

REMARKS
NUMBER 50

NAME Wheeler Wash

LOCATION
  Section(s) SE NE 35
  Township 19S
  Range 54E
  Quadrangle Wheeler Well

LAND OWNERSHIP Federal (BLM)

AREA REPRESENTED About 1000' along canyon wall

DEPTH EXPOSED 120'

SIZE DISTRIBUTION
  Clay
  Silt -
  Sand -
  Pebble ++
  Cobble +
  Boulder -

ROCK TYPE(S)
  Limestone ++
  Chert
  Siltstone
  Sandstone --
  Volcanics
  Granitic
  Metamorphic
  Gypsum
  Other

CALICHE
  Depth 3'
  Thickness 120'

SAMPLE TAKEN No

REMARKS Edge of alluvial fan adjacent to bedrock. Wheeler Wash cuts deeply into contact between bedrock and alluvium. NW canyon wall is composed of caliche-cemented alluvium. Caliche is poorly to moderately indurated.
NUMBER 51

NAME Wulfenstein pit, Pahrump

LOCATION
Section(s) NW SW 11
Township 20S
Range 53E
Quadrangle Pahrump

LAND OWNERSHIP Private

AREA REPRESENTED 1500' diameter pit

DEPTH EXPOSED 15'

SIZE DISTRIBUTION
Clay
Silt ++
Sand -
Pebble ++
Cobble ++
Boulder --

ROCK TYPE(S)
Limestone ++
Chert
Siltstone
Sandstone -
Volcanics
Granitic
Metamorphic
Gypsum
Other

CALICHE None observed
Depth
Thickness

SAMPLE TAKEN No

REMARKS
NUMBER 52

NAME   Pahrump N pit

LOCATION
Section(s)  W NE 5
Township   19S
Range      53E
Quadrangle Last Chance Range

LAND OWNERSHIP   Private

AREA REPRESENTED  400' x 700' pit

DEPTH EXPOSED  18'

SIZE DISTRIBUTION
Clay
Silt -
Sand ++
Pebble ++
Cobble ++
Boulder +

ROCK TYPE(S)
Limestone -
Chert
Siltstone
Sandstone
Volcanics
Granitic
Metamorphic ++ mostly hard quartzite (>90%), some schist
Gypsum
Other

CALICHE
Depth  Local at 4'
Thickness  3'+

SAMPLE TAKEN LV-11

REMARKS  Moderately hard to hard caliche in wash bottom at N end of pit (possibly case-hardened), otherwise little or no caliche. Pit appears to have mainly yielded type 1 and 2 base. This is very clean (low fines) gravel with relatively high sand content.
NUMBER 53

NAME Bell Vista Road pit

LOCATION
Section(s) NE SE 27
Township 19S
Range 52E.
Quadrangle Last Chance Range

LAND OWNERSHIP Federal (BLM)

AREA REPRESENTED 300' diameter pit

DEPTH EXPOSED 12'

SIZE DISTRIBUTION
Clay
Silt ++
Sand -
Pebble ++
Cobble +
Boulder -

ROCK TYPE(S)
Limestone ++
Chert
Siltstone
Sandstone -
Volcanics
Granitic
Metamorphic - quartzite, white to pink
Gypsum
Other

CALICHE
Depth Local at 12'
Thickness unknown

SAMPLE TAKEN No

REMARKS
NUMBER 54

NAME  Borrow pit

LOCATION
  Section(s)  NW SW 54  
  Township  19S  
  Range  52E  
  Quadrangle  High Peak

LAND OWNERSHIP  Federal (BLM)

AREA REPRESENTED  200' diameter pit

DEPTH EXPOSED  6'

SIZE DISTRIBUTION
  Clay  
  Silt +  
  Sand +  
  Pebble ++  
  Cobble +  
  Boulder --

ROCK TYPE(S)
  Limestone +  
  Chert -  
  Siltstone  
  Sandstone  
  Volcanics  
  Granitic  
  Metamorphic + quartzite, white to brown  
  Gypsum  
  Other

CALICHE
  Depth variable  
  Thickness  1'-2'

SAMPLE TAKEN  No

REMARKS  Caliche is moderately hard.
NUMBER 55

NAME  Sixmile Spring borrow pit

LOCATION
Section(s)  NW NE 2
Township  20S
Range  52E
Quadrangle  Sixmile Spring

LAND OWNERSHIP  Federal (BLM)

AREA REPRESENTED  300' diameter pit

DEPTH EXPOSED  5'

SIZE DISTRIBUTION
Clay
Silt +
Sand -
Pebble ++
Cobble ++
Boulder +

ROCK TYPE(S)
Limestone ++
Chert
Siltstone
Sandstone
Volcanics
Granitic
Metamorphic
Gypsum
Other

CALICHE Minor
Depth
Thickness

SAMPLE TAKEN No

REMARKS
NUMBER 56

NAME  Charleston Ave. W pit, Pahrump

LOCATION
   Section(s)  SW SE 15
   Township  20S
   Range  52E
   Quadrangle  Sixmile Spring

LAND OWNERSHIP  Private

AREA REPRESENTED  1000' diameter pit

DEPTH EXPOSED  3'

SIZE DISTRIBUTION
   Clay
   Silt ++
   Sand ++
   Pebble ++
   Cobble -
   Boulder

ROCK TYPE(S)
   Limestone --
   Chert
   Siltstone
   Sandstone
   Volcanics
   Granitic
   Metamorphic  ++ mainly varicolored quartzite, v. minor schist
   Gypsum
   Other

CALICHE  Minor
   Depth 3'
   Thickness

SAMPLE TAKEN LV-12

REMARKS
NUMBER 57

NAME  Simkins Road E pit, Pahrump

LOCATION
  Section(s)  N NE 26
  Township  19S
  Range 53E
  Quadrangle Horse Springs

LAND OWNERSHIP  Private

AREA REPRESENTED  700' diameter pit

DEPTH EXPOSED 18'

SIZE DISTRIBUTION
  Clay
  Silt -
  Sand --
  Pebble ++
  Cobble +
  Boulder --

ROCK TYPE(S)
  Limestone ++
  Chert
  Siltstone
  Sandstone
  Volcanics
  Granitic
  Metamorphic - schist, white quartzite
  Gypsum
  Other

CALICHE  None observed
  Depth
  Thickness

SAMPLE TAKEN LV-13

REMARKS  Machinery present, but operator not known. Main product appears to be pit run gravel, but some type 2 base screened.
NUMBER 58

NAME Chicken Ranch Hill, Pahrump

LOCATION
Section(s) SW SW 6
Township 22S
Range 54E
Quadrangle Mound Spring

LAND OWNERSHIP Federal (BLM)

AREA REPRESENTED Hill approx. 1000' diameter

DEPTH EXPOSED Hill approx. 80' high

SIZE DISTRIBUTION
Clay
Silt ++
Sand -
Pebble +
Cobble +
Boulder -

ROCK TYPE(S)
Limestone ++
Chert -
Siltstone -
Sandstone -
Volcanics
Granitic
Metamorphic + quartzite
Gypsum Occurs in fine sediments at base of hill, not identified in gravel.
Other

CALICHE None observed
Depth
Thickness

SAMPLE TAKEN No

REMARKS This is one of a NW-trending, three-mile-long row of gravel hills that appear to overlie fine-grained sediments. These gravel hills may be the remnants of a debris flow.
NUMBER 59

NAME Losee Road N pit

LOCATION
Section(s) SW SW 12
Township 19S
Range 61E
Quadrangle Valley

LAND OWNERSHIP Federal (BLM), Federal Protective Withdrawal

AREA REPRESENTED 100' x 200' pit

DEPTH EXPOSED 7'

SIZE DISTRIBUTION
Clay
Silt +
Sand -
Pebble ++
Cobble ++
Boulder +

ROCK TYPE(S)
Limestone ++
Chert
Siltstone
Sandstone
Volcanics
Granitic
Metamorphic - buff to purple quartzite
Gypsum
Other

CALICHE None observed

SAMPLE TAKEN LV-17

REMARKS
NUMBER 60

NAME Exposure in wash S of Blue Diamond

LOCATION
Section(s) NE SE 20
Township 22S
Range 59E
Quadrangle Blue Diamond

LAND OWNERSHIP Federal (BLM)

AREA REPRESENTED 1000' along wash

DEPTH EXPOSED 6'

SIZE DISTRIBUTION
Clay
Silt +
Sand -
Pebble ++
Cobble +
Boulder +

ROCK TYPE(S)
Limestone ++
Chert -
Siltstone
Sandstone + reddish-brown to white
Volcanics
Granitic
Metamorphic
Gypsum
Other

CALICHE Local
Depth variable
Thickness

SAMPLE TAKEN No

REMARKS Caliche may be due to case-hardening along walls of wash. Reddish-brown sandstone crops out 1000' to W, limestone 500' to S.
NUMBER 61

NAME  Cottonwood Wash

LOCATION
   Section(s)  NW NE 19
   Township  22S
   Range  59E
   Quadrangle  Blue Diamond

LAND OWNERSHIP  Federal (BLM)

AREA REPRESENTED  100’ along wash

DEPTH EXPOSED  10’

SIZE DISTRIBUTION
   Clay
   Silt -
   Sand ++
   Pebble ++
   Cobble +
   Boulder +

ROCK TYPE(S)
   Limestone  ++ (ca. 80%)
   Chert --
   Siltstone
   Sandstone  + (ca. 20%), reddish-brown to white
   Volcanics
   Granitic
   Metamorphic
   Gypsum
   Other

CALICHE  N side wash moderately hard, none in active gravel or low terrace S side wash.
   Depth  2’
   Thickness  8’

SAMPLE TAKEN LV-23

REMARKS  Active alluvium may contain a considerable resource, depth unknown.
NUMBER 62

NAME Wash along Bird Spring Road

LOCATION
Section(s) NW NW 21
Township 23S
Range 59E
Quadrangle Bird Spring

LAND OWNERSHIP Federal (BLM)

AREA REPRESENTED 200' along was

DEPTH EXPOSED 8'

SIZE DISTRIBUTION
Clay
Silt +
Sand -
Pebble ++
Cobble +
Boulder +

ROCK TYPE(S)
Limestone ++
Chert -
Siltstone
Sandstone -
Volcanics
Granitic
Metamorphic
Gypsum
Other

CALICHE
Depth 1'-4'
Thickness

SAMPLE TAKEN No

REMARKS Caliche does not appear to be very hard or continuous.
NUMBER 63

NAME  Wash along Bird Spring Road

LOCATION
Section(s)  SW SW 3
Township  23S
Range  59E
Quadrangle  Bird Spring

LAND OWNERSHIP  Federal (BLM)

AREA REPRESENTED  About 200' along wash

DEPTH EXPOSED  6'

SIZE DISTRIBUTION
Clay
Silt +
Sand -
Pebble ++
Cobble +
Boulder +

ROCK TYPE(S)
Limestone ++
Chert -
Siltstone
Sandstone -
Volcanics
Granitic
Metamorphic
Gypsum
Other

CALICHE Local
Depth variable
Thickness

SAMPLE TAKEN LV-19

REMARKS  Caliche is sparse, may be case-hardened.
NUMBER 64

NAME Small pit S of Blue Diamond Road

LOCATION
Section(s) NW SE 20
Township 22S
Range 60 E
Quadrangle Blue Diamond SE

LAND OWNERSHIP Private

AREA REPRESENTED 10' diameter test pit

DEPTH EXPOSED 6'

SIZE DISTRIBUTION
Clay
Silt ++
Sand --
Pebble ++
Cobble +
Boulder -

ROCK TYPE(S)
Limestone ++
Chert --
Siltstone
Sandstone -
Volcanics
Granitic
Metamorphic
Gypsum
Other

CALICHE None observed
Depth
Thickness

SAMPLE TAKEN No

REMARKS Moderately hard caliche at 6' depth in wash just to south.
NUMBER 65

NAME Del Webb Subdivision Trench

LOCATION
  Section(s) NW NE 13
  Township 20S
  Range 59E
  Quadrangle Blue Diamond NE

LAND OWNERSHIP Private

AREA REPRESENTED Trench 20' x 50'

DEPTH EXPOSED 10'

SIZE DISTRIBUTION
  Clay
  Silt +
  Sand -
  Pebble ++
  Cobble +
  Boulder +

ROCK TYPE(S)
  Limestone ++
  Chert
  Siltstone
  Sandstone
  Volcanics
  Granitic
  Metamorphic
  Gypsum
  Other

CALICHE
  Depth 6'
  Thickness 4'

SAMPLE TAKEN No

REMARKS Caliche is moderately hard, rippable by bulldozer, generally 3'-6' below surface in area. No excavations in area greater than 10' deep.
NUMBER 66

NAME Cheyenne Rd./ Buffalo Rd. pit

LOCATION
Section(s) SE SE 9
Township 20S
Range 60E
Quadrangle Blue Diamond NE

LAND OWNERSHIP Private, Federal minerals

AREA REPRESENTED Pit approx. 500' diameter

DEPTH EXPOSED 5'

SIZE DISTRIBUTION
Clay
Silt +
Sand -
Pebble ++
Cobble +
Boulder --

ROCK TYPE(S)
Limestone ++
Chert
Siltstone
Sandstone
Volcanics
Granitic
Metamorphic
Gypsum
Other

CALICHE
Depth None to 5'
Thickness

SAMPLE TAKEN No

REMARKS There are several large, shallow pits (none over 10' deep) in this area. Surface ownership is a complex patchwork of private/federal.
NUMBER 67

NAME American Asphalt Lone Mountain Pit

LOCATION
Section(s) NW NE 1
Township 20S
Range 59E
 Quadrangle Blue Diamond NE

LAND OWNERSHIP Private, Federal minerals

AREA REPRESENTED 300' x 600' pit

DEPTH EXPOSED 50'

SIZE DISTRIBUTION
Clay
Silt -
Sand -
Pebble ++
Cobble -
Boulder -

ROCK TYPE(S)
Limestone ++
Chert
Siltstone
Sandstone
Volcanics
Granitic
Metamorphic
Gypsum
Other

CALICHE
Depth 10'
Thickness 20'

SAMPLE TAKEN LV-20

REMARKS Active pit. Similar to material in Las Vegas Paving pit (gravel descr. 42). Caliche is poorly indurated to hard and is apparently mostly rippable. Some very well-sorted beds of pebble gravel.
NUMBER 68

NAME Flamingo/Durango pit

LOCATION
Section(s) SE NW Sec 21
Township 21S
Range 60E
Quadangle Blue Diamond SE

LAND OWNERSHIP Private, Federal minerals

AREA REPRESENTED pit approx 500' diameter

DEPTH EXPOSED 40'

SIZE DISTRIBUTION
Clay
Silt +
Sand -
Pebble ++
Cobble ++
Boulder --

ROCK TYPE(S)
Limestone ++
Chert
Siltstone
Sandstone -
Volcanics
Granitic
Metamorphic
Gypsum
Other

CALICHE
Depth 10'
Thickness variable up to 5'

SAMPLE TAKEN LV-9

REMARKS Caliche is particularly well-exposed along the west wall, where it is moderate to hard, all apparently rippable. Sample taken from pushed pile along east wall.
NUMBER 69

NAME Wells Cargo pit

LOCATION
   Section(s)  S NW 15
   Township  21S
   Range  60E
   Quadrangle Blue Diamond SE

LAND OWNERSHIP Private

AREA REPRESENTED  1000' x 2500' pit

DEPTH EXPOSED  150'

SIZE DISTRIBUTION
   Clay
   Silt +
   Sand -
   Pebble ++
   Cobble ++
   Boulder +

ROCK TYPE(S)
   Limestone ++
   Chert
   Siltstone
   Sandstone -
   Volcanics
   Granitic
   Metamorphic
   Gypsum
   Other

CALICHE
   Depth variable
   Thickness variable

SAMPLE TAKEN No

REMARKS Deepest sand and gravel pit in the Las Vegas area. Caliche is moderately hard but all is rippable. Mostly used for hot plant aggregate. Some base sold.
NUMBER 70

NAME Cheyenne and 5th pit

LOCATION
   Section(s)  S SE 10
   Township  20S
   Range  61E
   Quadrangle Las Vegas SW

LAND OWNERSHIP Private

AREA REPRESENTED 500' x 2500'

DEPTH EXPOSED 15'

SIZE DISTRIBUTION
   Clay
   Silt ++
   Sand +
   Pebble -
   Cobble --
   Boulder --

ROCK TYPE(S)
   Limestone ++
   Chert
   Siltstone
   Sandstone
   Volcanics
   Granitic
   Metamorphic
   Gypsum
   Other

CALICHE None observed
   Depth
   Thickness

SAMPLE TAKEN No

REMARKS Material from abandoned and partially refilled pit is probably too fine for anything but landscaping sand.
NUMBER 71

NAME  Hwy 95 North pit

LOCATION
Section(s)  NE SW 17
Township  19S
Range  60E
Quadrangle  Tule Springs Park

LAND OWNERSHIP  Federal (BLM)

AREA REPRESENTED  300' x 1000' pit

DEPTH EXPOSED  15'

SIZE DISTRIBUTION
Clay
Silt -
Sand +
Pebble ++
Cobble ++
Boulder -

ROCK TYPE(S)
Limestone ++
Chert --
Siltstone
Sandstone -
Volcanics
Granitic
Metamorphic
Gypsum
Other

CALICHE
Depth  locally present at about 10'
Thickness  unknown

SAMPLE TAKEN LV-22

REMARKS  Relatively clean (low silt) gravel. Caliche is only locally seen in pit
floor. Pit across Hwy 95 in NE SE Sec 17 is entirely fenced off, about 10'-15' deep with
similar material.
NUMBER 72

NAME Cosmo World pit

LOCATION
Section(s) NE NW 2
Township 23S
Range 61E
Quadrangle Sloan

LAND OWNERSHIP Private

AREA REPRESENTED 3 pits approx 500' diameter

DEPTH EXPOSED 10' to 30'

SIZE DISTRIBUTION
Clay
Silt ++
Sand +
Pebble +
Cobble ++
Boulder ++

ROCK TYPE(S)
Limestone +
Chert +
Siltstone
Sandstone
Volcanics ++ basalt, some andesite
Granitic
Metamorphic
Gypsum
Other

CALICHE
Depth surface - distinct surface pavement
Thickness 5' to 7'

SAMPLE TAKEN LV-25

REMARKS Fine material has reddish color, partially cemented by calcite.
NUMBER 73

NAME Roach pit

LOCATION
Section(s) NW SE 27
Township 25S
Range 59E
Quadrangle Roach

LAND OWNERSHIP Federal (BLM)

AREA REPRESENTED pit approx. 300' diameter

DEPTH EXPOSED 10'

SIZE DISTRIBUTION
Clay
Silt +
Sand +
Pebble ++
Cobble +
Boulder

ROCK TYPE(S)
Limestone ++
Chert +
Siltstone +
Sandstone
Volcanics - basalt
Granitic
Metamorphic
Gypsum
Other

CALICHE None observed
Depth
Thickness

SAMPLE TAKEN LV-27

REMARKS Good quality gravel. Caliche in wash 1 mi. N of pit at depth of 3', thickness unknown.
NUMBER 74

NAME Jean

LOCATION
  Section(s) N 14
  Township 25S
  Range 59E
  Quadrangle Jean

LAND OWNERSHIP Federal (BLM)

AREA REPRESENTED 300' x 500' pit

DEPTH EXPOSED 15'

SIZE DISTRIBUTION
  Clay
  Silt +
  Sand +
  Pebble ++
  Cobble +
  Boulder

ROCK TYPE(S)
  Limestone ++
  Chert +
  Siltstone
  Sandstone +
  Volcanics
  Granitic
  Metamorphic
  Gypsum
  Other

CALICHE
  Depth 5'
  Thickness 3'

SAMPLE TAKEN LV-28

REMARKS Pit now receiving clean fill. Caliche soft to moderately hard, rippable.
NUMBER 75

NAME   South Jean Dry Lake pits

LOCATION
   Section(s) S 22
   Township 25S
   Range 60E
   Quadrangle Hidden Valley

LAND OWNERSHIP Federal (BLM)

AREA REPRESENTED 50' x 20'

DEPTH EXPOSED 3'

SIZE DISTRIBUTION
   Clay
   Silt ++
   Sand +
   Pebble ++
   Cobble +
   Boulder

ROCK TYPE(S)
   Limestone
   Chert
   Siltstone
   Sandstone
   Volcanics + mainly basalt
   Granitic ++
   Metamorphic +
   Gypsum
   Other

CALICHE None observed
   Depth
   Thickness

SAMPLE TAKEN LV-29

REMARKS Material has very high silt content. Granitic clasts break down easily. Poor material for construction aggregate.
NUMBER 76

NAME  Jean North pit

LOCATION
   Section(s)  NW 20, NW 21
   Township  24S
   Range  60E
   Quadrangle Jean

LAND OWNERSHIP  Federal (BLM)

AREA REPRESENTED  pit approx. 300' diameter

DEPTH EXPOSED  15'

SIZE DISTRIBUTION
   Clay
   Silt +
   Sand +
   Pebble ++
   Cobble +
   Boulder

ROCK TYPE(S)
   Limestone ++
   Chert +
   Siltstone
   Sandstone --
   Volcanics
   Granitic
   Metamorphic
   Gypsum
   Other

CALICHE  None observed
  Depth
  Thickness

SAMPLE TAKEN  No

REMARKS  No caliche observed. Not sampled due to poor access.
NUMBER 77

NAME Cathedral Canyon

LOCATION
Section(s) NW NW 25
Township 22S
Range 54E
Quadrangle Hidden Hills Ranch

LAND OWNERSHIP Private, Federal minerals

AREA REPRESENTED Canyon 200' x 1000'

DEPTH EXPOSED 40'

SIZE DISTRIBUTION
Clay +
Silt ++
Sand +
Pebble -
Cobble --
Boulder

ROCK TYPE(S)
Limestone ++
Chert
Siltstone
Sandstone -
Volcanics
Granitic
Metamorphic
Gypsum
Other

CALICHE
Depth surface
Thickness 5'-10'

SAMPLE TAKEN No

REMARKS Mostly calcareous fine-grained sedimentary section with some tuffaceous material. Upper 5'-10' is hard, caliche-cemented gravel. Poor area for construction aggregate. About 1 mile to NW is similar section exposed along side of mesa. Fine sediments with a thin lag gravel cover extend at least 3 miles to the east of Location 77.
NUMBER 78

NAME  Browns Spring

LOCATION
  Section(s)  38 (irregular section) otherwise NE SE 15
  Township  22S
  Range  54E
  Quadrangle  Mound Spring

LAND OWNERSHIP  Private

AREA REPRESENTED  200' x 1000' canyon

DEPTH EXPOSED  55'

SIZE DISTRIBUTION
  Clay -
  Silt ++
  Sand +
  Pebble -
  Cobble
  Boulder

ROCK TYPE(S)
  Limestone ++
  Chert -
  Siltstone
  Sandstone -
  Volcanics
  Granitic
  Metamorphic
  Gypsum
  Other

CALICHE
  Depth  local at surface, continuous at 25'
  Thickness  surface zone up to 3', lower zone 5'-10'

SAMPLE TAKEN  No

REMARKS  Poor aggregate source area, some pebbly beds in section dominated by siltstone.
APPENDIX B. SAND AND GRAVEL PRODUCERS ACTIVE IN 1991
<table>
<thead>
<tr>
<th>COMPANY</th>
<th>OPERATION</th>
<th>MAP NO.</th>
<th>NUMBER OF EMPLOYEES</th>
</tr>
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<tbody>
<tr>
<td><strong>LAS VEGAS AREA</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Southern Nevada Paving</td>
<td>Lone Mtn Stocks pit</td>
<td>A</td>
<td>25</td>
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<tr>
<td>Unknown</td>
<td>Lone Mtn pit</td>
<td>B</td>
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</tr>
<tr>
<td>Janet's Sand Co.</td>
<td>Janet Sand pit</td>
<td>C</td>
<td>4</td>
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<tr>
<td>Las Vegas Paving Corp.</td>
<td>Lone Mtn</td>
<td>D</td>
<td>10</td>
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<tr>
<td>Nevada Ready Mix Corp.</td>
<td>Lone Mountain East pit</td>
<td>E</td>
<td>2</td>
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<tr>
<td>Vosberg Equipment</td>
<td>Quality Sand &amp; Gravel pit</td>
<td>F</td>
<td></td>
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<tr>
<td>American Asphalt Inc.</td>
<td>Blue Sky Pit (Lone Mtn)</td>
<td>G</td>
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<tr>
<td>Ron Williams Constr.</td>
<td>Lone Min (BLM) pit</td>
<td>H</td>
<td>3</td>
</tr>
<tr>
<td>Diamond Constr. Co.</td>
<td>Summerlin pit</td>
<td>I</td>
<td>4</td>
</tr>
<tr>
<td>Wells Cargo Inc.</td>
<td>Spring Mtn pit</td>
<td>K</td>
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<td>WMK Transit Mix Inc.</td>
<td>Buffalo pit</td>
<td>L</td>
<td>12</td>
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<tr>
<td>Bonanza Materials Inc.</td>
<td>Henderson</td>
<td>M</td>
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<tr>
<td>Skyline Construction Co.</td>
<td>Skyline pit</td>
<td>N</td>
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<tr>
<td>KMI Materials</td>
<td>Middle East pit</td>
<td>O</td>
<td>4</td>
</tr>
<tr>
<td>Bob's Constr.</td>
<td>East pit</td>
<td>P</td>
<td>5</td>
</tr>
<tr>
<td>ISOM Sand &amp; Gravel</td>
<td>ISOM pit</td>
<td>Q</td>
<td></td>
</tr>
<tr>
<td>Hess Constr. Co.</td>
<td>Middle East pit</td>
<td>R</td>
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<tr>
<td>Airway Rock Products Co.</td>
<td>Airway Pit #1</td>
<td>S</td>
<td>5</td>
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<tr>
<td>Southern Nevada Paving</td>
<td>Hollywood (Sunrise) pit</td>
<td>T</td>
<td>8</td>
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<tr>
<td>Charlie Brown Constr.</td>
<td>Nellis pit</td>
<td>V</td>
<td></td>
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<tr>
<td>Western States Aggregate</td>
<td>Western States pit</td>
<td>W</td>
<td>4</td>
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<tr>
<td>All-Star Ready Mix</td>
<td>Salt Lake Hwy pit</td>
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<td></td>
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<tr>
<td>American Sand &amp; Gravel</td>
<td>Salt Lake Hwy pit</td>
<td>Y</td>
<td>6</td>
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<tr>
<td>Desert Ready Mix</td>
<td>Salt Lake Hwy pit</td>
<td>Z</td>
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<td>Southern Nevada Paving</td>
<td>Losee Road pit</td>
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<tr>
<td>Nevada Ready Mix Corp.</td>
<td>Henderson Pit</td>
<td>BB</td>
<td>19</td>
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<td>Gornowich Sand &amp; Gravel</td>
<td>Dry Lake pit</td>
<td>CC</td>
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<td>Frehner</td>
<td>Sloan (Chemstar) operation</td>
<td>DD</td>
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<td>Lakes Sand &amp; Gravel</td>
<td>North Jean pit</td>
<td>EE</td>
<td>3</td>
</tr>
<tr>
<td>Jet Concrete Inc.</td>
<td>Jet pit</td>
<td>FF</td>
<td>3</td>
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<td><strong>PAHRUMP AREA</strong></td>
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<tr>
<td>Bolling Construction Inc.</td>
<td>Pahrump Community pit</td>
<td>A</td>
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<tr>
<td>Calhoon's Sand &amp; Gravel</td>
<td>Pahrump Community pit</td>
<td>B</td>
<td>3</td>
</tr>
<tr>
<td>Wulfenstein Constr. Co.</td>
<td>Pahrump Community pit</td>
<td>C</td>
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<td>Wulfenstein Constr. Co.</td>
<td>Wulfenstein pit</td>
<td>D</td>
<td>5</td>
</tr>
<tr>
<td>Ron Murphy Construction Co</td>
<td>Ron Murphy pit</td>
<td>E</td>
<td></td>
</tr>
<tr>
<td>Unknown</td>
<td>W Simkins Rd pit</td>
<td>F</td>
<td></td>
</tr>
</tbody>
</table>

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PLATE 1b

SAND AND GRAVEL IN THE LAS VEGAS BASIN PRELIMINARY REPORT

LITHOLOGIC MAP OF THE PAHRUMP AREA

S. B. Castor
J. R. Carr
F. J. Breit

Legend:
- Dr: Wadi-rafted deposits
- Do: Modern alluvium
- Dq: Fine-grained Quaternary sediments
- Dqt: Sand and gravel that contains Holocene fluvial deposits, no gypsum
- Dqs: Sand and gravel that contain Pleistocene deposits, no gypsum
- Dqy: Sand and gravel that contain small amounts of gypsum
- T: Tertiary sedimentary rocks, fine-grained, with gypsum
- Tt: Tertiary volcanic rocks
- Pg: Cretaceous and (ev) Tertiary granitic rocks
- Pr: PreCambrian through Cenozoic rocks, sedimentary units that contain gypsum locally
- Ph: PreCambrian through Mesozoic rocks, sedimentary units that do not contain gypsum

GIS-ARC/MapInfo Database Development and Digital Cartography by:
- Whitney D. Hulseman
- Ronald P. Fose
- Martin S. Behavior
- Huong N. Huy
- David L. Jeffreys
- Sue L. Johnson

Compiled December 30, 1991
SIMPLIFIED URBANIZATION MAP OF THE LAS VEGAS AREA

S. B. Castor
J. B. Carr
F. J. Breit
SAND AND GRAVEL IN THE LAS VEGAS BASIN PRELIMINARY REPORT

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F. J. Breit

Urban areas (residential and commercial).
Rural areas (agricultural, undeveloped).
Underdeveloped land (includes mining areas).

GIS-ARC/INFO Del Norte Development
Digital Cartography by:
L. E. Deitz
R. H. Hueso
H. K. Hong
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Compiled December 10, 1987
SAND AND GRAVEL PRODUCERS IN THE PAHRUMP AREA

S. B. Castor
J. R. Carr
F. J. Breit
SAND AND GRAVEL IN THE LAS VEGAS BASIN
PRELIMINARY REPORT

SAND AND GRAVEL POTENTIAL IN THE PAHRUMP AREA

S. B. Castor
J. R. Carr
F. J. Breit

[Map showing sand and gravel potential in the PaHRUMP area with legend and map scale]

GIS-ARC/INFO Database Development and Digital Cartography by:
Lindsey G. Sorensen
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Compiled December 31, 1990