

TASK 1-B-2

PRELIMINARY SOILS, MINERALS AND GEOLOGY ASSESSMENT

HOUGHTON ROAD CORRIDOR, TUCSON, ARIZONA

Terracon Consultants, Inc. Project No. 63085011



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INTRODUCTION

This report contains the results of our preliminary soils, minerals and geology assessment for the proposed Houghton Road Corridor Project located in Tucson, Arizona.

The purpose of these services is to provide information and geotechnical engineering recommendations relative to:

- subsurface soil conditions
- depth to groundwater
- depth to bedrock

The information contained in this report are based upon the analysis of maps and geological information provided by Natural Resource Conservation Service, United States Department of Agriculture, Arizona Geological Survey, and Arizona Department of Water Resources.

PROJECT DESCRIPTION

We understand the proposed project consists of assessing and analyzing site characteristics, the potential for mining aggregate construction materials and constraints for developing the Houghton Road Corridor. The assessment will include the review of available soil maps and geologic information including any subsidence studies.

CONCLUSIONS AND RECOMMENDATIONS

Mineral Potential: Regarding the potential for mineral mining on this property, sand and gravel has been previously mined on a portion of the subject site. The Pinelano-Stagecoach complex soils (designated as soil type C in our report) are commonly well suited for this purpose. These soils are found within the project boundaries adjacent to the west bank of the Pantano Wash. We believe sand and gravel mining is feasible and could be pursued in these areas.

Given that bedrock at this site is between 4800 and 9600 feet below the ground surface. Even if the bedrock contains mineral potential of the types found in some areas of the Tucson Basin (copper, limestone), the depth of alluvial overburden would make it un-feasible economically to produce.

Development Considerations: Regarding soil conditions that may impact residential or commercial development, the most common conditions that may occur are collapsible or expansive soils. The soils that exhibit shrink (collapse potential) and swell (expansive) potential are mostly located around the Hantz (soil type H) Soils and the Pantano Wash. The Mojave (soil type E) and Tubac (soil type G) also have been known to have expansive potential.

The red colored areas shown in Figure 3 located within the proposed project site are the same areas that consist of soil types H and G. found in Figure 1. Soil types H and G contain Hantz and Tubac soils which are known to have swell and shrinkage potential. The yellow colored areas shown in Figure 3 located within the proposed project site are the same areas that contain soil types B and E found in Figure 1. Soil types B and E contain Mohave and Tubac soils, which has a moderate shrink and swell potential. The green colored areas shown in Figure 3 located within the proposed project site are the same areas that contain soil type D found in Figure 1. Soil type D contains small portions of Mohave and Hantz Soils, which accounts for the low swell potential.

These soil types and conditions extend into areas adjacent to the site where development has occurred. An expansive soil condition is generally mitigated by measures such as designing structural floor slabs and foundations to resist potential heave, or limited removal of the expansive soils and replacement with less expansive soils. Collapsible soils are typically mitigated by densifying the soils by limited excavation and recompaction during earthwork operations. These measures have historically not been cost prohibitive on residential and commercial projects in this area.

The clayey Mojave soils generally have low permeability and are not well suited for septic systems and typically require public septic system. Other than for custom home sites on lots with an area of more than one-acre, septic systems are not typically used.

The Arizo (soil type I) soils are commonly cohesionless and granular. When performing trench excavations in these soils, temporary sloped excavations with inclinations no steeper than 1.5 to 1 (horizontal to vertical) or less steep are commonly required to help protect against caving. Trench shoring is also sometimes used. These measures have historically not been cost prohibitive on trench excavation projects.

Land subsidence has occurred in the Tucson Basin, but generally less than other areas of the state where subsidence and subsequent earth fissures are a major concern. Agricultural or former agricultural areas are more common potential earth fissures sites, particularly near the margin of a basin. Given that this site is relatively near the center of the basin, had not been a heavily agricultural area, and at this time does not have any known evidence of earth fissures, we believe the potential for earth fissures is relatively low.

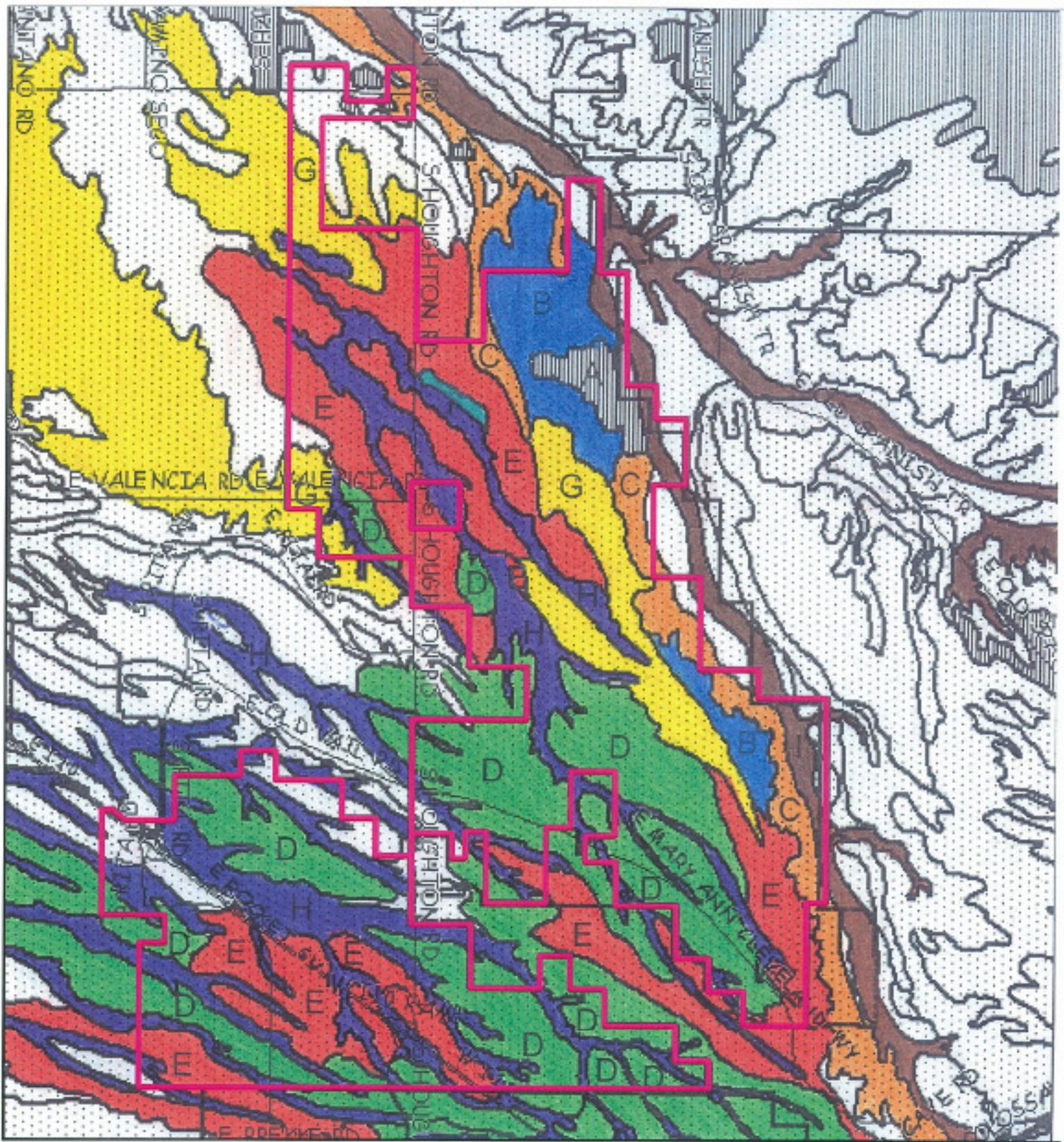
Therefore we believe this project site is generally well suited for commercial, residential, and municipal development. We believe areas of this project site are also viable for the production of sand and gravel.

GENERAL COMMENTS

The analysis and recommendations presented in this report are based upon the data obtained and from other information discussed in this report.

The scope of services for this project does not include either specifically or by implication any environmental assessment of the site or identification of contaminated or hazardous materials or conditions. If the owner is concerned about the potential for such contamination, other studies should be undertaken.

This report has been prepared for the exclusive use of our client for specific application to the project discussed and has been prepared in accordance with generally accepted geotechnical engineering practices. No warranties, either express or implied, are intended or made. In the event that changes in the nature, design, or location of the project as outlined in this report, are planned, the conclusions and recommendations contained in this report shall not be considered valid unless Terracon reviews the changes, and either verifies or modifies the conclusions of this report in writing.

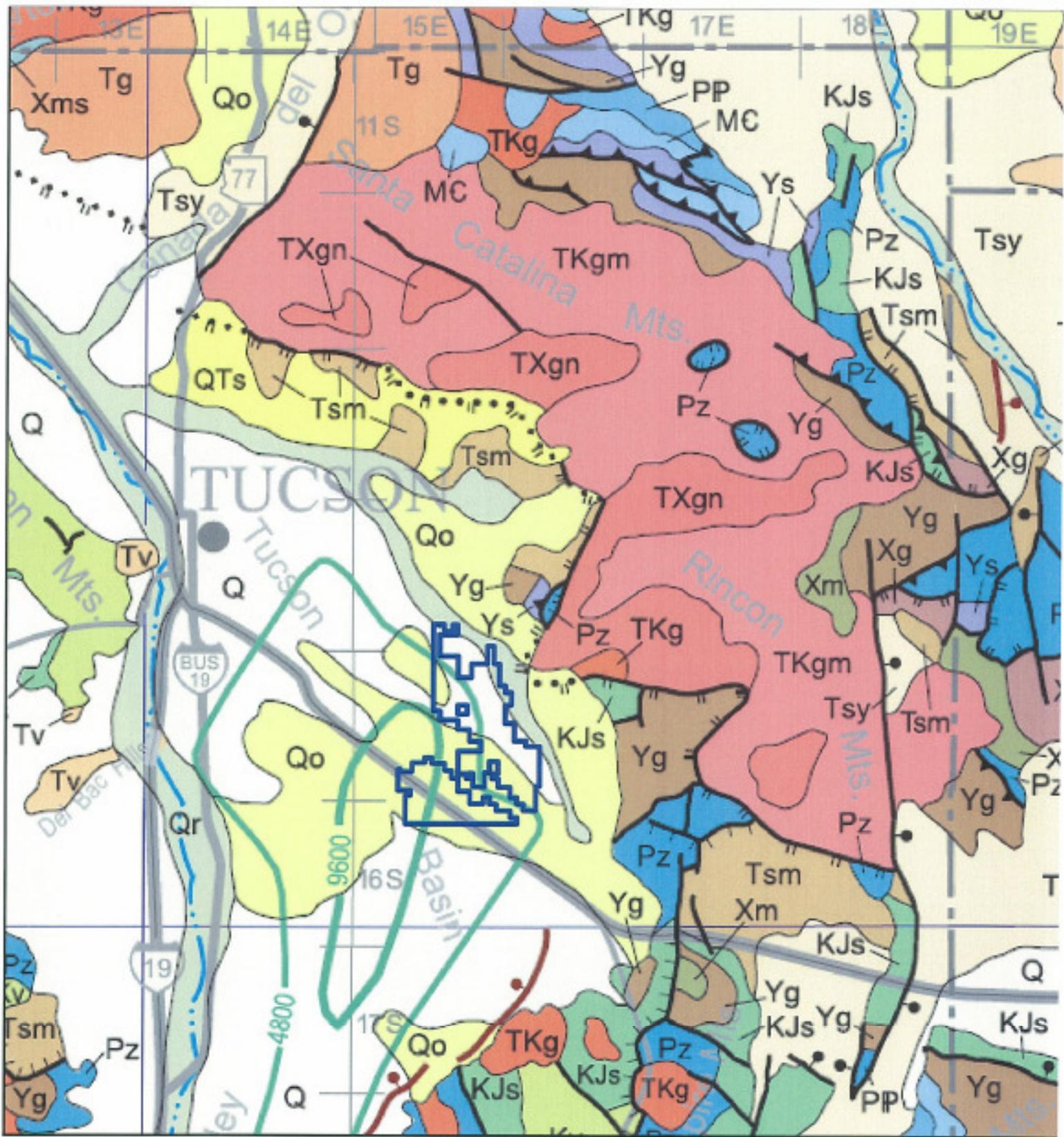


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Approved By:	OBL	Date:	03-2008

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SITE PLAN
PRELIMINARY SOILS, MINERALS AND DRAINAGE
 WESTCOOR COMPANY
 TUCSON ARIZONA

FIG. No.	1
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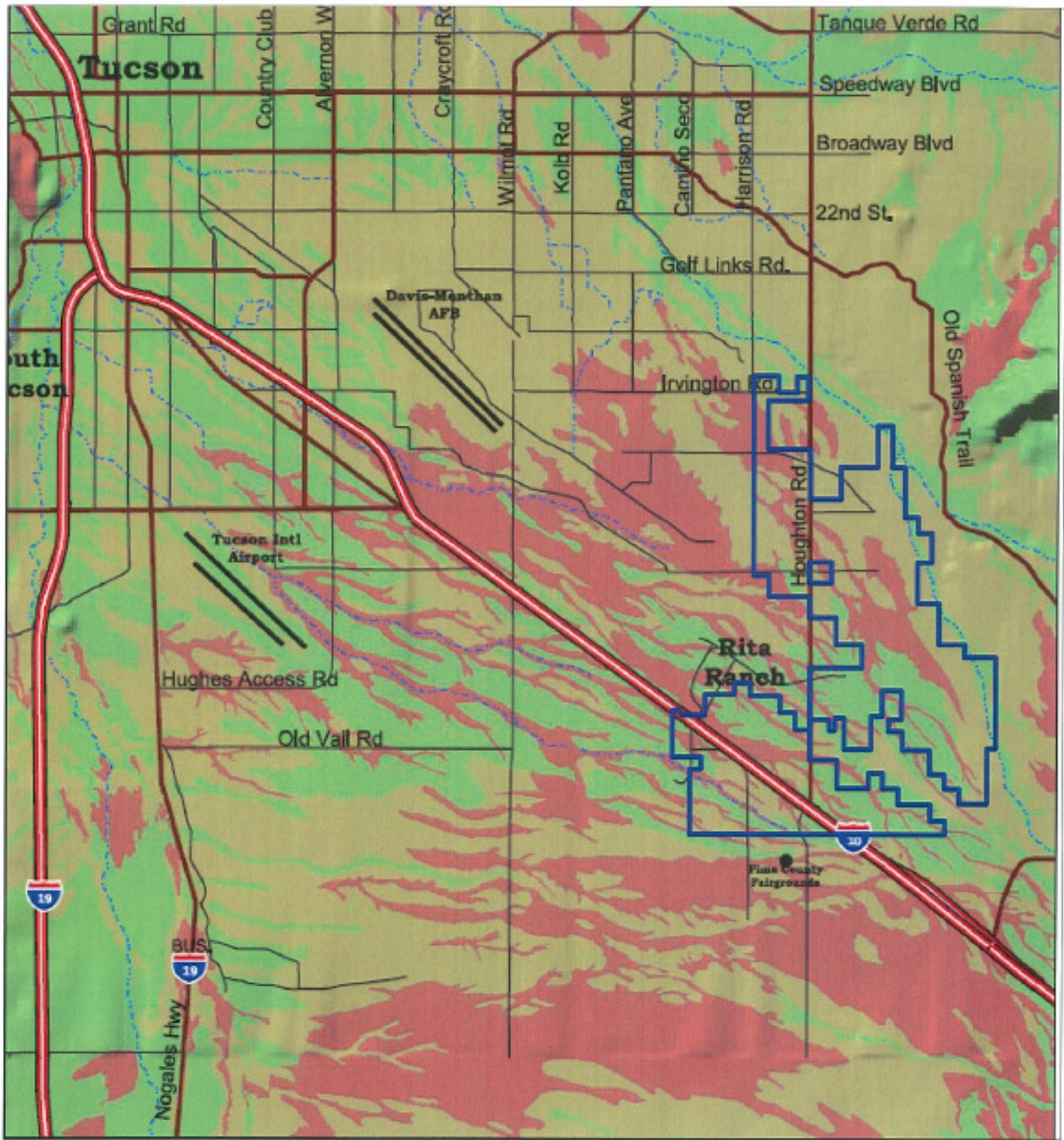


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SITE PLAN	
PRELIMINARY SOILS, MINERALS AND DRAINAGE	
WESTCOR COMPANY	
TUCSON	ARIZONA

FIG. No.	2
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LEGEND

**SOIL SHRINK/SWELL POTENTIAL
GREATER TUCSON AREA**

- High
- Moderate
- Low
- U.S. Forest Service



Project Mgr:	OBL	Project No.:	63085011
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SITE PLAN

PRELIMINARY SOILS, MINERALS AND DRAINAGE

WESTCOR COMPANY

TUCSON ARIZONA

FIG. No.	3
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