

APPEAL TO THE BOARD OF SUPERVISORS

COUNTY OF SANTA BARBARA 2016 JUL 11 PM 3:27

Submit to: Clerk of the Board
County Administration Building
105 E. Anapamu Sreet, Suite 407
Santa Barbara, CA 93101

COUNTY OF SANTA BARBARA
CLERK OF THE
BOARD OF SUPERVISORS

RE: Project Title SHELL GUADALUPE DUNES GRAVEL REMEDIATION IN-LIEU PROPOSAL

Case Number 13RVP-00000-00119, 14CDP-00000-00072

Tract/ APN Number APN 113-020-09

Date of action taken by Planning Commission, or Surveyor June 29, 2016

I hereby appeal the approval of the Planning Commission
(approval/ approval with conditions/ or denial) (Planning Commission or County Surveyor)

Please state specifically wherein the decision of the Planning Commission or Surveyor is not in accord with the purposes of the appropriate ordinance (one of either Article II Coastal Zoning Ordinance, County Land Use and Development Code, Montecito Land Use and Development Code or Chapter 21, Land Division) or other applicable law, or wherein it is claimed that there was an error or an abuse of discretion by the Planning Commission or Surveyor, or that there was a lack of a fair and impartial hearing, or that the decision is not supported by the evidence presented for consideration leading to the making of the decision or determination that is being appealed, or that there is significant new evidence relevant to the decision which could not have been presented at the time the decision was made. {References: Article II Section 35-182.2.C; County Land Use and Development Code Section 35.102.020.C; Montecito Land Use and Development Code Section 35-492.020.C, Chapter 21 Section 21-71.4.2.C.2}

Attach additional documentation, or state below the reason(s) for this appeal.

SEE ATTACHED LETTER

Specific conditions being appealed are:

SEE ATTACHED LETTER

Name of Appellant (please print): GORDON SAND COMPANY

Address: 28310 Industrial Boulevard, Suite F

(Street, Apt #)

Hayward, CA 94545

(City/ State/ Zip Code)

(510) 782-5640

(Telephone)

Appellant is (check one): Applicant Agent for Applicant X Third-Party Agent for Third Party

Fee \$ N/A {Fees are set annually by the Board of Supervisors. For current fees or breakdown, contact Planning & Development or Clerk of the Board. Check should be made payable "County of Santa Barbara".}

Signature: Peter L. Candy, Hollister & Brace Date: July 11, 2016

Peter L. Candy, Hollister & Brace
Attorneys for Applicant

FOR OFFICE USE ONLY

Hearing set for: Date Received: By: File No.

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Since 1966

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July 11, 2016

By Hand Delivery

Board of Supervisors
County of Santa Barbara
123 East Anapamu Street
Santa Barbara, CA 93101

**Re: Appeal of Planning Commission Approval
Shell Guadalupe Dunes Gravel Remediation In-Lieu Proposal Project;
Case Nos. 13RVP-00000-00119; 14CDP-00000-00072**

Dear Honorable Chair Adam and Honorable Board Members:

This appeal is submitted on behalf of the Gordon Sand Company (Gordon Sand) in response to the Planning Commission's approval of the Shell Guadalupe Dunes Gravel Remediation In-Lieu Project (In-Lieu Project) on June 29, 2016.

The In-Lieu Project proposes to revise Conditional Use Permit 82-CP-75(cz) and Coastal Development Permit 96-CDP-10 to eliminate Condition #31 and relieve Shell of its obligation to remediate foreign road-base materials imported into the Guadalupe Dunes in the early 1980's for purposes of an exploratory oil drilling project. Shell proposes to make a monetary contribution to the County in exchange for the permit modification. The payment will be made in-lieu of remediating the gravel contamination that exists throughout the Project Site, including on land owned and lawfully used by Gordon Sand for operation of its sand mining business.

The gravel and cobbles imported into the dunes in the early 1980's contaminated an important local mineral resource. Approval of the In-Lieu Project will authorize continued contamination of the resource.

The in-lieu payment is intended to mitigate recreational and aesthetic/visual impacts to County-owned property - the Rancho Guadalupe Dunes Beach Park - identified in the

Supplement to the Environmental Impact Report (SEIR) prepared for the In-Lieu Project. The in-lieu payment is not intended to and will not compensate Gordon Sand for any past or future damage caused to its property, including the mineral resource which has regional and statewide significance.

I. Reasons for Appeal

This appeal is necessary to correct a legally deficient SEIR which, contrary to the requirements of the California Environmental Quality Act (CEQA), fails to recognize the significant environmental impact that the In-Lieu Project will have on an important local mineral resource.

This appeal is necessary to prevent the abuse of discretion which will result from the County's certification of a legally deficient SEIR, and its refusal to recognize substantial evidence in the record demonstrating the significant environmental impact that the In-Lieu Project will have on an important local mineral resource.

This appeal is necessary to ensure the County's final decision on the In-Lieu Project takes account of all evidence incorporated into the administrative record of these proceedings, including substantial evidence demonstrating that the In-Lieu Project will effectively authorize ongoing and permanent contamination of an important local mineral resource thereby contributing significantly to the loss of availability of the resource.

II. Background Facts

A. Gordon Sand Company's Operation. Gordon Sand operates a commercial sand mining business in the Guadalupe Dunes of northern Santa Barbara County. The business has been in continuous operation since 1967. Dune sand is harvested in the coastal area immediately south of the County-owned Rancho Guadalupe Dunes Beach Park. The sand is processed at a facility located at the end of Main Street several miles west of the City of Guadalupe. Gordon Sand's operation consists of an excavation area, sand collection pit, harvesting equipment, access road, and sand screening and processing facility.

Gordon Sand's excavation area and sand collection pit are located on land that Gordon Sand owns in fee. (APN 113-020-09; See Exhibit "A".) The neighboring property is owned by the County of Santa Barbara. Gordon Sand's screening and processing facilities are located on two nearby parcels, which Gordon Sand leases. (APNs 113-020-18 and 113-020-20; See Exhibit "B".) A road easement deeded to Gordon Sand connects the excavation area to the screening and processing facilities. (See Exhibit "C".) The road easement traverses County-owned land, and provides the Gordon Sand parcel access to Main Street.

Over the years, Gordon Sand has washed native clay material from the mined Guadalupe sand to create a slurry which it applies to the access road as a base material. The native clay hardens to create a surface sufficiently stable to accommodate the flotation tires Gordon Sand uses on its harvesting equipment. At no point has Gordon Sand ever imported gravel, cobbles or

other foreign material into the dunes for use as road-base. Gordon Sand has never required a gravel or cobble-based road to access its mining area or otherwise operate its sand harvesting equipment.

B. The Husky Oil Project. Sixteen years after Gordon Sand commenced its sand mining operations, the County of Santa Barbara, in 1983, approved an oil drilling project proposed by Husky Oil (Shell's predecessor in interest) in the Guadalupe Dunes. (Conditional Use Permit 82-CP-759(cz) and Coastal Development Permit 96-CDP-10.) The approval conditionally granted Husky permission to develop 42 oil and gas wells from two drilling islands located in the sand dunes on County-owned property adjacent to the parcel that Gordon Sand owns in fee.

Following approval, Husky constructed a single drilling island - Island D - where five oil and gas wells were developed. This area is referred to as Site D in the SEIR prepared by the County for the In-Lieu Project. Site D is located approximately 175 feet north of Gordon Sand's active excavation area, and approximately 240 feet northwest of the sand road Gordon Sand uses to access its excavation area and sand pit. (See Exhibit "D".)

In order to develop the drilling area, Husky imported large amounts of gravel and cobbles into the sand dunes. These materials were used to stabilize the sand for a drilling pad and construct a road through the dunes capable of accommodating the heavy equipment Husky was using in its drilling operation. The County authorized the placement of the rock and gravel material in the dunes pursuant to Conditional Use Permit 82-CP-759(cz) and Coastal Development Permit 96-CDP-10.

Permit Condition #31 was included in 82-CP-75(cz) to require removal of all road-base materials brought into the dunes by Husky once the exploratory oil drilling project was abandoned. Permit Condition #31 reads as follows:

#31. All introduced materials on or near the surface (depth of 15 feet) shall be removed when the drilling islands are abandoned.

C. The In-Lieu Project. Shell is proposing a revision to Conditional Use Permit 82-CP-75(cz) and Coastal Development Permit 96-CDP-10 to eliminate Condition #31. If approved, the project would relieve Shell of its obligation to remove introduced materials and remediate areas where the sand is contaminated with gravel and cobbles remnant from the Husky drilling project. In exchange for leaving the gravel and cobbles in place, Shell proposes to pay the County a monetary contribution (in-lieu fee) which the County intends to use acquiring replacement property in the County's north coastal region at an acreage ratio of not less than 3:1. The replacement property will be used by the County for public recreational or open space purposes.

The in-lieu fee is intended to compensate the County for the recreational and aesthetic/visual impacts to the Rancho Guadalupe Dunes Beach Park identified in the SEIR. However, no mitigation or monetary contribution has been proposed to compensate Gordon Sand

for impacts to its property and mineral resource resulting from permanently leaving the gravel and cobbles in place.

III. Extent of Contamination on Land Owned or Occupied By Gordon Sand

Over the years, a significant amount of the gravel and cobble materials imported into the dunes by Husky have come to be distributed and dispersed across Gordon Sand's fee-owned land and road easement.

The SEIR states that remaining gravel from the exploratory drilling project is concentrated in four primary areas: Site D, Site 2, Road Site and Upper Area. (See SEIR discussion of "Project Site" p. 2-5.) These areas are delineated on SEIR Figure 2-2, attached to this letter as Exhibit "E". Of these areas, Site 2, the Road Site and the Upper Area all overlap land which Gordon Sand either owns in fee or lawfully uses pursuant to a recorded road easement.

Site 2 is comprised almost entirely of Gordon Sand's fee-owned property. This is the area where sand harvesting operations occur now and are likely to continue in the future. According to the SEIR, Site 2 extends west along and within Gordon Sand's access road into the sand pit area. The SEIR estimates the area to be 4.59 acres in size, containing approximately 66,625 cubic yards of remnant gravel. Sampling within the area indicates that gravel is predominantly within the top one (1) foot and the percentage of gravel diminishes rapidly below that depth. (See SEIR discussion of "Site 2" p. 2-5.)

Similarly, a significant portion of the Road Site is comprised of Gordon Sand's access road which it holds pursuant to recorded easement. According to the SEIR, the Road Site extends for approximately 1,730 feet between Site 2 and the Upper Area. The Road Site varies in width from approximately 132 feet wide in the eastern portion to approximately 34 feet wide further to the west. Approximately 26,645 cubic yards of remnant gravel occur within this approximately 2.4-acre area, mostly located within the top 4 feet. (See SEIR discussion of "Road Site" p. 2-5.) A 20 foot wide strip through the length of the Road Site is Gordon Sand's recorded access easement.

The same situation exists in the Upper Area. According to the SEIR, Husky/Shell used the Upper Area for its gravel-based access road, and a "rock spoil" area for the partial remediation work it did in the 1990s. Approximately 136,843 cubic yards of remnant gravel occur, predominantly at the surface over most of this 8.49-acre area, and down to 4 feet below the surface near the southern edge of the area. (See SEIR discussion of "Upper Area" p. 2-5.) A 20 foot wide strip through the length of the Upper Area is Gordon Sand's recorded access easement.

Additional remnant gravel exists in locations other than those identified in the SEIR. Husky built a section of road approximately 500 feet in length which connects the east end of the Upper Area to a large staging area at the west entrance to the dunes. Husky imported large amounts of rocks and gravel into this area for purposes of constructing the staging area and

stabilizing the initial section of road out into the dunes. The imported rocks and gravel persist at depths of approximately 1 to 4 feet below the surface. This area is not identified or delineated as an area of contamination in the SEIR. Similar to the Road Site and Upper Area, a 20 foot wide strip through the length of this area is Gordon Sand's recorded access easement.

IV. Dispersal of Imported Materials Across The Project Site

At the Environmental Review Hearing held by the County on May 28, 2014, Gordon Sand testified that natural coastal processes, primarily the prevailing northwest wind, were responsible for moving gravel and other coarse materials around the Project Site, including onto property owned and lawfully used by Gordon Sand. County P&D staff rejected this contention, asserting it was impossible for wind to be moving the imported material, given the high wind speeds needed to move coarse material of this size.

In its written responses to comments on the SEIR, staff stated its position as follows:

Comment Response 5-1a: Comment noted. Sand dunes, like those found at Rancho Guadalupe Dunes County Park, form when there is (1) a ready supply of sand, (2) a steady wind, and (3) some kind of obstacle such as vegetation, rocks, or fences, to trap some of the sand. Sand dunes form when moving air slows down on the downwind side of an obstacle. The sand grains drop out and form a mound that becomes a dune (Nelson 2003). Using the Bagnold (1941) equation for entrainment of particles by wind, it was found that a 0.025 cm diameter particle has a theoretical critical sheer velocity of approximately 5.15 miles per hour (Beckstrand 1998). Other publications estimate the actual threshold wind velocity for sand at approximately 14 miles per hour (Worley Parsons 2010; Tsoar 2004). Using the Bagnold equation, it follows that in order to transport a six inch diameter cobble winds in excess of 120 miles per hour would be required. Even gravel three inches in diameter would require wind gusts in excess of 50 miles per hour. Realistically, the requisite threshold wind velocity might be even greater than these theoretical calculations. As winds of these velocities are uncommon at Rancho Guadalupe Dunes County Park, the evidence does not support a conclusion that cobbles from the Husky Oil operations have blown over 500 feet from Site D into the Gordon Sand Company sand mine. Further, as the prevailing winds at the Project Site are from the westnorthwest (WRCC 2002), it is unlikely that aeolian processes are transporting gravel or cobbles to the southwest from Site D into the Gordon Sand Company mine. In order for materials to be transported in this direction a prevailing northeast wind would be required.

V. Report Prepared by Dr. Nicholas Lancaster

Attached hereto as Exhibit "F" is a report prepared by Dr. Nicholas Lancaster of the Desert Research Institute entitled "Movement of Gravel And Other Coarse Material By Wind at the Shell Guadalupe Dunes Remediation Site." The report discusses how natural coastal processes, primarily the prevailing northwest wind, could be moving gravel and other coarse materials around the Project Site.

Dr. Lancaster is an expert in dune morphology and aeolian transport. Dr. Lancaster has pre-existing familiarity with the environmental conditions affecting the Guadalupe Dunes, given his extensive past research involving the nearby Oceano State Recreational Vehicle Area. The purpose of Dr. Lancaster's report is to demonstrate how, contrary to what the County staff asserts, natural processes are able to over time transport and disperse gravel (material 2 – 64 mm or .079 – 2.5 inches in diameter) and other larger size materials (e.g., cobbles 64 – 256 mm or 2.5 – 10.1 inches in diameter) over a coastal dune landscape.

As discussed in detail in Dr. Lancaster's report, a representative sample of sand from the Project Site has a modal size of 0.5125 mm (0.021 in). Such grains moved by wind in saltation mode have the potential to move grains of 3 mm (0.12 in) in diameter in surface creep mode. Samples of remnant gravel from the Project Site indicate there is a significant quantity of remnant gravel at Site D, Site 2, the Road Site, and the Upper Area that is of a size 3 mm (0.12 in) in diameter or less. This material is capable of being moved in surface creep mode by the impacts of saltating sand.

With regard to material that is significantly coarser (larger) than 3 mm (0.12 in) in diameter, it is not likely this material can be moved by the impacts of saltating sand. This material is more likely to be moved by the effects of gravity than it is by the impacts of saltating sand. As wind erodes the sand around the coarser material, its sub-lateral support is eliminated. Such a process is facilitated by sloping surfaces, so that the coarser particles or objects move downslope regardless of prevailing wind direction. Field observations suggest that this process operates to transport and disperse material on down-sloping dune surfaces, and explains how material could be moving to the southwest despite the prevailing northwest winds.

As observed in Dr. Lancaster's report, the Guadalupe Dunes are a very dynamic environment in which the dune surfaces are continually changing as a result of erosion and deposition of wind-blown sand. Erosion of sand in one area is balanced by deposition in other areas. The dune surfaces will shift and move as a result of erosion and deposition of wind-blown sand. As the dune surfaces shift and move, the effects of gravity over material dispersed across the dune surfaces will cause it to shift and move as well.

VI. Approval of The In-Lieu Project Will Result in a Physical Change to the Environment

The California Environmental Quality Act (CEQA) was enacted in 1970 to ensure disclosure to decision makers and the public of the significant environmental effects of proposed activities and the ways to avoid or reduce those effects by requiring implementation of feasible alternatives or mitigation measures.

In order to adequately inform governmental decision makers and the public regarding the potentially significant environmental effects of the In-Lieu Project, the following facts must be adequately disclosed and discussed in the SEIR:

- Imported gravel remaining from the oil operation is intermixed with significant quantities of river cobbles ranging in size up to six (6) inches in diameter. (Testimony of George Gordon, Gordon Sand Company, at May 28, 2014 public hearing on draft SEIR.)
- The remnant gravel and cobbles that exist at Site D, Site 2, Road Site, and Upper Area (collectively the "Project Site") have, over the years, been distributed and disbursed over and beyond the areas where they were initially deposited as a result of natural coastal processes, primarily the prevailing northwest wind. (See Report of Dr. Nicholas Lancaster, Exhibit "F".)
- These natural coastal processes have moved remnant gravel and cobbles onto property owned and used by Gordon Sand Company for its mining operation. (Testimony of George Gordon, Gordon Sand Company, at May 28, 2014 public hearing on draft SEIR.)
- The prevailing northwest wind is an ongoing and perpetual coastal process that will continue to move remnant gravel and cobbles around the Project Site, including onto property owned and used by Gordon Sand Company for its mining operation – most importantly its sand pit and access road. (See Report of Dr. Nicholas Lancaster, Exhibit "F".)

As a consequence, the proposed Project will result in a physical change to the existing environment – a change which has not been identified or discussed in the SEIR. Notably, this physical change would not exist under the No Project Alternative, since pursuant to Permit Condition #31 of 82-CP-75(cz), the applicant would be required to remove all remnant gravel and cobbles from the Project Site.

VII. Impacts of Gravel Contamination on Gordon Sand's Mining Operation

The sand which Gordon Sand extracts from the Guadalupe Dunes is a unique and commercially valuable natural resource. It exists only in the coastal zone. There are only two such sand mining operations located in the State of California, the other facility being located in Marina, Monterey County. Gordon Sand's operation could not exist without its excavation area, sand pit and access road.

The gravel and cobbles that exist on Gordon Sand's fee-owned land, in areas where sand harvesting operations are now occurring or likely to occur in the future, have contaminated an important local mineral resource. These materials are interfering with Gordon Sand's ongoing harvesting operations, and will continue to interfere with operations in the future if the condition is permitted to persist.

A. Scalping Equipment. Gordon Sand has been forced to install "scalping" machines necessary to remove non-native materials from the sand its extracts from the dunes. A portable "scalping" unit has been installed on the front end of Gordon Sand's wet plant to screen out gravel pieces and cobbles over 1 inch in diameter. Another "scalping" unit has been installed on top of Gordon Sand's dry plant to screen out all non-native materials greater in size than U.S.

No.12. (Note - U.S. No.12 and smaller is the native sand grain size required for Gordon Sand to meet its production requirements.)

The "scalping" units were expensive to purchase and install (approximately \$150,000 each) and add significantly to Gordon Sand's overall operating and maintenance costs. Moreover, the "scalping" units were intended to only be a temporary stop-gap measure, to mitigate damages and allow Gordon Sand to continue its harvesting operations until the gravel and cobbles were cleaned up consistent with CUP requirements. Gordon Sand has all along relied on the fact that Shell would clean up the gravel contamination per Condition #31 thereby abating the nuisance caused by it. If the In-Lieu Project is approved, and the gravel and cobbles are allowed to remain on the Project Site indefinitely, more expensive permanent equipment will be necessary to abate the condition and allow Gordon Sand to continue operating. .

B. Additional Operational Modifications. Prior to the mid-1980s, Gordon Sand was able to load its Santa Barbara Natural sand product onto trucks directly from its upper plant area for transport offsite to market. Simultaneously, it would feed additional material to its lower plant for further processing and preparation for market. This was Gordon Sand's operating model for roughly sixteen years before foreign road-base materials were introduced to the Guadalupe Dunes. In the mid-1980s, when gravel contamination started to become a problem, this cost saving operational practice had to cease. Gordon Sand could no longer harvest and sell its Santa Barbara Natural sand product without first feeding the material through its lower plant for "scalping" and further processing. Over the years, the additional processing required to prepare its various sand products for market has contributed significantly to Gordon Sand's overhead, operating and maintenance costs. This has translated into a corresponding reduction in profits.

C. Uncertainty Regarding Reclamation Obligation. The existence of foreign material imported into the dunes also creates uncertainty regarding the cost of Gordon Sand's future reclamation obligation. The intent of the Reclamation Plan is that areas owned or used by Gordon Sand in its mining operation be returned to their original pristine condition. In order to comply with the intent of Reclamation Plan, Gordon Sand must clean up the areas under its ownership and control that have been impacted by the imported gravel and cobbles.

For example, a requirement of Gordon Sand's approved Reclamation Plan is that the native clay road-base used to stabilize its access road be removed and disposed of in the sand pit when mining operations are complete. In addition, the access road must be decompacted to aid in the establishment of native vegetation. In order to meet the removal and decompaction requirements, Gordon Sand must remove the rock and gravel road base that currently exists immediately adjacent to and in some cases over the top of its access road. Gordon Sand never brought these materials into the dunes, but nevertheless cannot comply with its reclamation obligation without cleaning them up. This has the potential to add tens of thousands of dollars, if not more, to Gordon Sand's overall reclamation costs, a fact which has both immediate and long-term economic effects. First, it increases the financial assurance requirements Gordon Sand must meet on an ongoing basis to continue operating under its existing CUP. Second, by

increasing operating costs and reducing profits, it effectively shortens the economic life of the mining operation.

VIII. The Role Economic Impacts Play In Determining The Significance of Environmental Effects

CEQA ordinarily does not require lead agencies to treat economic impacts of a given project as significant effects on the environment. The CEQA Guidelines state that, where appropriate, a draft EIR should contain discussion of the economic and social consequences of a proposed project; however, by themselves, such impacts "shall not be treated as significant effects on the environment." CEQA Guidelines, § 15131(a) (*italics added*), 15382.

However, for projects that result in physical changes to the environment, if the physical changes could cause economic and/or social consequences, the magnitude of these consequences may be relevant in determining whether the physical changes or impacts are "significant." For example, if the construction of a new freeway or rail line divides an existing community, the construction would be the physical change, but the social effect on the community would be the basis for determining that the effect would be significant. (CEQA Guidelines § 15131(d).)

A similar situation exists with regard to the In-Lieu Project. The physical change in the environment will be the continued distribution and deposition of imported remnant gravel and cobbles in areas where active mining operation occur. This physical change will continue to have an economic impact on the Gordon Sand Company's mining operation, both in the short-term and long-term. The economic impact is relevant to determining the significance of the In-Lieu Project's impacts on an important local mineral resource.

IX. CEQA Requires Analysis of Impacts On Important Local Mineral Resources

CEQA requires lead agencies to consider the potential effects that a proposed project will have on local mineral resources. According to CEQA Guidelines Appendix G, a project will be found to have a significant impact on mineral resources if the project:

- "a) Results in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state; or*
- b) Results in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan."* (SEIR Section 3.11.5.)

The Conservation Element of the County's Comprehensive Plan delineates the Guadalupe Dunes as an important local mineral resource recovery site with regional and state-wide significance. (See *County-Wide Mineral Resources Map*.) The Conservation Element states that: "In the Santa Maria-Orcutt area, Guadalupe Dune Sand is used for sandblasting and foundry sand." (*Conservation Element*, p. 161.)

The California State Legislature has declared that the state's mineral resources are vital, finite, and important natural resources, and the production and development of mineral resources at the local level helps to maintain a strong economy, are necessary to build the state's infrastructure, and are vital to reducing transportation emissions that result from the distribution of hundreds of millions of tons of construction aggregates used annually in building and maintaining the state. (See Public Resources Code § 2711(d) and (f) - Legislative declarations accompanying the Surface Mining and Reclamation Act of 1975.)

X. Summary

The gravel and cobbles imported into the dunes by Husky Oil in the early 1980's contaminated an important local mineral resource. The resource has value to the region and the residents of the State. The contamination makes it difficult for Gordon Sand to operate profitably. Gordon Sand has all along relied on the fact that Shell would clean up the gravel contamination per Condition #31 thereby abating the nuisance caused by it. However, the County's approval of the In-Lieu Project effectively authorizes ongoing and permanent contamination of the resource. The economic hardship this forces upon Gordon Sand shortens the economic life of the mining operation and contributes to the loss of availability of the resource. This is a significant environmental effect that CEQA requires the County to address. The SEIR must identify this impact and propose feasible alternatives or mitigation measures before it can be certified as adequate.

Respectfully submitted,

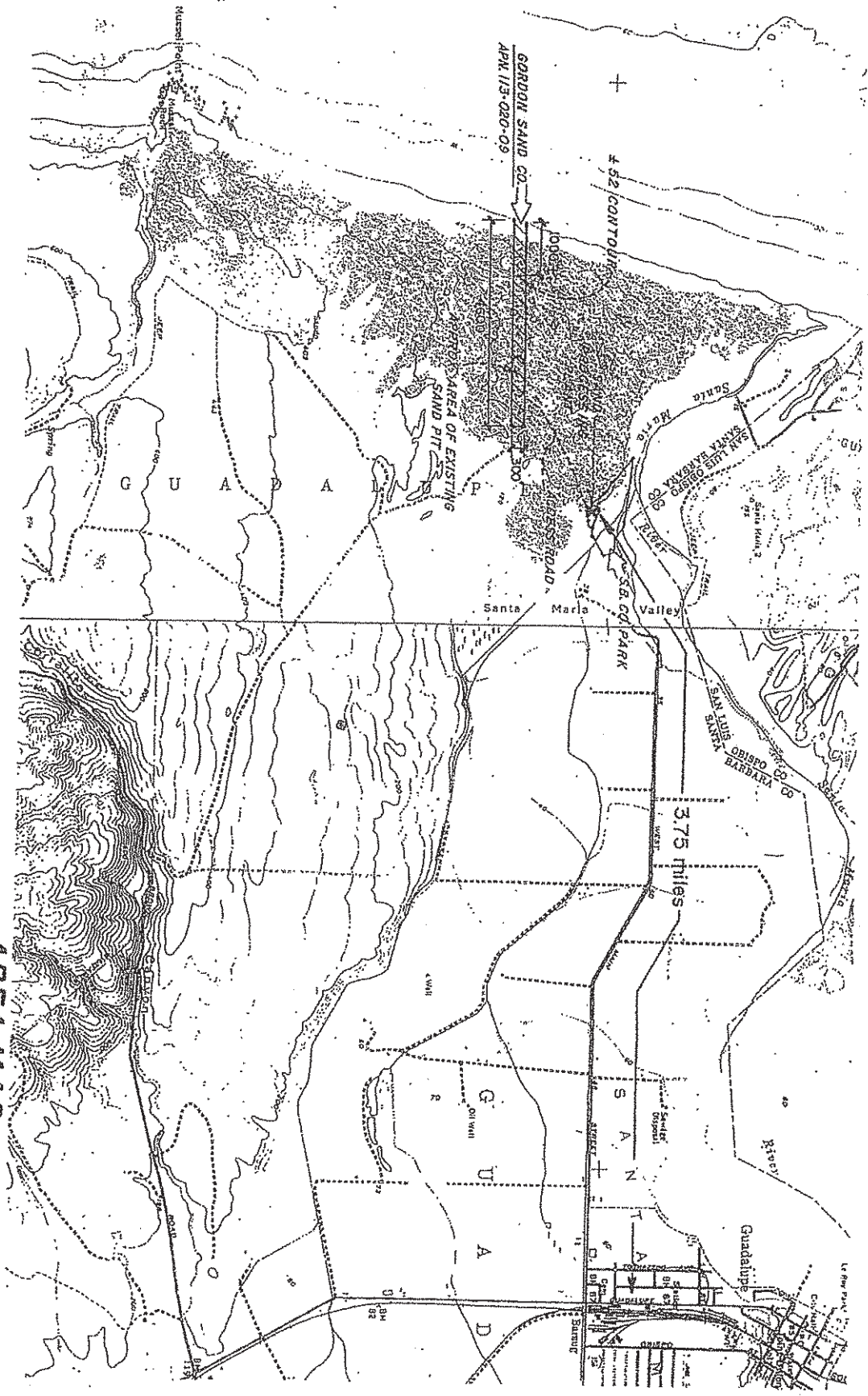
HOLLISTER & BRACE
A Professional Corporation

By


Peter L. Candy
Attorneys for Gordon Sand Company

.PLC:crr

Attachments



AREA MAP

EXHIBIT "A"

PACIFIC

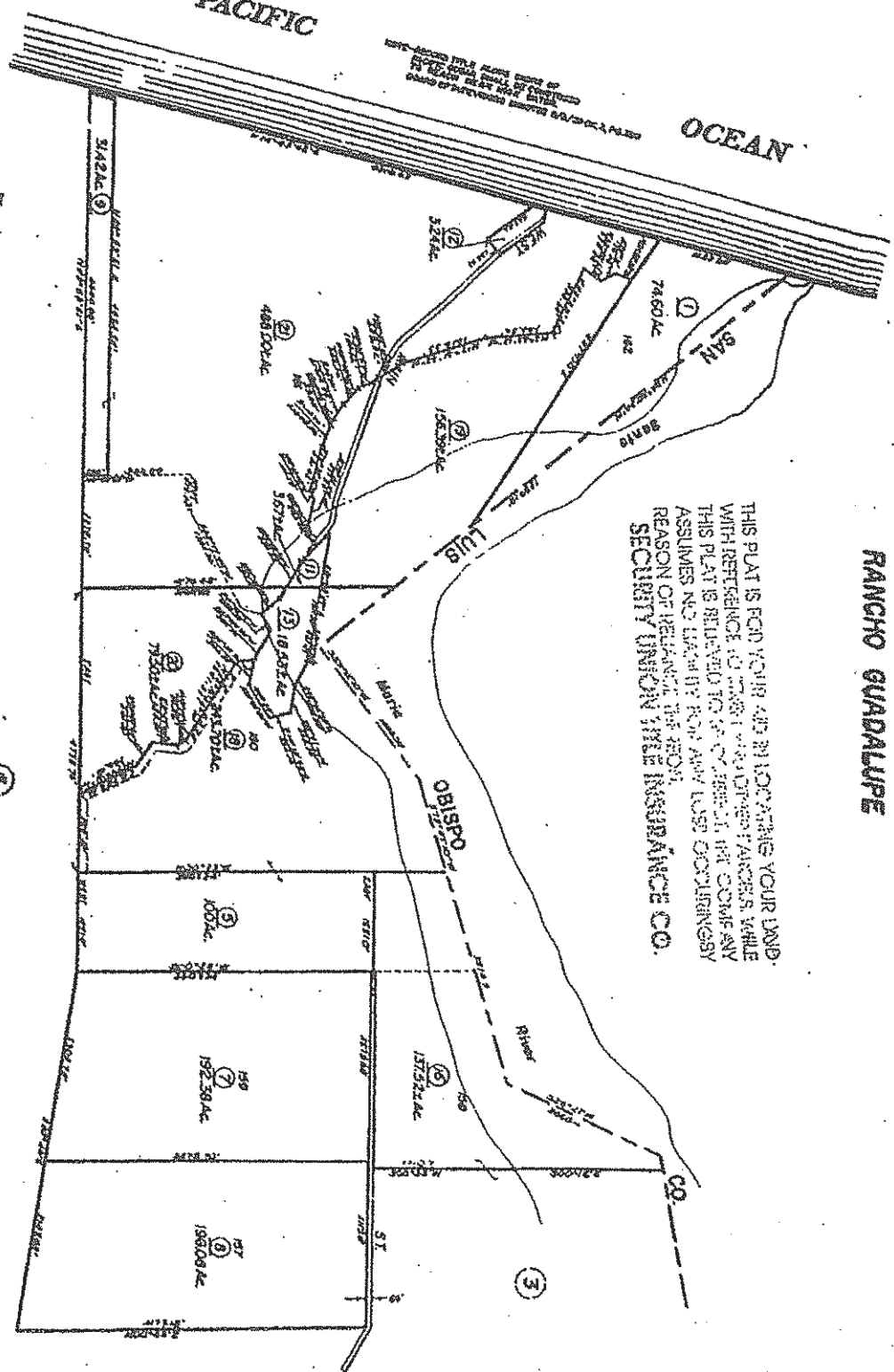
OCEAN

NOT ASSURED WHILE ALONG SHORE OF
RIVER, LAKE OR STREAM UNLESS SPECIALLY
NOTED BY THIS MAP. DISTANCE
FROM CENTER OF RIVER TO CENTER OF
ROAD OR FENCE IS 50 FEET.

RANCHO GUADALUPE

113-02

THIS PLAT IS FOR YOUR USE IN LOCATING YOUR LAND
WITH REFERENCE TO NEIGHBORING PARCELS, WHILE
THIS PLAT IS BELIEVED TO BE CORRECT, WE COME ANY
ASSUMES NO LIABILITY FOR ANY LOSS OCCURRING BY
REASON OF RELIANCE THEREON.
SECURITY UNION TITLE INSURANCE CO.

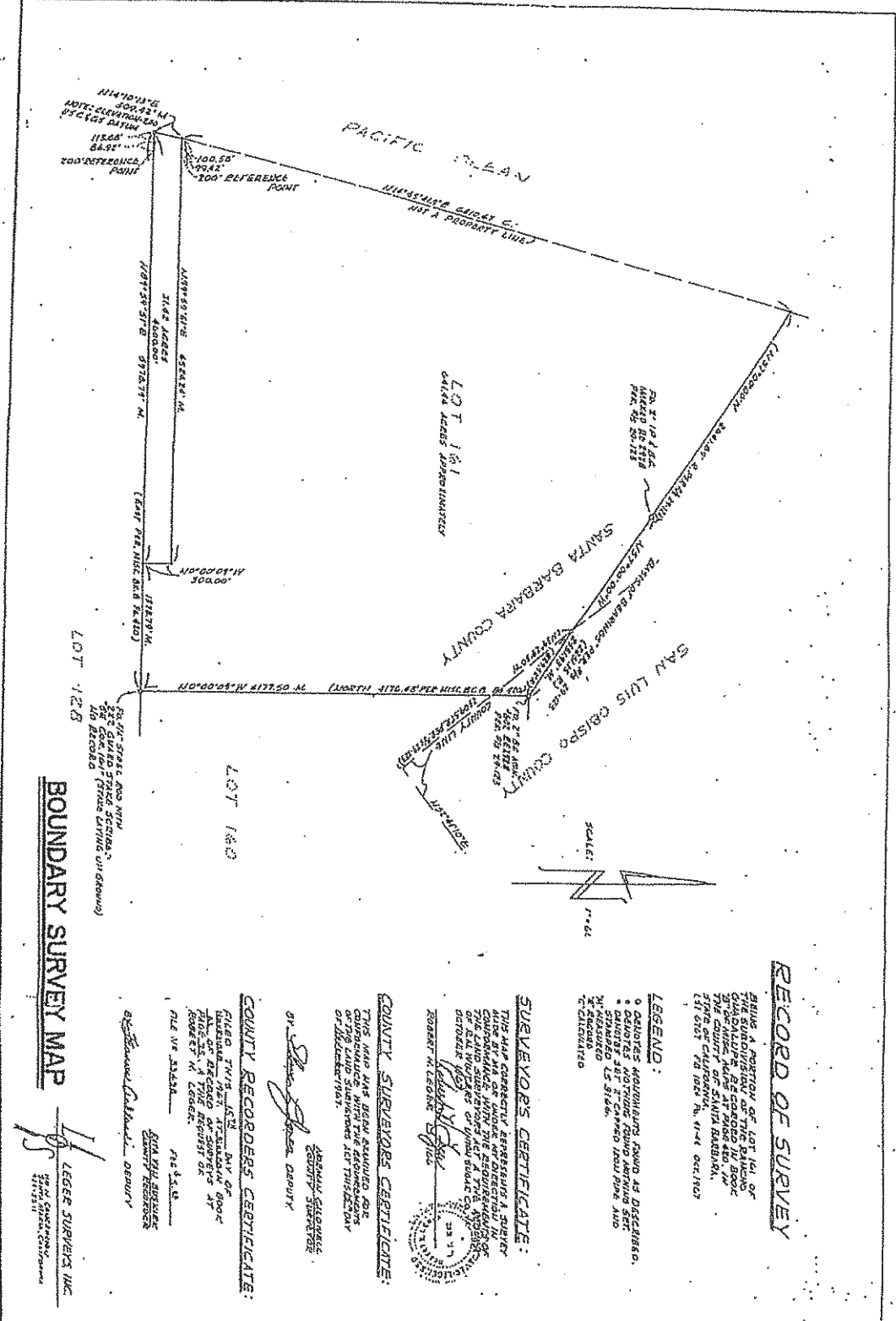


ASSESSOR'S MAP

Assessor's Map Bk. 113-Fg. 02
County of Santa Barbara, Calif.

NOT ASSURED'S BEST INTERESTS ARE TO BE
PROTECTED BY THE ASSURANCE COMPANY'S
POLICY.





RECORD OF SURVEY

THIS IS A PORTION OF LOT 128 OF THE SUBDIVISION OF THE PLANNED QUADANGLE, AS SET FORTH IN BOOK THE COURT OF SANTA BARBARA, 1914 DIST. 78 (1914 P. 11-1) OCT. 1907

LEGEND:

- DENOTES MONUMENTS FOUND AS DESCRIBED.
- DENOTES MONUMENT FOUND MARKING SET STANDARD 45° 31' 40" N. 85° 20' 00" W. 100' PER 1928 AND CALCULATED.
- DENOTES MONUMENT FOUND AS DESCRIBED.
- DENOTES MONUMENT FOUND MARKING SET STANDARD 45° 31' 40" N. 85° 20' 00" W. 100' PER 1928 AND CALCULATED.

SURVEYORS CERTIFICATE:

THIS MAP CORRECTLY REPRESENTS A SURVEY CONDUCTED BY THE SURVEYORS AND THE LAND SURVEYORS ACT A THE ABOVE DESCRIBED MONUMENTS OR POINTS OF THE SURVEY.

Robert M. LeDore
 ROBERT M. LE DORE
 COUNTY SURVEYOR

COUNTY SURVEYORS CERTIFICATE:

THIS MAP HAS BEEN EXAMINED AND CONFIRMED, WITH THE REQUIREMENTS OF THE ACT OF 1907.

Robert M. LeDore
 ROBERT M. LE DORE
 COUNTY SURVEYOR

COUNTY RECORDERS CERTIFICATE:

FILED THIS 15th DAY OF SEPTEMBER 1928 AT 10:30 AM IN THE OFFICE OF THE COUNTY RECORDER.

Robert M. LeDore
 ROBERT M. LE DORE
 COUNTY RECORDER

BOUNDARY SURVEY MAP

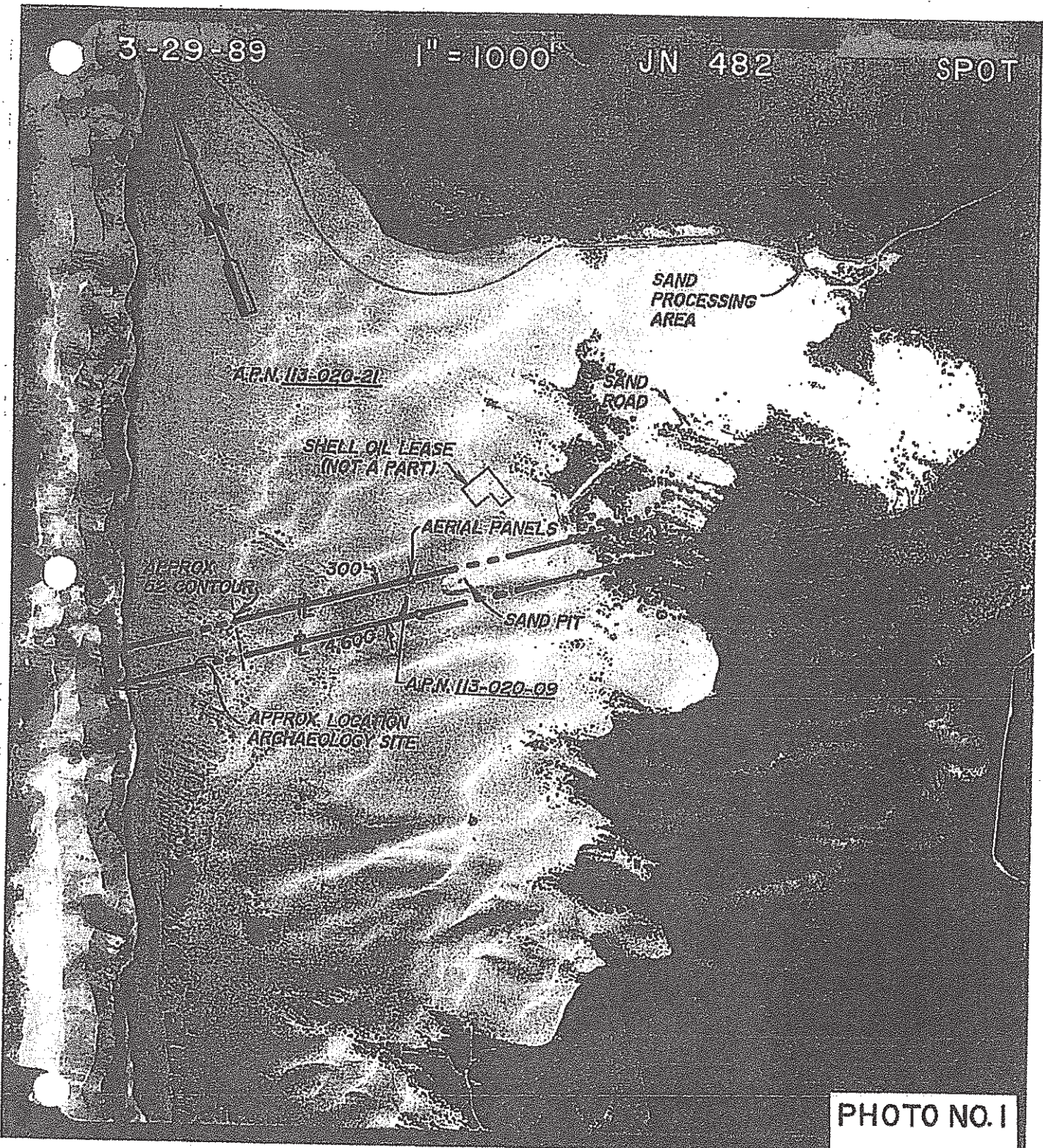
Legal Surveyors Inc.
 LEGAL SURVEYS INC.
 1000 W. GARDEN AVENUE
 SANTA BARBARA, CALIF. 93101
 PHONE 939-7411

3-29-89

1" = 1000'

JN 482

SPOT



A.P.N. 113-020-21

SAND
PROCESSING
AREA

SAND
ROAD

SHELL OIL LEASE
(NOT A PART)

AERIAL PANELS

APPROX
52' CONTOUR

500'

4,600'

SAND PIT

A.P.N. 113-020-09

APPROX LOCATION
ARCHAEOLOGY SITE

PHOTO NO. 1

1989

PAGE 7

EXHIBIT "B"

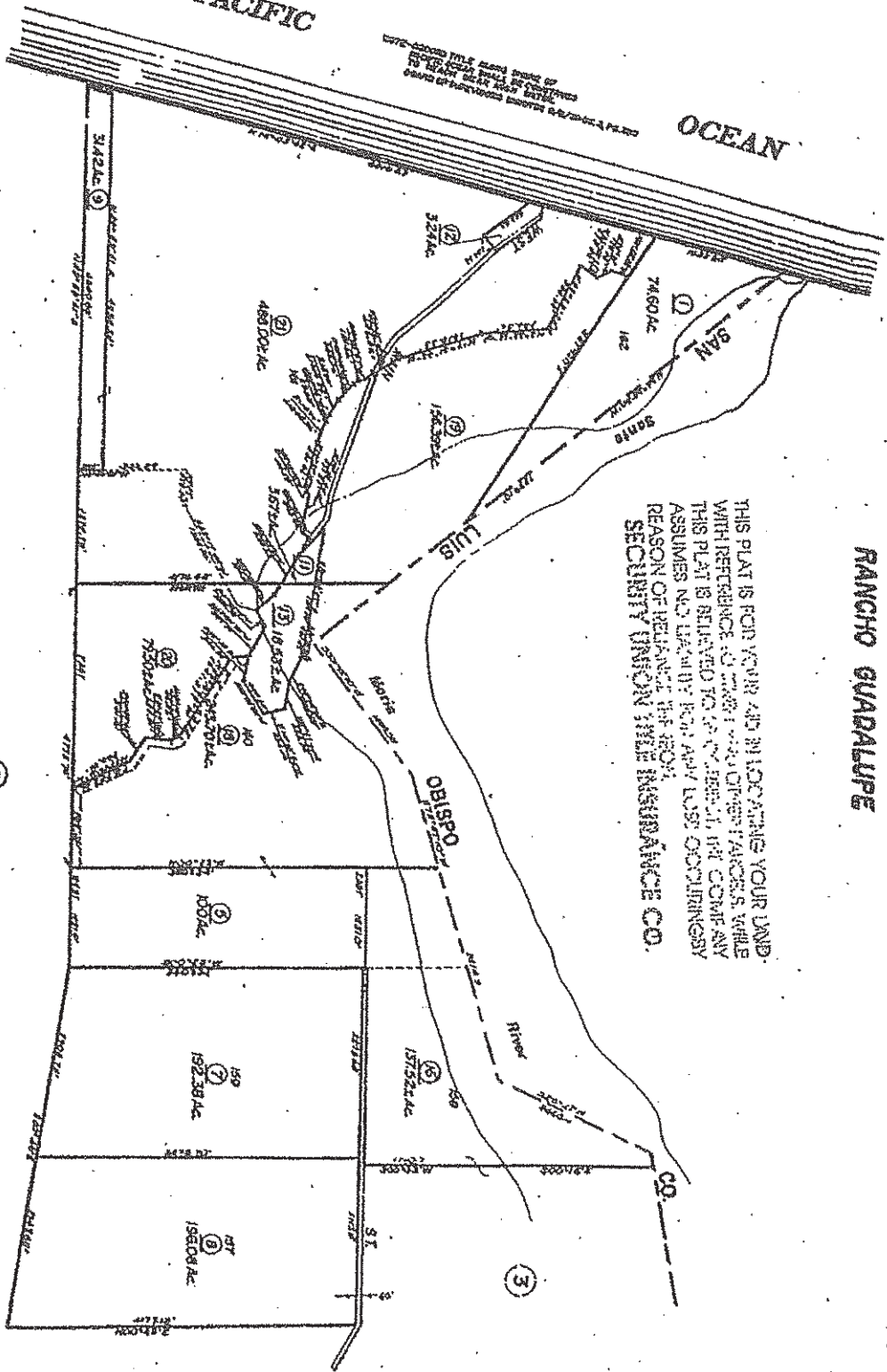
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OCEAN

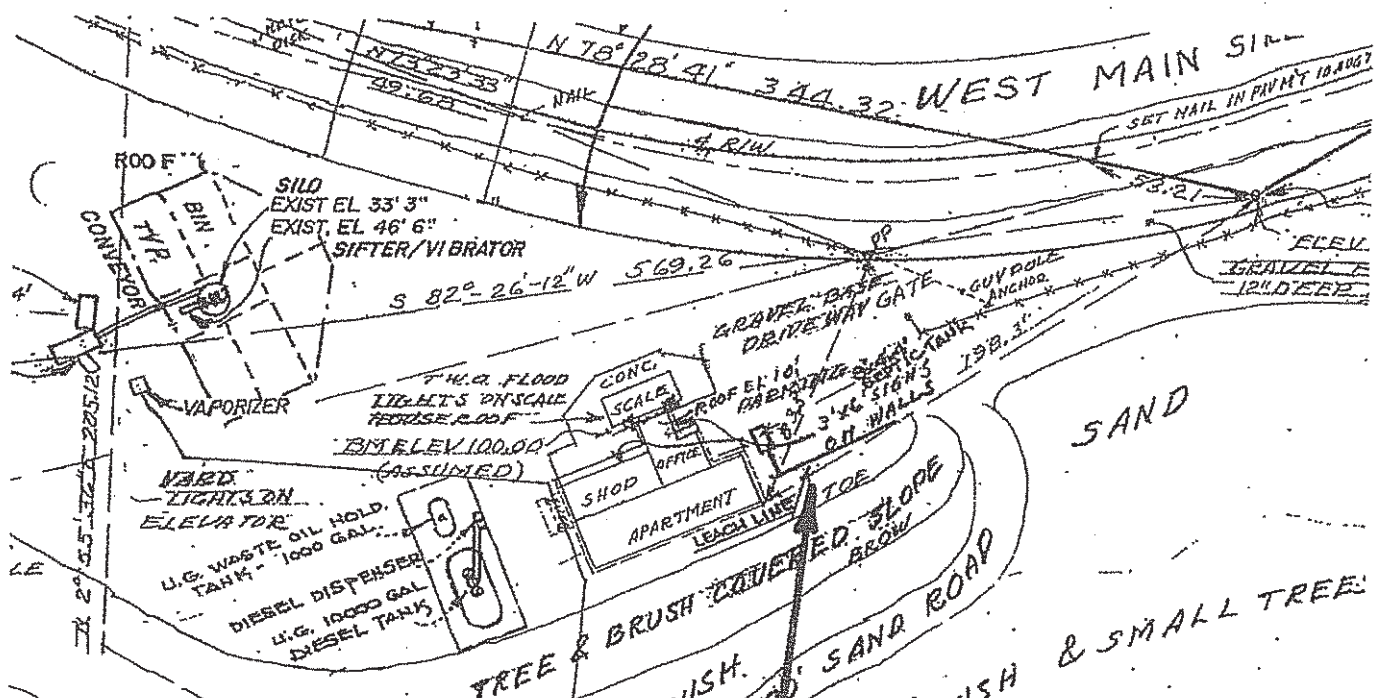
RANCHO GUADALUPE

113-02

THIS PLAT IS FOR YOUR AID IN LOCATING YOUR LAND WITH REFERENCE TO STATE AND OTHER PARCELS. WHILE THIS PLAT IS BELIEVED TO BE CORRECT, THE COMPANY ASSUMES NO LIABILITY FOR ANY LOSS OCCURRING BY REASON OF RELIANCE THEREON. SECURITY UNION TITLE INSURANCE CO.

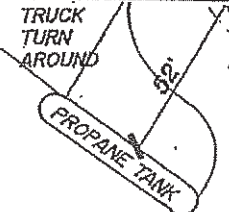


ASSESSOR'S MAP



The Septic Tank and Leach Field (if required) shall be abandoned in a manner approved by and monitored by the County of Santa Barbara Environmental Health Department per any County or State guidelines in effect at the time of implementation of the Reclamation Plan.

LINE WEEDS
LOW BRUSH



TRUCK TURN AROUND
PROANE TANK
N 59° 10' 43" 1241.31'
REF: TENTATI NO 1

PARCEL 113-020-20
79.5 ACRES
1" = 50'
ADDED SEPTIC SYSTEM 2-13-81
ADDENDUM - MAP NO. 1 A

3-29-89

1" = 1000'

JN 482

SPOT

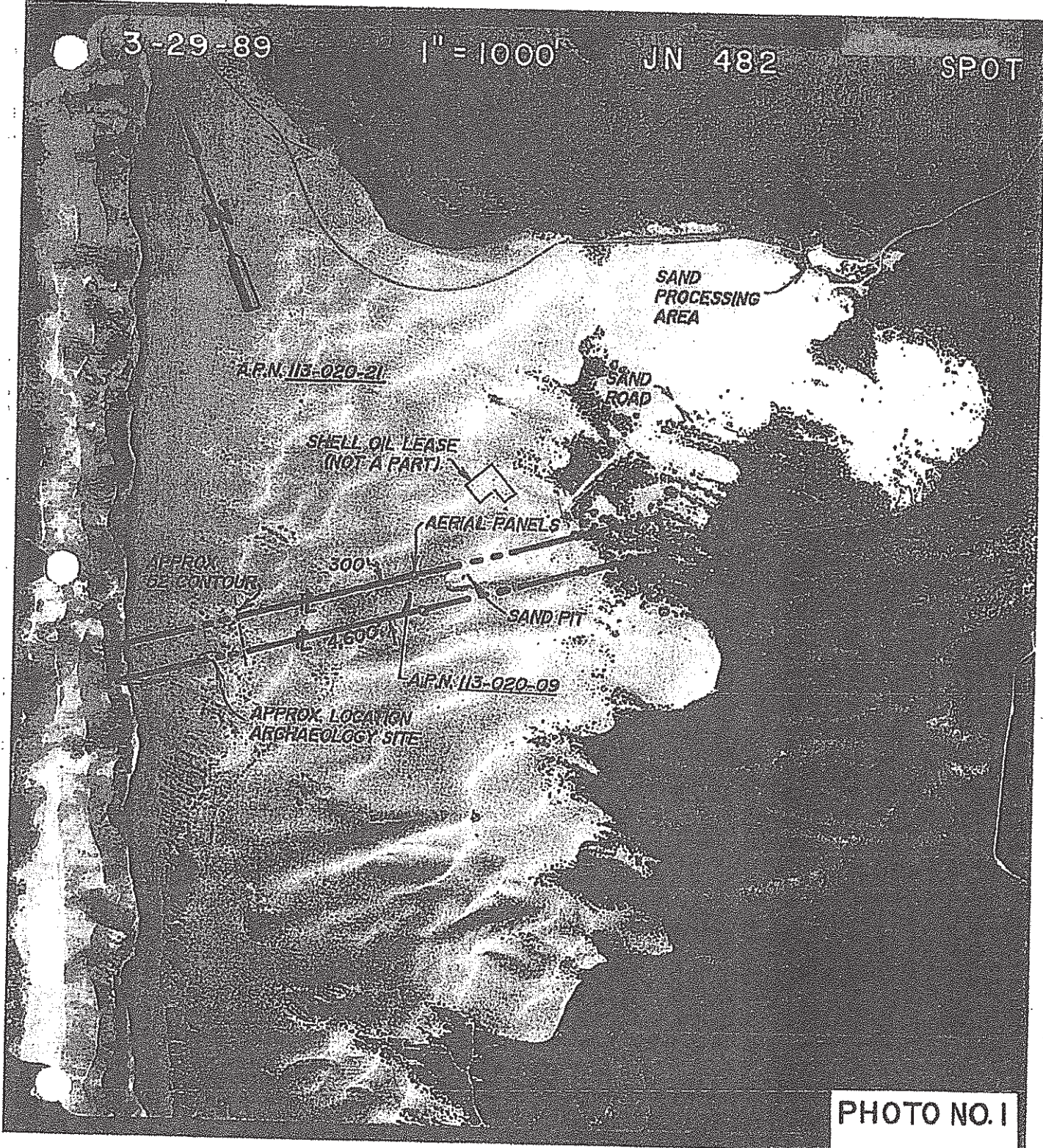


PHOTO NO. 1

1989

PAGE 7

EXHIBIT "C"

3-29-89

1" = 250'

JN 482

2

SHELL GIBBLEASE
(NOT A PART)
SITE IS IN THE
PROCESS OF BEING
REMOVED

SAND PIT

SAND ROAD

PHOTO NO. 2

1989

PAGE 8

EXHIBIT "D"



Project Site
Shell Guadalupe Dunes Gravel Remediation In-lieu Project



FIGURE 2-2



Movement of gravel and other coarse material by wind at Shell Guadalupe Dunes Gravel Remediation Project Site

Report Prepared for
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SANTA BARBARA, CA

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Revised July 23, 2015

July 23, 2015

EXHIBIT "F"

Introduction

Gravel and other coarse materials were introduced into the Guadalupe Dunes by Husky Oil to support oil drilling operations, beginning in 1983, following permit approval by Santa Barbara County. The oil well drilling operation was discontinued in 1989 and all facilities were removed by late 1990. A proportion of the gravel was removed in 1997, but an estimated 293,752 cubic yards of gravel-containing sand remains. Currently, the County of Santa Barbara is evaluating the Shell Guadalupe Dunes Gravel Remediation In Lieu Proposal Project, which would leave in place approximately 293,752 cubic yards of sand that contains remnant gravel (SEIR, 2014). The site of the proposed project lies on the southeast margin of a dynamic and constantly shifting (vegetation-free) dune area. The site consists of four main areas referred to as: (1) Upper Area; (2) Road Site; (3) Site D; and (4) Site 2 (collectively the "Project Site") (Figure 1). The Project Site includes property owned by the County and property owned by the Gordon Sand Company and used for its mining operation. Figure 2 shows examples of remnant gravel in different parts of the Project Site.

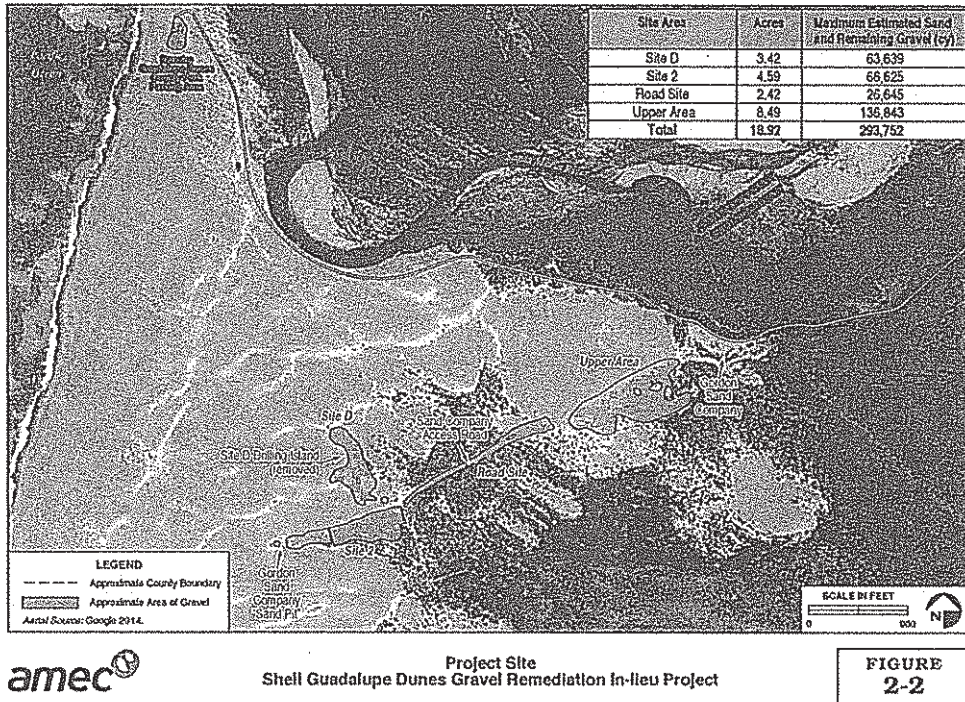


Figure 1: The Project Site, showing locations of gravel remediation areas (from SEIR, 2014).

The surface expression of the remnant gravels varies from area to area. The Upper Area exhibits widespread remnant gravel and cobbles in an area between vegetation-free sand sheets to the NW and hummocky and partly vegetated dune topography to the SE. Remnant gravel in the area of the Road Site mainly consists of fine gravel spreads up to 30 feet wide on each side of the current access road (Figure 2A). On the southeast side of the road, gravels and cobbles cover a berm (referred to as "push-off") adjacent to partly vegetated dunes (Figure 2B). Remnant gravels in the area of Site 2 (Figures 2C and 2D) cover partly vegetated hummocky dunes on the south side of the Gordon Sand access road. Site D is located in an area of mobile dunes. Remnant gravels are widespread in this site and consist of extensive spreads of fine gravels (Figure 2F and Figure 6) as well as concentrations of gravels and cobbles that form low (1- 3 feet high) "mesas" (Figures 2E, 2G). Similar remnant gravel patches also occur in the Gordon Sand Company's excavation area located in the western portion of Site 2 (Figure 2H).

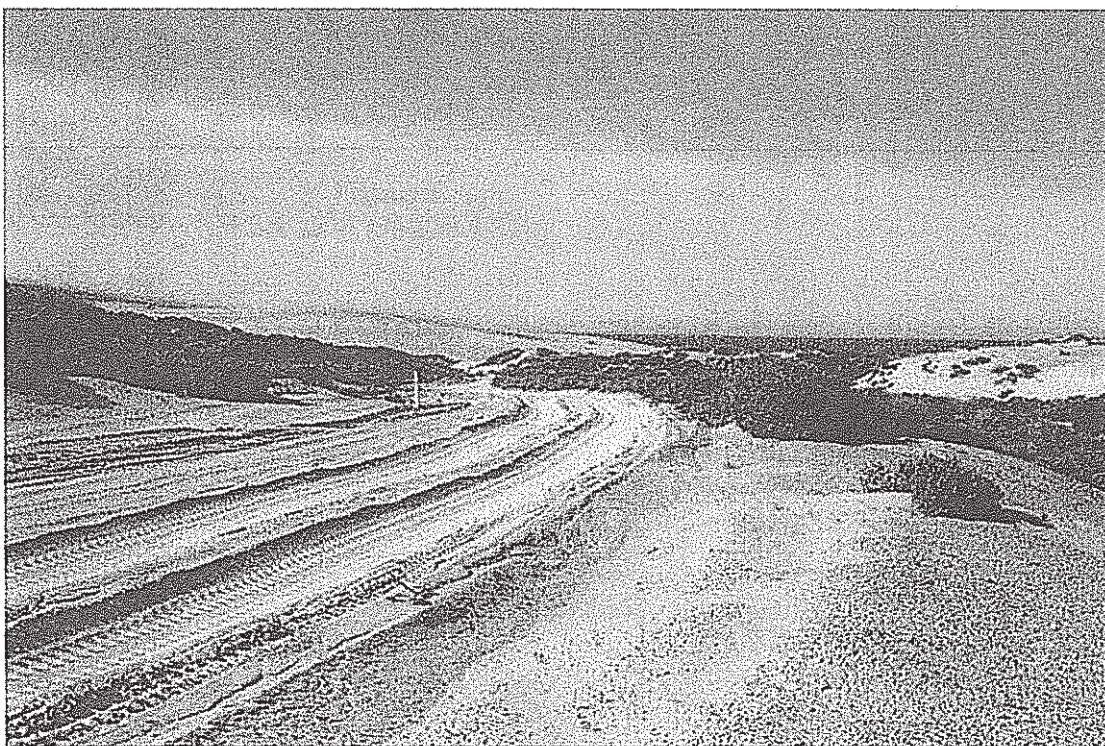


Figure 2A: Access road with gravel on edge of Gordon Sand easement (Road Site)



Figure 2B: Remnant gravel (also referred to as “push-off”) adjacent to Gordon Sand easement and access road (Road Site).



Figure 2C: Remnant gravel in Site 2 (Gordon Sand property). View to south.



Figure 2D: Close up of remnant gravel in Site 2 (Gordon Sand property). Pen for scale.

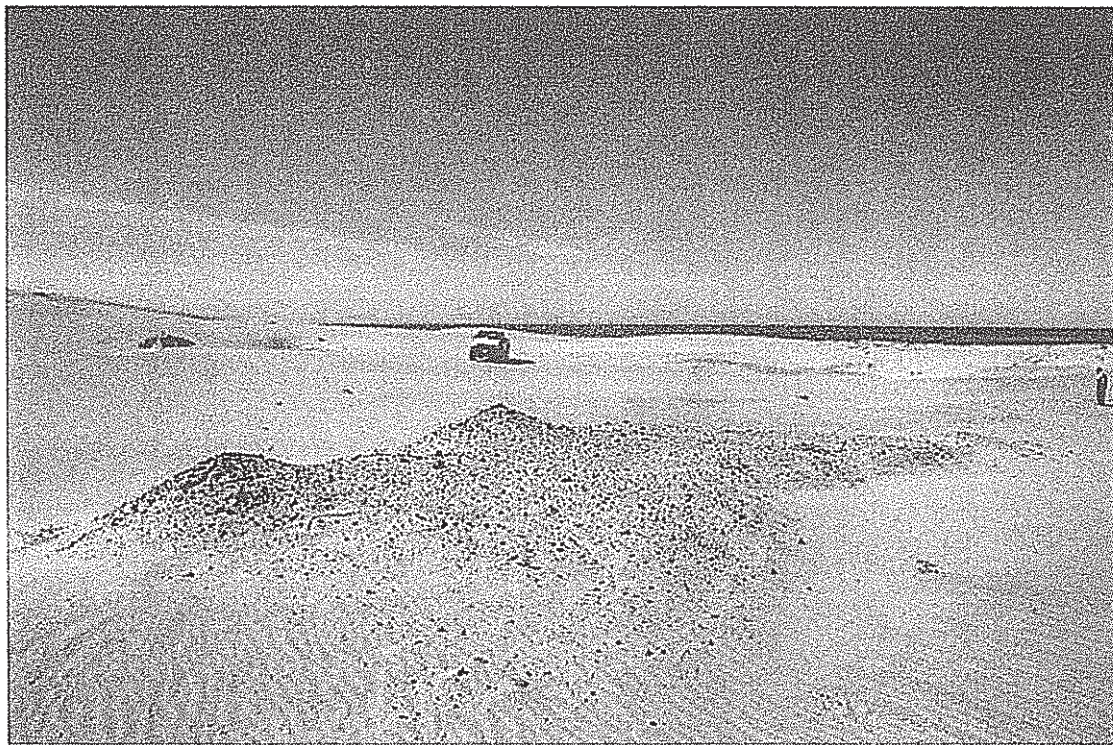


Figure 2E: Remnant gravel at Site D (County property). Truck for scale.



Figure 2F: View south across Site D (County property) to Gordon Sand property and sand pit. Remnant gravels are arrowed (blue arrow). The Gordon Sand Company's sand pit is located to the right of the truck (red arrow).



Figure 2G: Close up of remnant gravel and cobbles at Site D (County property). Pen for scale.



Figure 2H: Remnant gravels in Gordon Sand Company's excavation area (Site 2). View to west with Gordon Sand Company's sand pit seen in the distance.

Purpose of this report

The purpose of this report is to examine possible natural processes by which gravel (material 2 – 64 mm (0.079 – 2.5 inches)) in diameter, following the Wentworth Scale) and other coarse (large size) materials (e.g. cobbles: 64 – 256 mm (2.5 – 10.1 inches diameter)) introduced into the Guadalupe Dunes area as a result of the Husky Oil exploration operations are being transported and dispersed over time to areas throughout the Project Site. These processes could include, but are not limited to: (1) wind action; and (2) movement of particles downslope under gravity – referred to here as dispersal or diffusion of particles.

The report includes a brief primer on movement of sand and larger particles by the wind and an assessment of possible natural processes by which gravel and other coarse materials are being transported and dispersed over time throughout the Project Site.

Wind Action

Areas of sand dunes, such as the Guadalupe Dunes, are very dynamic environments that are characterized by mobile surfaces over which sand is transported by the wind. Interactions between the wind and the varied topography of the dunes

result in areas of erosion (removal) of sand, especially where winds are accelerated. Other areas, where winds slow, are areas of deposition (accumulation) of sand. Over time, these processes result in a constantly changing topography in which small features (e.g. wind ripples) move rapidly over periods of hours. Larger features, such as dunes, change over periods of days to years, and result in dune migration downwind over the years. Areas of vegetation slow the wind and decrease rates of sand transport so that these areas of vegetated sand surfaces and dunes are relatively stable and change little over periods of years.

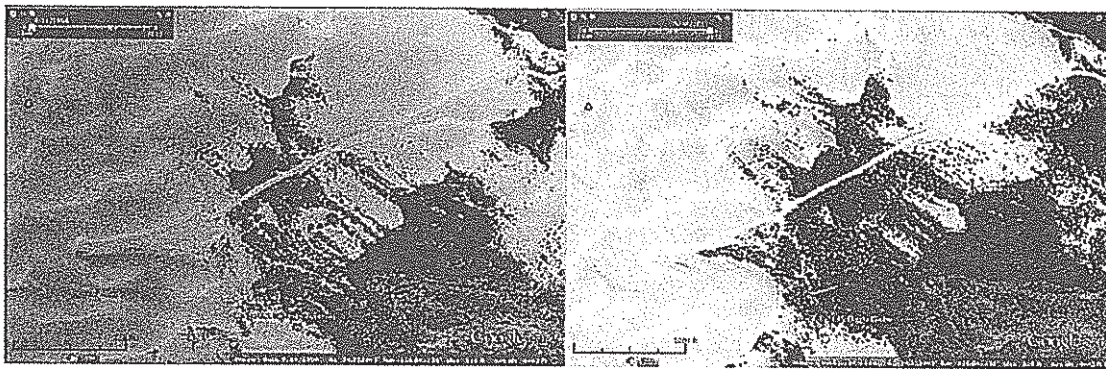


Figure 3: Comparison of aerial photographs of Project Area in 1994 (left) and 2011 (right). Images from Google Earth.

An indication of the dynamic nature of the environment of the Project Site can be gained from comparison of aerial photographs taken at different times in the past. Figure 3 provides a comparison between the Project Site in 1994 and 2011 from Google Earth images. Changes visible include migration of dune ridges to the south and southeast, as well as colonization of bare sand areas by vegetation.

Sand Transport Processes

Wind moves particles via a combination of direct wind shear stress on the surface and atmospheric turbulence (Kok et al., 2012). There are three modes of sediment transport by wind: creep or reptation, saltation, and suspension (Figure 4). The mode of transport depends primarily on the ratio between particle size, and wind shear stress and turbulence intensity (which are proportional to wind speed). Very small particles (less than 20 microns (0.008 inches) diameter) are transported in suspension (tens of miles or more) and are kept aloft by turbulent eddies in the wind. Larger particles (20–63 microns (0.008 – 0.025 inches)) undergo short-term suspension for distances of tens to hundreds of meters; material of sand size (0.063–2 mm (0.0025 – 0.079 inches)) is transported mainly in a series of short hops (saltation), in which the vertical component of wind velocity (turbulence) has no effect on particle trajectories. Material coarser than 0.5 mm (0.020 inches) diameter is transported in contact with the surface by

reptation and creep. The modes of transport are interdependent: saltating sand particles eject silt- and clay-size particles into the wind and impact coarse grains that are rolled along the bed.

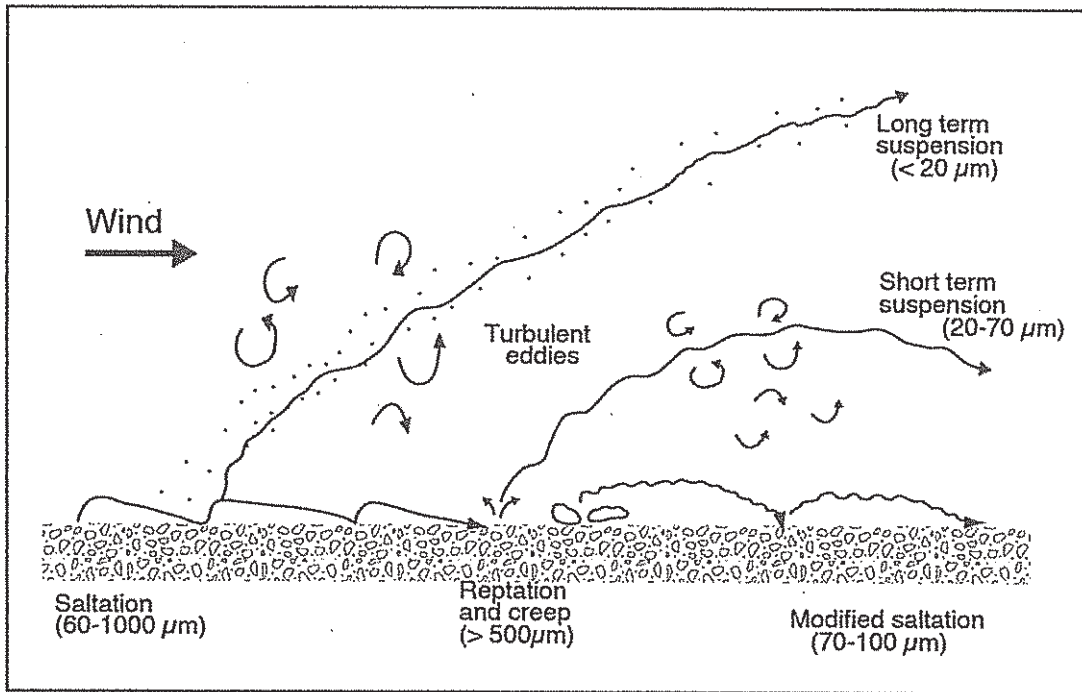


Figure 4: Modes of sediment transport by the wind.

Most sand particles are moved by saltation in a layer close to the bed. Particles in saltation move in a parabolic path with a steep ejection limb and a gradual return to the bed. The impacting grains may rebound directly (successive saltation), deform the bed, eject fine particles, or move coarse grains a short distance by reptation or surface creep.

Grains begin to move and sediment is entrained by the wind when fluid forces (lift, drag, and moment) exceed the effects of the weight of the particle (essentially its size) and any cohesion between adjacent particles as a result of moisture, salts, or soil crusts. This is defined as the threshold wind speed for sediment transport.

Once the wind speed exceeds the transport threshold, the rate of sand movement by wind increases exponentially. As a result strong winds have a much greater effect on the rate of movement compared to weaker winds (Figure 5).

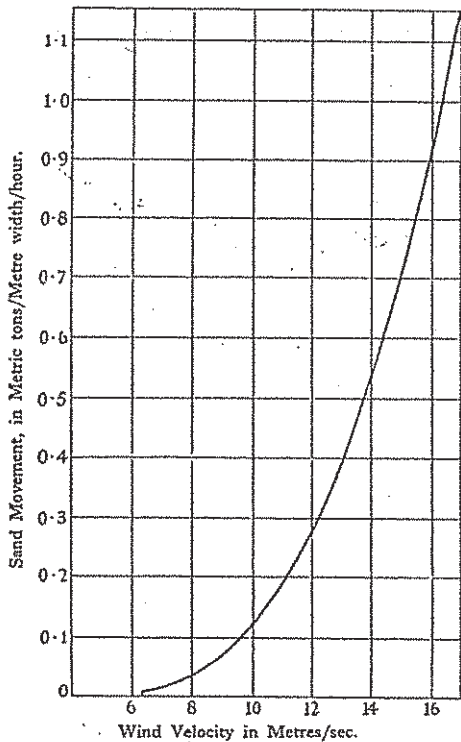


Figure 5: Rate of sand transport in relation to wind speed. From Bagnold (1941).

Sand transport studies at Oceano Dunes

Studies of wind and sand transport processes have been conducted at the Oceano Dunes State Vehicular Recreation Area (ODSVRA), approximately 12 km (8 miles) north of the Guadalupe Dunes. These studies provide an indication of the processes involved at the Guadalupe Dunes, which is a similar but less geographically extensive dune area. Gillies and Lancaster (2012) noted that:

“Transport was observed to occur with mean hourly winds in excess of 5-6 m/s (11.2 – 13.4 mph) measured at 2.2 m (7.22 feet) height”.

This is equivalent to a threshold wind speed of 7 m/sec (15.66 mph) at the standard measurement height of 10 m (32.81 feet).

Detailed measurements of the threshold for sand movement at OSDVRA (Gillies and Etymezian, 2014) in the period May – July 2013 indicate that the threshold wind speed for sand movement (at a height above ground level of 10 m (32.81 feet)) ranges between 5.81 and 6.21 m/sec (13 to 14.05 mph).

Rates of sand transport by wind are very high in windy coastal locations like the central California Coast. During the windy season (March – June), winds at the Oceano Dunes SVRA exceed sand transport thresholds for 4 to 6 hours each day

(Lancaster et al., 2011). Rates of sand movement measured here are as much as 1.2 kg/meter width/hour (0.21 pounds/foot width/hour).

Vegetation has a very significant effect on sand transport by wind, by covering the surface, and especially by absorbing the stress exerted by the wind, so that only a proportion is available for sand transport (Wolfe and Nickling, 1993). Field studies show that a plant cover of as little as 15-20% reduces sand transport to minimal amounts (Lancaster and Baas, 1998). At ODSVRA, sand transport in vegetated dune areas was found to be 5 – 10% of that on adjacent un-vegetated sand dunes (Lancaster et al., 2011).

Movement of coarse particles by wind

At the Environmental Review Hearing (28 May 2014), the possibility was raised that gravel and other coarse materials could have been dispersed throughout the Project Site by the wind. The County of Santa Barbara contended that this was not feasible, given the high wind speeds needed to effect this. Written responses (Comment response 4.4 and 5.1) discuss their view:

Comment Response 4-4: Comment noted. With regard comments associated with wind-blown gravels and cobbles please see Comment Response 5-1a. Using the Bagnold (1941) equation for entrainment of particles by wind, it was found that a 0.025 cm diameter particle has a theoretical critical shear velocity of approximately 5.15 miles per hour (Beckstrand 1998). Other publications estimate the actual threshold wind velocity for sand at approximately 14 miles per hour (Worley Parsons 2010; Tsoar 2004). Using the Bagnold equation, it follows that in order to transport a six inch diameter cobble winds in excess of 120 miles per hour would be required.

Several studies indicate that coarse particles (coarse sand – 0.50 mm (0 .02 inches) and upwards in size) are not moved by direct wind action (lift and drag), but are moved by the impact of saltating fine sand on the larger grains (see reviews by Gillies et al., 2012; Jerolmack et al., 2006; Kok et al., 2012). The transfer of momentum from the saltating sand to the coarse grains causes the latter to creep along the surface. Bagnold (1941) observed (p35) that “a grain in saltation can by impact move a surface grain six times its diameter, or more that 200 times its own weight”. His observations have been confirmed by recent field studies (Isenberg et al., 2011; Yizhaq, 2004). It is therefore not necessary to imply very high wind speeds, as suggested by Comment Response 4.4, to move moderately coarse particles (coarse sand to fine gravel size).

A representative sample of sand from the Project Site has a modal size of 0.5125 mm (0.021 in). Such grains moved by wind in saltation mode therefore have the

potential to move grains of 3 mm (0.12 in) in diameter in surface creep mode. Samples of remnant gravel from the Project Site, as well as field observations (Figure 2), indicate there is a significant quantity of imported material existing at the Project Site of this size capable of being moved in surface creep mode by the impacts of saltating sand. With regard to "gravel" material that is significantly coarser (larger diameter) than this, it is not likely this material can be moved by the impacts of saltating sand, nor it is likely to be moved by direct wind action. Different mechanisms are available to explain the possible dispersal of gravel and other particles larger than 3 mm (0.12 in) in diameter from areas of original deposition.

Dispersal or diffusion of particles under the influence of gravity on sloping surfaces

The movement of coarse particles on sand surfaces is not a subject that has been studied extensively. Nevertheless, it is commonly understood that removal of sand (deflation) by wind results in the concentration of coarse particles at the surface (Nickling and McKenna Neuman, 1995). Such lag surfaces are observed widely in areas north of Site D (Figure 6).

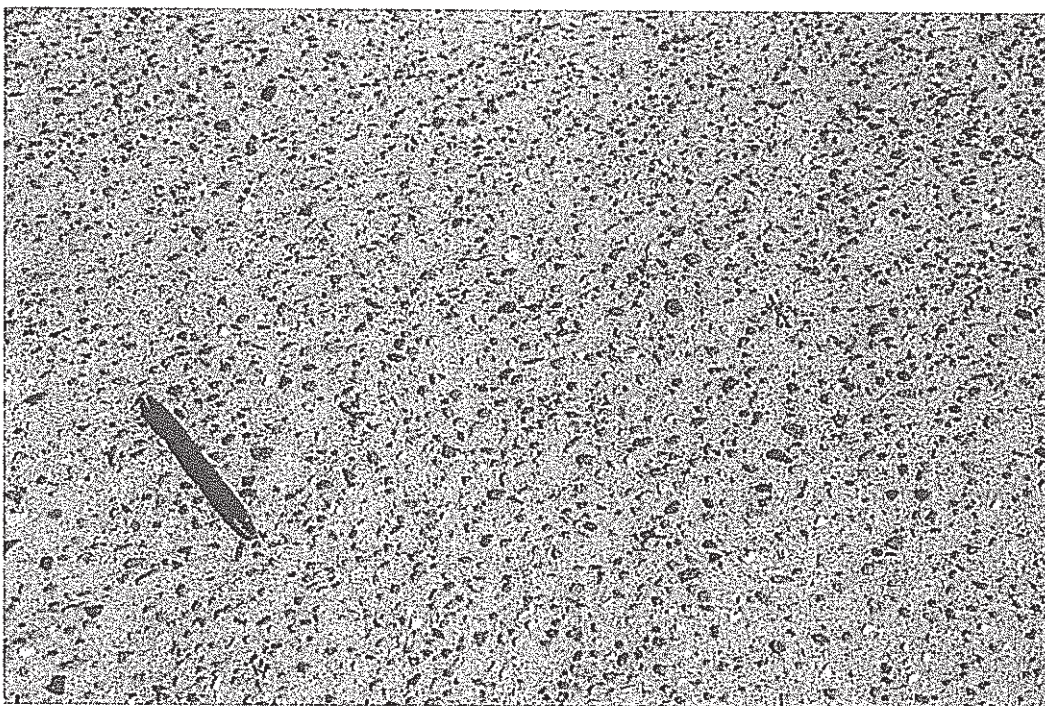


Figure 6: Deflation lag in fine gravel north of Site D (County property). Pen for scale.

Clusters of objects, such as archaeological materials (pottery, stone tools and flakes) have been observed to disperse across sand surfaces (Bagnold, 1941), by selective removal of sand by scouring around the object, which then falls into the scoured

area, and moves laterally (Figure 7). Such a process is facilitated by sloping surfaces, so that the coarse particles or objects move downslope regardless of prevailing wind direction. Similar processes have been observed in the formation of stone pavements in desert areas as well as on desert hill slopes (Abrahams et al., 1994; Cooke et al., 1993).

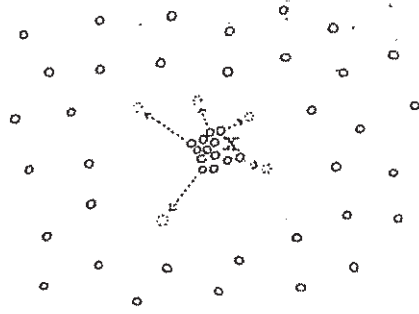


Figure 7: Dispersal of pebbles on a sand surface (after Bagnold, 1941).



Figure 8: Gravels near site D (County property). Note dispersal of material on slopes away from original surface.



Figure 9: Gravel patch between Site D and the Gordon Sand Company's excavation area. Pen for scale.

Field observations suggest that this process operates to transport and disperse material on down-sloping dune surfaces (Figure 8). The dune surfaces will shift and move as a result of erosion and deposition of wind-blown sand. As the dune surfaces shift and move, material dispersed over the dune surface will shift and move as well.

On a site visit in February 2015, small patches of gravels were observed in the area between Site D and the portion of Site 2 which is the Gordon Sand Company's excavation area (Figure 9). These gravel patches suggest a more extensive dispersal of material than what is indicated in the SEIR prepared for the Gravel Remediation In-Lieu Project, and indicate that additional remnant gravels may exist in this area that are now buried by migrating dunes or deposition of sand.

Conclusions

The Guadalupe Dunes are a very dynamic environment in which the dune surfaces are continually changing as a result of erosion and deposition of wind-blown sand. Erosion of sand in one area is balanced by deposition in other areas. Removal of sand by wind erosion may expose non-native gravels and other materials at the surface, whereas deposition of sand may bury pre-existing non-native gravels and other materials. These natural processes have the potential to disperse non-native gravels and other materials that were imported into the dunes for oil exploration activities.

A significant quantity of the remnant gravel that exists at Site D, Site 2, Road Site, and Upper Area is of a size 3 mm (0.12 in) in diameter or less. This material is capable of being moved in surface creep mode by the impacts of saltating sand. With regard to gravel and cobble material that is coarser (larger in diameter) than 3 mm (0.12 in), it is not likely that saltating sand is having an influence. Rather this material is more likely to be moved by the effects of gravity, as wind erodes the sand around the material eliminating its sub-lateral support. Such a process is facilitated by sloping surfaces, so that the coarse particles or objects move downslope regardless of prevailing wind direction.

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