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(Note: The PCMRP & the 15 Yr Mining Plan are in large folder in the hanging file.)

ENVIRONMENTAL IMPACT REPORT
PREPARED FOR
DEPARTMENT OF NATURAL RESOURCES
STATE OF MICHIGAN

APPLICANT

SARGENT SAND COMPANY

COVERING
SAND DUNE MINING PERMIT
SAND DUNE AND MANAGEMENT ACT
(ACT NO. 222, P.A. 1976)

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SARGENT SAND COMPANY
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INDUSTRIAL SAND MINING PROJECT
LOCATED IN SECTIONS 28, 29, 32 & 33
HAMLIN TOWNSHIP, MASON COUNTY
MICHIGAN

THIS IS A SAND MINING OPERATION PROVIDING INDUSTRIAL SAND FOR THE FOUNDRY IN MICHIGAN. IT IS A CONTINUING OPERATION AND HAS BEEN AT ITS PRESENT SITE SINCE 1937. THERE WILL BE LITTLE ADDITIONAL IMPACT ON THE ENVIRONMENT.

IV NEED FOR AND OBJECTIVE OF ACTION

THIS MASON COUNTY SAND DEPOSIT PROVIDES OVER FIFTY PERCENT OF THE SAND REQUIRED IN OUR INDUSTRIAL SAND SUPPLY BUSINESS. WE SUPPLY INDUSTRIAL SAND FOR FOUNDRIES ENGAGED IN PRODUCTION OF CASTINGS FOR AUTOMOBILE, AGRICULTURAL AND CONSTRUCTION MACHINERY AND VARIOUS OTHER METAL CASTINGS. THIS SAND DEPOSIT, CLASSIFIED AS DUNE SAND, WAS DEPOSITED BY A COMBINATION OF WIND ACTION AND WATER LEVEL FLUCTUATIONS OF LAKE MICHIGAN. DUNE SAND HAS A VERY HIGH SILICA CONTENT, IS REMARKABLY CLEAN AND IS OF UNIFORM GRAIN SIZE. THESE CHARACTERISTICS ENABLE THE MINING OF THIS SAMD WITHOUT EXTENSIVE PROCESSING; THUS A CONSIDERABLE SAVING OF ENERGY IS REALIZED.

MICHIGAN PRODUCES MORE MOLDING SAND THAN ANY OTHER STATE, THEREFORE, SAND MINING IS AN IMPORTANT INDUSTRY IN THIS STATE. THE SAND IS MINED WITH FRONTEND LOADERS OR DREDGES, TRANSPORTED TO THE WASHING AND PROCESSING PLANTS AND LOADED INTO TRUCKS OR RAILROAD CARS FOR TRANSPORTATION TO FOUNDRIES. SARGENT SAND COMPANY IS THE ONLY CUSTOMER OF THE LUDINGTON AND NORTHERN RAILWAY WHICH OPERATES BETWEEN THE SAND PIT AND THE CHESAPEAKE AND OHIO RAILROAD.

V. DESCRIPTION OF THE EXISTING ENVIRONMENT

THE SAND MINING PROPERTY IN HAMLIN TOWNSHIP, MASON COUNTY, ENCOMPASSES APPROXIMATELY 620 ACRES. THIS SITE HAS BEEN MINED CONTINUOUSLY SINCE 1937. AS OF JANUARY 1, 1978, APPROXIMATELY 30 ACRES HAVE BEEN MINED TO ABOUT 30 FEET BELOW WATER TABLE, CREATING A SMALL LAKE.

VERY LITTLE MARKETABLE TIMBER EXISTS ON THIS PROPERTY. SOME TIMBER HAS BEEN USED FOR FIRE WOOD, BUT THE MAJORITY OF THE BRUSH AND TREES HAVE BEEN USED FOR WINDBREAKS IN THE MINED OUT AREAS. SAND IS STABILIZED IN MOST OF THE MINED AREAS BY NEW GROWTH OF GRASS AND LIGHT BRUSH.

MANY ACRES OF BEACH GRASS AND RED PINE TREES HAVE BEEN PLANTED UNDER THE DIRECTION OF THE MASON LAKE SOIL CONSERVATION DISTRICT.

A. PHYSIOGRAPHY:

1. TOPOGRAPHY:

   A 15.0 MINUTE U.S. GEOLOGICAL SURVEY QUADRINGLE MAP, (APPENDIX 1), AND A 1" = 100', 2' CONTOUR AND PROJECT MAP OF THE SITE, (APPENDIX 6), SHOWING THE FEATURES OF THIS AREA AND THE SURROUNDING TERRITORY ARE INCLUDED IN THIS STATEMENT.

2. GEOLOGY:

   THE BEDROCK FORMATION OF THIS AREA CONSISTS OF COLDWATER SHALE. IT IS OVERLAID BY GLACIAL DRIFT

FROM 400 TO 600 FEET DEEP. THE SURFACE IS A SANDY PLAIN PARTIALLY COVERED BY DUNES AND BLOWOUTS.

3. SOILS:

THE SOIL SERIES OF THIS AREA ARE SHOWN ON ILLUSTRATIONS, (APPENDIX 3), PREPARED JOINTLY BY THE U. S. DEPARTMENT OF AGRICULTURE, SOIL AND CONSERVATION SERVICES AND THE MASON-LAKE CONSERVATION DISTRICT. THE TWO SOIL SERIES THAT DOMINATE THE AREA ARE:

A. DEER PARK SAND IS THE SOIL OF THE FORRESTED AREA OF THE DUNES. IT HAS A THIN SURFACE LAYER OF DARK BROWN ORGANIC MATTER, WHICH IS STRONGLY ACID, UNDERLAID BY THE MINERAL SOIL CONSISTING OF A UNIFORMLY GRAINED FINE SAND. THIS SOIL, WIND DEPOSITED FROM BEACHES OF ANCIENT LAKES, IS FREE FROM BOULDERS AND GRAVEL. IT IS WELL DRAINED, USUALLY QUITE SEVERELY SLOPED, AND THE EROSIION HAZARD IS MODERATE TO EXTREME. THIS SOIL IS UNSUITABLE FOR AGRICULTURE, BUT READILY GROWS PINE, ASPEN OR OAK TREES.

B. DUNE SAND IS THE SAME AS DEER PARK SAND AND IS THE SOIL OF THE ACTIVE DUNES. THIS IS REPRESENTED BY THE OPEN AREAS OF THE ACCOMPANYING ILLUSTRATIONS. THE ORIGINAL SUBSOIL HAS BLOWN AWAY. THESE AREAS WERE PROBABLY

FOREST COVERED AT ONE TIME, BUT DUE TO FIRES OR TIMBERING THE FORESTS WERE LOST AND THE RESULTING EROSION CONVERTED THEM TO ACTIVE DUNES.

B. CLIMATE:

THE CLIMATE OF THE AREA IS MORE MODERATE THAN FURTHER INLAND DUE TO THE INFLUENCE OF LAKE MICHIGAN. THE AVERAGE PRECIPITATION PER YEAR IS 30.6 INCHES, 60% OF WHICH OCCURS DURING THE SIX MONTH PERIOD FROM APRIL THROUGH SEPTEMBER. SNOWFALL AVERAGES APPROXIMATELY 120 INCHES PER YEAR. NO WIND RECORDS ARE KEPT FOR THIS AREA. THE PREVAILING WINDS ARE FROM THE WEST-SOUTH-WEST DURING THE WARM MONTHS AND FROM THE NORTH-NORTH-WEST DURING THE COLDER MONTHS. THE MEAN WIND SPEED FOR THE YEAR IS APPROXIMATELY 11.0 MILES PER HOUR.

C. TERRESTRIAL SYSTEMS:

1. FLORAL:

AN ON-SITE INSPECTION OF PLANT LIFE WAS MADE AND SPECIES WERE CATALOGUED. AN AERIAL PHOTOGRAPH OF THE AREA IS INCLUDED TO PROVIDE AN UNDERSTANDING OF THE GROUND COVER.

THE OVER-COVER CONSISTS OF THE FOLLOWING TREES:

JACK PINE	PINUS BANKSIANA
RED PINE	PINUS RESINOA
NORTHERN WHITE CEDAR	THUJA OCCIDENTALIS (ABORVITAL)

SMALL TOOTH ASPEN	POPULUS TREMULOIDES
WHITE BIRCH	BETULA PAPYRIFERA
RED OAK	QUERCUS BOREALIS
RED MAPLE	ACER RUBRUM
SUGAR MAPLE	ACER SCER SACCHARUM

THE UNDERCOVER CONSISTS OF THE FOLLOWING VARITIES OF PLANTS WHICH FURNISH A SOMEWHAT ADEQUATE GROUND COVER. THE THIN TOPSOIL AND ITS MARGIANL FERTILITY HOWEVER, ARE A LIMITING FACTOR.

PROSTRATE JUNIPER	JUNIPERUS COMMUNIS L. VAR. DEPRESSA
CHOCKE CHERRY	PRUNUS VIRGINIANA
GOLDENROD	SOLIDAGO SP.
BEACH GRASS	AMMOPHILIA BREVILIGUATATA
KENTUCKY BLUE GRASS	POA PRATENSIS
WINTERGREEN	GAULTHERIA PROCUMBENS
POISON IVY	RHUS RADICANS
CAT TAIL	TYPHA LATIFOLIA

THERE ARE NO ENDANGERED OR THREATENED SPECIES IN THE PROJECT AREA

2. FAUNA:

THE FOLLOWING ANIMALS HAVE BEEN OBSERVED IN THE PROJECT AREA IN THE PAST YEAR.

SKUNK	MEPHITIS MEPHITIS
CHIPMUNK	TASIAS STRISTUS
RED SQUIRREL	TAMIASCIURUS HUDSONICUS
GREY SQUIRREL	SCIURUS CAROLINENSIS
WHITETAIL DEER	ODOCOILEUS RUIGINIANUS
WOODCHUCK	MAROTA MONAX

DEER MOUSE	PEROMYSCUS MANICULATUS GRACILIS
RED FOX	VALPES FULVA
OPPOSSUM	DIDELPHIS MARSUPIALIS
RACCOON	PROCYON LOTOR
COTTON TAIL RABBIT	SYLVILAGUS FLORIDANUS
BLACK SQUIRREL	SCIURUS CAROLINENSIS

NO SPECIES ON THE DEPARTMENT OF NATURAL RESOURCES LIST OF THREATENED OR ENDANGERED ANIMALS HAVE BEEN OBSERVED IN THE PROJECT AREA. SOME BIRDS COMMON TO THE AREA DO MAKE USE OF THE DREDGING POND.

D. AQUATIC SYSTEMS:

THE PROJECT IS NOT TRAVERSED BY ANY STREAMS OR RIVERS. LAKE MICHIGAN PARALLELS IT APPROXIMATELY 800 FEET WEST OF THE WEST PROJECT BOUNDRY. THERE ARE 3 OR 4 VERY SMALL SWAMP AREAS ON THE PROPERTY, NONE OF WHICH ARE MORE THAN 1 ACRE IN SIZE. IN EXTREMELY DRY SUMMERS THESE DRY UP COMPLETELY AND THEREFORE SUPPORT VERY LITTLE ANIMAL OR AQUATIC LIFE.

E. HYDROLOGY:

ADJACENT TO THE PROJECT, THE WATER ELEVATION OF LAKE MICHIGAN IS APPROXIMATELY 580 FEET, (MAY, 1978). THE WATER TABLE ELEVATION ON THIS PROJECT VARIES. IN MAY, 1978, THE WATER TABLE ELEVATION ON THE EASTERLY PART OF THE PROJECT WAS 594.0 FEET AND THE WESTERLY PART 589.0 FEET. THE GROUND WATER FLOWS IN A WESTERLY DIRECTION TOWARDS LAKE MICHIGAN.

AS THE SOIL IS VERY POROUS AND MOST RAINFALL IS QUICKLY ABSORBED, THERE ARE NO WATER RUNOFF PATTERNS OF ANY EXTENT ON THIS PROPERTY. THERE BEING LITTLE INDUSTRY AND FEW HOMESITES IN THE AREA TO CREATE ADVERSE EFFECTS, THE QUALITY OF THE GROUND WATER APPEARS TO BE VERY GOOD.

F. AIR QUALITY:

OTHER THAN THIS PROJECT, THERE IS NO INDUSTRY IN THE IMMEDIATE AREA THAT WOULD EFFECT THE AIR QUALITY.

G. ASTHETICS:

THE LANDSCAPE OF THIS AREA IS DOMINATED BY THE SAND DUNES. THE DUNES ON THE NORTHERN PART OF THE PROJECT ARE QUITE ACTIVE, THEREFORE BARREN OF VEGETATION. LUDINGTON STATE PARK, ALSO MOSTLY ACTIVE DUNES, IS NORTH OF THE PROJECT. HAMLIN LAKE LIES TO THE NORTH-EAST AND IS A HIGHLY DEVELOPED LAKE RESORT. LINCOLN HILLS COUNTRY CLUB BORDERS THE PROJECT ON THE SOUTH AND LAKE MICHIGAN IS WEST OF THE PROJECT.

H. LAND USE:

THE OWNERSHIP AND USE OF THE LAND ADJACENT TO THE PROJECT IS SHOWN BY THE ACCOMPANYING AERIAL PHOTOGRAPH AND GENERAL PROPERTY MAP, (APPENDIX 4).

I. ARCHAEOLOGICAL AND HISTORICAL RESOURCES AND SITES:

IN 1978 DR. RICHARD E. FLANDERS OF GRAND VALLEY STATE COLLEGE MADE AN ARCHAEOLOGICAL SURVEY OF THE AREA. NO ARCHAEOLOGICAL SITES WERE FOUND ON THE PROJECT PROPERTY. DR. FLANDERS SURVEY REPORT. (APPENDIX 5).

J. SOCIAL ENVIRONMENT:

THE POPULATION GROWTH IN THE LUDINGTON AREA, (MASON COUNTY INCLUDED), HAS BEEN RATHER SLOW. THE POPULATION INCREASED FROM 22,00 IN 1960 TO 24,000 IN 1977, AN INCREASE OF ONLY 2,000, OR 10% IN A 17 YEAR PERIOD.

THE UNEMPLOYMENT FIGURE FOR MASON COUNTY AS OF DECEMBER, 1977, WAS 6.0% COMPARED WITH THE STATE FIGURE OF 5.6%. APPROXIMATELY 3,000 OF THE 8,000 PEOPLE EMPLOYED IN MASON COUNTY ARE IN INDUSTRY.

THE LEADING INDUSTRIAL EMPLOYERS IN THE AREA ARE:

DOW CHEMICAL COMPANY
GREAT LAKES CASTING
STAR WATCH CASE
HARVESTON WALKER
JACKSON VIBRATOR

ALL NECESSARY SUPPORT SYSTEMS FOR THIS OPERATION ARE PRESENT AND ADEQUATE. THE PROJECT AREA IS SERVED BY A MICHIGAN STATE HIGHWAY BORDERING THE PORPERTY AND THE LUDINGTON & NORTHERN RAILWAY. ELECTRIC POWER IS FURNISHED BY CONSUMERS POWER COMPANY AND NATURAL GAS BY MICHIGAN CONSOLIDATED GAS COMPANY.

THE PROJECT PROPERTY AND PROCESSING EQUIPMENT PROVIDE AN APPRECIABLE PARE OF THE TAX BASE OF HAMLIN TOWNSHIP.

VI. ALTERNATIVES CONSIDERED:

AS THIS WAS AN IDEAL SAND DEPOSIT NO ALTERNATIVES WERE CONSIDERED WHEN THIS PROJECT WAS DEVELOPED SOME FORTY YEARS AGO. THE GRAIN SIZE AND QUALITY OF THE SAND WERE EXCELLENT, AND THE DEPOSIT WAS LOCATED ON AN EXISTING RAILROAD. AT THE PRESENT TIME, THE ONLY ALTERNATIVES APPLICABLE TO THIS PROJECT ARE:

1. CONTINUE THE PROJECT AT ITS PRESENT ANNUAL PRODUCTION OF 800,000 TONS PER YEAR.
2. ACQUIRE ADDITIONAL CUSTOMERS AND INCREASE PRODUCTION TO A MUCH HIGHER LEVEL
3. DECREASE PRODUCTION.
4. CLOSE DOWN THE OPERATION ENTIRELY.

IT IS THE DECISION OF THIS COMPANY TO CONTINUE OPERATIONS ACCORDING TO ALTERNATIVE NUMBER 1. THIS ALTERNATIVE WILL BE DESCRIBED IN DETAIL IN SECTION VII OF THIS REPORT.

ALTERNATIVE NUMBER 2 WOULD RESULT IN THE FOLLOWING ENVIRONMENTAL, ECONOMIC AND SOCIAL IMPACTS:

1. INCREASE EMPLOYMENT ON THE PROJECT.
2. REQUIRE MORE PLANT AND OPERATING EQUIPMENT, THUS INCREASING THE TAX BASE.
3. INCREASE RAIL AND TRUCK SHIPMENTS FROM THE SITE.
4. EXPOSE LARGER MINED-OUT AREAS TO WIND EROSION BEFORE THEY COULD BE STABILIZED.

5. INCREASED ACTIVITY WOULD INCREASE THE NOISE LEVEL AND HAVE SOME ADVERSE IMPACT ON AIR QUALITY THROUGH THE INCREASED USE OF DIESEL ENGINES.

ALTERNATIVE NUMBER 3 WOULD HAVE A REVERSE EFFECT OF ALTERNATIVE NUMBER 2. IT WOULD NOT BE ECONOMICAL AND WILL NOT BE DISCUSSED FURTHER.

ALTERNATIVE NUMBER 4 WOULD RESULT IN THE LOSS OF APPROXIMATELY 35 JOBS IN THE AREA AND CAUSE CESSATION OF OPERATION OF THE LUDINGTON AND NORTHERN RAILWAY. THIS ACTION WOULD ALSO RESULT IN CONSIDERABLE TAX BASE LOSS FOR HAMLIN TOWNSHIP.

VII DESCRIPTION OF PROPOSED ACTION:

A. IT IS THE DECISION OF THIS COMPANY TO CONTINUE ITS SAND MINING ACTIVITY ON THIS PROJECT AT THE APPROXIMATE LEVEL AS IN PAST YEARS, (800,000 TONS PER YEAR). ALL PROPERTIES SHOWN AND IDENTIFIED ON THE CONTOUR MAP, (APPENDIX 6), ARE EITHER OWNED OR LEASED BY THE COMPANY. INCLUDED ON THIS MAP ARE ALL PROPERTY OWNERS AND A PARTIAL SURVEY OF THE PROPERTIES INVOLVED.

OF THE TOTAL TONNAGE MINED, 175,000 TONS ARE MINED BY DREDGING. THE BALANCE IS MINED DRY, USING FRONT END LOADERS AND CONVEYORS. THE 175,000 TONS DREDGED EACH YEAR CREATES A POND 30 FEET IN DEPTH, APPROXIMATELY 3 ACRES IN SIZE. THE 625,000 TONS OF SAND MINED DRY FROM THE DUNES REPRESENTS LEVELING APPROXIMATELY 7 TO 10 ACRES EACH YEAR.

IN THE DRY MINING OPERATION, THE SAND IS LOADED FROM THE DUNE BY FRONT END LOADERS ONTO CONVEYORS AND TRANSPORTED TO THE DRYING AND LOADING AREA. AT THE DRYING AREA THE SAND IS SCREENED TO REMOVE ANY VEGETATION AND PLACED IN A LARGE STOCKPILE TO AWAIT DRYING. THE STOCKPILE AT THE DRYER CONTAINS APPROXIMATELY 200,000 TONS AT THE BEGINNING OF COLD WEATHER. THE SAND IS REMOVED FROM THE STOCKPILE, DRYED, AND SCREENED TO REMOVE OVERSIZE MATERIAL AND LOADED INTO RAILROAD CARS OR TRUCKS FOR SHIPMENT. APPROXIMATELY 80% OF THIS SAND IS DRIED FOR SHIPMENT, THE BALANCE IS SOLD UNDRIED. THE SAND IS MINED FROM THE DUNES ONLY DURING THE WARMER MONTHS. IN WET MINING, OR DREDGING, THE SAND IS DREDGED FROM BELOW WATER AND PUMPED TO WASH PLANT WHERE IT IS SCREENED TO REMOVE OVER-SIZE MATERIAL AND DEWATERED. THE SAND IS STOCKPILED TO APPROXIMATELY 80,000 TO 100,000 TONS AT THE BEGINNING OF COLD WEATHER. APPROXIMATELY 80% OF THIS SAND IS SOLD UNDRIED. THE DREDGE OPERATES ONLY WHEN THE TEMPERATURE IS ABOVE FREEZING.

B. THE ADVANTAGES OF THIS ALTERNATIVE ARE:

1. THIS LEVEL OF PRODUCTION REQUIRES OPERATING TWO SHIFTS PER DAY, THUS CREATING MORE EMPLOYMENT AND REALIZATION OF GREATER EFFICIENCY OF EQUIPMENT.
2. DECREASES THE NUMBER OF YEARS THE PROJECT WILL BE IN OPERATION.
3. THIS PROJECT, BEING LUDINGTON AND NORTHERN RAILWAY'S ONLY CUSTOMER, MEANS CONTINUING OPERATION AND REVENUE FOR THE RAILROAD.

C. THE DISADVANTAGES OF OTHER ALTERNATIVES WERE DESCRIBED IN SECTION VI OF THIS REPORT.

D. REQUIRED PERMITS AND LICENSES:

THE ONLY PERMIT NECESSARY TO CONTINUE THIS PROJECT IS THAT REQUIRED UNDER ACT 222, P.A. 1976, EFFECTIVE 8-31-78.

E. MAINTENANCE:

THE ONLY MAINTENANCE REQUIRED WITHIN THE PROJECT, OTHER THAN THE PROCESSING PLANT, ROADS AND RAILROADS, IS REPAIRING OF DUNE GRASS AND PINE TREE PLANTINGS, DAMAGED BY DUNE BUGGIES AND MOTORCYCLES. ALL TYPES OF "NO TRESPASSING" SIGNS ARE USED ON THIS PROJECT, BUT THEY DO NOT KEEP OUT ALL TRESPASSERS.

VIII ANTICIPATED ENVIRONMENTAL IMPACT OF PROPOSED ACTION:

CONTINUING THIS MINING PROJECT, AS IN THE PAST FORTY YEARS, SHOULD HAVE THE FOLLOWING IMPACT.

A. PHYSIOGRAPHY

1. TOPOGRAPHY

AT THE PRESENT TIME, AN ESTIMATED 75% OF THE DUNES HAVE BEEN MINED FROM THIS PROPERTY. THERE ARE ONLY TWO DUNE AREAS REMAINING COVERING APPROXIMATELY 120 ACRES AND CONTAINING APPROXIMATELY 5,000,000 TONS OF SAND. REMOVAL OF THESE DUNES WILL NOT ALTER THE TOPOGRAPHY NEARLY AS MUCH AS PAST MINING HAS.

MOST OF THIS DUNE SAND IS LOCATED ON THE NORTH 60 ACRES OF THE PROPERTY, ADJACENT TO LUDINGTON STATE PARK. LEAVING A PORTION OF THIS SAND

UNMINED IS ANTICIPATED IN ORDER TO FORM A BUFFER ZONE ADJACENT TO THE PARK. THE PROJECT MAP, (APPENDIX 6) SHOWS THAT THE STATE OF MICHIGAN OWNS 60 ACRES OF LAND INCLUDED IN THIS PROJECT. THIS 60 ACRES IS UNDER LEASE TO THE PROJECT OWNERS UNTIL 1983 FOR THE SPECIFIC PURPOSE OF SAND REMOVAL.

A MAP OF LUDINGTON STATE PARK'S LONG RANGE DEVELOPMENT PLAN, (APPENDIX 2), INDICATES THAT THE PARK PLANS TO EVENTUALLY ACQUIRE ALL OF THIS PROJECT LAND. AS PREVIOUSLY STATED, THE PROJECT'S DREDGING OPERATION HAS FORMED A SMALL LAKE COVERING APPROXIMATELY 30 ACRES AND IS 30 FEET IN DEPTH.

BEING AWARE OF LUDINGTON STATE PARK'S PLANS TO EVENTUALLY ACQUIRE ALL THE PROJECT PROPERTY, THE PROJECT OWNERS MET WITH PARK ADMINISTRATORS TO DETERMINE THE MOST SATISFACTORY DEVELOPMENT PLAN FOR THE PROPERTY.

AFTER SEVERAL MEETINGS, IT WAS DECIDED THAT THE LONG RANGE MINING PLANS AND THE FIFTEEN YEAR PLAN FOR THIS PROJECT SHOULD INCLUDE THE FOLLOWING CONDITIONS:

1. THE LUDINGTON STATE PARK SHOULD ACQUIRE THE PROJECT PROPERTY WHEN MINING IS COMPLETED.

2. THIS PROJECT COULD BEST SERVE THE AREA AND THE PUBLIC BY ENLARGING THE PRESENT DREDGE POND TO APPROXIMATELY 180 ACRES: DREDGE TO A FIGURATION BEST SUITED TO THE AREA AND APPROVED BY THE MICHIGAN STATE PARKS ADMINISTRATION.
3. THE BALANCE OF THE PROJECT TO BE MINED AND RECLAIMED IN A PROGRAM COMPATIBLE TO A FUTURE RECREATIONAL AREA.

THE DREDGING OF 6,000,000 TONS OF SAND, ENLARGING THE POND OR LAKE TO 180 ACRES, IS ESTIMATED TO BE COMPLETED IN 20 YEARS.

AS CONTINUED MINING WILL REMOVE MOST OF THE REMAINING SAND DUNES FROM THE PROJECT PROPERTY, THE GREATEST IMPACT WILL BE ON THE TOPOGRAPHY. CONTINUED MINING WILL HOWEVER, CREATE A 180 ACRE INLAND LAKE WHICH WOULD BE AS ENHANCING TO THE TOPOGRAPHY AS THE DUNES, YET CONSIDERABLY MORE ADAPTABLE TO RECREATIONAL DEVELOPMENT. FOR EXAMPLE:

1. THE LAKE WOULD BE DEVELOPED WITH SHALLOW BEACHES.
2. THE LAKE WOULD BE WARMER THAN LAKE MICHIGAN PROVIDING A MORE ATTRACTIVE SWIMMING AREA FOR MANY.
3. THE LAKE WOULD PROVIDE ADDITIONAL AREA FOR ALL AQUATIC ACTIVITIES.

4. AN INLAND LAKE, HAVING MUCH LESS WAVE ACTION THAN THE GREAT LAKES, WOULD PROVIDE A SAFER AREA FOR MANY WATER ACTIVITIES.
5. CAMPSITES COULD BE DEVELOPED ON THE LAKESHORE.
6. THE LAKE WOULD PROVIDE ADDITIONAL HABITAT FOR WATERFOWL.

THIS INLAND LAKE WOULD BE A GREAT ASSET TO LUDINGTON STATE PARK.

AS YET THERE IS NO BINDING AGREEMENT BETWEEN THE PROJECT OWNERS AND THE MICHIGAN STATE PARK'S ADMINISTRATION CONCERNING THE FINAL DISPOSITION OF THIS PROJECT'S PROPERTIES. IT IS THE PROJECT OWNER'S INTENT HOWEVER, TO ENTER SUCH AN AGREEMENT. BECAUSE OF THE NUMEROUS DETAILS IN SUCH AN ARRANGEMENT, ITS COMPLETION MAY INVOLVE A NUMBER OF YEARS.

2. GEOLOGY:

THE SAND MINING ACTIVITY WILL NOT ALTER THE BASIC GEOLOGY OF THE AREA.

3. SOILS:

THERE BEING LITTLE OR NO TOPSOIL ON THE DUNES, THERE'LL BE NO SALVAGE ATTEMPTED. MINING OF THE DUNE SAND TO WATERTABLE OR BELOW, WILL TEND TO HAVE A STABILIZING EFFECT ON THE SOIL CONDITION. THE SOIL REMAINING, HAVING A MUCH GREATER MOISTURE CONTENT, WILL NOT BE SUBJECT TO WIND EROSION AS WERE THE DUNES.

B. CLIMATE:

CONTINUED MINING WILL HAVE NO EFFECT ON THE CLIMATE.

C. TERRESTRIAL SYSTEMS:

1. FLORA:

MOST OF THE REMAINING AREA TO BE MINED HAS VERY LITTLE PLANT LIFE. APPROXIMATELY 60 ACRES OF SPARSE WOOD AND UNDERSTORY PLANTS WILL BE REMOVED OVER THE PROJECTED TWENTY YEARS, (APPROXIMATELY 5% IN EACH YEAR). IN AREAS ABOVE WATERTABLE, PLANTING OF RED PINES AND DUNE GRASS FOR SIGHT SCREENING AND EROSION CONTROL WILL ACCELERATE RECOVERY OF GROUND COVER.

2. FAUNA:

NO APPRECIABLE IMPACT ON THE ANIMAL LIFE IS ANTICIPATED. REMOVAL OF THE SIXTY ACRES OF SPARSE WOODS WILL REDUCE THE WHITE-TAILED DEER POPULATION, BUT HAVE LITTLE OR NO EFFECT ON SMALL ANIMAL LIFE. THE SLOW MINING PROGRESS WILL ALLOW RECOVERY OF GROUND COVER FOR THE SMALLER ANIMAL POPULATION. THE FORMATION OF THE LAKE WILL PRODUCE SOME TRADE-OFF BETWEEN AQUATIC AND TERRESTRIAL LIFE.

D. AQUATIC SYSTEMS:

AN AERIAL PHOTOGRAPH, (APPENDIX 4), OF THE PROJECT AREA INDICATES NO RIVERS OR STREAMS ON THE PROPERTY. THE TWO SMALL POT HOLES INDICATED,

(APPROXIMATELY TWO ACRES EACH) DRY UP ENTIRELY DURING DRY YEARS, THUS SUPPORTING LITTLE OR NO AQUATIC LIFE. THE THIRTY ACRE MAN MADE POND INDICATED, (INCREASING IN THE NEXT TWENTY YEARS TO 180 ACRES), SHOULD BEGIN SUPPORTING MORE WILDLIFE IN THE NEAR FUTURE.

E. HYDROLOGY:

THE SAND MINING WILL HAVE NO IMPACT ON WATER CONDITIONS. THE POND DREDGING OPERATION RETURNS ALL WATER TO THE POND AS IT IS REMOVED. THERE ARE NO ADDITIVES OR ALTERATIONS TO THE WATER. BECAUSE OF THE SANDY SOIL, THERE ARE NO WATERSHED OR RUN-OFF PATTERNS FROM SURFACE WATER.

F. AIR QUALITY:

THE MINING OPERATION CREATES SOME ADVERSE IMPACT ON AIR QUALITY THROUGH USE OF DIESEL POWERED EQUIPMENT AND THE SAND DRYING SYSTEM. APPROXIMATELY EIGHT PIECES OF DIESEL EQUIPMENT ARE USED IN LOADING AND PROCESSING THE SAND AND DO CONTRIBUTE TO AIR POLLUTION.

THE SAND DRYING SYSTEM CREATES SOME PARTICULATE EMISSION. THE SAND ENTERS THE DRYING SYSTEM CONTAINING APPROXIMATELY 8% MOISTURE. IT LEAVES THE SYSTEM WITH A TEMPERATURE OF 180° FAHRENHEIT AND APPROXIMATELY 2% MOISTURE. IT IS THEN AERATED, REMOVING THE REMAINDER OF THE MOISTURE AND REDUCING THE TEMPERATURE TO 100° FAHRENHEIT.

DISCHARGING THE SAND FROM THE DRYER WITH 2% MOISTURE VERY NEARLY ELIMINATES PARTICULATE EMISSION. THE NATURAL GAS USED TO DRY THE SAND BURNS COMPLETELY, HAVING LITTLE IMPACT ON AIR QUALITY. ELECTRIC POWER, USED WHEREVER POSSIBLE IN THE OPERATION MINIMIZES POLLUTION.

SOME BLOWING OF SAND OCCURS IN THE IMMEDIATE MINING AREA. WHEN NECESSARY THIS WILL BE STABILIZED WITH PLANTING OF DUNE GRASS WHEN THE AREA IS MINED OUT.

G. AESTHETICS:

CONTINUED MINING WILL ALTER THE AREA LANDSCAPE. THERE ARE TWO LARGE DUNE AREAS, APPROXIMATELY SIXTY ACRES EACH, REMAINING ON THE PROJECT PROPERTY. THE CENTRALLY LOCATED DUNE WILL BE COMPLETELY REMOVED. THE DUNE ON THE NORTHERN END OF THE PROJECT WILL BE PARTIALLY REMOVED PROVIDING A BUFFER AREA BETWEEN THE PROJECT AND THE LUDINGTON STATE PARK. WHEN MINING IS COMPLETED, THE 180 ACRE LAKE WILL REMAIN. THE SHORELINE OF THE LAKE WILL RANGE FROM 200 TO 300 FEET FROM THE PROJECT PROPERTY LINES. THE AREAS BETWEEN THE SHORELINE AND PROPERTY LINES WILL BE PLANTED WITH DUNE GRASS TO PREVENT EROSION AND PROVIDE GREEN VEGETATION. ON THE SOUTHWEST CORNER OF THE PROPERTY A SMALL, 40 FOOT HIGH 6 ACRE DUNE WILL BE LEFT UNDISTURBED TO SERVE AS A SCREEN FOR THE SAND DRYING PLANT. THERE WILL BE NO

FURTHER MINING WITHIN 600 FEET OF PINEY RIDGE ROAD. THE REMAINING SMALLER DUNES IN THIS AREA WILL PROVIDE SIGHT SCREENING. IN 1979 FURTHER SCREENING WILL BE PROVIDED BY PLANTING PINE TREES NEAR THE PROJECT'S MAIN ENTRANCE AND ALONG THE EASTERLY SIDE OF THE DREDGE LAKE.

AS EARLIER INDICATED, LUDINGTON STATE PARK'S LONG RANGE DEVELOPMENT PLANS INCLUDE ACQUISITION OF THE PROJECT PROPERTIES. THE DREDGE LAKE WILL BE DEVELOPED TO A FIGURATION ALREADY PARTIALLY DESIGNED BY THE MICHIGAN STATE PARK'S ADMINISTRATION. THE ABOVE DESCRIBED RECLAMATION PROGRAM WILL CONTINUE UNTIL A TENTATIVE AGREEMENT ON THE PROPERTY ACQUISITION IS COMPLETED. WHEN SUCH AN AGREEMENT IS REACHED, THE MICHIGAN STATE PARK'S ADMINISTRATION MAY WISH TO DIRECT THE LANDSCAPING DESIGN.

H. LAND USE:

CONTINUING THIS PROJECT WILL HAVE NO IMPACT ON LAND USE IN THE SURROUNDING AREA. SINCE THE PROJECT BEGAN FORTY YEARS AGO, THERE HAVE BEEN FEW CHANGES IN THIS AREA. LUDINGTON STATE PARK HAS CONTINUED DEVELOPING AND A COMBINED TRAILER PARK AND MARINA WERE BUILT ON THE SOUTH END OF HAMLIN LAKE. IN THE NEAR FUTURE THE TRAILER PARK OWNERS PLAN TO DOUBLE THE SIZE OF THEIR PARK. THEY HAVE ALL THE NECESSARY PERMITS TO DO SO.

IN 1968 HAMLIN TOWNSHIP REQUESTED NO FURTHER MINING BE DONE WITHIN 600 FEET OF PINEY RIDGE ROAD. THIS REQUEST HAS BEEN HONORED. AS STATED EARLIER IN THIS REPORT, WHEN MINING IS COMPLETED, THE PROJECT PROPERTIES WILL PRESUMABLY BECOME A PART OF LUDINGTON STATE PARK.

I. SOCIAL ENVIRONMENT:

THE GENERAL SOCIAL ENVIRONMENT OF THE COMMUNITY IS DESCRIBED IN SECTION 1 OF THIS REPORT. CONTINUING THE MINING OPERATION WILL MAINTAIN EMPLOYMENT AND INCOME FOR THOSE WORKING AT THE SITE. ALL EMPLOYEES EXCEPT THE GENERAL SUPERINTENDENT, ARE LOCAL RESIDENTS. HAMLIN TOWNSHIP WILL BENEFIT THROUGH THE CONTINUING SUPPORT OF THE TAX BASE. THIS PROJECT IS THE ONLY CUSTOMER OF THE LUDINGTON AND NORTHERN RAILROAD. DISCONTINUING THE PROJECT WOULD DISCONTINUE THE RAILROAD. THE LUDINGTON AND NORTHERN RAILROAD HAS NINE FULL TIME EMPLOYEES. IT SUPPORTS THE COMMUNITY THROUGH EMPLOYEE INCOME, PAYMENT OF APPRECIABLE TAXES AND SPENDING MUCH OF ITS OPERATING REVENUE IN THE LOCAL AREA. THE MINING PROJECT TO THE LOCAL COMMUNITY IN 1977 WERE:

1. NUMBER OF FULL TIME EMPLOYEES (31).
2. LOCAL TAXES PAID ($4,817.06).
3. FREIGHT PAID LUDINGTON & NORTHERN RAILWAY ($450,000).

4. EMPLOYEES PAYROLLS ($427,694.24).

5. SUPPLIES PURCHASED LOCALLY, NOT INCLUDING NATURAL GAS AND ELECTRICITY ($200,000.00).

6. NUMBER OF CARS OF SAND SHIPPED VIA LUDINGTON & NORTHERN, AND CHESAPEAKE AND OHIO RAILROADS (6961).

THIS MINING INDUSTRY IS SMALL COMPARED TO SOME IN THE AREA AND CESSATION OF OPERATIONS WOULD NOT HAVE GREAT IMPACT ON THE COMMUNITY IN GENERAL. THE GREATEST IMPACT WOULD BE ON HAMLIN TOWNSHIP BECAUSE OF THE SUBSTANTIAL TAX BASE LOSS.

IX. ENERGY CONSIDERATION:

THE SAND FROM DUNES ALONG LAKE MICHIGAN IS GENERALLY FREE OF CARBONATES. NO OTHER SAND IN MICHIGAN HAS THIS DISTINCTION. SAND CONTAINING MORE THAN 0.2% CARBONATES IS NOT ACCEPTABLE TO THE FOUNDRY INDUSTRY. FOUNDRIES ADD RESINS AS A BINDER TO THE SAND TO FORM CORES AND MOLDS. A HIGH CARBONATE LEVEL IN THE SAND GREATLY INCREASES THE AMOUNT OF RESINS REQUIRED, THEREFORE INCURING HIGHER COSTS TO THE FOUNDRY. THERE ARE A FEW SAND DEPOSITS IN MICHIGAN, OTHER THAN THE DUNES, BEING PROCESSED FOR THE FOUNDRY INDUSTRY. THESE DEPOSITS, HOWEVER, WERE FORMED BY THE GLACIERS AND CONTAIN 3.0 TO 4.0 PERCENT CARBONATES. PRODUCING INDUSTRIAL SAND FROM THESE DEPOSITS GREATLY IN-

CREASES MONETARY COST AND WATER AND ENERGY CONSUMPTION. THE OWNERS OF THIS PROJECT ARE PRESENTLY PRODUCING INDUSTRIAL SAND FROM A GLACIAL DEPOSIT NEAR CADILLAC, MICHIGAN. A FLOTATION PROCESS, USING GREAT AMOUNTS OF WATER AND ELECTRICITY, IS USED TO REMOVE THE CARBONATES FROM THE SAND. THE SAND MUST BE WASHED EXTREMELY CLEAN BEFORE THE CARBONATES WILL SEPARATE DURING FLOTATION. CHEMICAL REAGENTS ARE ADDED TO THE SAND TO ENABLE THE CARBONATES TO FLOAT OFF THE SAND. THE USE OF CHEMICALS IN THE FLOTATION PROCESS DOES CREATE A POSSIBILITY FOR GROUND WATER CONTAMINATION. MOST OF THE GLACIAL SAND DEPOSITS IN MICHIGAN, LOCATED INLAND, ARE REMOVED FROM ADEQUATE WATER AND RAIL TRANSPORTATION. THE NECESSARY TRUCK TRANSPORTING OF THIS SAND REQUIRES MORE ENERGY AND CONTRIBUTES MORE AIR POLLUTION THAN WATER OR RAIL TRANSPORTATION. GENERALLY, THE ADDED COST OF TRUCK TRANSPORTING IS AT LEAST DOUBLE THAT OF WATER OR RAIL TRANSPORTATION.

X. UNAVOIDABLE ADVERSE IMPACTS:

PROBABLY THE MOST DAMAGING ADVERSE IMPACT RESULTING FROM CONTINUED MINING WILL BE THE REMOVAL OF THE DUNES, SOME AIR POLLUTION AND DESTROYING SOME ANIMAL HABITATS.

OBSERVATION, HIKING AND DUNE BUGGY RIDING REPRESENT THE REAL VALUE OF THE DUNES TO THE PUBLIC.

SINCE THE DUNES SUPPORT MINIMAL PLANT LIFE, THERE IS MINIMAL WILDLIFE PRESENT.

AS PREVIOUSLY STATED, THROUGH COMPLICATED PROCESSING, SOME INLAND SAND DEPOSITS ARE SUITABLE FOR INDUSTRIAL USE. THESE DEPOSITS, ESPECIALLY THOSE FROM GLACIAL OUTWASH, ARE SHALLOWER AND REQUIRE MUCH MORE ENERGY TO PROCESS. GLACIAL SAND DEPOSITS USUALLY OCCUR IN FAIRLY FLAT AREAS. BECAUSE OF BETTER SOIL, THESE AREAS SUPPORT CONSIDERABLY MORE PLANT LIFE.

THE USE OF GLACIAL SAND, AS OPPOSED TO DUNE SAND, WOULD DISTURB PROPORTIONATELY GREATER LAND AREAS TO PRODUCE EQUAL AMOUNTS OF USABLE SAND.

THE FORMATION OF THE 180 ACRE LAKE WILL COMPENSATE FOR THE LOSS OF THE DUNES. BUILDING THIS LAKE WITHOUT THE MINING PROJECT WOULD BE IMPOSSIBLE BECAUSE OF THE PROHIBITIVE COST.

XI. MITIGATING MEASURES:

A FEW MODIFICATIONS CONSIDERED, REGARDLESS OF COST, SHOULD MINIMIZE THE NEGATIVE ENVIRONMENTAL IMPACT OF THE PROJECT. THE MODIFICATIONS ARE:

A. LEAVING THE REMAINING DUNES, SAND COULD BE MINED ONLY BELOW WATER TABLE WHERE DUNES HAVE ALREADY BEEN REMOVED. NUMEROUS SMALL PONDS WOULD REMAIN. SUCH PONDS WOULD PROVIDE SOME WILDLIFE HABITAT BUT HAVE LITTLE PUBLIC VALUE.

THE COST OF DREDGING SAND IS APPROXIMATELY 50% GREATER THAN DUNE MINING. THIS MODIFICATION WOULD REDUCE THE LIFE OF THIS PROJECT ABOUT 50%.

B. THESE NUMEROUS PONDS COULD BE DREDGED DEEPER TO AVOID DISTURBING THE REMAINING DUNES. THOUGH THERE IS APPROXIMATELY 100 FEET OF SAND BELOW WATER TABLE, THE SAND BELOW THIRTY FEET IN DEPTH CONTAINS EXCESSIVE CARBONATES. AS PREVIOUSLY STATED, REMOVAL OF EXCESSIVE CARBONATES NECESSITATES A FLOTATION PROCESS. AGAIN, THE FLOTATION PROCESS REQUIRES GREATER ENERGY, AND BECAUSE OF ITS CHEMICAL REAGENTS, THE POSSIBILITY OF GROUND WATER POLLUTION IS INTRODUCED.

C. AN EXTENSIVE RECLAMATION PROGRAM COULD BE CONSIDERED FOR THE PROJECT PROPERTY. THIS COULD ACCELERATE RECOVERY OF SOME WILDLIFE HABITAT AND ENHANCE THE LANDSCAPE.

STATE OF MICHIGAN TRANSMITTAL

TO:

1 DNR

2 Land Resource Programs

3 Karl Hosford

4

FOR ACTION AS INDICATED

☐ SIGNATURE	☐ REPLY—MY SIGNATURE	☐ NOTE AND FORWARD
☐ APPROVAL	☐ REPLY—COPY TO ME	☐ NOTE AND FILE
☐ ACTION	☐ PLEASE SUMMARIZE	☐ NOTE AND RETURN
☐ COMMENTS	☐ PLEASE INVESTIGATE	☐ PLEASE PHONE ME
☐ INFORMATION	☐ FORWARDED PER REQUEST	☐ PLEASE SEE ME

REMARKS:

FROM	DATE
Dennis Tierney	1-11-79

FORM 10575 11

Environmental Enforcement

MICHIGAN DEPARTMENT OF NATURAL RESOURCES

INTEROFFICE COMMUNICATION

January 11, 1979

TO: Troy Yoder, Regional Director, Region II
Karl Hosford, Chief, Land Resource Programs Division
Robert Courchaine, Chief, Water Quality Division
John Scott, Chief, Fisheries Division
Jack Butterfield, Chief, Parks Division
David Jenkins, Chief, Wildlife Division

FROM: Dennis Tierney, Environmental Specialist
Environmental Enforcement Division

SUBJECT: Preliminary Draft EIS, Sargent Sand Company, Hamlin Township, Mason County

Attached is a copy of the above indicated EIS. Please review this document to determine the impact it may have on existing programs under your administrative responsibility, and what activities under the proposed project would require regulatory approval from your Division other than Public Act 222 of 1976.

Copies of the large appendices to the draft EIS are available for review in my office and in the Reclamation and Mining Control Unit of Geological Survey Division.

I would like to receive all comments by January 31, 1979. If you are not able to meet this deadline, please inform me so that arrangements can be made to complete this review.

DT:MSB:dr

Attachment

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JAN 12 1979
NATURAL RESOURCES
LAND RESOURCE PROGRAMS