UNITED STATES DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

CIRCULAR 645
PLATE 1

II PROPOSED ACTIONS WHICH MAY CAUSE ENVIRONMENTAL IMPACT

INSTRUCTIONS

1- Identify all actions (located across the top of the matrix) that are part of the proposed project.

2- Under each of the proposed actions, place a slash at the intersection with each item on the side of the matrix if an impact is possible.

3- Having completed the matrix, in the upper left-hand corner of each box with a slash, place a number from 1 to 10 which indicates the MAGNITUDE of the possible impact; 10 represents the greatest magnitude of impact and 1, the least, (no zeroes). Before each number place + if the impact would be beneficial. In the lower right-hand corner of the box place a number from 1 to 10 which indicates the IMPORTANCE of the possible impact (e. g. regional vs. local); 10 represents the greatest importance and 1, the least (no zeroes).

4- The text which accompanies the matrix should be a discussion of the significant impacts, those columns and rows with large numbers of boxes marked and individual boxes with the larger numbers.

SAMPLE MATRIX

	a	b	c	d	e
a		2/1			+5/5
b		7/2	8/8	3/1	9/7

PROPOSED ACTIONS	A. MODIFICATION OF REGIME	B. LAND TRANSFORMATION AND CONSTRUCTION	C. RESOURCE EXTRACTION	D. PROCESSING	E. LAND ALTERATION	F. RESOURCE RENEWAL	G. CHANGES IN TRAFFIC	H. WASTE EMPLACEMENT AND TREATMENT	I. CHEMICAL TREATMENT	J. ACCIDENTS	OTHERS	COMPUTATIONS
	a. Exotic flora or fauna introduction	a. Urbanization	a. Blasting and drilling	a. Farming	a. Erosion control and terracing	a. Reforestation	a. Railway	a. Ocean dumping	a. Fertilization	a. Explosions	a.	
	b. Biological controls	b. Industrial sites and buildings	b. Surface excavation	b. Ranching and grazing	b. Mine sealing and waste control	b. Wildlife stocking and management	b. Automobile	b. Landfill	b. Chemical deicing of highways, etc.	b. Spills and leaks	b.	
	c. Modification of habitat	c. Airports	c. Subsurface excavation and retorting	c. Feed lots	c. Strip mining rehabilitation	c. Ground water recharge	c. Trucking	c. Emplacement of tailings, spoil and overburden	c. Chemical stabilization of soil	c. Operational failure		
	d. Alteration of ground cover	d. Highways and bridges	d. Well drilling and fluid removal	d. Dairying	d. Landscaping	d. Fertilization application	d. Shipping	d. Underground storage	d. Weed control			
	e. Alteration of ground water hydrology	e. Roads and trails	e. Dredging	e. Energy generation	e. Harbor dredging	e. Waste recycling	e. Aircraft	e. Junk disposal	e. Insect control (pesticides)			
	f. Alteration of drainage	f. Railroads	f. Clear cutting and other lumbering	f. Mineral processing	f. Marsh fill and drainage		f. River and canal traffic	f. Oil well flooding				
	g. River control and flow modification	g. Cables and lifts	g. Commercial fishing and hunting	g. Metallurgical industry			g. Pleasure boating	g. Deep well emplacement				
	h. Canalization	h. Transmission lines, pipelines and corridors		h. Chemical industry			h. Trails	h. Cooling water discharge				
	i. Irrigation	i. Barriers including fencing		i. Textile industry			i. Cables and lifts	i. Municipal waste discharge including spray irrigation				
	j. Weather modification	j. Channel dredging and straightening		j. Automobile and aircraft			j. Communication	j. Liquid effluent discharge				
	k. Burning	k. Channel revetments		k. Oil refining			k. Pipeline	k. Stabilization and oxidation ponds				
	l. Surface or paving	l. Canals		l. Food				l. Septic tanks, commercial and domestic				
	m. Noise and vibration	m. Dams and impoundments		m. Lumbering				m. Stack and exhaust emission				
		n. Piers, seawalls, marinas, and sea terminals		n. Pulp and paper				n. Spent lubricants				
		o. Offshore structures		o. Product storage								
		p. Recreational structures										
		q. Blasting and drilling										
		r. Cut and fill										
		s. Tunnels and underground structures										
A. PHYSICAL AND CHEMICAL CHARACTERISTICS — 1. EARTH — a. Mineral resources												
b. Construction material												
c. Soils												
d. Land form												
e. Force fields and background radiation												
f. Unique physical features												
2. WATER — a. Surface												
b. Ocean												
c. Underground												
d. Quality												
e. Temperature												
f. Recharge												
g. Snow, ice, and permafrost												
3. ATMOSPHERE — a. Quality (gases, particulates)												
b. Climate (micro, macro)												
c. Temperature												
4. PROCESSES — a. Floods												
b. Erosion												
c. Deposition (sedimentation, precipitation)												
d. Solution												
e. Sorption (ion exchange, complexing)												
f. Compaction and settling												
g. Stability (slides, slumps)												
h. Stress-strain (earthquake)												
i. Air movements												
B. BIOLOGICAL CONDITIONS — 1. FLORA — a. Trees												
b. Shrubs												
c. Grass												
d. Crops												
e. Microflora												
f. Aquatic plants												
g. Endangered species												
h. Barriers												
i. Corridors												
2. FAUNA — a. Birds												
b. Land animals including reptiles												
c. Fish and shellfish												
d. Benthic organisms												
e. Insects												
f. Microfauna												
g. Endangered species												
h. Barriers												
i. Corridors												
C. CULTURAL FACTORS — 1. LAND USE — a. Wilderness and open spaces												
b. Wetlands												
c. Forestry												
d. Grazing												
e. Agriculture												
f. Residential												
g. Commercial												
h. Industrial												
i. Mining and quarrying												
2. RECREATION — a. Hunting												
b. Fishing												
c. Boating												
d. Swimming												
e. Camping and hiking												
f. Picnicking												
g. Resorts												
3. AESTHETICS AND HUMAN INTEREST — a. Scenic views and vistas												
b. Wilderness qualities												
c. Open space qualities												
d. Landscape design												
e. Unique physical features												
f. Parks and reserves												
g. Monuments												
h. Rare and unique species or ecosystems												
i. Historical or archaeological sites and objects												
j. Presence of misfits												
4. CULTURAL STATUS — a. Cultural patterns (life style)												
b. Health and safety												
c. Employment												
d. Population density												
5. MAN-MADE FACILITIES AND ACTIVITIES — a. Structures												
b. Transportation network (movement, access)												
c. Utility networks												
d. Waste disposal												
e. Barriers												
f. Corridors												
D. ECOLOGICAL RELATIONSHIPS SUCH AS: — a. Salinization of water resources												
b. Eutrophication												
c. Disease-insect vectors												
d. Food chains												
e. Salinization of surficial material												
f. Brush encroachment												
g. Other												
OTHERS — a.												
b.												

I EXISTING CHARACTERISTICS AND CONDITIONS OF THE ENVIRONMENT

COMPUTATIONS	

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INFORMATION MATRIX FOR ENVIRONMENTAL IMPACT ASSESSMENT