



# Rare Earth Element Mines, Deposits, and Occurrences

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## TABLE OF CONTENTS

	<u>Page</u>
INTRODUCTION .....	3
DATA DESCRIPTION .....	3
REFERENCES .....	10

### TABLES

Table 1. Rare earth mineral codes and associated mineral names.....	6
Table 2. Non-rare earth mineral codes and associated mineral names.....	7
Table 3. Other abbreviations and acronyms used in this report.	8

### APPENDICES

Appendix A. REE deposits.....	27
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## **INTRODUCTION**

Data on rare earth (including yttrium) mines, deposits, and occurrences were compiled as part of an effort by the USGS and the University of Arizona Center for Mineral Resources to summarize current knowledge on the supply and demand outlook and related topics for this group of elements. Economic competition and environmental concerns are increasingly constraining the mining and processing of rare earths from the Mountain Pass mine in California. For many years, the deposit at Mountain Pass was the world's dominant source of rare earth elements and the United States was essentially self-sufficient. Starting approximately 10 years ago, the U.S. has become increasingly dependent (> 90 percent of separated rare earths) upon imports from China, now the dominant source of rare earths. Knowledge of the known economic and non-economic sources of rare earths is basic to evaluating the outlook for rare earth supply and associated issues.

## **DATA DESCRIPTION**

Data on rare earth mines, deposits, and occurrences were collected from a variety of sources, including: databases of the U.S. Geological Survey and other agencies; published literature; gray literature and unpublished data and compilations; and company, institute, and government websites. Data on rare earth occurrences were included in the compilation along with mines and deposits of known economic potential to better reflect the geologic spectrum of rare earth element concentration. Many of the occurrences have not been well studied and the economic potential is not really known. Throughout this report and the accompanying data tables, the following abbreviations are used: RE- rare earths; REE- rare earth elements; REO- rare earth oxides. For most of the deposits, the rare earths include yttrium. For a few deposits, yttrium is considered separately because it was treated separately in the literature. The compilation of rare earth mines, deposits, and occurrences may be found in Appendix A.

Data collected for this report include the following fields:

Deposit type

Deposit or district name

Location information:

Country

State or province

Latitude and longitude

Source of location information

Resource information

Tonnage/grade

Source of data

Production status

Mineralogy

Rare earth minerals

Other ore/significant minerals

Gangue/rock-forming minerals

Geochronology

Age (method, material)

Host rock

Company

Comments

References

The rare earth occurrences were initially classified into the following deposit types: carbonatites, carbonatites with residual enrichment, alkaline igneous complexes, hydrothermal iron-oxide deposits, deposits hosted by metamorphic rocks, shoreline placer deposits, alluvial placer deposits, paleoplacers, ion adsorption weathering crusts, phosphorites, uranium deposits, and "Other", a miscellaneous and unknown deposits category. To decrease the number of deposits classified as "Other", the following categories were added: other igneous-affiliated deposits (including pegmatites and veins) and placers of unknown origin. In addition, subcategories were used within the "Other" category for deposits of known deposit type, but with too few rare earth occurrences to justify a separate category. Sub-categories within "Other" include:

bauxite and laterite-hosted and those affiliated with fluorspar and lead deposits of various origins.

Within each deposit type, the mines, deposits, and occurrences are listed alphabetically. The deposit or district name field contains the most common name used in the literature for a given mine, deposit, or district/area. Common alternate names and spellings are shown in parentheses.

Location information for each site includes country name, state or province name, latitude and longitude in degrees and minutes where available, and a reference for the location information. Most location information was taken from published sources and no effort was made to verify its accuracy. Some province information and latitudes/longitudes were determined using location descriptions and online gazetteers such as those operated by United States National Imagery and Mapping Agency (<http://164.214.2.59/nimahome.html>) and the Australian National Mapping Agency (<http://www.auslig.gov.au/>).

A minimal amount of resource information is provided in 3 fields: resource tonnage/grade, source, and production status. Published tonnage and grade data are listed with different estimates separated by semicolons; the source(s) of the information are separated by semicolons to correspond with the resource figures. For the most part, this information represents geologic estimates. If the grades and tonnages in this field are known to be other than geologic estimates, that information is noted. The reader should know that for most resource estimates, the grade for REE or REO includes yttrium, if not, the yttrium grade will be listed separately. Most of the sites in this compilation are occurrences of rare earths. Other designations in the production status field include active producer, by product rare earth (RE) producer, past producer, and potential producer. This field is left blank if no information or conflicting information was given in the source document(s).

The next three fields describe the mineralogy of the site. Minerals known to be, or reported to be, rare earth-bearing are listed in the "RE Mineralogy" field. To help keep the size of the table compact, abbreviations are used for the mineral names; these abbreviations may be found in table 1. Ore & other significant minerals and gangue & rock-forming minerals of interest are found in the fields

Code	Mineral Name	Code	Mineral Name	Code	Mineral Name
aes	aeschynite	flor	florencite	par	parisite
all	allanite	fcer	fluocerite	prv	perovskite
ana	anatase	fapa	fluorapatite	ppyro	plumbopyrochlore
anc	ancylite	flu	fluorite	pcra	polycrase
apa	apatite	for	formanite	plit	polyolithionite
ast	astrophyllite	gad	gadolinite	pyro	pyrochlore
bad	baddeleyite	gag	gagarinite	rhab	rhabdophane
bpyro	bariopyrochlore	git	gittinsite	rink	rinkite
bas	bastnäsité	gor	gorceixite	ros	rosenbuschite
bran	brannerite	goy	goyazite	sah	sahamalite
bri	britholite	hel	hellandite	sam	samaraskite
bro	brockite	hing	hingganite	ste	steenstrupine
bur	burbankite	hua	huanghoite	stil	stillwellite
ccer	carbocernaite	hapa	hydroxlapatite	syn	synchysite
cay	caysichite	iim	iimoriite	teng	tengerite
cer	cerianite	joa	joaquinite	tha	thalenite
cpyro	ceriopyrochlore	kai	kainosite	thor	thorite
crt	cerite	kam	kamphaugite	tit	titanite
che	chevkinite	kar	karnasurtite	ves	vesuvianite
chu	churchite	kei	keiviite	who	wöhlerite
coll	collophane	kul	kuliokite	xen	xenotime
col	columbite	lav	lavenite	ytt	yttrialite
cor	cordylite	Les	lessingite	ytan	yttrotantalite
cran	crandallite	lpha	leucophanite	zirk	zirkelite
daq	daqingshanite	lop	loparite		
dav	davidite	lov	lovchorrite		
eud	eudialyte	lue	lueshite		
eux	euxenite	mis	miserite		
ferg	fergusonite	mon	monazite		
fers	fersmite	mos	mosandrite		

following the rare earth mineralogy. The mineral names for the abbreviations used in these fields may be found in table 2.

Age of mineralization, age date method and (or) material, and host rock are the other fields containing geologic information. The age field contains a generalized geologic age classification and (or) a numeric age. If there is a numeric age, any data on the method, mineral, and rock source used to determine that age will be in the adjacent field. For instance, if a date was determined using K-Ar (method) on phlogopite (mineral or material) from carbonatite (rock source), "(K-Ar, phlo, carbonatite)" will follow the numeric age.

**Table 2. Non-rare earth mineral codes and associated mineral names.**

<u>Code</u>	<u>Mineral</u>	<u>Code</u>	<u>Mineral</u>	<u>Code</u>	<u>Mineral</u>
act	actinolite	cbe	chrysoberyl	hem	hematite
aeg	aegirine	cin	cinnabar	hin	hinsdalite
aen	aenigmatite	cly	clay	hrt	hiortdahlite
agr	agrellite	chum	clinohumite	hol	hollandite
alb	albite	cof	coffinite	horn	hornblende
ama	amazonite	coll	collophane	hapa	hydroxlapatite
amph	amphibole	col	columbite	ilm	ilmenite
anl	analcime	crn	corundum	irut	ilmenorutile
ana	anatase	cran	crandallite	inn	innelite
anhy	anhydrite	croc	crocidolite	iso	isokite
ank	ankerite	cry	cryolite	kao	kaolinite
ann	annite	cub	cubanite	kat	katophorite
ano	anorthoclase	daw	dawsonite	kup	kupletskite
apa	apatite	dia	diamond	kya	kyanite
arag	aragonite	dsp	diaspore	lab	labuntsovite
arf	arfvedsonite	dio	diopside	lam	lamprophyllite
arm	armstrongite	dol	dolomite	lat	latrappite
apy	arsenopyrite	edi	edingtonite	lav	lavenite
ast	astrophyllite	elp	elpidite	lei	leifite
aug	augite	epd	epididymite	leu	leucoxene
azu	azurite	epi	epidote	lim	limonite
bad	baddeleyite	eps	epistolite	lom	lomonosovite
bpyro	bariopyrochlore	eud	eudidymite	lor	lorenzenite
bar	barite	fay	fayalite	lovo	lovozerite
bry	barylite	fld	feldspar	lue	lueshite
bert	bertrandite	fed	ferro-edenite	lus	lusungite
beta	betafite	fer	fersmanite	mgs	magnesite
bio	biotite	fapa	fluorapatite	mag	magnetite
bis	bismuthinite	flu	fluorite	mal	malachite
boh	böhmite	fers	fersmite	mar	marcasite
bor	bornite	frs	forsterite	mrt	martite
bran	brannerite	gah	gahnite	mel	melanite
brk	brookite	gal	galena	mll	melillite
cah	cahnite	gar	garnet	mica	mica
cal	calcite	grg	georgechaoite	mcc	microcline
can	cancrinite	gib	gibbsite	mlyb	molybdenite
car	carbonate	git	gittinsite	mnt	monticellite
cas	cassiterite	gla	glaucophane	mont	montmorillonite
cata	catapleiite	goe	goethite	mur	murmanite
cel	celestite	got	götzenite	musc	muscovite
crs	cerussite	goy	goyazite	nah	nahcolite
cld	chalcedony	gra	graphite	nar	narsarsukite
ccc	chalcocite	grn	garnierite	nat	natrolite
cpy	chalcopyrite	gyp	gypsum	n nb	natroniobite
chk	chkalovite	has	hastingsite	nep	neptunite
chl	chlorite	hau	hauyne	neph	nepheline
cho	chondrodite	hed	hedenbergite	nphy	niobophyllite
chr	chromite	hlv	helvite	nio	niocalite

**Table 2. (cont'd).**

<u>Code</u>	<u>Mineral</u>	<u>Code</u>	<u>Mineral</u>	<u>Code</u>	<u>Mineral</u>
ok	okaite	rink	rinkite	thor	thorite
olig	oligoclase	ros	rosenbuschite	tgum	thorogummite
oliv	olivine	rut	rutile	tit	titanite
omph	omphacite	sam	samarskite	top	topaz
orth	orthoclase	san	sanadine	tour	tourmaline
pkel	parakeldyshite	sca	scapolite	trem	tremolite
pec	pectolite	sch	scheelite	uran	uraninite
pent	pentlandite	sel	sellaite	uph	uranophane
prv	perovskite	srn	serandite	val	valleriite
phe	phenakite	src	sericite	van	vanadinite
phlo	phlogopite	ser	serpentine	var	variscite
plit	polyolithionite	sid	siderite	vrn	vermiculite
pow	powellite	sil	sillimanite	vil	villiaumite
pyr	pyrite	sod	sodalite	viv	vivianite
pyro	pyrochlore	sph	sphalerite	vla	vlasovite
plus	pyrolusite	snn	stannite	wag	wagnerite
prym	pryomorphite	sta	staurolite	wav	wavellite
pph	pyrophanite	sti	stibnite	wlf	wolframite
pyx	pyroxene	str	strontianite	wol	wollastonite
pyrh	pyrrhotite	sva	svanbergite	wul	wulfenite
qtz	quartz	tae	taeniolite	zeo	zeolite
rho	rhodonite	tan	tantalite	zir	zircon
rich	richterite	tet	tetrahedrite	zoi	zoisite
rie	riebeckite	thrn	thorianite		

**Table 3. Other abbreviations and acronyms used in this report.**

<u>Abbreviation/ Acronym</u>	<u>Explanation</u>
ABMRGG	Australia Bureau of Mineral Resources, Geology and Geophysics
ama	as much as
ESCAP	Economic and Social Commission for Asia and the Pacific
HM	heavy mineral(s)
HREE	heavy rare earth elements
LREE	light rare earth elements
Ma	million years
MASMLS	Mineral Availability System, Mineral Information Locator System
MRDS	Mineral Resources Data System
Mt	millions of metric tons
NIMA	National Imagery and Mapping Agency
RE	rare earth(s)
REE	rare earth elements
REO	rare earth oxides, undifferentiated
USGS	U.S. Geological Survey



Host rock contains a description of the host rock for the mineralization and may contain the age of the host rock if it is different from the age of mineralization

The remaining fields in the data compilation list the owner/operator (Company) of the site, additional commentary on the site (Comments), and the references used to compile the data in the table (References). Data in the comments field may include location, geologic, or economic information. If a deposit's classification is uncertain, that information will also be listed in the comments field.

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## APPENDIX A. REE Deposits

Appendix A. REE Deposits  
USGS OF02-189

DEPOSIT	Location					Resources	Source & Date of Estimate(s)
TYPE	Deposit or district name	Country	State or Province	Latitude	Longitude	Source	Tonnage and grade
CARBONATITE							
	Adiounedj	Mali		20-11N	0-04E	Woolley, 2001	
	Agate Mountain	Namibia		18-27S	12-05E	Woolley, 2001	
	Aley	Canada	British Columbia	56-27N	123-44W	Nokleberg and others, 1997	
	Amma (Amba) Dongar (Ambadungar)	India					105 Mt @ 3% REO; 11.6 Mt @ 30% CaF2 Singer, 1998; Pell, 1996
	Anezrouf	Mali		20-04N	0-03E	Sauvage and Savard, 1985	
	Argor (South Bluff Creek, James Bay, Alpha-B)	Canada	Ontario	50-45N	81-01W	Woolley, 1987	
	Bailundo	Angola		12-09S	15-57E	Woolley, 2001	
	Barra do Itapirapua	Brazil	Sao Paulo	24-41S	49-13W	Woolley, 1987	
	Bayan Obo (Baotou)	China	Inner Mongolia	41-45N	109-58E	Jackson and Christiansen, 1993	750 Mt @ 4.1% REO; 48 Mt @ 6% REO, 15000 Mt @ 35% Fe; 800 Mt @ 6% REO (1990); 36 Mt REO Singer, 1998; Drew and others, 1990; Jackson and Christiansen, 1993; Kingsnorth and Harries-Rees, 1993
	Bear Lodge Mountains (southern)	USA	Wyoming	44-29N	104-27W	Woolley, 1987	726 Mt @ 1.306% REO (1978) Jackson and Christiansen, 1993
	Bearpaw Mountains (Rocky Boy)	USA	Montana	48-10N	109-44W	Woolley, 1987	
	Big Spruce Lake	Canada	Northwest Territories	63-33N	115-55W	Woolley, 1987	
	Bonga	Angola	Huila?	4-16S	13-58E	Woolley, 2001	
	Bou Naga	Mauritania		20-48N	13-42W	Jackson and Christiansen, 1993	3.66% REO; 0.1 Mt @ 8% mon or 4.4% REO (1970) Neary and Highley, 1984; Jackson and Christiansen, 1993
	Capuia	Angola	Bié	11-54S	16-15E	Woolley, 2001	

Appendix A. REE Deposits  
USGS OF02-189

DEPOSIT			Mineralogy			Geochronology
TYPE	Deposit or district name	STATUS	REE Mineralogy	Other Ore or Significant Minerals	Gangue and Rock-forming Minerals	Age (method, mineral, rock)
CARBONATITE						
	Adiounedj	Occurrence	syn	flu, tit, apa, bar, pyro	qtz, cal, Fe oxides, can, sod, aeg-aug, cal	Permian?
	Agate Mountain	Occurrence	bas	flu, Mn		Post-early Cretaceous
	Aley		fers	pyro, col, apa, rut, mag, zir		349 ± 12 Ma (K-Ar, mica) -- Mississippian
	Amma (Amba) Dongar (Ambadungar)	Active F producer (2002)		flu, P		
	Anezrouf	Occurrence	pyro, woh	apa, tit, flu, zir, pyr	sod, can, aeg, aug, cal, wol, neph, pyx, bio	Permian or younger
	Argor (South Bluff Creek, James Bay, Alpha-B)			apa, Ti-mag, pyro, zir, pyr, cpy	dol, rie, phlo, cal, oliv, bio, aug	
	Bailundo	Occurrence	bas, par, syn, RE phosphates	apa, bar, pyro, mag, hol, str	cal, dol, ank	Cretaceous
	Barra do Itapirapua	Occurrence	bas, anc, syn, par	flu, gal, bar, str, pyro	cal, dol, mll, qtz	
	Bayan Obo (Baotou)	Current producer	bas, mon, aes, all, apa, par, hua, ferg, fers, xen, daq, cor, ccer, che, bri	mag, hem, flu, apa, bar, Nb-rut, col, mrt, pyro, pyr, ana	dol, qtz, cal, fld, arf, phlo, aeg, rie, bio	Middle Proterozoic-- 1580 Ma
	Bear Lodge Mountains (southern)	Large, low-grade resource of REE-Th		str, hem, thor, U, Nb, flu, Ba, mag	aeg-aug, act, qtz, fld, cal, bio, horn	38.3 to 50.5 Ma (K-Ar, san,)
	Bearpaw Mountains (Rocky Boy)	Occurrence	anc, bur	apa, Zr, U, Nb, pyr, mag, tit	pyx, anl, bio, aug, , neph, qtz, cal, fld	Eocene-- 49-55 Ma (K-Ar)
	Big Spruce Lake	Occurrence		flu, tit, apa, mag	bio, sod, neph, aeg, zeo	1785 Ma (K-Ar, bio, nepheline syenite)
	Bonga	Occurrence	par, syn	apa, pyr, bar, pyro, mag, rut, str, P	gar, cal, ank-dol, bio	
	Bou Naga	Past small producer?	bas, mon			
	Capuia	Occurrence		Th, mag, bar, U, Sr, Nb, Cu, Zn, Zr		

Appendix A. REE Deposits  
USGS OF02-189

DEPOSIT	Host Rock(s)	Company	COMMENTS	REFERENCES
TYPE	Deposit or district name			
<b>CARBONATITE</b>				
	Adiounedj		Hydrothermal syn found in flu, cal, and qtz.	Woolley, 2001; Wall and Mariano, 1996; Mariano, 1983a; Sauvage and Savard, 1985
	Agate Mountain		Carbonatite contains irregular patches of bastnasite.	Woolley, 2001; McManus and Schneider, 1994
	Aley		REE is associated with sovite veins.	Nokleberg and others, 1997; Pell, 1996
	Amma (Amba) Dongar (Ambadungar)		Veins in carbonatite.	Singer, 1998; Pell, 1996
	Anezrouf			Woolley, 2001; Sauvage and Savard, 1985
	Argor (South Bluff Creek, James Bay, Alpha-B)			Woolley, 1987
	Bailundo		Small scale mining of magnetite has occurred.	Woolley, 2001; Alberti and others, 1999
	Barra do Itapirapua		ama 6% REE in hematite mine. REE probably from hydrothermal solutions.	Woolley, 1987; Mariano, 1989; Mariano, 1979; Ulbrich and Gomes, 1981
	Bayan Obo (Baotou)		MRDS gives location as 41-38N, 110-00E.	Singer, 1998; Drew and others, 1990; Castor, 1994; Mariano, 1989; Möller, 1989a; Jackson and Christiansen, 1993; Lee, 1970; Yuan Zhongxin and others, 1992; Kingsnorth and Harries-Rees, 1993; Wu and others, 1996; Zhang Peishan and others, 1995; Zhou, 1980; Chao and others, 1989; Yuan Zhongxin and others, 2000
	Bear Lodge Mountains (southern)		Veins and disseminated deposits. Samples ranged from 112 to 30000 ppm with REE more abundant than Th. Area incompletely explored.	Woolley, 1987; Mariano, 1989; Jackson and Christiansen, 1993; King, 1991; Mariano, 1981a
	Bearpaw Mountains (Rocky Boy)		Lat-long is for the Rocky Boy stock.	Woolley, 1987; Hearn and others, 1964; Wall and Mariano, 1996
	Big Spruce Lake			Woolley, 1987
	Bonga		Carbonatite plug.	Premoli, 1994; Woolley, 2001; Alberti and others, 1999
	Bou Naga		LREE dominant. Deposit was worked for 18 months 1968-1970. AOMR gave location of 18-59N, 13-19W.	Jackson and Christiansen, 1993; Neary and Highley, 1984; Arab Organisation for Mineral Resources, 1987
	Capuia		High grades of REE and Th have been reported.	Premoli, 1994; Woolley, 2001

Appendix A. REE Deposits  
USGS OF02-189

DEPOSIT	Location					Resources	Source & Date of Estimate(s)
TYPE	Deposit or district name	Country	State or Province	Latitude	Longitude	Source	Tonnage and grade
	Carb Lake	Canada	Ontario	54-48N	92-00W	Woolley, 1987	
	Cerro Manomo	Bolivia	Santa Cruz	15-30S	60-43W	Woolley, 1987	
	Changit	Russia		70-12N	100-06E	Kogarko and others, 1995	
	Chernigovskii (Novopol'tavskii)	Ukraine		47-14N	36-15E	Kogarko and others, 1995	
	Chiriguelo	Paraguay		22-39S	55-57W	Woolley, 1987	
	Coola	Angola	Huambo	12-31S	15-16E	Woolley, 2001	
	Dalkainle	Somalia		10-24N	43-16E	Woolley, 2001	
	Deep Creek	USA	Oregon	42-03N	119-57W	USGS, 2002, Geographic Names Information System	
	Eldor Carbonatite Complex	Canada	Quebec	56-36N	68-25W	Wright and others, 1998	
	Elet'ozerskii (Elet'ozero)	Russia		66-04N	31-57E	Kogarko and others, 1995	
	Elk Creek	USA	Nebraska	40-18N	96-12W	Woolley, 1987	
	Eureka	Namibia		21-58S	15-19E	Woolley, 2001	Proven: 0.03 Mt@ 6.3% REE (1989, to 20 m depth)
	Fen	Norway		59-17N	9-17E	Commission for Geological Map of the World, 1972	McManus and Schneider, 1994
	Francon Quarry - Orleans (Eastview)	Canada	Ontario	45-28N	75-33W	Woolley, 1987	
	Gatineau	Canada	Quebec				
	Gem Park	USA	Colorado	38-16N	105-33W	Woolley, 1987	

Appendix A. REE Deposits  
USGS OF02-189

DEPOSIT			Mineralogy			Geochronology
TYPE	Deposit or district name	STATUS	REE Mineralogy	Other Ore or Significant Minerals	Gangue and Rock-forming Minerals	Age (method, mineral, rock)
	Carb Lake	Occurrence	syn, anc	apa, mag, pyro, pyr, flu, vrm	cal, dol, bio	1824 Ma
	Cerro Manomo	Occurrence	bas, mon, cer, La-Nd phosphates and silicates	bar, apa, carbonate-hapa, carbonate-fapa, coll, Th, U, Sc, Nb	qtz, goe, p	Cretaceous?
	Changit	Occurrence		pyro, Ti-mag, tit, prv, apa	aeg-aug, neph, bio, fld, phlo	
	Chernigovskii (Novopol'tavskii)	Occurrence	mon, all, anc, Ce-ferg	apa, mag, ilm, pyro, zir, tit, ana, bad, col	aeg, bio, amph, phlo	1820 - 2190 Ma
	Chiriguelo	Occurrence	mon, cer, ppyro	thor, U-pyro		128 ± 5 Ma (K-Ar, bio, sovite)
	Coola	Occurrence	par, syn, RE phosphates	bar, flu, Sr, Nb, Zn	dol, qtz	Cretaceous
	Dalkainle	Occurrence	all	mag, bar, Sr, pow, mlyb, apa, zir, pyro, pyr, pyr, Cu	dol, cal, qtz	
	Deep Creek	Occurrence		Nb, P, F, Sr	qtz, amph, aen	
	Eldor Carbonatite Complex	Occurrence	mon	apa, pyro, fers, zir, rut, bad, U, mag	cal, dol, ank, phlo, aeg	Precambrian
	Elet'ozerskii (Elet'ozero)	Occurrence	all	apa, ilm, Ti-mag, pyro, zir, tit, col, fers, thor	mcc, neph, aeg, arf, bio	1740-1860 Ma
	Elk Creek			hem, bar, pyr, cpyr, gal, sph, apa, flu	dol, ank, phlo, ser, qtz, fld	Pre- Pennsylvanian
	Eureka	Potential resource	mon	Zr, mag, gra	dol, cal	Cambrian-Ordovician
	Fen	Past Nb-Fe producer; REE occurrence	mon, syn, par, bas	hem, pyro, apa, mag, Th, flu, zir, bar	cal, trem, mica, top, zoi	
	Francon Quarry - Orleans (Eastview)	Occurrence		apa, Nb, Mo, Sr	phlo, dol	Lower Cretaceous
	Gatineau		par, syn, mon	apa		
	Gem Park	Past prod of vrm, Ni, Ag	fers, anc, mon	Nb, Th, Cu, apa, str, vrm, bar, mag, lue, nnb, thrn, Ni, Ag	dol, cal, aeg, phlo	551 Ma (K-Ar, rie, fenite)



Appendix A. REE Deposits  
USGS OF02-189

DEPOSIT	Host Rock(s)	Company	COMMENTS	REFERENCES
TYPE	Deposit or district name			
	Carb Lake		Intrusion does not crop out. Locally REE concentrations are 72%.	Woolley, 1987; Erdosh, 1979; British Sulphur Corporation, 1987
	Cerro Manomo		Manomo carbonatite complex- silicified carbonatite, tuff, agglomerate	Litherland and others, 1986; Woolley, 1987; Wall and Mariano, 1996; British Sulphur Corporation, 1987; Fletcher and others, 1981; Fletcher and Litherland, 1981
	Changit		jacupirangite, melteigite, carbonatite, stockworks, limestone	In Maimecha-Kotui extrusive province. Kogarko and others, 1995
	Chernigovskii (Novopol'tavskii)		beforsite, alvikite, carbonatite breccia, syenite, pyroxenite	Kogarko and others, 1995
	Chiriguelo		sovite, rodbergite, carbonatite, syenite, fenite	There is small scale development of laterite with this deposit. Wall and Mariano, 1996; Woolley, 1987
	Coola		carbonatite breccia, syenite, ijolite, fenite	Ama 12500 ppm La has been detected in samples. Premoli, 1994; Woolley, 2001; Alberti and others, 1999
	Dalkainle		carbonatite, syenite, nepheline syenite, gneiss	Woolley, 2001
	Deep Creek		pantellerite	SE of Crane Mountain. Woolley, 1987; Walker, 1961
	Eldor Carbonatite Complex		syenite, calcite carbonatite, dolomite carbonatite, ankerite carbonatite, glimmerite, feldspathic breccia	Wright, 1997; Wright and others, 1998
	Elet'ozerskii (Elet'ozero)		carbonatite, alkaline pegmatites, nepheline syenite, gabbro, pyroxenite	Kogarko and others, 1995
	Elk Creek		carbonatite	Near Usakos. REE 0.35-1.86% in carbonatite 200 m below Quaternary and Pennsylvanian sediments. Woolley, 1987
	Eureka		carbonate rocks	Carbonatite dikes on Eureka 99 farm, 38 km W of Usakos. Resource estimate is to depth of 20 m. Murray, 1989; ; Murray, 1991; Woolley, 2001
	Fen		ankerite carbonatite, hematite-rich carbonatite	Past production of Fe and Nb. REE are highest in rodberg that is red from finely dispersed hematite. O'Driscoll, 1995; Bugge, 1978; Wall and Mariano, 1996
	Francon Quarry - Orleans (Eastview)		limestone	Carbonatite dikes in limestone have high concentrations of La, Ce, Nb, Mo and Sr. Woolley, 1987
	Gatineau		calcite carbonatite	Wall and Mariano, 1996
	Gem Park		gabbro, pyroxenite, tuff	Carbonatitic dikes. Concentrations of Th, REE, Cu, P, and vermiculite have not been fully appraised. Woolley, 1987; Mariano, 1989

Appendix A. REE Deposits  
USGS OF02-189

DEPOSIT TYPE	Deposit or district name	Location				Source	Resources	Source & Date of Estimate(s)
		Country	State or Province	Latitude	Longitude		Tonnage and grade	
	Glenover	South Africa	Northern Transvaal	24-41S	27-21E	USGS, 2001, MASMILS database		
	Gornoe Ozero (Gornoozerskii, Ozrnyi)	Russia		59-56N	136-53E	Kogarko and others, 1995	0.35% REO	Nokleberg and others, 1997
	Goudini	South Africa	Northern Transvaal	25-08S	26-12E	Woolley, 2001		
	Hicks Dome	USA	Illinois	37-36N	88-24W	Jackson and Christiansen, 1993	14.7 Mt @ 0.42% REO (1978)	Jackson and Christiansen, 1993
	Iron Hill (Powderhorn, Cebolla Creek)	USA	Colorado	38-15N	107-03W	Woolley, 1987	36.3 Mt @ 0.01% REO; 655.6 Mt @ 0.397% REO (1989)	Singer, 1998; Jackson and Christiansen, 1993
	Itanhaem	Brazil	Sao Paulo	24-08S	46-48W	de Souza Rodrigues and Amorim dos Santos Lima, 1984		
	Kalkfeld (Etaneno)	Namibia		20-48S	16-07E	Woolley, 2001	20 Mt REO (1989)	Jackson and Christiansen, 1993
	Kapfrugwa (Gungwa)	Zimbabwe		16-28S	32-09E	Woolley, 2001		
	Keshya	Zambia		15-53S	28-27E	Woolley, 2001		
	Khamna (Khamninskii)	Russia		59-43N	136-25E	Nokleberg and others, 1997	0.2-1.93% REE	Nokleberg and others, 1997
	Khanneshin	Afghanistan	Helmand	30-28N	63-35E	ESCAP, 1995		
	Kirumba	Congo (Zaire)		1-05S	29-18E	Woolley, 2001		
	Kizilçaören	Turkey	Eskisehir	39-38N	31-23E	NIMA, 2001	4.7 Mt @ 2.78% REE (1990)	Castor, 1994
	Kugda	Russia		70-43N	103-28E	Kogarko and others, 1995		

Appendix A. REE Deposits  
USGS OF02-189

DEPOSIT TYPE	Deposit or district name	STATUS	Mineralogy			Geochronology
			REE Mineralogy	Other Ore or Significant Minerals	Gangue and Rock-forming Minerals	Age (method, mineral, rock)
	Glenover	Past P producer	ferg, eux, lop, sam, syn	apa, pyro, col, bar, cel, gal, prv, rut, mag, ana, pyr, cpyr, zir, Ta, flu	pyx, cal, phlo, qtz	Proterozoic
	Gornoe Ozero (Gornoozerskii, Ozrnyi)	Occurrence	pyro, fer, bas, par, mon, bur, ccer	apa, bar, pyro, beta, col, Sr-tit, flu, zir	ank, dol, aug, dio, cal, frs, aeg, arf, chl, rie, alb, qtz	290 Ma (K-Ar, bio, nepheline syenite); 350 Ma (K-Ar, phlo, carbonatite)
	Goudini		xen?	rut, apa, pyr, bar, flu, ana, brk	ank, cal, dol, aeg, lim, alb, phlo, qtz	
	Hicks Dome	Potential resource	xen, bas, chu	flu, thor, bar, apa, sulfides, hem	cal, qtz	252 ± 13 Ma and 269 ± 13 Ma (K-Ar, bio, mica peridotite)
	Iron Hill (Powderhorn, Cebolla Creek)	Ti resource/ prospect	bas, prv, syn, par, apa, pyro, mon	pyro, prv, ilm, rut, zir, apa, Ba, V, U, tit, mag, fapa, flu, thor, vrm	phlo, bio	Cambrian-- 570 Ma
	Itanhaem	Occurrence		Th		129.5 Ma (K-Ar, bio, tinguaite)
	Kalkfeld (Etaneno)	Th-REE occurrence	eud, mon	tit, Fe ore, mag, ccc, pyr, bar, pyro, pyr, Sr	qtz, chl	Jurassic
	Kapfrugwa (Gungwa)		apa	apa, mag, pyro	dol	
	Keshya	Occurrence	mon, xen	mag, pyr, apa, rut, Th, Mn, Pb		
	Khamna (Khamninskii)	Occurrence	bas, par	flu, gal	car	
	Khanneshin	Occurrence	bur, flu, apa, bas	apa, bar, flu, pyro, mag, gal, str, Zr, U	ank, cal, pyx, phlo, aeg, bio	Early Quaternary- <5 Ma (?, mica, sovite)
	Kirumba	Occurrence	che, crt?, lav?	mel, tit, apa, zir, flu, pyro, thor, lav	alb, zeo, aeg, bio	803 ± 22 Ma (Rb-Sr, whole rock)
	Kizilçaören	Potential resource	bas	flu, bar, Th		Tertiary
	Kugda	Occurrence		phlo, apa, tit, Ti-mag, prv	dol, oliv, gar, mnt, wol, cal, dol, pyx, bio, zeo, can	238 Ma (K-Ar, phlo)

Appendix A. REE Deposits  
USGS OF02-189

DEPOSIT TYPE	Deposit or district name	Host Rock(s)	Company	COMMENTS	REFERENCES
	Glenover	carbonatite, pyroxenite, breccia		Apatite locally constitutes 20% of the ore.	Möller, 1989a; Woolley, 2001
	Gornoe Ozero (Gornoozerskii, Ozrnyi)	carbonatite, pyroxenite, ijolite			Nokleberg and others, 1997; Kogarko and others, 1995
	Goudini	sovite and beforite (some metamorphosed), volcanic breccia, tuff		The Goudini volcano sits atop ultrabasic rocks on the eastern margin of the Bushveld Complex.	Mariano, 1989; Woolley, 2001; Adrian and others, 1989
	Hicks Dome	peridotite, intrusive breccia		Ore contains 0.42% REO and 0.15% ThO <sub>2</sub> .	Woolley, 1987; Jackson and Christiansen, 1993
	Iron Hill (Powderhorn, Cebolla Creek)	carbonatite, ijolite, nepheline syenite, pyroxenite, melasyenite, fenite	Teck Resources Corp.		Anstett, 1986; Castor, 1994; Woolley, 1987; Pell, 1996; Möller, 1989a; Thompson, 1990
	Itanhaem	tinguaite dikes		REE found in biotite tinguaite dikes.	Mariano, 1989; Woolley, 1987
	Kalkfeld (Etaneno)	carbonatite, syenite, foyaite, iron ore		11 km NW of Kalkfeld. Fe ore and carbonatites are enriched in La, Ce, Neodymium, and thorite.	McManus and Schneider, 1994; Jackson and Christiansen, 1993; Mining Journal, 1989a; Woolley, 2001
	Kapfrugwa (Gungwa)	magnetite-carbonate rock, apatite-magnetite rock		Probably metamorphosed carbonatite. Apatite-magnetite rocks contain ama 11% P2O5, 600 ppm Th, and several thousand ppm Ce + La.	Woolley, 2001
	Keshya	carbonatite (limestone)		This unit has been mapped as a limestone, but chemistry is consistent with late-stage carbonatite.	Woolley, 2001
	Khamna (Khamninskii)	metasomatic carbonate, nepheline syenite, peralkaline syenite		Fluorite-carbonate veins and stockworks 0.1 to 1.5 km long and 1.4 - 30 m thick.	Nokleberg and others, 1997; Kogarko and others, 1995
	Khanneshin	carbonatite, tuff, agglomerate, phonolite			ESCAP, 1995; Abdullah and others, 1977; Alkhazov and others, 1978
	Kirumba	syenite, minor carbonatite			Woolley, 2001
	Kizilçaören	phonolite, trachyte, and alkaline pyroclastic rocks	Maden Tetik ve Arama Enstitüsü	Bastnasite-fluorite-barite rock lenses associated with carbonatite dikes. Lat-long is for population center of same name.	Castor, 1994; Morteani and Satir, 1989
	Kugda	phoscorite, nephelinite, melteigite, olivinite, jacupiranite, syenite, glimmerite		In Maimecha-Kotui extrusive province.	Kogarko and others, 1995

Appendix A. REE Deposits  
USGS OF02-189

DEPOSIT	Location					Resources	Source & Date of Estimate(s)
TYPE	Deposit or district name	Country	State or Province	Latitude	Longitude	Source	Tonnage and grade
	Lesnaya Varaka	Russia		67-23N	33-04E	Kogarko and others, 1995	
	Lofdal-Bergville	Namibia	Damaraland	20-21S	14-45E	Woolley, 2001	
	Lolekek	Uganda		1-45N	34-27E	Woolley, 2001	
	Longonjo (Mt. Chibilundo)	Angola	Huambo	12-51S	015-15E	Premoli, 1994	
	Lugin Gol	Mongolia	East Govi	42-57N	108-34E	ESCAP, 1999	0.023 Mt REO @ 3.2% REO (drilled)
	Lupongola (Lupulonga, Chitado)	Angola	Huila	17-11S	13-42E	Premoli, 1994	Escap, 1999
	Makonde	Tanzania		10-03S	34-31E	Woolley, 2001	
	Marinkas Quellen (Marinkas Kwela)	Namibia		28-10S	17-25E	Woolley, 2001	
	Matchinskii	Kyrgyzstan		39-32N	70-47E	Kogarko and others, 1995	
	Mato Preto	Brazil	Parana	24-45S	49-12W	Woolley, 1987	
	Megiscane Lake	Canada	Quebec	48-34N	75-36W	Woolley, 1987	0.25% REO
	Miaoya	China	Hubei	32-15N	110-12E	Zhang Peishan and others, 1995	average grade of ~ 1.7% REO, 0.12% Nb2O5
	Monte Verde	Angola	Huambo	12-11S	15-02E	Woolley, 2001	Wu and others, 1996
	Mountain Pass	USA	California	35-29N	115-32W	Woolley, 1987	Proven + probable-- 29 Mt @ 8.9% REO (5% cutoff); >40 Mt @ 7.68% REO; 28 Mt @ 8.86% REO; 28.1 @ 12% bas or 8.9% REO (1989); 90 Mt @ 5% REO
							Castor, 1994; Pell, 1996; Mariano, 1989; Jackson and Christiansen, 1993; Singer, 1998

Appendix A. REE Deposits  
USGS OF02-189

DEPOSIT			Mineralogy			Geochronology
TYPE	Deposit or district name	STATUS	REE Mineralogy	Other Ore or Significant Minerals	Gangue and Rock-forming Minerals	Age (method, mineral, rock)
	Lesnaya Varaka	Occurrence	RE carbonates, phosphate, & fluocarbonates	apa, mag, Ti-mag, pyr, zir, lue, tit,	dol, trem, phlo, bio, cal, qtz,	
	Lofdal-Bergville	Occurrence	xen, bas, mon, par	thor, Nb, hem, mag, zir, flu, apa, W	cal, lim	Late Proterozoic
	Lolekek	Occurrence	pyro?	apa, tit, zir, pyr, pyro, bad, mag	bio, trem	
	Longonjo (Mt. Chibilundo)	Occurrence	par, syn, others	apa, bar, mag, Nb, str, Th, Zn, Cu	qtz, Fe oxide	Cretaceous
	Lugin Gol	Active exploration (1999)	bas, syn, par	bar, rut	car	Middle Triassic-- 230 Ma
	Lupongola (Lupulonga, Chitado)	Occurrence		Sr, Cu, Zn, Zr		Cretaceous
	Makonde	Occurrence		apa, mag, Ba, Sr	cal	
	Marinkas Quellen (Marinkas Kwela)	Occurrence	syn, mon, Y-flu	pyro	aeg-aug, arf	Cambrian
	Matchinskii	Occurrence			amph, pyx, tour	
	Mato Preto	Past F producer		flu, Th, P, bar, gal, pyr		65.6 and 67.0 Ma (K-Ar, phonolite)
	Megiscane Lake	Occurrence		mag, pyr, apa	bio, pyx	973 ± 36 Ma and 978 ± 40 Ma (K-Ar, bio and horn)
	Miaoya	Potential resource	mon, bas, par, bur	apa, flu, col, Nb-rut	cal, Fe-dol, bio	231-278 Ma
	Monte Verde	Occurrence		apa, pyro, bar, str, tit, zir	cal, dol, phlo, Fe oxides, wol	109-130 Ma
	Mountain Pass	Current producer	bas, par, mon, sah, all, crt	bar, sid, Sr-bar, Ba-cel, tit, mag, hem, gal, pyr, cpy, tet, mal, azu, crs, wul, flu, str, apa, thor	cal, dol, ank, qtz, croc, chl, bio, phlo, musc, talc, aeg, goe, arag	Proterozoic-- 1400 Ma

Appendix A. REE Deposits  
USGS OF02-189

DEPOSIT TYPE	Deposit or district name	Host Rock(s)	Company	COMMENTS	REFERENCES
	Lesnaya Varaka	carbonatite, pyroxenite, olivinite, ijolite			Kogarko and others, 1995
	Lofdal-Bergville	carbonatite, nepheline syenite		Swarm of carbonatite dikes in alkaline rocks. 30 km W of Khorixas on Lofdal 491 and Bergville 490 farms.	McManus and Schneider, 1994; Woolley, 2001; Mariano, 2001
	Lolekek	ijolite, melteigite, nepheline syenite, carbonatite			de Kun, 1987, Mathers, 1994; Woolley, 2001
	Longonjo (Mt. Chibilundo)	dolomite carbonatite, feldspathic breccias			Premoli, 1994; Alberti and others, 1999, Woolley, 2001
	Lugin Gol	nepheline syenite, ijolite, carbonatite dikes		In Gobi desert. 20 carbonatite dike zones with 400 separate mineralized pods.	Neary and Highley, 1984; Kovalenko and others, 1976; ESCAP, 1999; Kovalenko and Yarmolyuk, 1995
	Lupongola (Lupulonga, Chitado)	calcite carbonatite, syenite, trachyphonolite			Premoli, 1994; Woolley, 2001; Alberti and others, 1999
	Makonde	carbonatite		Magnesiocarbonatite contains 1500 ppm REE.	Woolley, 2001
	Marinkas Quellen (Marinkas Kwela)	beforsite, sovite, syenite, nepheline syenite, fenite, granite			McManus and Schneider, 1994; Woolley, 2001
	Matchinskii	schist, nepheline syenite		REE occur in carbonatite dikes cutting schists near margins of the intrusion.	Kogarko and others, 1995
	Mato Preto	ijolite, nepheline syenite, carbonatite, phonolite		F mine closed in 1999.	Woolley, 1987; Pell, 1996
	Megiscane Lake			Spectrochemical analyses gave 0.13% CeO and 0.13% LaO.	Woolley, 1987
	Miaoya	syenite, carbonatite		Lat-long for Miaoya population center. Syenite-carbonatite complex intruding Late Proterozoic metavolcanics and Devonian carbonaceous schist.	Wu and others, 1996; Wen Lu, 1998; Zhang Peishan and others, 1995
	Monte Verde	calcite carbonatite, nepheline syenite, fenite			Woolley, 2001; Alberti and others, 1999
	Mountain Pass	carbonatite	Molycorp (2000)		Olson and others, 1954; Woolley, 1987; Castor, 1994; Neary and Highley, 1984; Mariano, 1989; Möller, 1989a; Haxel, in press

Appendix A. REE Deposits  
USGS OF02-189

DEPOSIT TYPE	Deposit or district name	Location				Source	Resources	Source & Date of Estimate(s)
		Country	State or Province	Latitude	Longitude		Tonnage and grade	
	Mushgai Khudag (Mushgia Khudag, Mushugai Khuduk, Mushugai-Hudag)	Mongolia	South Govi	44-20N	104-00E	ESCAP, 1999	200 Mt @ 1.5% RE; 6.1 Mt @ 1.37% REO	ESCAP, 1999; Singer, 1998
	Namo-Vara	USSR						
	Narssarsuaq (Narssarsuk)	Greenland		61-11N	45-25W	Woolley, 1987		
	Ngualla	Tanzania		7-42S	32-50E	Woolley, 2001		
	Nizhnesayanskii	Russia		53-31N	100-31E	Kogarko and others, 1995		
	Nkombwa Hill (Nkumbwa, Nkumba)	Zambia		10-09S	32-51E	Turner and others, 1989		
	Nolan's Bore	Australia	Northern Territory	22-35S	133-14E	Australia National Mapping Agency, 2001, accessed at URL <a href="http://www.auslig.gov.au/mapping">http://www.auslig.gov.au/mapping</a>		
	Nooitgedacht (Gelukshoek, Nooitgedagt)	South Africa		25-03S	27-30E	Woolley, 2001		
	North Fork area	USA	Idaho	45-24N	114-00W	USGS, 2002, Geographic Names Information System	21% REO	Castor, 1994
	Nsengwa	Malawi		15-25S	34-43E	Woolley, 2001		
	Okorusu Complex	Namibia		20-02S	16-46E	Woolley, 2001	2-7% REO in siliceous rocks	Murray, 1991
	Ondurukurme Complex (Ondumakorume, Kameelberg)	Namibia		20-46S	16-15E	Woolley, 2001	8 Mt @ 3% REO, 0.3% Nb <sub>2</sub> O <sub>5</sub>	Singer, 1998
	Palabora (Phalaborwa)	South Africa		23-59S	31-07E	Towner, 1992	123.8 Mt @ 0.105% REO (1989); 652 Mt @ 0.15% REO	Jackson and Christiansen, 1993; Singer, 1998



Appendix A. REE Deposits  
USGS OF02-189

DEPOSIT			Mineralogy			Geochronology
TYPE	Deposit or district name	STATUS	REE Mineralogy	Other Ore or Significant Minerals	Gangue and Rock-forming Minerals	Age (method, mineral, rock)
	Mushgai Khudag (Mushgia Khudag, Mushugai Khuduk, Mushugai-Hudag)	Occurrence	apa, bas	Sr, P, flu, Th, bar, Pb, mag		Late Mesozoic
	Namo-Vara			Ba, Sr		
	Narssarsuaq (Narssarsuk)		anc	flu, str, epd	qtz, aeg, alb, nat	Gardar
	Ngualla	Occurrence	par, mon	apa, mag, bar, flu, pyro, sulfides, dia	dol, bio, musc, qtz	Proterozoic
	Nizhnesayanskii	Occurrence?	bas, mon, par	apa, mag, thor, pyro, mlyb, pyr, sph, gal, flu, str	qtz, dol, ank, amph	675-720 Ma (various)
	Nkombwa Hill (Nkumbwa, Nkumba)	Occurrence	mon, pyro, bas, daq	apa, iso, pyro, sel, Th, sid, mgs, str, pyr, bar, ilm	dol, ank, Fe oxide, qtz, phlo	Late Proterozoic-- 679 ± 25 Ma (K-Ar, phlo, carbonatite)
	Nolan's Bore	Occurrence	apa, all			
	Nooitgedacht (Gelukshoek, Nooitgedagt)	Occurrence	mon	pyro, apa, pyr, flu, tit	ank, dol, qtz, phlo, cho	
	North Fork area		mon, all, anc, aes, fers	thor, Nb-rut, col	dol, cal	90-99 Ma (Pb-alpha, mon)
	Nsengwa	Occurrence	mon	flu, pyro, apa, bar	qtz, cal, ank, dol	
	Okorusu Complex	F producer; Potential REE resource	syn, mon, Y-flu, xen	flu, apa, bar, thor, tit, mag, pyr	cal, pyx, qtz, aeg, phlo, bio, mel, neph, can	Early Cretaceous-- 126.6 ± 7.3 Ma (Rb-Sr)
	Ondurukurme Complex (Ondumakorume, Kameelberg)	REE, P, Sr, Nb resource	mon, anc, cer, ccer	apa, pyro, Sr, hem, vrm, mag, zir, gal, pyr	chl, bio, cal, aeg, goe,	
	Palabora (Phalaborwa)	Potential byproduct REE recovery	apa, syn, mon	cpyr, ccc, bor, apa, vrm, phlo, bad, uran, val, cub, mag, tit, U-thrn, Au, Ag, PGE	cal, dol, chum, oliv, horn, pyx	Early Proterozoic

Appendix A. REE Deposits  
USGS OF02-189

DEPOSIT TYPE	Deposit or district name	Host Rock(s)	Company	COMMENTS	REFERENCES
	Mushgai Khudag (Mushgia Khudag, Mushugai Khuduk, Mushugai-Hudag) Namo-Vara	magnetite-apatite rock, potassic alkaline volcanic rocks, carbonatite, melanephelinite, melaleucitite		Apatite has high REE.	Singer, 1998; Möller, 1989a; ESCAP, 1999; Kovalenko and Yarmolyuk, 1995; Samoylov and others, 1988; Mariano, 1998 Premoli, 1994
	Narssarssuaq (Narssarssuk)	carbonatite, alkaline intrusive, tuffsite, ultrabasic rock			Mariano, 1989; Woolley, 1987; Roskill, 1988
	Ngualla	carbonatite, breccia		Magnetite-apatite veins ama 20 m wide and several hundred meters long contain 12- 35% P2O5.	Woolley, 2001
	Nizhnesayanskii	carbonatite, syenite, urtite- melteigite-jacupirangite			Kogarko and others, 1995
	Nkombwa Hill (Nkumbwa, Nkumba)	magnesian carbonatite, rauhaugite, breccia			Neary and Highley, 1984; Overstreet, 1967; de Kun, 1987; Woolley, 2001
	Nolan's Bore	carbonatite	Arafura Resources NL (1999)	130 km N of Alica Springs, 8 km W of Stuart Hwy. In places REE grades exceeds 10%.	Mariano, 2000; Australia Mining and Exploration website, 2000, accessed at URL <a href="http://www.reflections.com.au/MiningandExploration/Companies/Prospectus.html">http://www.reflections.com.au/MiningandExploration/ Companies/Prospectus.html</a>
	Nooitgedacht (Gelukshoek, Nooitgedagt)	sovite, beforite, pyroxene fenite, syenite, tinguaitite			Woolley, 2001
	North Fork area	carbonatite dikes			Castor, 1994; Woolley, 1987
	Nsengwa	carbonatite, agglomerate, carbonatite agglomerate			Woolley, 2001
	Okorusu Complex	carbonatite, iron deposits, nephelinite, pyroxenite, syenite, foyaite, aegirine fenite	Solvay Group (1997)	On Brandenburg 87 farm. Mineralization in beforsitic carbonatite dikes and carbonate- fluorite-bearing metasomatites. Significant HREE content.	Murray, 1991; Woolley, 2001; McManus and Schneider, 1994; de Kun, 1987; Hagni and Shivdasan, 2001
	Ondurukurme Complex (Ondumakorume, Kameelberg)	beforsite, sovite, breccia, syenite		Ondumakorume complex forms a prominent hill on the Etaneno 44 farm, about 10 km NE of Kalkfeld. Separation of ore is problematic. Carbonatite contains 3% REO, 7% P2O5, 2.5% SrCO3.	Mining Journal, 1989a; Murray, 1989; Pell, 1996; Woolley, 2001; McManus and Schneider, 1994
	Palabora (Phalaborwa)	weathered pyroxenite, carbonatite, phoskorite	Foskor Ltd. And Palabora Mining Co. Ltd. (1995)	Possible by-product REE recovery. Apatite concentrates contain 0.4-0.9% REO.	de Kun, 1987; Neary and Highley, 1984; Jackson and Christiansen, 1993; Kovalenko and others, 1976; Skillen, 1995; Pell, 1996; Möller, 1989a; Woolley, 2001

Appendix A. REE Deposits  
USGS OF02-189

DEPOSIT	Location					Resources	Source & Date of Estimate(s)	
TYPE	Deposit or district name	Country	State or Province	Latitude	Longitude	Source	Tonnage and grade	
	Qaqarssuk	Greenland		65-23N	51-42W	Woolley, 1987		
	Ravalli County	USA	Montana	45-30N	113-20W	Woolley, 1987		
	Rock Canyon Creek (Candy)	Canada	British Columbia					
	Salitre I and II	Brazil	Minas Gerais	19-02S	46-47W	Azevedo Branco, 1984		
	Salmon Bay	USA	Alaska	56-19-12N	133-10-06W	USGS, 2000, MRDS database		
	Sandkopsdrif (Zandkops Drift)	South Africa		30-53S	17-57E	Woolley, 2001	57 Mt @ 1% REO	Singer, 1998
	Sangu Carbonatite Group, Karema Depression (includes Ikola, Ikambwa, Middle carbonatites)	Tanzania		6-48S	30-31E	Woolley, 2001		
	Sarfartoq	Greenland		66-30N	51-15W	Secher, 1989		
	Sarnu	India	Rajasthan				5.5% REO	Wall and Mariano, 1996
	Siilinjarvi	Finland	Kuopio	63-05N	27-40E	USGS, 2001, MASMILS database	0.4% REO	Neary and Highley, 1984
	Sokolo	Kenya		0-28S	34-23E	Estimate		
	Songwe Scarp	Tanzania		8-81S	33-16E	Woolley, 2001		
	Soroy	Norway						
	Springer (Lavergne)	Canada	Ontario	46-27N	79-57W	Woolley, 1987		
	St. Honoré	Canada	Quebec	48-33N	71-04W	Woolley, 1987	16 Mt @ 0.0088% REO; ama 4.5% LREE	Singer, 1998; Castor, 1994
	Stjernoy	Norway						

Appendix A. REE Deposits  
USGS OF02-189

DEPOSIT TYPE	Deposit or district name	STATUS	Mineralogy			Geochronology
			REE Mineralogy	Other Ore or Significant Minerals	Gangue and Rock-forming Minerals	Age (method, mineral, rock)
	Qaqarssuk	Occurrence		mag, apa, pyro, U, V	dol, ank, mica, aeg, alb, alkali amph, phlo, oliv	169 ± 7 Ma to 176 ± 7 Ma (K-Ar)
	Ravalli County	Occurrence	all, mon, aes, fers, anc	str, bar, cpyr, col, ilm, mag, mlyb, pyr, pyrh, rut, sid	act, cal, hydro-bio, qtz	
	Rock Canyon Creek (Candy)	Occurrence	syn, par	flu, bar, qtz, car, pyro, Nb-rut		Ordovician to Devonian
	Salitre I and II	Ti resource; REE occurrence	mon, apa, ana, prv	carbonate-fapa, mag, tit, apa, zir, U, Th, Nb, ilm, pyr, zeo	can, zeo, aeg-aug, cal, bio	82.7 ± 4.2 Ma and 78.7 ± 4.0 Ma (K-Ar, bio, bebedourite)
	Salmon Bay	Occurrence	par, bas, mon	pyr, apa, flu, thor, zir, cpy, mar	ank-dol, hem, qtz, cal, musc, epi, top, gar	
	Sandkopsdrif (Zandkops Drift)	Occurrence	chu, goy	apa, pyro, Zn, vrm, ilm, tit	cal, phlo, aeg-aug	
	Sangu Carbonatite Group, Karema Depression (includes Ikola, Ikambwa, Middle carbonatites)	Occurrence		apa, mag, bad, pyro, Ti, Sr	aeg, dol, qtz, phlo	
	Sarfartoq	Nb resource; P- REE occurrence	pyro	pyro, mag, apa, U, zir, ilm, pyr	dol, phlo, arf, aeg, bio, cal, oliv, gar	598-604 Ma (various)
	Sarnu	Occurrence	carbocer	str	cal	
	Siilinjarvi	P, LIME, PHLOG producer	apa	zir, sulfides, Fe oxides	phlo, cal, dol	Late Archean-- 2580 (U-Pb)
	Sokolo			flu, apa	bio, aeg	12.7 ± 0.6 Ma (K-Ar, bio, sovite)
	Songwe Scarp			apa, pyr, mag, bar, gal, rut, Sr, Nb, Th, U	ank, qtz	Early to Middle Cretaceous
	Soroy			P, Ba, Sr		
	Springer (Lavergne)	Occurrence	bas	flu, Ti, pyr	aeg	
	St. Honoré	Nb producer; Potential REE resource	bas, pyro, par, mon	pyro, apa, pyr, Mo, tit, bar, sph, cpy, pyrh	dol, ank, cal, mel, mnt, neph, can, mel, phlo	Late Proterozoic-- 629-656 Ma (various)
	Stjernoy	Producer of nepheline syenite		P, Ba, Sr		

Appendix A. REE Deposits  
USGS OF02-189

DEPOSIT TYPE	Deposit or district name	Host Rock(s)	Company	COMMENTS	REFERENCES
	Qaqarsuk	carbonatite, gneiss, fenite		Concentrations of Fe, V, Nb, U, & P in carbonatites and ultramafic rocks. Ages from 3 carbonatite bodies.	Notholt and others, 1989a; Woolley, 1987
	Ravalli County	carbonate veins and dikes, metamorphic rocks		REE in carbonate veins and dikes in metamorphic rocks.	Crowley, 1960; Mariano, 1989; Woolley, 1987
	Rock Canyon Creek (Candy)	dolostone, limestone; lesser shale, sandstone		No link to igneous activity known, but many workers believe deposit related to hidden carbonatitic magmatism. REE mineralization is carbonate-hosted vein and breccia-matrix mineralization with fluorite and lesser barite.	Hora, 1990; Samson and others, 2001
	Salitre I and II	syenite, nepheline syenite, pyroxenite, trachyte, carbonatite		High REE.	Castor, 1994; Woolley, 1987; Mariano, 1989; Ulbrich and Gomes, 1981
	Salmon Bay	lamprophyre and phonolite dikes, graywacke		Veins.	Houston and others, 1958
	Sandkopsdrif (Zandkops Drift)	glimmerite, carbonatized intrusions		Complex about 1 km in diameter.	Mariano, 1989; Woolley, 2001
	Sangu Carbonatite Group, Karema Depression (includes Ikola, Ikambwa, Middle carbonatites)	carbonatite, fenite			Woolley, 2001
	Sarfartoq	carbonatite (rauhaugite and sovite); fenite		Environmental restraints hinder commercial interest.	Notholt and others, 1989a; Möller, 1989a; Woolley, 1987
	Sarnu	carbonatite dikes		Dikes ~10 cm wide.	Wall and Mariano, 1996
	Siilinjarvi	carbonatite; glimmerite, syenite; diabase; fenite; dioritic dykes	Kemira Group	Apatite contains 0.4% REE.	Isokangas, 1978
	Sokolo	carbonatite, carbonatitic breccia, agglomerate		Part of Wasaki carbonatite complex.	Woolley, 2001
	Songwe Scarp	carbonatite, K-feldspar rock			Woolley, 2001
	Soroy				USGS unpublished files
	Springer (Lavergne)	granite, fenite, carbonate veins		Near Brule Creek in Springer Township. Classification uncertain.	Woolley, 1987
	St. Honoré	carbonatite, syenite, nepheline syenite, jiolite	Soquem	REE range from 0.1-1.7%. Complex is 8 km x 6.5 km. Carbonatite core is surrounded by syenite and other alkaline rocks.	Notholt and others, 1989a; Harben and Kuzvart, 1996; Singer, 1998; Woolley, 1987; Pell, 1996; Wall and Mariano, 1996; British Sulphur Corporation, 1987
	Stjerno	alkaline intrusions, carbonatites, ultramafics			Olerud, 1993

Appendix A. REE Deposits  
USGS OF02-189

DEPOSIT TYPE	Deposit or district name	Location				Source	Resources	Source & Date of Estimate(s)
		Country	State or Province	Latitude	Longitude		Tonnage and grade	
	Tamazert (Oued Tamazert, Tamazeght, Bou Agrao)	Morocco		32-34N	4-39W	Woolley, 2001		
	Taohulashan	China	Inner Mongolia				0.1-0.9% REO	Wu and others, 1996
	Tikshozerskii	Russia		66-17N	31-40E	Kogarko and others, 1995		
	Toisuk - Bol'shaya Zhidaya	USSR						
	Tundulu	Malawi		15-32S	35-48E	Woolley, 2001		
	Uyaynah	United Arab Emirates						
	Venturi Township (Township 107, Spanish River)	Canada	Ontario	46-35N	81-43W	Woolley, 1987		
	Verkhnesayanskii	Russia		53-27N	100-25E	Kogarko and others, 1995		
	Virulundo	Angola	Namibe	16-18S	12-56E	Woolley, 2001		
	Vishnevye Mountains (Ilmenogorskii-Vishnevogorskii)	Russia		55-59N	60-34E	Kogarko and others, 1995; USGS files		
	Vuoriyarvi	Russia		6-48N	30-07E	Kogarko and others, 1995		
	Wajiertage (Wajiltag)	China	Xinjiang	39-30N	79-00E	Zhang Peishan and others, 1995	0.15-4.3% REO, 1-8% P <sub>2</sub> O <sub>5</sub>	Wu and others, 1996
	Weishan (Chisan, Xishan, 1010)	China	Shandong	34-45N	117-12E	Zhang Peishan and others, 1995	>1.6% REO in production	Wu and others, 1996
	Welgevonden	South Africa		25-26S	27-26E	Woolley, 2001		
	Westcriste	USA						
	Wet Mountains	USA	Colorado	38-12N	105-24W	Jackson and Christiansen, 1993	13.96 Mt @ 1.0% REO (1989); 2.5% REO	Jackson and Christiansen, 1993; Castor, 1994

Appendix A. REE Deposits  
USGS OF02-189

DEPOSIT TYPE	Deposit or district name	STATUS	Mineralogy			Geochronology
			REE Mineralogy	Other Ore or Significant Minerals	Gangue and Rock-forming Minerals	Age (method, mineral, rock)
	Tamazert (Oued Tamazert, Tamazeght, Bou Agrao)	Occurrence	syn, par, mon	apa, pyro, U, Th; lesser bar, str, flu, zir, col, pyr, mag, cel, gal	cal, ank	Tertiary
	Taohulashan	Potential resource	mon, all	col, Nb-rut		Late Proterozoic
	Tikshozerskii	Occurrence	anc, RE phosphates	mag, ilm, rut,	cal, ank, dol, cor	Proterozoic?
	Toisuk - Bol'shaya Zhidaya			P, Nb		
	Tundulu	Occurrence	bas, flor, syn, par; rare mon	apa, pyro, ana, str, bar	cal, dol	Late Jurassic-Early Cretaceous-- 133 ± 7 Ma (K-Ar, bio, sovite)
	Uyaynah	Occurrence	all		cal	
	Venturi Township (Township 107, Spanish River)	Occurrence		Nb, P, vrm	dol, phlo	Proterozoic-- 1560 Ma (K-Ar, mic)
	Verkhnesayanskii	Occurrence	anc, bur, par, mon	bar, str, thor, apa, tit, zir, pyro, mag, pyr	cal, dol, ank, chl, qtz, zeo, bio	Late Proterozoic-- 725 ± 25 Ma (K-Ar, arf, carbonatite)
	Virulundo	Occurrence	par, syn	pyro, apa, flu, str, zir, hol, Zn, mal, mag, U	cal, dol, ank, Fe oxides	
	Vishnevye Mountains (Ilmenogorskii-Vishnevogorskii)	Occurrence	all	mag, pyro, zir, ilm, apa, tit, U, thor, sph, rut, brk, F, Sr, Mo	aeg-aug, ank, cal, neph, nat, fld, bio, can, zeo	
	Vuoriyarvi	Occurrence		Ti-mag, apa, bar, verm, mag, bad, pyr, pyro, zir, tit, cpy	phlo, cal, dol, mll, dio	380-402 Ma (K-Ar, phlo & bio, clinpyroxenite)
	Wajiertage (Wajiltag)	Potential resource	mon, bas	pyro, apa	cal, dol	Hercynian?
	Weishan (Chisan, Xishan, 1010)	Active REE Producer	bas, par, bri, ccer, mon, anc, pyro, all, che, aes	bar, flu, pyro, mag, rut, ana, apa, prv, col, thor	qtz, cal, epi, aeg, bio, chl, dio, hem	110 Ma (K-Ar, musc, vein)
	Welgevonden	Occurrence				
	Westcriste			P, Ba, F		Late Precambrian
	Wet Mountains	Occurrence	apa, bas, syn, xen, mon	thor, bar, hem	qtz	Cambrian

Appendix A. REE Deposits  
USGS OF02-189

DEPOSIT TYPE	Deposit or district name	Host Rock(s)	Company	COMMENTS	REFERENCES
	Tamazert (Oued Tamazert, Tamazeght, Bou Agra)	carbonatite, nepheline syenite, breccia		Carbonatite may be hydrothermally altered.	Mourtada and others, 1997; Woolley, 2001; Arab Organisation for Mineral Resources, 1987
	Taohulashan	biotite-calcite marble, calcite-biotite schist		Deposit is stratiform.	Wu and others, 1996
	Tikshozerskii	carbonatite, ijolite, melteigite, olivinite			Kogarko and others, 1995
	Toisuk - Bol'shaya Zhidaya				USGS unpublished files
	Tundulu	carbonatite; nepheline syenite, ijolite, agglomerate			Woolley, 2001; Wall and Mariano, 1996; U.S. Geological Survey, 2000, Mineral Resources Data System
	Uyaynah	extrusive silicic calcite carbonatite lapilli		Deposit metamorphosed.	Wall and Mariano, 1996
	Venturi Township (Township 107, Spanish River)	dolomitic carbonatite			Woolley, 1987
	Verkhnesayanskii	ankerite carbonatite, calcite carbonatite, urtite-melteigite-jacupirangite			Kogarko and others, 1995
	Virulundo	potassic carbonatite, fenite			Woolley, 2001; Premoli, 1994
	Vishnevye Mountains (Ilmenogorskii-Vishnevogorskii)	carbonatite, nepheline syenite, fenite		In the Ural Mountains. Past producer of ceramic raw materials.	Kogarko and others, 1995
	Vuoriyarvi	carbonatite, pyroxenite, ijolite, melteigite			Kogarko and others, 1995; Wall and Mariano, 1996
	Wajiertage (Wajiltag)	carbonatite, syenite, gabbro, pyroxenite		Carbonatite veins and lenses associated with pyroxenite-gabbro complex intrude metamorphic rocks.	Wu and others, 1996; Zhang Peishan and others, 1995
	Weishan (Chisan, Xishan, 1010)	syenite, quartz syenite, aegirine-quigite syenite		Tens of bastnasite-barite-carbonate veins on eastern shore of Weishan Lake. Veins trend NW and are 1 cm to several m thick. Host rocks are about 140 Ma (K-Ar, syenite)	Hedrick and Templeton, 1991; Wu and others, 1996; Wen Lu, 1998; Zhang Peishan and others, 1995
	Welgevonden	beforsite dikes, fenite		Soil-covered depression may conceal carbonatite or other intrusion. Carbonatite dikes contain ama 2370 ppm La, 149 ppm Nb, and 4.59% P2O5.	Woolley, 2001
	Westcliffe				USGS unpublished files
	Wet Mountains	alkaline rocks, carbonatite dikes		REE, Nb, and Th occur in veins and carbonatite dikes. Province includes Gem Park, McClure Mtn-Iron Mtn, Democrat Creek, and other occurrences.	Castor, 1994; Möller, 1989a; Jackson and Christiansen, 1993; Armbrustmacher, 1989; Woolley, 1987



Appendix A. REE Deposits  
USGS OF02-189

DEPOSIT	Location					Resources	Source & Date of Estimate(s)
TYPE	Deposit or district name	Country	State or Province	Latitude	Longitude	Source	Tonnage and grade
	Yangdun	China	Fujian	27-50N	118-30E	Zhang Peishan and others, 1995	
	Yinachang (Yenachang)	China	Yunnan	25-30N	102-00E	Zhang Peishan and others, 1995	0.1-0.2% REO, 50-60% Fe, 0.4-0.8% Cu, 1-2% P <sub>2</sub> O <sub>5</sub>
	Zijingshan	China	Shanxi	38-20N	110-50E	Zhang Peishan and others, 1995	
<b>CARBONATITE WITH RESIDUAL ENRICHMENT</b>							
	Angico dos Dias	Brazil	Bahia				
	Anitápolis	Brazil	Santa Catarina	27-48S	49-05W	Azevedo Branco, 1984	
	Araxa (Barreiro)	Brazil	Minas Gerais	19-38S	46-56W	Silva, 1986	>450 Mt Nb ore @ 2.5% Nb <sub>2</sub> O <sub>5</sub> , 4.4% REO + 0.8 Mt laterite ore @ 13.5% REO, 2% Nb <sub>2</sub> O <sub>5</sub> , 0.05% U <sub>3</sub> O <sub>8</sub> (1984); 0.546 Mt @ 10-11% REO (1982); 462 Mt @ 0.033% REO
	Bingo (Bingu)	Congo (Zaire)		0-36N	29-17E	Woolley, 2001	
	Bukusu Complex (Busumbu, Busumu, Busuku)	Uganda		0-53N	34-16E	Mathers, 1994	
	Buru	Kenya		0-11S	35-10E	Woolley, 2001	
	Caiapo	Brazil	Goias	16-00S	51-45W	Woolley, 1987	
	Cargill	Canada	Ontario	49-18N	82-49W	USGS, 2000, MASMILS database	

Appendix A. REE Deposits  
USGS OF02-189

DEPOSIT			Mineralogy			Geochronology
TYPE	Deposit or district name	STATUS	REE Mineralogy	Other Ore or Significant Minerals	Gangue and Rock-forming Minerals	Age (method, mineral, rock)
	Yangdun		mon, ferg	cpy, gal, sph, pyr, sid, wul, col, Nb-rut, zir, apa, mag	cal	
	Yinachang (Yenachang)		bas, all	hem, pyr, cpy, ccc, mlyb, flu		Proterozoic
	Zijingshan		tit, apa			134.8 Ma (K-Ar)
<b>CARBONATITE WITH RESIDUAL ENRICHMENT</b>						
	Angico dos Dias	Occurrence	apa			
	Anitápolis	P producer; REE occurrence	apa	apa, mag	pyx, bio, phlo, amph, oliv	Early Cretaceous
	Araxa (Barreiro)	Nb-P producer; REE-Ba occurrence	mon, gor, goy, apa, bpyro, calcite, anc, cpyro	apa, bpyro, bar, mag, gor, ilm, hem, gib, boh, pandaite, pyro, vrm, iso, pyr	dol, arf, aeg-aug, goe, lim, kao, qtz	87.2 ± 4.4 Ma (K-Ar, bio, glimmerite)
	Bingo (Bingu)	Occurrence		mag, apa, pyro, tit, mel, flu, got, zir	cal, wol, bio, sodic amph, fay, pec	
	Bukusu Complex (Busumbu, Busumu, Busuku)	Past P producer		apa, carbonate-fapa, mag, vrm, zir, bar, pyro, bad, Cu minerals		Tertiary
	Buru	Occurrence	mon	flu, pyro, bar, mag, apa	cal, bio, aeg	Probably 5-19 Ma
	Caiapo	Occurrence		sid, bar, rut, pyro	dol, cal, ank	Post-Devonian
	Cargill	P potential: REE occurrence	apa	apa, cran, vrm, Ti-chum	dol, arf, phlo, oliv, goe	1740 Ma (K-Ar, bio)

Appendix A. REE Deposits  
USGS OF02-189

DEPOSIT	Deposit or district name	Host Rock(s)	Company	COMMENTS	REFERENCES
TYPE					
	Yangdun	marble (carbonatite), amphibole schist		Deposit is stratiform.	Wu and others, 1996; Zhang Peishan and others, 1995
	Yinachang (Yenachang)	dolomitic marble (carbonatite), tuff		Deposit is stratiform.	Wu and others, 1996; Zhang Peishan and others, 1995
	Zijingshan	monazite, nepheline syenite, aegirine-augite syenite, carbonatite dikes		Carbonatite veins contain 1-2% REO.	Zhang Peishan and others, 1995
<b>CARBONATITE WITH RESIDUAL ENRICHMENT</b>					
	Angico dos Dias				Mariano, 1989
	Anitápolis	ijolite, peralkaline syenite, pyroxenite, nepheline syenite, glimmerite, weathered carbonatite		Woolley gives location as 27-54S, 49-09W.	Mariano, 1989; Azevedo Branco, 1984; Woolley, 1987
	Araxa (Barreiro)	beforsite, glimmerite, sovite, some pyroxenite	CBMM	Weathered carbonatite with 3 separate deposits. Barreiro Complex is circular and about 4.5 km in diameter. World's largest Nb reserve.	Silva, 1986; Azevedo Branco, 1984; Singer, 1998; Woolley, 1987; Castor, 1994; Neary and Highley, 1984; Morteani and Preinfalk, 1996; Mariano, 1989; McNeil, 1979
	Bingo (Bingu)	carbonatite, nepheline syenite, fenite		Deposit largely a phosphate resource.	Woolley, 2001
	Bukusu Complex (Busumbu, Busumu, Busuku)	carbonatite, agglomerate, ijolite, melteigite, nepheline syenite		Residual soils 60 m thick. Francolite occurs in a secondary phosphorete (concretionary hard pan).	Mathers, 1994; de Kun, 1987; Woolley, 2001
	Buru	carbonatite tuff, fenite		Tuff is laterized. Just SW of the Tinderet volcano.	Woolley, 2001
	Caiapo	carbonatite, carbonatitic breccia, ijolite, monchiquite, silexite, fenite		Anomalous Sr, Ba, REE in the lateritic cover.	Woolley, 1987
	Cargill	Cargill Alkaline Complex-calcite and dolomite carbonatite, pyroxenite, leached carbonatite, residium		Lake sediments overlying residium are Cretaceous in age.	Mariano, 1989; British Sulphur Corporation, 1987; Erdosh, 1989; Dawson and Currie, 1984

Appendix A. REE Deposits  
USGS OF02-189

DEPOSIT	Location					Resources	Source & Date of Estimate(s)	
TYPE	Deposit or district name	Country	State or Province	Latitude	Longitude	Source	Tonnage and grade	
	Catalão I	Brazil	Goias	18-15S	47-47W	Azevedo Branco, 1984	2 Mt laterite @ 12% REO; 5 Mt @ 12% REO; 21 Mt @ 1.02% REO; 4.6 Mt @ 4% REE	Castor, 1994; Notholt and others, 1990; Singer, 1998; Azevedo Branco, 1984
	Catalão II	Brazil	Goias	18-02S	47-52W	Woolley, 1987		
	Cerro Impacto	Venezuela	Bolivar	6-00N	65-10W	Woolley, 1987	0.1-11% REO	O'Driscoll, 1988
	Chilwa Island	Malawi		15-20S	35-36E	Woolley, 2001		
	Cone Negosa (Negoza)	Mozambique		15-32S	31-16E	Woolley, 2001		
	Goias	Brazil	Sao Paulo					
	Kaluwe	Zambia		15-11S	30-01E	Woolley, 2001		
	Kangankunde	Malawi		15-08S	34-55E	Jackson and Christiansen, 1993	11 Mt @ 1.97% REO; 11 Mt @ 5% mon (1983); 11 Mt @ 0.62% REO	Notholt and others, 1990; Jackson and Christiansen, 1993; Singer, 1998
	Kapiri	Malawi		15-17S	34-55E	Woolley, 2001		
	Karonge (Gakara)	Burundi		3-30S	29-27E	Woolley, 2001	Mineable ore-- 0.06 Mt @ 3.0% bas (1.59% REO)	Jackson and Christiansen, 1993
	Luicuisse (Lucuisse)	Mozambique		12-23S	36-11E	Woolley, 2001		
	Mabounie	Gabon	Moyen-Ogooue	00-42S	11-42E	Jackson and Christiansen, 1993	2.52% REO	Jackson and Christiansen, 1993
	Magnet Cove	USA	Arkansas	34-27N	92-52W	Woolley, 1987		
	Maicuru	Brazil	Pará	00-28S	54-13W	Azevedo Branco, 1984	laterite contains ama 17% REE	Castor, 1994

Appendix A. REE Deposits  
USGS OF02-189

DEPOSIT			Mineralogy			Geochronology
TYPE	Deposit or district name	STATUS	REE Mineralogy	Other Ore or Significant Minerals	Gangue and Rock-forming Minerals	Age (method, mineral, rock)
	Catalão I	Nb-P producer; minor byproducer of REE (Ce); Ti resource	Ce-Ba-pyro, gor, apa, mon, flor, anc, goy, ana, rhab	pyro, apa, vrm, prv, fapa, ilm, tit, bar, hem, mag, zir, gib, boh, sva, goy, viv, hin, coll, lus, cah, pyr	phlo, ser, oliv, car, amph, pyx, fld, neph, aeg, qtz, kao, goe	82.9 ± 4.2 Ma (K-Ar, alkali syenite)
	Catalão II	Nb resource	REE phosphates	mag, pyro, vrm, bar, Ba-pyro	cal, phlo, fld, amph	87.1 Ma (fission track, apatite)
	Cerro Impacto	Potential resource	bas, flor, mon	pyro, prv, goy, rut, Th, Zn, bar, Nb	kao, goe, qtz	
	Chilwa Island	Occurrence	flor, syn, bas	apa, pyro, rut, tan, mag	mcc	Early Cretaceous
	Cone Negosa (Negoza)		bas, mon	pyr, bar, pyro, brk, fapa, Ti, Fe		
	Goias	Occurrence	apa			
	Kaluwe	P-REE occurrence	mon	apa, pyro, Th, Fe oxide, mag	cal, phlo	Cretaceous
	Kangankunde	REE-Sr resource	mon, bas, flor-goy, daq	str, sta, flu, bar, sph, apa, pyro	dol, qtz, Mn oxides, cal	Late Cretaceous- 123 ± 6 Ma (K-Ar, phlo)
	Kapiri		syn, mon (?)	apa, bar, prv, Ti, F, Sr	ank, cal,	
	Karonge (Gakara)	Past small producer REE	bas, mon, rhab, cer, fcer	cas, bar, prym, gal	qtz, car, mcc, bio, goe	Precambrian
	Luicuisse (Lucuisse)		mon	U, apa, pyro, col, zir, mag		
	Mabounie	Nb resource; potential REE resource	mon, xen, pyro, flor, cran	apa, mag, cran, bad	hem, goe, qtz, kao	Late Proterozoic
	Magnet Cove	Past small producer rut, mag	eud, mon	rut, mag, apa, prv, Nb, Mo, car, mnt, pyr	fld, neph, oliv, gar, aeg, dio, bio, sod, anl, horn	90-105 Ma; Mid-Cretaceous (various)
	Maicuru		apa, ana, mon	Ti, Cr, V		Proterozoic

Appendix A. REE Deposits  
USGS OF02-189

DEPOSIT TYPE	Deposit or district name	Host Rock(s)	Company	COMMENTS	REFERENCES
	Catalão I	carbonatite, pyroxenite, serpentinized peridotite, glimmerite		Plug- 6 km in diameter. Woolley gives location as 18-08S, 47-50W.	Azevedo Branco, 1984; Gierth, and Baecker, 1986; Singer, 1998; Woolley, 1987; Mariano, 1989; Morteani and Preinfalk, 1996
	Catalão II	sovite, phoscorite, glimmerite		15 km N of Catalao I.	Pell, 1996; Woolley, 1987; Eby and Mariano, 1992
	Cerro Impacto	laterite, carbonatite, fenite		Very deeply weathered.	Aarden and others, 1973; Castor, 1994; Woolley, 1987; Mariano, 1989
	Chilwa Island	carbonatite, sovite, breccia			Woolley, 2001
	Cone Negosa (Negoza)	carbonatite		Premoli classified this deposit as metasomatic.	Premoli, 1994; Woolley, 2001
	Goias				Mariano, 1989
	Kaluwe			In Rufunsa Rift.	de Kun, 1987; Simukanga and others, 1994; Turner and others, 1989; Woolley, 2001
	Kangankunde	dolomitic carbonatite, fenite		Mon almost thorium-free. Carbonatite contains average of 7% euhedral green mon crystals. High iron content. Locally, REE of hydrothermal origin.	Anstett, 1986; Castor, 1994; Notholt and others, 1990; de Kun, 1987; Neary and Highley, 1984; Mariano, 1989; Pell, 1996; Wall and Mariano, 1996; Woolley, 2001; Deans, 1966; Mariano, 1996
	Kapiri	carbonatite dikes cut Precambrian dolomite			Woolley, 2001
	Karonge (Gakara)	metasedimentary rocks, gneiss, granite	Societe Miniere de Muhinga et de Kigali (1988)	REE deposit in quartz-barite-bas-mon stockworks of uncertain affiliation, but assumed in references to have carbonatite source. Weathering has produced rhab and cer. Production ceased, due to irregular distribution of grade, in 1978.	Harben and Bates, 1990; Mariano, 1989; Möller, 1989a; Jackson and Christiansen, 1993; de Kun, 1987; Roskill, 1988; Woolley, 2001; Wambeke, 1977
	Luicuisse (Lucuisse)	carbonatite		Premoli reports that deposit is metasomatic. Residual deposits are commonly 7-8 m thick, but can be 30 m thick.	Premoli, 1994; Woolley, 2001
	Mabounie	carbonatite, weathered carbonatite, syenite			Jackson and Christiansen, 1993; Notholt, 1994; Morteani and Preinfalk, 1996; Woolley, 2001
	Magnet Cove	ijolite, melteigite, jacupirangite, pyroxenite, syenite, trachyte, carbonatite			Pell, 1996; Mariano, 1989; Woolley, 1987
	Maicuru	laterite, ultrabasic alkaline intrusives with probable carbonatite		Intrusions covered by laterite.	Castor, 1994; Woolley, 1987; Mariano, 1989; Lemos and de Costa, 1987

Appendix A. REE Deposits  
USGS OF02-189

DEPOSIT	Location					Resources	Source & Date of Estimate(s)	
TYPE	Deposit or district name	Country	State or Province	Latitude	Longitude	Source	Tonnage and grade	
	Maraconai	Brazil	Pará	00-32S	53-24W	de Souza Rodrigues and Amorim dos Santos Lima, 1984		
	Martison Lake	Canada	Ontario	50-19N	83-24W	Canada Department of Energy, Mines, and Resources, 1984		
	Matum (Marum, Mutum)	Brazil	Pará	01-53S	57-25W	Woolley, 1987		
	Mbeya (Panda Hill)	Tanzania		9-00S	33-14E	Woolley, 2001		
	Morro Dos Seis Lagos (Sao Gabriel da Cachoeira)	Brazil	Amazonas	00-38N	66-24W	USGS, 2000, MRDS database	0.13 Mt REE; 1.50% REO in laterite cover	Azevedo Branco, 1984; Woolley, 1987
	Mount Weld	Australia	Western Australia	28-52S	122-33E	Jackson and Christiansen, 1993	Indicated 15.4 Mt @ 11.2% REO + Y <sub>2</sub> O <sub>3</sub> (5% cutoff) + 4.0 Mt @ 0.36% Y <sub>2</sub> O <sub>3</sub> ; 6.3 Mt @ 16.2% REO; 15.2 Mt @ 11.2% REO (including Y); 6.3 Mt @ 17.2% REO (1990)	Mariano, 1989/1988; Notholt and others, 1990; Pell, 1996/1995; Jackson and Christiansen, 1993
	Mrima Hill	Kenya		04-25S	39-15W	de Kun, 1987	6 Mt @ about 5% REO (1966); 50.8 Mt @ 0.59% REO	Mariano, 1989; Singer, 1998
	Oka	Canada	Quebec	45-30N	74-00W	Woolley, 1987	221 Mt @ 0.1% REO; 4.0 Mt @ 0.31% Nb <sub>2</sub> O <sub>5</sub> , 0.39% REO, 3.8% P <sub>2</sub> O <sub>5</sub>	Castor, 1994; 1956
	Ruri Complex	Kenya		00-32S	34-20E	Idman and Mulaha, 1991	0.375 Mt @ 6.4% mon or 3.5% REO (1989)	Jackson and Christiansen, 1993
	Sallanlatvi (Sallanlatvinskii)	Russia		66-57N	29-10E	Kogarko and others, 1995		
	Sebl'yavr Carbonatite Complex (Seblyavr)	Russia		68-43N	32-08E	Kogarko and others, 1995		
	Serra Negra	Brazil	Minas Gerais	18-55S	46-50W	de Souza Rodrigues and Amorim dos Santos Lima, 1984	200 Mt @ 27.7% Ti <sub>2</sub> -- Ti concentrates contain >3% REE	Castor, 1994
	Sokli	Finland	Lappi	67-45N	29-15E	USGS, 2000, MASMILS database		

Appendix A. REE Deposits  
USGS OF02-189

DEPOSIT TYPE	Deposit or district name	STATUS	Mineralogy			Geochronology
			REE Mineralogy	Other Ore or Significant Minerals	Gangue and Rock-forming Minerals	Age (method, mineral, rock)
	Maraconai		mon, ana	Cr, V, Zr, Ni, Ta		
	Martison Lake	Active P prospect	apa, flor	apa, pyro, mag, carbonate-fapa, pyr	dol, cal, phlo, bio, Fe oxides, cly	
	Matum (Marum, Mutum)	Occurrence		apa, flu, tit	neph, can, aeg, epi	1026 ± 28 Ma (K-Ar, fld)
	Mbeya (Panda Hill)	Nb-P resource	bas, mon, RE carbonates	apa, pyro, pyr, mag, flu, cel, bar, ilm, rut, tit	cal, qtz	
	Morro Dos Seis Lagos (Sao Gabriel da Cachoeira)	Potential Nb-REE resource	flor, RE oxides and hydroxides	Nb-rut, pyro, brk, Th, V, Be, sid, bar, pyr	ank, dol, goe	Cretaceous
	Mount Weld	REE-P resource	mon, chu, xen, flor, goy, cer, others	P, Nb, Ta	cal, dol	2064 Ma
	Mrima Hill	REE-Nb resource, past producer	mon, gor, goy, pyro	pyr, flu, mag, Ba, Mn, Pb, Zn, Ag	cal, dol, chl, bio, aeg-aug	
	Oka	Past Nb producer; Potential REE resource	pyro, bri, apa, cpyro	pyro, apa, prv, nio, pyr, pyr, h, mag, ok, lat	bio, neph, cal, mnt, mll, rich, wol, hau	117 Ma, average (K-Ar)
	Ruri Complex	Potential resource	mon, bas, eud	mag, apa, pyro, flu, bar, got	bio, aeg, wol, can	4.1-11 Ma
	Sallanlatvi (Sallanlatvinskii)	Occurrence	lue, par, anc, bur, bas, crt, mon, hua, rhab, cor	apa, bar, sid, tit, mag, zir, lue, pyro, hapa, Ti-mag, str, sph, pyr, apy	dol, ank, cal, phlo, can, nat, aeg, chl	
	Sebl'yavr Carbonatite Complex (Seblyavr)	Occurrence	anc, lue, bur, bas, crt, mon, hua, rhab, cor	apa, mag, bar, str, pyr, gal, sph, pyro, zir, tit, Ti-mag, zirconite, bad, vrm	cal, frs, ank, phlo, act, qtz, chl	383-388 Ma (K-Ar, phlo, carbonatite)
	Serra Negra	Ti resource w/ potential byproduct REE	apa, ana	ana, Th, U, pyro		Cretaceous
	Sokli	P resource	apa, rhab	apa, mag, pyro, zir, carbonate- fapa, bad, sulfides, Ti, Zn, Sr	goe, cal, trem, phlo, ser, chum	334-392 Ma: Holocene



Appendix A. REE Deposits  
USGS OF02-189

DEPOSIT TYPE	Deposit or district name	Host Rock(s)	Company	COMMENTS	REFERENCES
	Maraconai	probably alkaline-ultrabasic intrusions		2 intrusions; lat-long is for the northern intrusion. Deep lateritic cover.	Mariano, 1989; Woolley, 1987; Ulbrich and Gomes, 1981
	Martison Lake	carbonatite; ultrabasic kimberlites and porphyry diatreme breccias	MCK Mining Corp. (1999)	Development hampered by lack of all-weather access. 100 km N of Hearst. Residium is a coarse gray apatite sand 170 m thick.	Mariano, 1989; Guillet, 1985; Notholt and others, 1989a; Potapoff, 1989; Canada Department of Energy, Mines, and Resources, 1984; Jasinski, 2000
	Matum (Marum, Mutum)	nepheline syenite, weathered carbonatite		Most of intrusion lies in Guyana.	Woolley, 1987; Ulbrich and Gomes, 1981
	Mbeya (Panda Hill)	beforsite, sovite, agglomerate, tuff, fenite		Nb reserve.	Möller, 1989a; de Kun, 1987; Woolley, 2001
	Morro Dos Seis Lagos (Sao Gabriel da Cachoeira)	weathered carbonatite		3 carbonatitic alkaline pipes that form laterite-covered hills. Laterites average 230 m in depth. Woolley gives location as 0-17N, 66-41W.	Azevedo Branco, 1984; Cuadros Justo and Souza, 1986; Woolley, 1987; Mariano, 1989; Issler, 1978
	Mount Weld	carbonatite	Ashton Mining Ltd. (2000)	Mon has < 0.3% ThO <sub>2</sub> . Pilot plant at site in 1993.	Harben and Kuzvart, 1996; O'Driscoll, 1988; Industrial Minerals, 1990; Duncan and Willet, 1990; Mariano, 1989; Morteani and Preinfalk, 1996; Lottermoser, 1990; Griffiths, 1992; Fetherston and others, 1997; Mining Journal, 1989c; Dreissen, 1990; Western Australia Department of Mineral and Petroleum Resources, 2001, accessed at URL <a href="http://www.dme.wa.gov.au/">http://www.dme.wa.gov.au/</a>
	Mrima Hill	sovite, lamprophyre, agglomerate, fenite,	Rhone-Poulenc (1981)	Supergene.	Singer, 1998; Mariano, 1989; Deans, 1966; Möller, 1989a; Woolley, 2001; Parker and Baroch, 1971
	Oka	carbonatite, okaite, melteigite, urtite, alnoite		Apatite from the Bond zone averages 8.6% REO. 1956 resource estimate was for Advance Red Lake GML holdings. Average age based on 28 determinations from 22 samples.	Castor, 1994; Singer, 1998; Woolley, 1987; Pell, 1996; Mariano, 1989; Chakhmouradian, 1996; Möller, 1989a; British Sulphur Corporation, 1987; Eby, 1971
	Ruri Complex	carbonatite, carbonatite agglomerate, nepheline syenite, phonolite plugs		Complex of twin, deeply eroded, carbonatitic volcanoes.	de Kun, 1987; Idman and Mulaha, 1991; Möller, 1989a; Jackson and Christiansen, 1993; Woolley, 2001
	Sallanlatvi (Sallanlatvinskii)	dolomitic carbonatite, calcite carbonatite, ijolite, melteigite		Apatite, barite, and REE are concentrated in the weathered crust.	Kogarko and others, 1995; Chakhmouradian, 1996; Belolipetskii and Voloshin, 1996
	Sebl'yavr Carbonatite Complex (Seblyavr)	gneis, pyroxenites, phoscorite		Carbonatite veins.	Kogarko and others, 1995; Belolipetskii and Voloshin, 1996; British Sulphur Corporation, 1987
	Serra Negra	weathered carbonatite, peridotite, dunite, shonkinite, jacupirangite		Hi LREE/HREE ratio.	Castor, 1994; Mariano, 1989; Azevedo Branco, 1984; Ulbrich and Gomes, 1981
	Sokli	carbonatite, weathered carbonatite		REE content of the apatite is similar to that of the Khibina complex (Isokangas, 1978).	Isokangas, 1978; Vartiainen, 1989

Appendix A. REE Deposits  
USGS OF02-189

DEPOSIT	Location					Resources	Source & Date of Estimate(s)	
TYPE	Deposit or district name	Country	State or Province	Latitude	Longitude	Source	Tonnage and grade	
	Sukulu	Uganda	Bukedi	0-39N	34-09E	Woolley, 2001		
	Tapira	Brazil	Minas Gerais	19-54S	46-52W	Azevedo Branco, 1984	150 Mt @ 0.03% REO; 166 @ 0.03% REO	Jackson and Christiansen, 1993; Singer, 1998
	Tchivira (Chivara, Quicuco)	Angola		14-19S	13-53E	Woolley, 2001		
	Tomtor	Russia		71-00N	116-35E	Kogarko and others, 1995	large resource with 8-31% REO, 3-8% Nb2O5	Pell, 1996/1995
	Twareietau	Guyana		02-00N	57-00W	Woolley, 1987		
	Wigu Hill	Tanzania		7-26S	37-34E	Woolley, 2001	ama 20% REO	Castor, 1994
	Yangibana	Australia	Western Australia	23-53S	116-10E	Australia National Mapping Agency, 2001, accessed at URL <a href="http://www.auslig.gov.au/mapping">http://www.auslig.gov.au/mapping</a>	3.1 @ 1.7% REO (1989); ama 11% REO; 3.5 Mt @ 3.09% mon (1.7% REO)	Hedrick and Templeton, 1991; O'Driscoll, 1988; Jackson and Christiansen, 1993
<b>ALKALIC IGNEOUS</b>								
	Akitskii	Russia	Baikal	56-01N	110-22E	Kogarko and others, 1995		
	Ablah	Saudi Arabia		20-05N	41-55E	Matzko and Naqvi, 1978		
	Ambatofinandrahana igneous complex	Madagascar		20-27S	46-57E	Woolley, 2001		
	Ampasindava area-Bezavona complex	Madagascar		13-48S	48-05E	Woolley, 2001		
	Amis Complex	Namibia		21-10S	14-30E	Estimated		

Appendix A. REE Deposits  
USGS OF02-189

DEPOSIT			Mineralogy			Geochronology
TYPE	Deposit or district name	STATUS	REE Mineralogy	Other Ore or Significant Minerals	Gangue and Rock-forming Minerals	Age (method, mineral, rock)
	Sukulu	Past P producer		apa, mag, pyro, zir, bad		Cretaceous-Early Miocene?
	Tapira	Ti-P producer; Potential for Nb, REE, vrm	ana, hapa, pyro, apa	apa, pyro, prv, mag, ilm, tit, vrm, Th, U	lim, cly, phlo, pyx, gar, oliv	69.5 ± 3.5 Ma (K-Ar, bio, bebedourite)
	Tchivira (Chivara, Quicuco)	Occurrence		apa, flu, bar, pyro, pyr, tit, Sr	cal, dol, qtz, ank	Cretaceous
	Tomtor	REE-Nb resource	pyro, flor, mon, gor, goy, rhab, xen, bas	pyro, apa, mag, rut, col, irut, pyr, vrm, carbonate-fapa, Sc	cal, dol, phlo, kao, pyx	Early to Middle Paleozoic
	Twareietau	Occurrence	goy-flor	zir	neph, can, sod, aeg-aug, amph, bio	1025 ± 28 Ma (K-Ar, fld)
	Wigu Hill	REE resource	bas, mon, Ce-goy, syn, par	Nb, flu, str, bar, cel, pyr, sph	qtz, dol, cal	
	Yangibana	Potential resource	mon	mag, hem		1.25 Ga (U-Pb, zir)
<b>ALKALIC IGNEOUS</b>						
	Akitskii	Occurrence	xen, par	flu, tae, bar, pyr, crs, hem, tit, apa, ilm	alb, cal, ank, mcc, can, aeg, arf, bio	199 Ma (K-Ar, bio, peralkaline syenite)
	Ablah			Zr, Nb, Ta		
	Ambatofinandrahana igneous complex	Past producer, minor	bas			
	Ampasindava area-Bezavona complex	Occurrence	rink, mos, eud		ast, arf, aen, bio	
	Amis Complex	Occurrence	Y-flu, mon, xen, bas, ferg	Th	arf, aeg	Early Cretaceous

Appendix A. REE Deposits  
USGS OF02-189

DEPOSIT TYPE	Deposit or district name	Host Rock(s)	Company	COMMENTS	REFERENCES
	Sukulu	carbonatite (solvite, dolomitic carbonatite, ankeritic carbonatite); tinguaite dykes; fenite-breccia		Residual deposits 15-67 m thick.	Mathers, 1994; de Kun, 1987; Mew, 1980; Notholt, 1994; Woolley, 2001
	Tapira	weathered pyroxenite, syenite, sovite, silixite, jacupirangite		At phosphate mine.	Harben and Bates, 1990; Jackson and Christiansen, 1993; Harben, 1984; Azevedo Branco, 1984; Woolley, 1987; Pell, 1996; Mariano, 1989; Ulbrich and Gomes, 1981
	Tchivira (Chivara, Quicuco)	carbonatite, syenite, nepheline syenite, ijolite			Woolley, 2001; Alberti and others, 1999
	Tomtor	weathered carbonatite, dolomite and calcite carbonatite, nepheline syenite		300 sq km massif. Weathered carbonatite contains ama 37% RE oxides.	Kogarko and others, 1995; Harben and Kuzvart, 1996; Pell, 1996; Kravchenko and Pakrovsky, 1995
	Twareietau	weathered carbonatite, nepheline syenite		In Muri alkaline complex.	Mariano, 1981c; Mariano, 1989; Woolley, 1987
	Wigu Hill	weathered dolomitic carbonatite		Carbonatite dikes. Deposit show extensive replacement by hydrothermal solutions rich in REE, Sr, F, BA, and silica.	Castor, 1994; Neary and Highley, 1984; Mariano, 1989; Pell, 1996; Overstreet, 1967; Woolley, 2001; Mariano, 1973
	Yangibana	mica schist and gneisses intruded by alkaline granite and syenite.		Gossan; ore referred to as "ironstones".	Castor, 1994; Industrial Minerals, 1989a; O'Driscoll, 1988; Pearson and Taylor, 1996; Jackson and Christiansen, 1993; Dreissen, 1990
<b>ALKALIC IGNEOUS</b>					
	Akitskii	peralkaline syenite, granosyenite, nepheline syenite			Kogarko and others, 1995
	Ablah	syenite, breccia			Matzko and Naqvi, 1978
	Ambatofinandrahana igneous complex	nepheline syenite dikes		Small amounts of bastnasite recovered from pegmatites.	Neary and Highley, 1984
	Ampasindava area-Bezavona complex	nepheline syenite, phonolite, nordmarkite, theralite			Woolley, 2001
	Amis Complex	fenitized peralkaline arfvedsonite-aegirine granite and associated agpaitic pegmatites		On SW periphery of the Brandberg complex.	McManus and Schneider, 1994

Appendix A. REE Deposits  
USGS OF02-189

DEPOSIT	Location					Resources	Source & Date of Estimate(s)
TYPE	Deposit or district name	Country	State or Province	Latitude	Longitude	Source	Tonnage and grade
	Arenopolis (Areianopolis)	Brazil	Goiás	16-22S	51-32W	Woolley, 1987	
	Azov Sea Coast Dikes	Ukraine		47-11N	36-34E	Kogarko and others, 1995	
	Baerzhe	China	Jilin (Inner Mongolia)				0.2-0.7% REO, 0.5-3.4% ZrO <sub>2</sub> , 0.02-0.3% Nb <sub>2</sub> O <sub>5</sub> , 0.02-0.15% BeO Wu and others, 1996
	Bakhuis Mountains - K/3 Deposit	Surinam		4-26N	57-04W	Dahlberg, 1989	
	Bancroft-Haliburton area	Canada	Ontario				
	Bokan Mountain (Ross-Adams)	USA	Alaska	54-55N	132-08W	Nokleberg and others, 1997	6.2 Mt (indicated resource) @0.09-0.46 % REO + 0.09-0.4% Y <sub>2</sub> O <sub>3</sub> Warner and Barker, 1989
	Bomin-Khara	Mongolia					ama 2% REE Kovalenko and Yarmolyuk, 1995
	Brandberg Complex	Namibia		21-08S	14-33E	Woolley, 2001	
	Brockman	Australia	Western Australia	18-19S	127-46E	Towner, 1992	9.0 Mt @ 0.15% Y <sub>2</sub> O <sub>3</sub> , 0.12% HREE, 1.3% Zr; 4.29 Mt @ 0.123% Y <sub>2</sub> O <sub>3</sub> , 0.0355% REO, 0.440% Nb <sub>2</sub> O <sub>5</sub> , 1.040% ZrO <sub>2</sub> ; 9.3 Mt @ 0.215% REO O'Driscoll, 1988, Roskill, 1988; Jackson and Christiansen, 1993
	Bunduk	Armenia		40-45N	44-45E	Kogarko and others, 1995	
	Burpalinskii (Burpala)	Russia	Baikal	56-33N	110-45E	Kogarko and others, 1995	
	Caballo Mountains	USA	New Mexico	32-32N	100-17W	Woolley, 1987	

Appendix A. REE Deposits  
USGS OF02-189

DEPOSIT			Mineralogy			Geochronology
TYPE	Deposit or district name	STATUS	REE Mineralogy	Other Ore or Significant Minerals	Gangue and Rock-forming Minerals	Age (method, mineral, rock)
	Arenopolis (Areianopolis)	Occurrence	bad, eud	bad	alb, orth, neph, aeg, anl, bio, can, zeo, oliv, pyx	Cretaceous?
	Azov Sea Coast Dikes	Occurrence		Ti, P, Nb	pyx	
	Baerzhe	REE, Zr, Nb Be resource	hing, pyro, syn, mon	col, zir, mag-hem, flu, Be, U, Fe-thor, rut, ilm	qtz, alb, cal, aeg, goe	127 Ma
	Bakhuis Mountains - K/3 Deposit	Occurrence		apa; wav		Late Archean to Early Proterozoic-- 2000-2600 Ma
	Bancroft-Haliburton area					
	Bokan Mountain (Ross-Adams)	Potential resource REE, Past Prod. U	kai, all, tha, bas, par, syn, mon, bri, teng, xen, ilm, ferg, sam, aes, lop, pcra	zir, col, thor, U-thor, uran, Be, flu, pyr, mag; minor pyro, gal, sph, rut, rho, plus, native silver	aeg, rie, qtz, alb, cal, bio, chl, epi, mcc	151 ± 5 Ma (Rb-Sr)
	Bomin-Khara	Occurrence		Zr, Nb		Middle Paleozoic
	Brandberg Complex		all, che, mon	flu, Th, U-pyro, zir	arf, qtz, rie, ast	Early Cretaceous
	Brockman	Potential resource	bas, xen	col, pyro, zir, cas, sph, Ga		Lower Proterozoic
	Buduk	Occurrence	all, dav, hel	zir, bad, tit, ilm, thor	olig, dio-aug, arf, Fe-has, bio	36 Ma (K-Ar, whole rock)
	Burpalinskii (Burpala)	Occurrence	eud, lop, crt, che	Mn-ilm, lav, Ti-lav, Fe-thor, cata, mel, Cs-ast, ilm, zir, apa, flu	aeg, aug, fld, mcc, dio, arf, Fe-bio, sod, nep	325-327 Ma (various)
	Caballo Mountains	Occurrence	bas	thor, uph, fluorocarbonate	mcc	

Appendix A. REE Deposits  
USGS OF02-189

DEPOSIT TYPE	Deposit or district name	Host Rock(s)	Company	COMMENTS	REFERENCES
	Arenopolis (Areianopolis)	alkali metagabbro, ijolite, melteigite, pyroxenite, nepheline syenite, foyaite, laterite		Rare earths concentrated in dikes within the syenite.	Woolley, 1987
	Azov Sea Coast Dikes	alkaline pyroxenites, jacupirangite		15 alkaline ultrabasic dikes form a belt 100 km wide and > 35 km long.	Kogarko and others, 1995
	Baerzhe	alkalic riebeckite granite		Veinlets and disseminations.	Wu and others, 1996
	Bakhuis Mountains - K/3 Deposit	plagioclase-apatite- clinopyroxene rock; clinopyroxene-bearing syenite; monzonite; mangerite; pelitic, quartzitic and calcsilicate gneiss and granulite; mafic to ultramafic igneous rocks			Dahlberg, 1989
	Bancroft-Haliburton area			See listing under uranium deposits.	
	Bokan Mountain (Ross- Adams)	peralkaline riebeckite and aegirine granites, syenite, granite porphyry		REE-bearing pegmatites, dikes, and shear zones/fractures in central part of the complex and in veins in the outer parts & nearby country rocks. Produced 98,000 mt of approx. 1% U3O8. Because dikes generally < 1 m thick and mineralogically complex, economic potential low.	Castor, 1994; Woolley, 1987; Mariano, 1983b; Mariano, 1989; Warner and Barker, 1989; Nokleberg and others, 1997
	Bomin-Khara	panellerite volcanic rocks, comendite, nepheline syenite		In northwest Mongolia.	Kovalenko and Yarmolyuk, 1995
	Brandberg Complex	K-altered biotite granite			McManus and Schneider, 1994; Woolley, 2001
	Brockman	rhyolite tuff, peralkaline granite	West Coast Holdings and Greater Pacific Investments (1988)	18 km SE of Hall's Creek in the East Kimberley.	Castor, 1994; O'Driscoll, 1988; Laval, 1992; Griffiths, 1992; Towner, 1992; Jackson and Christiansen, 1993; Roskill, 1988
	Bunduk	peralkaline leucosyenite (oligoclasite), nepheline syenite		REE mineralization in the oligoclasites.	Kogarko and others, 1995
	Burpalinskii (Burpala)	pulaskite, peralkaline syenite, foyaite, nepheline syenite			Kogarko and others, 1995
	Caballo Mountains	quartz monzonite		Potassic dikes with postulated alkaline body at depth.	Woolley, 1987

Appendix A. REE Deposits  
USGS OF02-189

DEPOSIT	Location					Resources	Source & Date of Estimate(s)	
TYPE	Deposit or district name	Country	State or Province	Latitude	Longitude	Source	Tonnage and grade	
	Cerro Bamba	Bolivia	Santa Cruz				-9% les + bri	Litherland and others, 1986
	Chilembwe (Petauke)	Zambia	Eastern	13-59S	31-41E	Estimate for center of area.		
	Churuata	Venezuela	Amazonas	03-27N	65-28W	Woolley, 1987		
	Cida	China	Sichuan/Miyi	27-00N	102-05E		0.05% REO	Wu and others, 1996
	Coldwell complex	Canada	Ontario	48-47N	86-30W	Woolley, 1987		
	Cornudas Mtns - Diablo Plateau (Wind Mtn.)	United States	New Mexico, Texas	31-29N to 32-06N	105-08W to 105-38W	Woolley, 1987		
	Dara-Pioz	Tajikistan		39-25N	70-44E	Kogarko and others, 1995		
	Dong Pao	Vietnam	Lai Chau	22-17N	103-34E	NIMA, 2001	Possible reserves-- 7 Mt REO and Proven + possible Orebody 3-- 0.645 Mt REO	Dzien, 1990
	Dora Bay	United States	Alaska	55-14N	132-13W	Mariano, 2000, written commun.	2.8 Mt eud	Mariano, 2000, written commun.
	Eden Lake	Canada	Manitoba	56-38N	100-15W			
	Eisenvaara (Eisenvaarskii; includes Kaivimyaki/Kaivomaki and Raivimyaki/Raivimaki)	Russia	Karelia	61-25N	29-55E	Kogarko and others, 1995		
	Eljozero (Elet'ozero, Elet'ozerskii)	Russia	Kola Peninsula	66-04N	31-57E	Kogarko and others, 1995		



Appendix A. REE Deposits  
USGS OF02-189

DEPOSIT TYPE	Deposit or district name	STATUS	Mineralogy			Geochronology
			REE Mineralogy	Other Ore or Significant Minerals	Gangue and Rock-forming Minerals	Age (method, mineral, rock)
	Cerro Bamba	Occurrence	bri, les			Late Jurassic - Early Cretaceous
	Chilembwe (Petauke)	Occurrence		hapa, chloro-fapa	qtz, horn, bio	Late Cambrian
	Churuata	Occurrence	mon, bas(?), pyro	U, Th, zir, Sn	aeg, arf, sod, bio, neph, rie	Proterozoic-- 1300 Ma
	Cida	Potential producer	ferg	flu, Zr, Be, U	qtz, alb	230 Ma
	Coldwell complex	Occurrence	bas, syn, pyro, col	thor, zir, flu, mag, apa, tit, V, Cu, Ni, neph, ilm	qtz, aeg, nat, car, bio, sod, zeo,	
	Cornudas Mtns - Diablo Plateau (Wind Mtn.)	Occurrence	eud, bas	aen, cata	arf, rie, neph, sod, anl, fay, bio	
	Dara-Pioz	Potential resource		nep, sogdianite, tienshanite, searlesite, hyalotekite	neph, aeg, qtz	Carboniferous
	Dong Pao	Prospect	bas, par	flu, bar, Sr, Nb, Ta, U, Th		Paleogene
	Dora Bay	Prospect				
	Eden Lake	Occurrence	bri +HREE + Yt			
	Elisenvaara (Elisenvaarskii; includes Kaivimyaki/Kaivomaki and Raivimyaki/ Raivimaki)	Active P mine	apa, RE-tit	apa, Sr- and Ba-feldspar, pyr, mag	aeg, dio, bio, phlo, fld, pyx, car, horn	1600-1900 Ma (K-Ar, bio)
	Eljozero (Elet'ozero, Elet'ozerskii)	Occurrence	aes (Y), ferg, Y-tit, tha, bri-(Y), gad, all, che, pyro, lop, mon, bas, fers	apa, ilm, Ti-mag, zir, tit, pyro, col, thor	neph, fel, aeg, arf, bio, cal	1620-2080 Ma (various)

Appendix A. REE Deposits  
USGS OF02-189

DEPOSIT TYPE	Deposit or district name	Host Rock(s)	Company	COMMENTS	REFERENCES
	Cerro Bamba	Velasco Alkaline Complex-nordmarkite, melansyenite dike		Melasyenite dike with bri and (or) les cuts nordmarkite.	Litherland and others, 1986
	Chilembwe (Petauke)	syenite		5 orebodies are intruded into syenite.	de Kun, 1987; Simukanga and others, 1994
	Churuata	alkaline granite, syenite, quartz syenite, nepheline syenite, sandstone		High values for U, Th, REE, Zr, and Sn have been detected in associated laterites. Intrusion centered on very large NW-SE-trending fault.	Woolley, 1987; Soares, 1985
	Cida	alkalic riebeckite granite			Wu and others, 1996; Wen Lu, 1998; Zhang Peishan and others, 1995
	Coldwell complex	pegmatites in amphibole syenite, nepheline syenite, gabbro, basic volcanics		Includes Marathon Niobium, Marathon, REE, Mink Creek, Port Munroe, Yres Point, Garden Cove and Peninsula Hill occurrences. Alkaline complex has area of 580 km <sup>2</sup> .	Walker and others, 1993; Platt, 1996a; Woolley, 1987
	Cornudas Mtns - Diablo Plateau (Wind Mtn.)	nepheline syenite, phonolite			Woolley, 1987
	Dara-Pioz	syenite, granite, peralkaline syenite, granosyenite, peralkaline granite, garnet-nepheline syenite		Alkali rare earth-rich minerals are reported.	Kogarko and others, 1995
	Dong Pao	syenite, quartz syenite	Vietnamese Gov't; LG Metal Group	Metasomatic + weathered ore in Phong Tho district, 40 km from Nam Xe deposits. 60 ore bodies of various sizes have been identified in the Dong Pao area. They form irregular pods, lenses, and veins in shear zones.	O'Driscoll, 1996; ESCAP, 1990; Hedrick, 1987?; O'Driscoll, 1996; ESCAP, 1990; Premoli, 1990; Mariano, 1997; Dzien, 1990
	Dora Bay	peralkaline, agpaitic nepheline syenite complex			Mariano, 2000, written commun. to J. Hedrick, USGS.
	Eden Lake	syenite complex	Strider Resources	A 32 kg sample contained 8% bri. Property largely unexplored.	Hedrick, 1999
	Elisenvaara (Elisenvaarskii; includes Kaivimyaki/Kaivomaki and Raivimyaki/Raivimaki)	alkaline and peralkaline syenites		Averages 3.63% P2O5. Lat-long for the town of Elisenvaara.	Shchiptsov, 1993; Kogarko and others, 1995
	Eljozero (Elet'ozero, Elet'ozerskii)	nepheline syenite, gabbro, pyroxenite			Belolipetskii and Voloshin, 1996; Kogarko and others, 1995

Appendix A. REE Deposits  
USGS OF02-189

DEPOSIT TYPE	Deposit or district name	Location				Source	Resources	Source & Date of Estimate(s)
		Country	State or Province	Latitude	Longitude		Tonnage and grade	
	Fanshan (Fangshan)	China	Hebei	40-22N	115-13E	USGS, 2000, MASMILS database		
	Flowers Bay	Canada	Labrador	55-40N	59-50W	Woolley, 1987		
	Gardiner complex	Greenland		68-37N	33-09W	Woolley, 1987		
	Ghurayyah	Saudi Arabia		27-55N	35-48E	Drysdall and others, 1984	440 Mt @ 0.15% REE+Y	Drysdall and others, 1984
	Gremyakha-Vyrmes	Russia		68-38N	32-28E	Kogarko and others, 1995		
	Guelb Zeilaga	Mauritania		19-00N	13-18W	Arab Organisation for Mineral Resources, 1987		
	Gzarta-Hudag	Mongolia					ama 2% REE	Kovalenko and Yarmolyuk, 1995
	Igaliko complex - Motzfeldt center, N & S Qoroq, Igdlertfigssalik	Greenland		61-08N	45-10W	Woolley, 1987		
	Ilmaussaq	Greenland	Gardar	63-00N	51-12W	Jackson and Christiansen, 1993	>6.6 Mt @ 6% ZrO <sub>2</sub> , 3% REO, 0.2% Y <sub>2</sub> O <sub>3</sub> (1994); 30 Mt @ 0.9% Y <sub>2</sub> O <sub>3</sub> (1990)	Pell, 1996; Jackson and Christiansen, 1993
	Ilomba	Malawi		9-31S	33-11E	Woolley, 2001		
	Itremo	Madagascar		20-35S	46-38E			
	Jabal Archenu	Libya		22-16N	24-43E	Woolley, 2001		
	Jabal Hamra'	Saudi Arabia		26-04N	38-36E	Drysdall and others, 1984; Laval, 1992	18. Mt @ 0.21% Nb <sub>2</sub> O <sub>5</sub> , 0.18% Y <sub>2</sub> O <sub>3</sub> , 1.78% ZrO <sub>2</sub> , 0.8% REO	Laval, 1992
	Jabal Sa'id (Jabal Sayid)	Saudi Arabia		23-49N	40-56E	Drysdall and others, 1984	23 Mt (to 100 m below surface) @0.6% REE+Y	Drysdall and others, 1984
	Jabal Tawlah	Saudi Arabia		28-14N	35-23E	Drysdall and others, 1984; Laval, 1992	6.4 Mt @0.42% Nb <sub>2</sub> O <sub>5</sub> , 0.62% Y <sub>2</sub> O <sub>3</sub> , 5.0% ZrO <sub>2</sub>	Laval, 1992

Appendix A. REE Deposits  
USGS OF02-189

DEPOSIT TYPE	Deposit or district name	STATUS	Mineralogy			Geochronology
			REE Mineralogy	Other Ore or Significant Minerals	Gangue and Rock-forming Minerals	Age (method, mineral, rock)
	Fanshan (Fangshan)	Active P mine	bas	apa, mag, V, Ti, Co, Ni	aeg, phlo, bio, kspar, tour	Triassic-- 205-222 Ma
	Flowers Bay	Occurrence	mon, ast, ferg	flu, zir, aen	aeg, cal, bio, qtz	1262± 7 Ma (Rb-Sr)
	Gardiner complex	Occurrence	prv, lop, apa	apa, mag, prv	neph, fld, aeg, sod, cal	50.3 ± 1.4 Ma (Fission track, sph & apa)
	Ghurayyah		aes (Y), xen, mon, sam, pyro	zir, flu, cas, col-tan, uran, thor, irut, gal, sph	mica, qtz, mcc, alb, chl, arf, aeg	
	Gremyakha-Vyrmes	Occurrence	all, ferg, che, pyro	ilm, tit, mag, zir, apa, ast, aen, pyro	neph, mcc, bio, aeg-aug, arf, fld, cal	Range from 1750 ± 40 Ma (K Ar, bio, urtite) to 1870 ± 40 Ma (K-Ar, neph, urtite)
	Guelb Zeilaga	Occurrence	bas			
	Gzarta-Hudag	Occurrence		Zr, Nb		Late Paleozoic
	Igaliko complex - Motzfeldt center, N & S Qoroq, Igdlertfigssalik	Nb-Ta resource	eud, pyro, mon, bas	pyro, col, U, zir, thor, mlyb, flu, aen	neph, arf, anl, nat, alkali fld, alkali pyx, amph, aeg, bio	Proterozoic-- 1310 ± 31 Ma (Rb-Sr, whole rock)
	llimaussaq	Zr, REE resource	eud; minor rink, ste, mon, apa, bri	U, Th, lue, pyro, aen, flu, zeo, sph, Li-mica, eps-mur, ast, vil, snn, chk, Sn, Zr	mcc, alb, neph, hed, kat, neph, fay, alkali pyx, bio, sod, aeg, arf	Proterozoic-- 1168 ± 21 Ma
	llomba	Occurrence	eud	pyro, U-pyro, Nb-tit, Th, apa, zir, beta	aeg, cal, amph	Late Proterozoic - Early Paleozoic
	ltremo		bas, par	pyro	mcc, arf, aeg, orth, neph	
	Jabal Archenu		eud	tit, lor, mag, ilm	neph, anl, sod, zeo, pyx, amph, bio, cata, lav, can	Tertiary
	Jabal Hamra'	Occurrence	mon, bas	zir, uran, Nb, Ta, Sn, Th, hem	qtz, mcc	
	Jabal Sa'id (Jabal Sayid)	Occurrence	bro; all, pyro	flu, zir, thor, Th-uran, irut, ana, sph, hem, Nb, Ta, Sn	qtz, alb, mcc, tour, aeg, arf	
	Jabal Tawlah	Occurrence	pyro, mon	zir, sph, Nb, Ta, Sn, Th	alb, qtz, mcc, mica	

Appendix A. REE Deposits  
USGS OF02-189

DEPOSIT TYPE	Deposit or district name	Host Rock(s)	Company	COMMENTS	REFERENCES
	Fanshan (Fangshan)	subalkaline ultramafic complex; pyroxene syenite, pyroxenite, syenite		Produces relatively low grade P ore at relatively high cost for Hubei Province fertilizer producers.	Fountain, 1999; Wen Lu, 1998; Li and others, 1996; Griffiths, 1995a; British Sulphur Corporation, 1987; McClellan and Saavedra, 1986
	Flowers Bay	peralkaline granite			Woolley, 1987
	Gardiner complex	peridotite, dunite, ijolite, melilitolite, volcanics		Age is weighted mean.	Woolley, 1987; Campbell and others, 1997
	Ghurayyah	microgranite		Enriched in HREE relatively to LREE.	Drysdall and others, 1984
	Gremyakh-Vyrmes	peralkaline granite, ijolite, syenite, urtite, gabbro		The REE-Zr-pyroxchlore mineralization in the ijolite-urtite rocks may be metasomatic.	Kogarko and others, 1995
	Guelb Zeilaga	alkaline igneous rocks		Pipe?	Arab Organisation for Mineral Resources, 1987
	Gzarta-Hudag	panthellerite volcanic rocks, comendite, nepheline syenite		In central Mongolia.	Kovalenko and Yarmolyuk, 1995
	Igaliko complex - Motzfeldt center, N & S Qoroq, Igdlerfigssalik	peralkaline syenites-pulaskite, goyaite, naujaite; syenite, nepheline syenite		Pegmatites related to peralkaline rocks.	Woolley, 1987; Pell, 1996; Möller, 1989a; Roskill, 1988; Northern Miner, 1986
	Ilmaussaq	agpaitic nepheline syenite; arfvedsonite lujavrite, pulaskite, foyaite	Highwood Resources Ltd.	One of the 10 alkaline intrusions of the Gardar Complex. Apatite containing >16.0 wt % REO has been identified. U-Be-Zr-Nb mineralization. Jackson and Christiansen classify as carbonatite. Woolley gives location as 60-56N, 45-45W.	Castor, 1994; Jackson and Christiansen, 1993; Woolley, 1987; Mariano, 1989; Chakhmouradian, 1996; Möller, 1989a; Laval, 1992; Sorensen and others, 1978; Platt, 1996a
	Ilomba	nepheline syenite, aegirine syenite			Woolley, 2001
	Itremo	peralkaline rocks		Pegmatites related to peralkaline rocks; pegmatite-like dikes.	Möller, 1989a; de Kun, 1967
	Jabal Archenu	syenite, phonolite, trachyte			Woolley, 2001
	Jabal Hamra'	silexite plug			Drysdall and others, 1984
	Jabal Sa'id (Jabal Sayid)	alkaline rocks, aplite-pegmatite			Castor, 1994; Drysdall and others, 1984; Matzko and Naqvi, 1978; Arab Organisation for Mineral Resources, 1987
	Jabal Tawlah	leucocratic microgranite-microsyenite-albite sill		High HREE/LREE.	Castor, 1994; Drysdall and others, 1984; Arab Organisation for Mineral Resources, 1987

Appendix A. REE Deposits  
USGS OF02-189

DEPOSIT	Location					Resources	Source & Date of Estimate(s)
TYPE	Deposit or district name	Country	State or Province	Latitude	Longitude	Source	Tonnage and grade
	Jacupiranga	Brazil	Sao Paulo	24-42S	48-08W	Woolley, 1987	
	Jarud Qi, no. 801	China	Inner Mongolia/Jarud Qi	44-37N	120-58E	NIMA, 2001	
	Junguni	Malawi		15-02S	35-17E	Woolley, 2001	
	Kamloops	Canada	British Columbia	50-40N	120-04W	Woolley, 1987	
	Karaganskii	Kyrgyzstan		39-45N	70-00E	Kogarko and others, 1995	
	Karsakpai	Kazakhstan		47-53N	66-25E	Kogarko and others, 1995	
	Khaldzan-Buregtey	Mongolia		48-25N	91-58E	Estimate	>1.2 Mt REE @ 0.3% REE, >0.4 Mt Nb @ 0.1% Nb, >8 Mt Zr @ 2.0% Zr
	Khan Bogdo	Mongolia		43-12N	107-12E	NIMA, 2001	0.3-4.5% REE
	Khibina (Khibiny)	Russia	Kola Peninsula	67-43N	33-47E	Kogarko and others, 1995	9 Mt REO
	Kipawa Lake	Canada	Ontario	46-48N	78-30W	Woolley, 1987	
	Kodal	Norway		59-15N	10-10E	USGS, 2000, MASMLS database	
	Konder	Russia		57-30N	134-25E	Kogarko and others, 1995	
	Korgeredaba	Russia	Tuva	50-05N	97-15E	Kogarko and others, 1995	
	Korsun-Novomirgorodskii pluton margin	Ukraine		48-14N	31-17E	Kogarko and others, 1995	ama 0.2% LREE, 0.1-0.2% Zr, ama 0.02% Nb

Appendix A. REE Deposits  
USGS OF02-189

DEPOSIT			Mineralogy			Geochronology
TYPE	Deposit or district name	STATUS	REE Mineralogy	Other Ore or Significant Minerals	Gangue and Rock-forming Minerals	Age (method, mineral, rock)
	Jacupiranga	P-Lime producer; REE, Ni Occurrence	apa	mag, apa, grn, pyr, pyrh, gal, ilm, pyro, bad, bar, prv, chum	cal, dol, phlo, frs, oliv, ser	125-161 Ma
	Jarud Qi, no. 801	Occurrence	ferg, par?, mon?			
	Junguni	Occurrence	eud, ros, bri	pph, Mn-Ti-lav, woh, kup, Sr-flu, pyro, ast	neph, alkali pyx, bio, arf, sod	Late Jurassic - Early Cretaceous
	Kamloops	Occurrence	eud	gar, zir, mag, pyrh, cpy	mcc, can, alb, aeg, has, neph, nat, qtz	
	Karaganskii	Occurrence	mon	zir, gar, apa, ana, tantaloniobates, mag, Cu, Pb, Zn, As, Mo	neph, liebernite, sod, can	Late Paleozoic
	Karsakpai	Occurrence	all	zir, bad, apa, tit, thor	fld, neph	Early Devonian
	Khaldzan-Buregtey	Occurrence	ferg, all, bas, syn, bri, mon, chev	elp, git, zir, pyro, plit, Ta, Hf, Th, flu	mcc, qtz, alb, arf, aeg	Devonian-- 380-390 Ma
	Khan Bogdo	Occurrence	plit, syn, mon, tit	elp, arm, Nb, Li, Ba, Ta, Hf, Th	arf	Late Paleozoic
	Khibina (Khibiny)	P, NEPH producer	apa, eud, bur, anc, syn, par, ccer, cor, apa, ast, lop, mos, lov, rink	apa, pyro, tit, lam, ast, zir, Ti-mag, vla, woh, git, flu, cry, sid, edi, ilm	cal, ank, arf, aeg-aug, bio, neph, mcc, alkali fld, agr, daw, nah, aen	364.5 Ma
	Kipawa Lake	Potential resource	eud, mos, bri, git, mis, apa	flu, zir, cho, vla, woh, git, hrt, U	neph, fld, agr, aeg, bio, phlo, alb, rie, arf, cal, k-fld	1240 Ma (complex) 995 Ma (min/alt)
	Kodal	Potential resource	apa	Ti-mag, ilm, pyr, tit	cal, talc	Permian
	Konder	Occurrence	eud	lam, lor, mur, tit, ilm, apa, vla, woh	arf, aeg, bio, zeo, orth, horn	
	Korgeredaba	Occurrence	eud, ast, rink	cata	aeg, arf, alb, qtz, ano	304 ± 12 Ma (K-Ar, bio)
	Korsun-Novomirgorodskii pluton margin	Occurrence	all, che	zir, ilm, apa, Nb	fay, hed	

Appendix A. REE Deposits  
USGS OF02-189

DEPOSIT TYPE	Deposit or district name	Host Rock(s)	Company	COMMENTS	REFERENCES
	Jacupiranga	pyroxenite, jacupirangite, ijolite, nepheline syenite, fenite			Mariano, 1989; Azevedo Branco, 1984; Melcher, 1966; Platt, 1996b; Woolley, 1987
	Jarud Qi, no. 801	riebeckite or arfvedsonite granite		Lat-long for the town of Jarud Qi.	Wen Lu, 1998
	Junguni	nepheline syenite, foyaite			Woolley, 2001
	Kamloops	syenite		Low grade Cu mineralization.	Woolley, 1987
	Karaganskii	alkaline syenite, nepheline syenite			Kogarko and others, 1995
	Karsakpai	lepidomelane syenite, liebenerite syenite, nepheline syenite		REE associated with albitization of syenites.	Kogarko and others, 1995
	Khaldzan-Buregtey	peralkaline granite, gabbro, basalt, pantellerite dikes, syenite		In western Mongolia. Discovered in 1984. Host rocks have been metasomatized.	Kovalenko and Yarmolyuk, 1995; Kovalenko and others, 1995
	Khan Bogdo	peralkaline granite, syenite, pegmatites		In southern Mongolia. Lat-long for town of Khan Bogdo.	Möller, 1989a; Kovalenko and others, 1976; Kovalenko and Yarmolyuk, 1995
	Khibina (Khibiny)	alkaline metasomites-- foyaite, nepheline syenite, ijolite, rischorrite, urtite, pegmatites, carbonatite?		Largest igneous apatite deposit in the world, in urtite-ijolite. REE minerals largely in alkaline rocks not carbonatite (Kogarko and others, 1995). Small bodies of carbonatites contain ama 9% REE, 6.5% Sr, 3% Ba.	Castor, 1994; Kogarko and others, 1995; Zaitsev, 1996; Chakhmouradian, 1996; Beliopetskii and Voloshin, 1996; Wall and Mariano, 1996; Pell, 1996; Neary and Highley, 1984; Hedrick and Templeton, 1991
	Kipawa Lake	peralkaline quartz syenite, amphibole schist		Mineralization probably resulted from high-grade metamorphism without obvious igneous relics. Geochemistry of some eudialyte-rich rocks strongly suggests metasomatic origin.	Castor, 1994; Woolley, 1987; Currie and Van Breemen, 1996
	Kodal	jacupirangite dike	Norsk Hydro (1978)		Notholt, 1979; British Sulphur Corporation, 1987; Möller, 1989a; Bugge, 1978
	Konder	alkaline pegmatite in dunite, olivinite, clinopyroxenite			Kogarko and others, 1995
	Korgeredaba	foyaite, pulaskite, essexite, granite, peralkaline syenite			Kogarko and others, 1995
	Korsun-Novomirgorodskii pluton margin	monzosyenite, syenite, rapakivi granite, gabbro, granite		REE and Zr concentrated in syenite. Syenite enclosed by rapakivi granite.	Kogarko and others, 1995



Appendix A. REE Deposits  
USGS OF02-189

DEPOSIT	Location					Resources	Source & Date of Estimate(s)
TYPE	Deposit or district name	Country	State or Province	Latitude	Longitude	Source	Tonnage and grade
	Kovdor Complex (Kovdorskoe)	Russia		67-34N	30-24E	MASMILS, 2000	
	Kpong area	Ghana		6-06N	0-03E	Woolley, 2001	
	Kribi (Mont des Eléphants, Mont de Rocher du Loup)	Cameroon		02-57N	09-55E	Rand McNally & Company, 1981	
	Kutessai-II	Kyrgyzstan		42-40N	76-10E	ESCAP, 1998	0.088 Mt REE @ 0.39% REE
	Kyzyl-Ompul	Kyrgyzstan	Baikal	42-21N	75-55E	Kogarko and others, 1995	
	Lackner Lake (Nemegos)	Canada	Ontario	47-45N	83-10W	Woolley, 1987	Zone 6- 4.8Mt**; 69.9% mag, 21.9% apa, 2.72% REO*
	Langesundsfjord District (Larvik)	Norway	Oslo area	59-00N	09-45E	Rand McNally & Company, 1981	
	Laramie Anorthosite Complex	USA	Wyoming/Albany County				
	Lavrent'evskii	Russia	Kola Peninsula	67-16N	37-01E	Kogarko and others, 1995	
	Letitia Lake - Mann 1	Canada	Labrador	54-14N	62-23W	Woolley, 1987	
	Los Archipelago (Los Islands, Iles de Los)	Guinea	Tamra, Roume, & Kassa islands	9-28N	13-48W	Woolley, 2001	
	Lovozero	Russia		67-47N	34-45E	Kogarko and others, 1995	>1000. Mt @ 0.8-1.5% REO
	Lutala (Serra da Neve)	Angola	Namibe	13-43S	13-10E	NIMA, 2001	

Appendix A. REE Deposits  
USGS OF02-189

DEPOSIT			Mineralogy			Geochronology
TYPE	Deposit or district name	STATUS	REE Mineralogy	Other Ore or Significant Minerals	Gangue and Rock-forming Minerals	Age (method, mineral, rock)
	Kovdor Complex (Kovdorskoe)	Occurrence		magnetite, apatite, baddeleyite, forsterite, calcite, phlogopite, francolite		Middle Devonian
	Kpong area	Occurrence	mon, all	tit, apa, zir, flu	cal, bio, neph, can, gar	
	Kribi (Mont des Elephants, Mont de Rocher du Loup)	Occurrence				
	Kutessai-II	Active mine (1998)	mon, xen, Y-syn, Y-par	Ta, Nb, zir, gal, thor, mlyb, cry, apy, azu, sid, mar, sph, pyr, Sn, cin, sch		Permian
	Kyzyl-Ompul	Occurrence		tit, apa, zir, Ti-mag, flu, pyr	dio, neph, fld, amph, bio, oliv, qtz	Permian
	Lackner Lake (Nemegos)	Nb-P potential	pyro	mag, apa, Nb, flu, pyro	aeg-aug, neph, cal, can, bio, fay, zeo, wol, mel	1170 ± 24 Ma (K-Ar, horn, pegmatite); 1190 ± 25 Ma (K-Ar, rie, quartz syenite)
	Langesunds fjord District (Larvik)	Occurrence	22 REE-bearing minerals including apa; pyro, woh, eud, zirk, lop		neph	Permian?
	Laramie Anorthosite Complex	Occurrence	all	apa, ilm, mag	clinopyx	Middle Proterozoic
	Lavrent'evskii	Occurrence	aes (Y), ferg, Y-tit, tha, bri-(Y), gad, all, che, pyro, lop, mon, bas	zir	qtz, ama	Early Proterozoic- Karelian
	Letitia Lake - Mann 1	Occurrence	eud	U, Mn-pec, aen, nep, pyro, bry, eud, nphy	alb, arf, aeg, pec, qtz	Middle Proterozoic
	Los Archipelago (Los Islands, Iles de Los)	Occurrence	eud, ros, pyro, ast, rink	flu, gal, cata, vil, stacyite, kup, Zr, woh	arf, aeg, ast, neph, pph, sod, anl, lav, srn	104.3 ± 1.7 Ma (Rb-Sr, whole rock)
	Lovozero	Nb producer w/ byproduct REE from loparite	lop, eud, rink, anc, mos, mon, bur, bas, hua, rhab, syn, carbonate-fapa	pyro, apa, zir, str, mur, lam, vil, tit, lav, ilm, mur, lam, lovo, chinglusuite, flu?	neph, mcc, arf, anl, aeg, dio, anl, alb, nat, sod	386 ± 12 Ma to 406 ± 12 Ma (K-Ar, neph, urtite-ijolite)
	Lutala (Serra da Neve)		eud?, lav?	flu	neph, anl, bio, aeg-aug, arf	

Appendix A. REE Deposits  
USGS OF02-189

DEPOSIT TYPE	Deposit or district name	Host Rock(s)	Company	COMMENTS	REFERENCES
	Kovdor Complex (Kovdorskoe)	apatite-forsterite rocks; ultrabasic rocks (pyroxenite, pyroxene-olivine rock, and olivinite); ijolite; melteigite; nepheline-pyroxenite			Harben and Kuzvart, 1996; Notholt, 1979; British Sulphur Corporation, 1987; Lyachov, 2000; Troitsky and others, 1998
	Kpong area	alkaline gneiss		This deposit variously described as a carbonatite, a metasomatic introduction of calcite into a mylonite, and as altered alkaline volcanic rocks.	de Kun, 1987; Woolley, 2001
	Kribi (Mont des Eléphants, Mont de Rocher du Loup)	syenite			Roskill, 1994; de Kun, 1987
	Kutessai-II	granophyre, dikes			ESCAP, 1998
	Kyzyl-Ompul	alkaline syenite, nepheline syenite, leucosyenite			Kogarko and others, 1995
	Lackner Lake (Nemegos)	nepheline syenite, ijolite, malignite, syenite	Multi-Minerals Ltd. (1982)	* Grade of REO is for non-metallic fraction (which is over 90 volume % apatite. ** Other ore zones with no REE not included.	Sage and Watkinson, 1991; Woolley, 1987; Harben and Kuzvart, 1996; Pell, 1996; British Sulphur Corporation, 1987; Notholt and others, 1990
	Langesundsfjord District (Larvik)	nepheline syenite pegmatites in monzonite (larvikite)		Pegmatites related to peralkaline rocks.	Larsen, 1996; Möller, 1989a
	Laramie Anorthosite Complex	syenite, magnetite-ilmenite bodies		T20-22N R70-71W	King, 1991
	Lavrent'evskii	aegirine-arfvedsonite granite, lepidomelane granite		Lat-long for the town of Lavrentevskiy.	Belolipetskii and Voloshin, 1996; Kogarko and others, 1995
	Letitia Lake - Mann 1	peralkaline volcano-plutonic complex		Y-rich. Prospected as U and Be deposit. Average grades of 0.35-0.4% BeO proved in one zone.	Woolley, 1987; Castor, 1994; Howse and Wardle, 2001
	Los Archipelago (Los Islands, Iles de Los)	peralkaline nepheline syenite		Islands extensively covered by bauxite.	Moreau and others, 1996; Woolley, 2001
	Lovozero	lujavrite, foyaite, urtite, syenite, nepheline syenite; min also in alkaline pegmatites and hydrothermal veins		Loparite min. is in urtite- foyaite-lujavrite rocks. Eudialyte lujavrite complex is being assessed for Zr and Y. Towner gives longitude as 35-05E.	Castor, 1994; Kogarko and others, 1995; Hedrick and Templeton, 1991; Mariano, 1989; Chakhmouradian, 1996; Belolipetskii and Voloshin, 1996
	Lutala (Serra da Neve)	nepheline syenite		Lat-long is a central location for Serra da Neve.	Woolley, 2001

Appendix A. REE Deposits  
USGS OF02-189

DEPOSIT TYPE	Deposit or district name	Location				Source	Resources	Source & Date of Estimate(s)
		Country	State or Province	Latitude	Longitude		Tonnage and grade	
	Malotersyanskii	Ukraine		48-20N	35-39E	Kogarko and others, 1995		
	Maoniuping	China	Sichuan				0.4 Mt proven resvs @1-8% REO (ave. 2%); 1-8% REO	Wu and others, 1996
	Meponda	Mozambique		13-27S	34-54E	Woolley, 2001		
	Mianning	China	Sichuan	28-33N	102-11E	NIMA, 2001		
	Miask	Russia						
	Mount Prindle (Roy Creek)	USA	Alaska	65-29N	147-06W	Armbrustacher, 1989	5-10% REE by volume in drill core	Nokleberg and others, 1996
	Mount St. Hilaire	Canada	Quebec	45-33N	73-10W	Woolley, 1987		
	Mutum	Brazil	Para	01-53N	57-25W	Woolley, 1987		
	Nejoio	Angola		13-40S	13-14E	Woolley, 2001		
	Nemegosenda Lake	Canada	Ontario	48-00N	83-05W	Woolley, 1987		
	Norra Kärr	Sweden						
	Nosy Komba	Madagascar		13-28S	48-20E	Woolley, 2001		
	Pajarito Mountain	USA	New Mexico	33-14N	105-26W	Woolley, 1987	24 Mt @ 0.18% Y <sub>2</sub> O <sub>3</sub> , 1.2% ZrO <sub>2</sub> ; 2.4 Mt @ 0.167% REO (1989)	Mariano, 1989; Jackson and Christiansen, 1993
	Pilansberg Complex (Pilanesberg, Pilaan's berg)	South Africa	Transvaal	25-14S	27-04E	Rand McNally & Company, 1981	13.5 Mt @ 0.7% REO + ThO <sub>2</sub> , 1.2 Mt @ 6.54% REO + ThO <sub>2</sub> , and 0.024 Mt @ 10% REO + ThO <sub>2</sub>	Mariano, 1989
	Pocos de Caldas (Morro do Ferro)	Brazil	Minas Gerais, Sao Paolo	21-55S	46-34W	Azevedo Branco, 1984	>1.0 Mt @ 4% REO, 1% ThO <sub>2</sub> ; 1.5 Mt bas or 0.050 t REO (1990); 6 Mt @ 3% REO	Roskill, 1988; Jackson and Christiansen, 1993; Singer, 1998
	Ponoiskii	Russia		67-01N	39-12E	Kogarko and others, 1995		

Appendix A. REE Deposits  
USGS OF02-189

DEPOSIT TYPE	Deposit or district name	STATUS	Mineralogy			Geochronology
			REE Mineralogy	Other Ore or Significant Minerals	Gangue and Rock-forming Minerals	Age (method, mineral, rock)
	Malotersyanskii	Occurrence	pyro, bas, all	zir, pyro, U-pyro, thor	aeg, alb, mica, car	1740 Ma (K-Ar, amph, nepheline syenite)
	Maoniuping	Active REE Producer	bas; lesser mon, all, bri, xen, aes, che	pyro, bar, flu, zir, pyr, gal, col, thor, Mn-pec, aen	epi, aeg, alb, mcc, qtz, arf, bio, pec, cal	27.8-40.3 Ma (K-Ar, arf & bio)
	Meponda	Occurrence	all, che, mon, ferg, bri	pyro, col, Nb, Ta, U, zir, mag, apa, tit, flu	car, bio	Proterozoic
	Mianning	Producer	bas, par, mon, xen, all, tit, apa, aes, che, sam	bar, flu, beta, gar, mag, ilm, col, zir	cal, aeg, fld	
	Miask		bri, fers, aes	pyro, zir, thor, beckelite, irut		
	Mount Prindle (Roy Creek)		all, bri, bas, mon, xen	thrn, uran, thor, flu, apa, tit, mag	neph, k-fld, aeg, aug, rie, bio, qtz	86.7 ± 3.6 Ma 85.4 ± 6.4 Ma (K-Ar, bio)
	Mount St. Hilaire	Occurrence	anc, lpha, eud,	mag, ilm, flu, str, epd, cata, lav, ast	qtz, aeg, bio, sod, neph, can, alb, nat?	120-134 Ma (various)
	Mutum	Occurrence	RE phosphates	tit, apa, flu	aeg, can, neph, car, epi	1026 ± 28 Ma (K-Ar, fld)
	Nejoio	Occurrence	ros, mos, lav, eud	tit, apa, zir, flu, mel, pyro	bio, sod arf, horn	104.03 ± 0.8 Ma
	Nemegosenda Lake	Nb Resource w/ potential for byproduct REE	pyro?	pyro, U, Th, zir, apa, mag, flu, bar, gal, sph, cpyr, gra	neph, aeg, neph, bio, sodic amph, wol, mel	min. 1010 Ma (K-Ar, neph)
	Norra Kärr	Occurrence?	eud	Zr		1540 Ma
	Nosy Komba	Occurrence	rink, mos	zir, flu	neph, anl, aeg, bio	10.4 Ma
	Pajarito Mountain	Potential resource	eud, mon, apa, kai	apa, flu, zir	arf, rie, aeg, qtz, mcc, alb, horn	Proterozoic
	Pilansberg Complex (Pilanesberg, Pilaan's berg)		bri, eud, pyro, all, mos	flu, apa, str, Th, Zn, sulfides, mag, tit, zir, aen, lam, ast, cata	aeg, arf, kat, fld, cal, can, sod, pec	Proterozoic
	Pocos de Caldas (Morro do Ferro)	Past producer U, Zr, Bauxite	all, bas, eud, cer	Th, U-bad, zir, caldasite, tgum, mag, flu, Mo, ast, lav, ros, gib	nat, can, nephm kao	60.8 Ma (K-Ar, lujarite) 86.3 Ma (Rb-Sr, lujavrite- khibinite)
	Ponoiskii	Occurrence?	mon	zir, tit, apa, ast, flu	qtz, mcc, alb, aeg, amph	2405 Ma (Pb, zir)

Appendix A. REE Deposits  
USGS OF02-189

DEPOSIT TYPE	Deposit or district name	Host Rock(s)	Company	COMMENTS	REFERENCES
	Malotersyanskii	syenites, foyaite		Probably associated with the Orekhovo-Pavlograd fault. REE occurs in metasomatic rocks.	Kogarko and others, 1995
	Maoniuping	quartz syenite, nordmarkite		Bastnasite-barite-carbonate veins associated with nordmarkite.	Wall and Mariano, 1996; Wu and others, 1996
	Meponda	syenite, nepheline syenite			Woolley, 2001
	Mianning	aegirine alkaline granite	Advanced Material Resources	Lat-long for Mianning population center. At Wutoushan Mountain.	Zhang Peishan and others, 1995; Wu and others, 1995; Mariano, 1994a, b
	Miask	albitite in nepheline syenite massif			Möller, 1989a
	Mount Prindle (Roy Creek)	syenite, nepheline syenite, pyroxenite		Selected material contained ama 25% REE and 15% Th. LREE more abundant in the quartz-bearing syenites.	Woolley, 1987; Mariano, 1981b; Mariano, 1989; Armbrustmacher, 1989; Nokleberg and others, 1996
	Mount St. Hilaire	breccias, nepheline syenite, nepheline diorite and monzonite, gabbro			Mariano, 1989; Woolley, 1987
	Mutum	nepheline syenite			Woolley, 1987
	Nejoio	fenite, nepheline syenite			Woolley, 2001
	Nemegosenda Lake	carbonatite, syenite breccia, pyroxenitic fenite,, malignite, jacupirangite		20 Mt @ 0.47% Nb2O5.	Woolley, 1987; Pell, 1996; British Sulphur Corporation, 1987
	Norra Kärr	peralkaline syenite		Eudialyte contains 1.3% Y.	Castor, 1994
	Nosy Komba	phonolite, nepheline syenite, syenite, perthite			Woolley, 2001
	Pajarito Mountain	syenite, melasyenite, quartz syenite		Quartz-bearing syenite contains ama 20% eud and 5% flu. Apatite containing ama 19.2% REO has been found in the peralkaline granites. Check Mining Engineering, 1989, July, p. 515 for tonnage.	Castor, 1994; Woolley, 1987; Mariano, 1989; Jackson and Christiansen, 1993
	Pilansberg Complex (Pilanesberg, Pilaan's berg)	foyaite, syenite, tinguaitite		Britholite-bearing veins and small areas of eudialyte syenite.	Mariano, 1989; Castor, 1994; Möller, 1989a; Woolley, 2001; Neary and Highley, 1984; Coetzee, 1976; von Backstrom, 1976
	Pocos de Caldas (Morro do Ferro)	highly weathered lujavrite and khibinite, nepheline syenite, phonolite; bauxite		Eudialyte contents range from 0 to 11% in the relatively small host bodies. Was once one of world's biggest baddeleyite deposits, but now nearly depleted. Weathered magnetite stockwork in alkaline rocks.	Castor, 1994; Azevedo Branco, 1984; Jackson and Christiansen, 1993; Woolley, 1987; Neary and Highley, 1984; Wedow, 1967; Ellert, 1966
	Ponoiskii			Classification uncertain.	Kogarko and others, 1995

Appendix A. REE Deposits  
USGS OF02-189

DEPOSIT TYPE	Deposit or district name	Location				Source	Resources	Source & Date of Estimate(s)
		Country	State or Province	Latitude	Longitude		Tonnage and grade	
	Oiganlaing	China	Inner Mongolia				1.5% REO, 4-10% P <sub>2</sub> O <sub>5</sub>	Wu and others, 1996
	Red Wine	Canada	Labrador	54-05N	62-35W	Woolley, 1987		
	Rexspar (Birch Island)	Canada	British Columbia	51-34N	119-54W	Nokleberg and others, 1997		
	Saima	China	Liaoning	40-59N	124-12E	Zhang Peishan and others, 1995	0.3-4.5% REO	Wu and others, 1996
	Sakhariokskii (Sacharijok)	Russia	Kola/Karelia	67-40N	36-12E	Kogarko and others, 1995		
	Seligdar	Russia	Siberia	58-24N	125-18E	Kogarko and others, 1995	300 Mt @6-8% P <sub>2</sub> O <sub>5</sub>	Kogarko and others, 1995
	Shallow Lake	Canada	Labrador					
	Shartolgoi	Mongolia	Uvs	49-03N	92-45E	ESCAP, 1999		
	Shvanidzorskii	Armenia		39-00N	46-23E	Kogarko and others, 1995		
	Sierra de Tamaulipas	Mexico	Tamaulipas	23-12N	98-24W	Woolley, 1987	1.3-3.0% REO	
	Songwe Syenite (includes Ilomba and Ulindi intrusions)	Malawi		9-33S	33-16E	Woolley, 2001		
	Srednetarskii (Zaangarskii)	Russia		58-24N	93-35E	Kogarko and others, 1995		
	Srednevorogovskii	Russia	Enisei	61-15N	90-02E	Kogarko and others, 1995		
	Strange Lake (Lac Brisson)	Canada	Quebec, Labrador	56-18N	64-07W	Woolley, 1987	52. Mt @ 0.54% REE, 0.31% Y <sub>2</sub> O <sub>3</sub> , 2.9% ZrO <sub>2</sub> (1983); 55. Mt @ 0.38% Y, 2.99% ZrO, 0.29% Nb <sub>2</sub> O <sub>5</sub> , 0.076% BeO, unspecified REO; 1.3% REO and 0.66% Y	Castor, 1994; Hedrick, 1997; Jackson and Christiansen, 1993

Appendix A. REE Deposits  
USGS OF02-189

DEPOSIT		Mineralogy				Geochronology
TYPE	Deposit or district name	STATUS	REE Mineralogy	Other Ore or Significant Minerals	Gangue and Rock-forming Minerals	Age (method, mineral, rock)
	Oiganlaing	P-REE resource	apa, all	tit	dio, phlo, ano, arf	Proterozoic
	Red Wine	Occurrence	eud, joa, ast, kar	apa, aen, lam, ramsayite, cata, flu, pec	mcc, alb, neph, arf, mica, pec, omph, aeg, rie	1345 ± 75 Ma, average (Rb-Sr, whole rock)
	Rexspar (Birch Island)	Occurrence		flu, U, Sr, Th		Mississippian?
	Saima	REE, U, Th, Nb resource	rink, mos, lop, eud	cata, str, U-pyro, beta, U-thor, aldanite, apa, ilm, zir, tit, lam	neph, bio, aeg, can, nat, mcc, pec	217-245 Ma
	Sakhariokskii (Sacharijok)	Occurrence	all, bri, all, bas	pyro, flu, gal, apa, zir	neph, cal, aeg, alb, mcc, aeg-aug, amph, bio, Fe-has	1740-2260 Ma (K-Ar, neph)
	Seligdar	P resource	apa, mon, all	mrt, zir, rut, tour, top, pyr, cpy, gal, mgs, tit	dol, cal, qtz, phlo, serp	Late Proterozoic
	Shallow Lake	Occurrence?	eud			
	Shartolgoi	Occurrence		Zr, Nb, Ta		
	Shvanidzorskii	Occurrence	mon	Th, U, Pb, pyro, flu, ilm, apa, tit, zir, bad	bio, olig, nep, aeg, sod, can, cal, tour	37-40 Ma (various)
	Sierra de Tamaulipas	Occurrence	eud, mon, bri, all	apa, aen, lav, mag, zir, bar, sph, rut, ilm, pyr, pyrh, Nb, tit	fld, aeg, rie, arf, hed, bio, sodic amphs, neph, minor qtz, epi, cal, chl, src, can, anl	28.0 ± 0.8 Ma (K-Ar, nephelinite)
	Songwe Syenite (includes Ilomba and Ulindi intrusions)		bas, eud	mag, ilm, pyro, apa, zir, gar		
	Srednetatarskii (Zaangarskii)	Occurrence	eud	ast, zir, flu, lav, tit, apa	neph, mcc, aeg	660-675 Ma (various)
	Srednevorogovskii	Occurrence	lop, mon, all, eux	apa, flu, gar, rut, tit, zir, irut, pyro, tour, cas, cpy, pyr, pyrh, mlyb, tour, cas	qtz, bio, arf, rie, alb, mcc	526-567 Ma (K-Ar, normarkite & syenite)
	Strange Lake (Lac Brisson)	Potential resource	gad, bas, kai, pyro, mon, all, apa, ast	git, apa, zir, Nb, Be, flu, nar, elp, thor, hem, arm, lei, tit, gal, ast, aen	aeg, arf, alb, qtz, k-fld	1271±30 Ma (K-Ar, amph, granite)



Appendix A. REE Deposits  
USGS OF02-189

DEPOSIT TYPE	Deposit or district name	Host Rock(s)	Company	COMMENTS	REFERENCES
	Qiganlaing	alkalic pegmatite		Alkalic pegmatite may be associated with carbonatite.	Wu and others, 1996
	Red Wine	syenite, gneiss		Has been U, Zr, Be, and REE prospect. Same as Shallow Lake? Age is average of 11 whole rock samples with relic igneous textures.	Woolley, 1987; Castor, 1994
	Rexspar (Birch Island)	alkalic volcanics			Nokleberg and others, 1997
	Saima	Fengcheng alkaline complex--syenite, nepheline syenite, phonolite		Significant U, Th, Nb potential. Lat-long for town of Saima.	Wu and others, 1996; Zhang Peishan and others, 1995
	Sakhariokskii (Sacharijok)	nepheline syenite, syenite		Syenite is metasomatically altered.	Kogarko and others, 1995; Belolipetskii and Voloshin, 1996
	Seligdar	apatite rock, syenite porphyry		Potassic alkaline igneous complex. Unclear if deposit high-temperature apatite-bearing carbonatite or phosphate mobilized from surrounding country rocks.	Möller, 1989a; Kogarko and others, 1995
	Shallow Lake	syenite of Red Wine Complex		Same as Red Wine?	Castor, 1994
	Shartolgoi	alkaline granites			ESCAP, 1999
	Shvanidzorskii	peralkaline syenite, nepheline syenite			Kogarko and others, 1995
	Sierra de Tamaulipas	nepheline syenite, ijolite, urtite, juvite, gabbro, diorite		Veins in outcrop of alkaline rocks with area of 9 km <sup>2</sup> . Area has undergone fenitization (alkaline metasomatism). Most veins <2 m wide.	Woolley, 1987; Gómez-Caballero, 1990; Elias-Herrera and others, 1990
	Songwe Syenite (includes Ilomba and Ulindi intrusions)	syenite		Central location for large outcrop area.	Woolley, 2001
	Srednetatarskii (Zaangarskii)	ijolite, foyaite, syenite		REE minerals in pegmatites.	Kogarko and others, 1995
	Srednevorogovskii	nordmarkite, peralkaline granite			Kogarko and others, 1995
	Strange Lake (Lac Brisson)	pegmatite in peralkaline granite	Iron Ore Co. of Canada and Ming Financial Corp. (1996)	Discovered in 1979. 250 km NE of Schefferville. Be deposit. Complex only partially exposed. Peralkaline granite complex about 6 km in diameter. Mineralization in roof zone of magma chamber.	Anstett, 1986; Castor, 1994; Jackson and Christiansen, 1993; Mariano, 1983b; Mariano, 1989; Miller, 1996; Roskill, 1994; Hedrick, 1997; Laval, 1992; Roskill, 1988; Howse and Wardle, 2001

Appendix A. REE Deposits  
USGS OF02-189

DEPOSIT	Location					Resources	Source & Date of Estimate(s)
TYPE	Deposit or district name	Country	State or Province	Latitude	Longitude	Source	Tonnage and grade
	Sucunduri	Brazil	Amazonas	8-32S	59-28W	Ulbrich and Gomes, 1981	
	Sugar Loaf (Mumbwa North, NW Mumbwa)	Zambia	Central	14-45S	26-50E	Estimate for location north of Mumbwa	
	Synnyr	Russia	Khrebet	56-55N	111-20E	Kogarko and others, 1995	204-349 Ma
	Tezhsar	Armenia		40-41N	44-39E	Kogarko and others, 1995	
	Thor Lake (Blachford Lake)	Canada	Northwest Territories	62-06N	112-40W	Woolley, 1987	65 Mt @ 0.3% Ta, 0.4% Nb, 1.7% REE, 3.5% Zr; Proven-- 0.507 Mt @ 0.17% Y oxide, 1.11% Be oxide; 0.51 Mt @ 0.45% REO (1987)
	Tiguesmat el Akhdar (Tigsmat)	Mauritania		24-51N	8-11W	Woolley, 2001	
	Tleumbetskii	Kazakhstan		50-46N	77-02E	Kogarko and others, 1995	
	Tommot	Russia		58-23N	125-13E	Kogarko and others, 1995	0.1-0.2% Y in grab samples
	Toongi (Dubbo)	Australia	New South Wales	32-26S	148-36E	Australia National Mapping Agency, 2001, accessed at URL <a href="http://www.auslig.gov.au/mapping">http://www.auslig.gov.au/mapping</a>	Indicated-- 10 Mt @ 0.12% Y <sub>2</sub> O <sub>3</sub> , 0.75% REO, 2% ZrO <sub>2</sub> , 0.04% HfO <sub>2</sub> , 0.5% Nb <sub>2</sub> O <sub>5</sub> , 0.3% Ta <sub>2</sub> O <sub>5</sub> ; Inferred-- 40 Mt
	Topsails	Canada	Newfoundland	48-45N	57-00W	Woolley, 1987	
	Tsakhirt	Mongolia	Hovd	48-33N	91-56E	ESCAP, 1999	
	Ulaan Tolgoi	Mongolia	Uvs	49-32N	93-01E	ESCAP, 1999	
	Ulkanshoe	Russia?		56-19N	134-49E	Nokleberg and others, 1997	

Appendix A. REE Deposits  
USGS OF02-189

DEPOSIT TYPE	Deposit or district name	STATUS	Mineralogy			Geochronology
			REE Mineralogy	Other Ore or Significant Minerals	Gangue and Rock-forming Minerals	Age (method, mineral, rock)
	Sucunduri	Occurrence	eud			
	Sugar Loaf (Mumbwa North, NW Mumbwa)	Occurrence	hapa	apa, hem, mag, pyr, cpyr, Cu phosphates	qtz, horn, bio	
	Synnyr	Occurrence	eud, all, apa, bas	mag, tit, rut, zir, prv, bad,	bio, neph, aeg, can, gar, phlo, wol, epi, crn, sta, kya	300-400 Ma
	Tezhsar	Occurrence		flu	car, alb, alkali fld, bio, musc	37-39 Ma (K-Ar)
	Thor Lake (Blachford Lake)	Potential. Byproduct of Be mining	xen, gad, Y-flu, bas, par, syn, mon	phe, col, flu, thor, bert, zir, Nb- tan, sph, pyr, mag, sid, plit	ank, aeg, rie, arf, qtz, mcc, alb, bio, chl, cars	Early Proterozoic- approx. 2100 Ma
	Tiguesmat el Akhdar (Tigsmat)	Occurrence	all	flu, ast, tit	qtz, mcc, aeg, rie, bio	1912 ± 47 Ma (Rb-Sr, whole- rock)
	Tleumbetskii	Occurrence	all, mon	flu, zir, Fe-thor, top, ilm, tit, apa, pyr, bar, col, gar, sch, rut, ana, gal, wul	rie, arf, bio, alb, chl	Early Permian
	Tommot	Occurrence	lop, rink, che, ytt, mon, y- tit, ferg, gad	inn, lom, Ca-rink, lab, pyro, zir	alb, aeg	
	Toongi (Dubbo)	Prospect		Zr, Ta, Nb, Hf		
	Topsails	Occurrence	mon, all	aen, zir, flu, mag	aeg, amph, qtz	421 ± 7 Ma, average (Rb-Sr)
	Tsakhirt	Occurrence	Y	Nb, Ta, Zr		
	Ulaan Tolgoi	Occurrence		Ta, Nb, Zn		
	Ulkanshoe		che, par, bas, gag	col, zir, cas, wlf, cbe, phe, pyro, plit, bert, hlv, Au, thor		

Appendix A. REE Deposits  
USGS OF02-189

DEPOSIT TYPE	Deposit or district name	Host Rock(s)	Company	COMMENTS	REFERENCES
	Sucunduri	agpaitic nepheline syenite complex, trachyte, phonolite			Ulbrich and Gomes, 1981; Woolley, 1987; Ulbrich and Gomes, 1981
	Sugar Loaf (Mumbwa North, NW Mumbwa)	syenite, brecciated syenite		North of Mumbwa. Phosphate mineralization in 3 forms: apatite with Cu-Fe mineralization, apatite pegmatites, supergene Cu phosphates. Too small and comparatively low grade for development. Apatite in pegmatite has high concentrations of yttrium. Discovered 1958.	Simukanga and others, 1994
	Synnyr	nepheline syenite, pulaskite, shonkinite			Möller, 1989a; Notholt, 1979; Hedrick and Templeton, 1991; Belolipetskii and Voloshin, 1996; Kogarko and others, 1995
	Tezhsar	nepheline syenite, pseudoleucite prophyry		Veins in nepheline syenite.	Kogarko and others, 1995
	Thor Lake (Blachford Lake)	peralkaline syenite, gabbro, granite	Highwood Resources Ltd. And Hecla Mining Co. of Canada (1988)	Small, remote deposit. The T Zone deposit has significant REE, Y, and Be mineralization. Deposits are part of the Blachford Lake alkaline complex.	Castor, 1994; O'Driscoll, 1988; Jackson and Christiansen, 1993; Trueman and others, 1985; Taylor and Pollard, 1996; Möller, 1989a; Laval, 1992; Roskill, 1988
	Tiguesmat el Akhdar (Tigsmat)	peralkaline granite			Arab Organisation for Mineral Resources, 1987; Woolley, 2001
	Tleumbetskii	peralkaline granite, syenite		Rare earth phosphates and REE-greisen-type mineralization.	Kogarko and others, 1995
	Tommot	syenite, larvikite, pulaskite		20 ore bodies and pegmatites in deposit. Nokleberg gives location as 68-24N, 141-14E.	Kogarko and others, 1995; Nokleberg and others, 1997
	Toongi (Dubbo)	altered trachytic intrusive	Alkane Exploration NL (1999)	50 pegmatites.	Lishmund and others, 1999; Mining Journal, 1998; Roskill, 1988; Hedrick, 2000
	Topsails	peralkaline granite, syenite, gabbro, comenditic flows and peralkaline ignimbrites		Age is average of 5 samples.	Woolley, 1987
	Tsakhirt	alkaline granites and pegmatites			ESCAP, 1999
	Ulaan Tolgoi	albitized alkaline syenite			ESCAP, 1999
	Ulkanshoe	alkalic granitic stock			Nokleberg and others, 1997

Appendix A. REE Deposits  
USGS OF02-189

DEPOSIT	Location					Resources	Source & Date of Estimate(s)	
TYPE	Deposit or district name	Country	State or Province	Latitude	Longitude	Source	Tonnage and grade	
	Umm al Birak	Saudi Arabia		23-22N	39-13E	Drysdall and others, 1984	6.6 Mt @0.14% REE+Y	Drysdall and others, 1984
	Vedi-Azatskii	Armenia		39-59N	45-00E	Kogarko and others, 1995		
	Wangu Hill	South Africa		28-48S	31-20E	Woolley, 2001		
	Western Keiv (Rovozero, Platongora, Yumperuaiv)	Russia	Kola Peninsula	67-47N	36-30E	Kogarko and others, 1995		
	White Tundra	Russia		67-28N	35-50E	Kogarko and others, 1995		
	Wind Mountain (see Cornudas Mtns)	USA	New Mexico	32-02N	105-32W	Potter, 1996		
	Yastrebits	Ukraine		51-14N	28-51E	Kogarko and others, 1995		
	Yousuobao	China	Hebei				0.15-2.6% REO, 18-36% P <sub>2</sub> O <sub>5</sub>	Wu and others, 1996
<b>HYDROTHERMAL FE-OXIDE</b>								
	Mineville dumps	USA	New York	44-04N	73-29W	Jackson and Christiansen, 1993	15.7 Mt @ 1.04% REO (1983)	Jackson and Christiansen, 1993
	Olympic Dam	Australia	South Australia	30-27S	136-53E	Jackson and Christiansen, 1993	0.5% REE on average; 2000 Mt @ 0.24-0.45% La + Ce; 0.3285% REO	Castor, 1994; Neary and Highley, 1984; Jackson and Christiansen, 1993
	Pea Ridge	USA	Missouri				0.6 Mt @ 12% REO	Whitten and Yancey, 1990
	Scrub Oaks	USA	New Jersey					
<b>OTHER IGNEOUS-AFFILIATED (INCLUDING PEGMATITES AND VEINS)</b>								
	Alice Springs	Australia	Northern Territory	23-04S	134-33E	Jackson and Christiansen, 1993	1 Mt @ 4% all	O'Driscoll, 1988
	Atlin-Ruffner	Canada	Ontario	45-01N	78-11W	Canada Department of Energy, Mines, and Resources, 1984	0.0366 Mt @ 2.29% CeO <sub>2</sub>	Canada Department of Energy, Mines, and Resources, 1984
	Azovske	Ukraine		45-35N	34-34E	NIMA, 2001		
	Big Creek	USA	Wyoming/Carbon County					

Appendix A. REE Deposits  
USGS OF02-189

DEPOSIT		Mineralogy				Geochronology
TYPE	Deposit or district name	STATUS	REE Mineralogy	Other Ore or Significant Minerals	Gangue and Rock-forming Minerals	Age (method, mineral, rock)
	Umm al Birak		mon, bas, pyro	zir, flu, sch, thor(?), cpyr	alb, mcc, aeg, arf, bio, qtz	
	Vedi-Azatskii	Occurrence		Cu, Mo, Hg		12 Ma (K-Ar, whole rock)
	Wangu Hill	Occurrence		mag, Nb, An, Zr	qtz, mcc, alb, aeg-aug, rie, bio	
	Western Keiv (Rovozero, Platongora, Yumperuaiv)	Produces amazonite; potential Zr-REE deposit?	ama, all, mon, bri-(Y), ast, ytt, aes, ferg, pyro, che, Y-tit, tha, gad, pyro, lop, mon, bas	tit, zir, apa, flu, mag, sulfides, mlyb	aeg, arf, qtz, mcc, alb, amph	2100 ± 50 Ma (Sm-Nd) 2400 ± 50 Ma (Pb, zir & tit)
	White Tundra	Occurrence	mon, xen	aen, Fe-bio, zir, tit, apa, flu	aeg, arf, qtz, mcc, alb, rie, kat	2430 Ma (Pb, zir)
	Wind Mountain (see Cornudas Mtns)	Occurrence	eud, mon, aes	Be, aen, cata, grg, pkel, pyr, flu	neph, fld, aeg, chabazite, nat, oliv, anl	
	Yastrebits	Occurrence	bas, par, all, bri(?)	zir, flu, ilm, apa, gar	aeg, hed, Fe-has, rie, ann, fed	1720 to 1740 Ma (Pb, zir, syenite)
	Yousuobao	P-REE resource	apa, all	tit	dio, phlo, ano, arf	1827 Ma
<b>HYDROTHERMAL FE-OXIDE</b>						
	Mineville dumps	Past Fe producer; REE resource	xen-bearing apa	mag, hem, mrt	qtz, fld	Precambrian
	Olympic Dam	REO not recovered; potential byproduct	mon, bas, fcer, flor	flu, bar, ccc, bran, cpyr, uran, bor, hem	qtz	Middle Proterozoic - 1500 Ma
	Pea Ridge	Potential resource	mon, xen, all	mag, hem, cas, thor, cpyr, apa, zir, flu, bar	qtz, fld, act	1.48 Ga
	Scrub Oaks	Byproduct	syn, xen, bas, che, apa	mag, hem, U, Th, zir, ilm, pyr, leu, cpyr, bor	qtz, alb-olig	
<b>OTHER IGNEOUS-AFFILIATED (INCLUDING PEG)</b>						
	Alice Springs	Potential resource	all	Th		
	Atlin-Ruffner	Occurrence	all			
	Azovske	Potential producer		apa, zir		
	Big Creek	Occurrence				

Appendix A. REE Deposits  
USGS OF02-189

DEPOSIT TYPE	Deposit or district name	Host Rock(s)	Company	COMMENTS	REFERENCES
	Umm al Birak	microgranite stock			Drysdall and others, 1984
	Vedi-Azatskii	alkaline volcanics, subvolcanics			Kogarko and others, 1995
	Wangu Hill	peralkaline gneiss			Woolley, 2001
	Western Keiv (Rovozero, Platongora, Yumperuaiv)	granosyenite, quartz syenite, alkaline granite, silexite			Kogarko and others, 1995; Belolipetskii and Voloshin, 1996
	White Tundra	peralkaline porphyritic granite			Kogarko and others, 1995
	Wind Mountain (see Cornudas Mtns)			Eudialyte in dikes, sills, and laccoliths.	McLemore and others, 1996a; McLemore and others, 1996b
	Yastrebets	syenite, foyaite		REE and Zr mineralization in syenites. Massif nearly oval with an area of 4 sq km.	Kogarko and others, 1995
	Yousuobao	alkalic pegmatite		Alkali pegmatite may be associated with carbonatite.	Wu and others, 1996
<b>HYDROTHERMAL FE-OXIDE</b>					
	Mineville dumps	magnetite-hematite vein in gneiss	Rhône-Poulenc	Apatite in mill tailings averages from 4 to more than 11% REO. Magnetite-hematite orebody in metamorphic rocks.	Castor, 1994; Mariano, 1989; Möller, 1989a; Jackson and Christiansen, 1993; Möller and others, 1989
	Olympic Dam	Olympic Dam Breccia Complex- granite breccia	Western Mining Corp. BP Group (1988)		Castor, 1994; Jackson and Christiansen, 1993; Kennedy, 1988; Gieré, 1996
	Pea Ridge	breccia pipes assoc. with granite and syenite		95 km SW of St. Louis.	Castor, 1994; Whitten and Yancey, 1990
	Scrub Oaks	metamorphic rocks		Magnetite-hematite orebody in metamorphic rocks.	Möller, 1989a; Klemic and others, 1959
<b>OTHER IGNEOUS-AFFILIATED (INCLUDING PEG</b>					
	Alice Springs	pegmatite		Allanite contains 20% rare earths and 1.5% Th.	O'Driscoll, 1988; Jackson and Christiansen, 1993
	Atlin-Ruffner		Uranex Resources Ltd. (1984)	Pegmatite zone is 61 m long, 1.8 m wide, 49 m deep and contains allanite crystals of to 15 cm in size.	Canada Department of Energy, Mines, and Resources, 1984
	Azovske			Hosted in igneous rock.	O'Driscoll, 1998
	Big Creek			T30N, R80-81W	King, 1991

Appendix A. REE Deposits  
USGS OF02-189

DEPOSIT	Location					Resources	Source & Date of Estimate(s)
TYPE	Deposit or district name	Country	State or Province	Latitude	Longitude	Source	Tonnage and grade
	Cooglegong	Australia	Western Australia	21-30S	119-24E	NIMA, 2001	
	Crescent Peak	USA	Nevada				
	Denegama	Sri Lanka	Balangoda	6-43N	80-43E	NIMA, 2001	
	Diamond Creek	USA	Idaho/Caribou	45-15N	113-54W	Jackson and Christiansen, 1993	0.235 Mt @ 1.96% mon or 1.23% REO (1978)
	Guilherme Group	Mozambique	Zambezia	14-24S	40-21E	Premoli, 1994	
	Guposhan	China					
	Hall Mountain Group	USA	Idaho	48-59N	116-26W	Jackson and Christiansen, 1993	0.026% Y <sub>2</sub> O <sub>3</sub>
	Huashan	China	Hebei				
	Ile (Namatacatue)	Mozambique	Zambezia	16-02S	37-05E	Premoli, 1994	
	Kasagwe	Burundi		3-25S	29-25E	Jackson and Christiansen, 1993	0.067 Mt @ 3% bas or 1.5% REO (1990)
	Little Friar Mountain (Massie)	USA	Virginia	37-46N	79-06W	USGS, 2000, MRDS database	
	Llano County (Williams Mine, others)	United States	Texas	30-40-09N	098-28-22W	USGS, 2000, MRDS database	
	M'Tomoti	Mozambique	Zambezia	15-30S	38-19E	Premoli, 1994	
	Macotaia	Mozambique	Zambezia	15-25S	38-25E	Premoli, 1994	
	MacDonald Pegmatite	Canada	Ontario				
	Mazurivske	Ukraine					
	McKeel Lake	Canada	New Brunswick	45-29-03N	66-10-55W	New Brunswick Department of Natural Resources & Energy, 2001	
	Mineral X	USA	Arizona	35-07N	114-04W	USGS, 2000, MRDS database	
	Nipissis	Canada	Quebec	51-00N	65-15W	Mariano, 1999	
	Nisikkatch-Hoidas Lakes	Canada	Saskatchewan	69-50N	109-10W	Woolley, 1987	
	Nuwara Eliya	Sri Lanka		7-18N	80-46E	NIMA, 2001	
	Odegarden	Norway		58-57N	9-38E	Commission for Geological Map of the World, 1972	
	Petaca District	USA	New Mexico	36-30N	106-03W	USGS, 2000, MRDS database	



Appendix A. REE Deposits  
USGS OF02-189

DEPOSIT TYPE	Deposit or district name	STATUS	Mineralogy			Geochronology
			REE Mineralogy	Other Ore or Significant Minerals	Gangue and Rock-forming Minerals	Age (method, mineral, rock)
	Cooglegong	Past producer, minor	ytan, gad			
	Crescent Peak	Occurrence	mon, apa			Precambrian?
	Denegama	Occurrence	mon			
	Diamond Creek	Prospect	mon, xen	flu, hem, thor	fld, qtz	Precambrian
	Guilherme Group	Occurrence				
	Guposhan	Occurrence	ferg, all, aes, thor	tit	bio	
	Hall Mountain Group	Occurrence	mon, all	Au, zir, apa, hem, thor, mag	qtz	
	Huashan	Occurrence	cer			
	Ile (Namatacatue)	Occurrence				
	Kasagwe	Occurrence	bas			
	Little Friar Mountain (Massie)	Small Past Producer	all, ferg	mcc, zir, apa, mag	qtz, bio, horn, hyper	
	Llano County (Williams Mine, others)	Small Past Producer	all, gad, ferg	flu		Middle Proterozoic
	M'Tomoti	Occurrence				
	Macotaia	Occurrence				
	MacDonald Pegmatite	Occurrence	all, RE-zircon	mag, tit, pyr, mlyb, beta, U-thor, Sr	qtz, cal, gr	877 Ma (Pb)
	Mazurivske	Potential producer		apa, zir		
	McKeel Lake	Occurrence		apa, flu, hem, cas, uran, Zr, Nb	chl	
	Mineral X	Occurrence	ferg	fld, Nb, Ta		
	Nipissis	Occurrence	apa	mag		
	Nisikkatch-Hoidas Lakes	Occurrence	all, apa	Th, bar, anl, pyr, sid, zir, tit	fld, amph, cal, qtz, chl	
	Nuwara Eliya	Occurrence	mon			
	Odegarden		apa, mon	rut, wag, pyr, pent, cpyr, pyr, V, phlo	phlo, sca	
	Petaca District	Occurrence	mon	mica, sam, bis, ber, flu, col, mag, Ta, U, Th	qtz, mcc, alb, gar	Precambrian

Appendix A. REE Deposits  
USGS OF02-189

DEPOSIT TYPE	Deposit or district name	Host Rock(s)	Company	COMMENTS	REFERENCES
	Cooglegong			Produced a few hundred kilograms of yttrantalite and gadolinite. Lat-long is for town of Cooglegong.	Neary and Highley, 1984
	Crescent Peak	granite			Castor, 1994
	Denegama			Pegmatites are weathered.	ESCAP, 1989
	Diamond Creek	quartzite			Jackson and Christiansen, 1993
	Guilherme Group				Premoli, 1994
	Guposhan	granite, granodiorite, limestone		There are placers associated with this deposit.	Wen Lu, 1998; Zhang Peishan and others, 1995
	Hall Mountain Group	quartzite		Mining ceased in the 1940's.	Jackson and Christiansen, 1993
	Huashan	alkali granite			Zhang Peishan and others, 1995
	Ile (Namatacatue)				Premoli, 1994
	Kasagwe				Jackson and Christiansen, 1993
	Little Friar Mountain (Massie)	granodiorite		Pegmatite dike in hypersthene granodiorite.	Mitchell, 1966; Pegau, 1932
	Llano County (Williams Mine, others)	pegmatite		Several tons of pegmatite were mined prior to 1909.	Möller, 1989a
	M'Tomoti				Premoli, 1994
	Macotaia				Premoli, 1994
	MacDonald Pegmatite	zoned granite pegmatite			Lentz, 1991
	Mazurivske				O'Driscoll, 1998
	McKeel Lake	aplitic granite, syenite, alkali granite, granophyre		Veins in hematized and chloritized fractures.	New Brunswick Department of Natural Resources and Energy, 2001, accessed at URL <a href="http://www.gnb.ca/0078/minerals/index.asp">http://www.gnb.ca/0078/minerals/index.asp</a>
	Mineral X				Phillips, 1987; Parker, 1963
	Nipissis	granitic gneiss		Hydrothermal apatite and magnetite mineralization.	Mariano, 1989; Mariano, 1999
	Nisikkatch-Hoidas Lakes			Apatite and carbonate-rich veins in zone ama 10 km long. Grab samples contain ama 12% REE. 40 km NE of Uranium City.	Saskatchewan Geological Survey, 1991; Woolley, 1987
	Nuwara Eliya			Pegmatites are weathered. Lat-long is for the town of Teldenya.	ESCAP, 1989
	Odegarden	meta-gabbro, amphibolite		Apatite contains ama 3000 ppm REE. Dikes formed from magmatic hydrothermal replacement.	British Sulphur Corporation, 1987; Bugge, 1978
	Petaca District	pegmatites in schist, quartzite			U.S. Geological Survey, 2000, Mineral Resources Data System

Appendix A. REE Deposits  
USGS OF02-189

DEPOSIT	Location					Resources	Source & Date of Estimate(s)
TYPE	Deposit or district name	Country	State or Province	Latitude	Longitude	Source	Tonnage and grade
	Pitinga	Brazil	Amazonas	00-45S	60-07W	Towner, 1992	
	Ploskaya Mountain	Russia	Kola Peninsula				
	Pomona Tile Company	USA	California	34-20N	115-33W	USGS, 2000, MRDS database	
	Signal district	USA	Arizona	34-32N	113-33W	USGS, 2000, MRDS database	
	South Platte District	USA	Colorado				
	Teldeniya	Sri Lanka	Nugatenne	7-18N	80-46E	NIMA, 2001	
	Telixtlahuaca	Mexico	Oaxaca	17-18N	96-54W	NIMA, 2001	
	Tie Siding	USA	Wyoming/Albany County				
	Valle Fertil	Argentina	San Juan	31-00S	67-30W	USGS, 2000, MRDS database	
	Wolf Mountain	USA?	Alaska?	62-20N	161-29W	Nokleberg and others, 1997	About 0.10% REE
	Xihuashan	China	Jiangxi	25-26N	114-20E	NIMA, 2001	
<b>ION ADSORPTION</b>							
	Chenxian County	China	Hunan	25-48N	113-02E	NIMA, 2001	8000 t, 0.05-0.30% REO
	Dingnan	China	Jiangxi	24-47N	15-02E	NIMA, 2001	
	Gannan Mine	China	Jiangxi				
	Guangdong	China	Guangdong				
	Guidong	China	Hunan				11,000 t, 0.05-0.30% REO
	Jianghua area	China	Hunan				12,000 t, 0.35% REO
	Lanshan area	China	Hunan				medium size, 0.03-0.10% REO
							Zhang Chuanfu, 1994, 1996

Appendix A. REE Deposits  
USGS OF02-189

DEPOSIT TYPE	Deposit or district name	STATUS	Mineralogy			Geochronology
			REE Mineralogy	Other Ore or Significant Minerals	Gangue and Rock-forming Minerals	Age (method, mineral, rock)
	Pitinga	Potential. byproduct	xen, Y-Nb mineralization	cas, zir, pyro, col, tan		
	Ploskaya Mountain		Y-flu, kei, hing, fcer, ppyroe, aes, lop, ferg, for, cay, gad, kai, kul, tha, chu, mon, xen, bas, kam, syn, teng			
	Pomona Tile Company	Occurrence	eux, all, mon			
	Signal district	Occurrence	eux, sam	Nb, Ta		
	South Platte District		flu	F, Nb		1010 Ma
	Teldeniya	Occurrence	mon			
	Telixtlahuaca					
	Tie Siding	Occurrence	unknown, minor all	cry, pyro, Th, U, K	qtz, bio, Fe oxide	Middle Proterozoic
	Valle Fertil	Occurrence	mon	qtz, mica	vrn	
	Wolf Mountain		mon, bas	apy, cin, U, Th, Nb, Mo, Hg		
	Xihuashan	Producer	gad, ferg, mon, eux, xen	wlf, sch		
<b>ION ADSORPTION</b>						
	Chenxian County	Active producer		Ta, Nb, Be		
	Dingnan	Producer	clay			
	Gannan Mine Guangdong					
	Guidong					
	Jianghua area					
	Lanshan area					

Appendix A. REE Deposits  
USGS OF02-189

DEPOSIT TYPE	Deposit or district name	Host Rock(s)	Company	COMMENTS	REFERENCES
	Pitinga		Mineraçao Taboca SA	Greisenization of biotite granite produced primary mineralization. Also weathered zone with assoc. placers	O'Driscoll, 1989; Towner, 1992
	Ploskaya Mountain	amazonite pegmatites in contact zone of metasomatically altered granite			Belolipetskii and Voloshin, 1996
	Pomona Tile Company				Hewett and Glass, 1953
	Signal district				Parker, 1963
	South Platte District	Pikes Peak batholith- quartz monzonite			Levasseur, 1997; Möller, 1989a; Möller, 1989b
	Teldeniya			Pegmatites are weathered. Lat-long is for the town of Teldeniya.	ESCAP, 1989
	Telixtlahuaca			Pegmatites? Lat-long is for town of Telixtlahuaca.	Gómez-Caballero, 1990
	Tie Siding	Sherman granite			King, 1991
	Valle Fertil			Mineralization is in pegmatites and veins.	Angelelli and others, 1980
	Wolf Mountain	andesite, dacite, tuff, granite, alaskite, adamellite			Nokleberg and others, 1997
	Xihuashan	granite	State-owned	Lat-long is for town of Xihuashan.	Hedrick and Templeton, 1991; Zhang Peishan and others, 1995
<b>ION ADSORPTION</b>					
	Chenxian County			Complex REE and polymetallic deposit. Ore bodies are closely spaced, layer-like, and 4-10 m thick. 90-99% recovery of REE.	Industrial Minerals, 1988; Zhang Chuanfu, 1994, 1996
	Dingnan			Possibly a separate orebody in the Ganan Mine.	Hedrick and Templeton, 1991; Clark and Zheng, 1991b
	Gannan Mine Guangdong			The Gannan Mine may have 3 separate orebodies-- Dingnan, Longnan, Xunwu.	Roskill, 1988; Clark and Zheng, 1991b
	Guidong Jianghua area			Closely spaced ore bodies. ore bodies layer-like and 5-12 m thick. 90-99% recovery of REE.	Roskill, 1988 Zhang Chuanfu, 1994, 1996 Zhang Chuanfu, 1994, 1996
	Lanshan area			Small, scattered, lenticular, discontinuous ore bodies. 50-80% recovery of REO.	Zhang Chuanfu, 1994, 1996

Appendix A. REE Deposits  
USGS OF02-189

DEPOSIT TYPE	Deposit or district name	Location				Source	Resources	Source & Date of Estimate(s)
		Country	State or Province	Latitude	Longitude		Tonnage and grade	
	Linwu	China	Hunan				1500 t, 0.01-0.10% REO	Zhang Chuanfu, 1994, 1996
	Longchuan Heping	China	Guangdong					
	Longnan (Zudong?)	China	Jiangxi/Longnan	24-54N	114-48E		1 Mt REO	Kingsnorth and Harries-Rees, 1993
	Pingyuan	China	Guangdong					
	Qingyuan	China	Guangdong	23-42N	113-02E	NIMA, 2001		
	Rucheng area	China	Hunan				3000 t, 0.01-0.10% REO	Zhang Chuanfu, 1994, 1996
	Ruyuan	China	Guangdong	24-46N	113-16E	NIMA, 2001		
	Tongsalin	China	Hunan					
	Unnamed	China	Fujian					
	Xunwun (Xunwu, Xun wa, Heling, Nanqiao)	China	Jiangxi/Xunwu	24-58N	115-38E			
	Zhangding (Longyan)	China	Fujian	25-08N	117-02E			
	Zixing	China	Hunan				5000t, 0.01-0.30% REO	Zhang Chuanfu, 1994, 1996
<b>METAMORPHIC</b>								
	Anomalnoe	Russia?		54-04N	157-24E	Nokleberg and others, 1997		
	Bastnäs	Sweden						
	Bordvedaga	Norway						
	Guangshui	China	Hubei				0.2-0.3% REO, 0.086% Y <sub>2</sub> O <sub>3</sub> , 0.5-1.0% ZrO <sub>2</sub> , 0.027% Nb <sub>2</sub> O <sub>5</sub>	Wu and others, 1996
	Indian Creek District	USA	Idaho	45-25N	114-10W	USGS, 2000, MRDS database		
	Ingichke	Uzbekistan						
	Lemhi Pass	USA	Idaho	44-57N	113-37W	Jackson and Christiansen, 1993	39 Mt @ 0.81% mon or 0.51% REO (1989)	Jackson and Christiansen, 1993
	Mineral Hill District	USA	Idaho	45-28N	114-17W	USGS, 2000, MRDS database		
	Monumental Summit	USA	Idaho	44-54N	115-16W	Cater and others, 1973	0.086 Mt @ 3.6 kg REE/t	Cater and others, 1973
	Music Valley	USA	California	34-01N	115-57W	Jackson and Christiansen, 1993	ama 16% REO (1964); 0.05 Mt @ 8.6% REO (1983)	Castor, 1994; Jackson and Christiansen, 1993

Appendix A. REE Deposits  
USGS OF02-189

DEPOSIT			Mineralogy			Geochronology
TYPE	Deposit or district name	STATUS	REE Mineralogy	Other Ore or Significant Minerals	Gangue and Rock-forming Minerals	Age (method, mineral, rock)
	Linwu					
	Longchuan Heping	Producer	clay			
	Longnan (Zudong?)	Producer	clay			
	Pingyuan	Producer	clay			
	Qingyuan	Producer	clay			
	Rucheng area					
	Ruyuan	Producer	clay			
	Tongsalin	Producer	clay			
	Unnamed					
	Xunwun (Xunwu, Xun wa, Heling, Nanqiao)		clay			
	Zhangding (Longyan)		clay			
	Zixing					
METAMORPHIC						
	Anomalnoe			col-tan, ilm, rut	K-fld, alb	170 Ma (K-Ar, fld) -- Proterozoic
	Bastnäs		all, cer, fcer	hem		
	Bordvedaga			Be		
	Guangshui	Occurrence	gad, ferg, xen, mon, all	zir, gah, apa	epi, qtz, alb, mcc	Late Proterozoic
	Indian Creek District	Occurrence	all, mon	ilm, rut, mag, bar, pyr, sid	cal, act, qtz, gla, bio	Precambrian
	Ingichke	Occurrence				
	Lemhi Pass	Occurrence	mon, xen, bas, all, anc, lop, chu	thor, rut, apa, coll, prym, hem, bar, flu	fld, qtz, ank	90-99 Ma (Pb-alpha, mon) -- Precambrian
	Mineral Hill District	Occurrence	mon	Th, P, mag, sid, rut?, pyr	qtz, act, cal	Precambrian
	Monumental Summit	Occurrence	rhab			Precambrian
	Music Valley	Occurrence	xen, mon	Au	bio, qtz	Precambrian

Appendix A. REE Deposits  
USGS OF02-189

DEPOSIT TYPE	Deposit or district name	Host Rock(s)	Company	COMMENTS	REFERENCES
	Linwu			Very small, scattered, irregular orebodies. 40-70% recovery of REE.	Zhang Chuanfu, 1994, 1996
	Longchuan Heping		State-owned		Hedrick and Templeton, 1991
	Longnan (Zudong?)	weathered granite		High content of MREE and HREE. Possibly a separate orebody in the Ganan Mine.	Anstett, 1986; Morteani, 1991; Wu and others, 1996; Clark and Zheng, 1991; Wen Lu, 1998; Hedrick and Templeton, 1991; Kingsnorth and Harries-Rees, 1993
	Pingyuan		State-owned		Hedrick and Templeton, 1991
	Qingyuan		State-owned	Lat-long is for town of Qingyuan.	Hedrick and Templeton, 1991
	Rucheng area			Very small, scattered, irregular orebodies. 40-70% recovery of REE.	Zhang Chuanfu, 1994, 1996
	Ruyuan		State-owned	Lat-long is for town of Ruyuan.	Hedrick and Templeton, 1991
	Tongsalin		State-owned		Hedrick and Templeton, 1991
	Unnamed				Hedrick and Templeton, 1991
	Xunwun (Xunwu, Xun wa, Heling, Nanqiao)	weathered syenite		High content of MREE and HREE. Possibly a separate orebody in the Ganan Mine.	Morteani and Preinfalk, 1996; Wu and others, 1996; Clark and Zheng, 1991; Wen Lu, 1998
	Zhangding (Longyan)	weathered granite		Cited as Longyan by Wu and others, 1996.	Wu and others, 1996; Clark and Zheng, 1991, 1991b
	Zixing			Irregular, lenticular ore bodies 5-8 m thick. 60-80% recovery of REE.	Zhang Chuanfu, 1994, 1996
<b>METAMORPHIC</b>					
	Anomalnoe	schist		Vein forms orebody over 1 km long and 12.5 m thick.	Nokleberg and others, 1997
	Bastnäs			Hematite skarn.	Moller, 1989a
	Bordvedaga				O'Driscoll, 1995
	Guangshui	silicic metaschist		Deposit is stratiform.	Wu and others, 1996
	Indian Creek District	marble, biotite schist, gneiss		Includes Wilkey Evans and Reese Esker claims, Radiant group.	Anderson, 1958
	Ingichke	skarn		REE associated with scheelite skarns.	Harben and Kuzvart, 1996
	Lemhi Pass	quartzite, phyllite, gneiss, schist		Veins. Thorium is dominant mineralization.	Harben and Kuzvart, 1996; Woolley, 1987; Austin and others, 1970; Möller, 1989a; Jackson and Christiansen, 1993; Newton and others, 1960
	Mineral Hill District	mica schist, marble			Abbott, 1954
	Monumental Summit	quartzite, schist, calcareous rock			Cater and others, 1973
	Music Valley	gneiss			Castor, 1994; Möller, 1989a; Jackson and Christiansen, 1993







Appendix A. REE Deposits  
USGS OF02-189

DEPOSIT TYPE	Deposit or district name	Host Rock(s)	Company	COMMENTS	REFERENCES
	Nam Xe North (Mau Xe North)	limestone, marble, schist	Vietnamese Gov't	Metasomatic + weathered ore. On N side of Nam Xe River in Phong Tho district. Lenses, veins, disseminated ore in crushed zones of 1st affected by metasomatism. Weathered ore contains 4-5% REO to depth of 20 m. Primary ore contains an average of 1.4% REO.	Hedrick, 1997; O'Driscoll, 1996; ESCAP, 1990; Premoli, 1990; Juskowiak and others, 1986; Dzien, 1990
	Nam Xe South (Mau Xe North)	basic volcanics	Vietnamese Gov't	Metasomatic + weathered ore. On S side of Nam Xe River in Phong Tho district. REE reserves include 3225 t of Y2O3	Hedrick, 1997; O'Driscoll, 1996; ESCAP, 1990; Premoli, 1990; Juskowiak and others, 1986; Dzien, 1990
	Sheep Creek	carbonate rocks, gneiss, schist			Crowley, 1960
	Shengtieling	migmatized gneiss			Wu and others, 1996
	Steenkampskraal (Steentampskraal)	gneiss	Rare Earth Extraction Co. (1997)	Mon-apa veins in gneiss. Approximately 20,000 t of mon remained in 1986. In 1996, restart planned for 1998, mine life was estimated at 10 years.	Harben and Kuzvart, 1996; Castor, 1994; de Kun, 1987; Hedrick, 1998; von Backstrom, 1976
	Wuhe	migmatite		Lat-long is for the town of Wuhe.	Wen Lu, 1998
<b>PLACER, Shoreline</b>					
	Agnes Waters (Rocky Point)	dune sand	Mineral Deposits Ltd.	Marine placer. 3 generations of dune formation.	Towner, 1992; Towner and others, 1988; Jackson and Christiansen, 1993; ESCAP and ABMRGG, 1988
	Aguas Dulces	beach sands			Bossi, 1978
	Alcobaça	dune and beach sand	Nuclebras de Monazita e Associados Ltda (1989)	Marine placer.	Anstett, 1986; Neary and Highley, 1984; Hedrick and Templeton, 1991; Overstreet, 1967; Azevedo Branco, 1984; Jackson and Christiansen, 1993
	Allied Eneabba		Renison Goldfields (1988)		Anstett, 1986; Roskill, 1988
	Alwaya (Alwaye)				Hedrick and Templeton, 1991
	Amity		Consolidated Rutile Ltd. (1989)		Hedrick and Templeton, 1991
	Anchieta (Parati, Imbiri, Pipa de Viho, Mãebá)	Grupo Barreiras and younger sediments	Nuclebras de Monazita e Associados Ltda. (1988)	Small modern beach placers, elevated bars. Mon contains about 5.2% ThO <sub>2</sub> . Probably depleted.	Anstett, 1986; Overstreet, 1967; Azevedo Branco, 1984; Jackson and Christiansen, 1993

Appendix A. REE Deposits  
USGS OF02-189

DEPOSIT	Location					Resources	Source & Date of Estimate(s)	
TYPE	Deposit or district name	Country	State or Province	Latitude	Longitude	Source	Tonnage and grade	
	Angoche	Mozambique					Estimated reserves-- 124 Mt @ 4% HM	Roskill, 1988
	Antete area	Madagascar						
	Aracruz	Brazil	Espirito Santo	19-58S	40-09W	Azevedo Branco, 1984	Measured reserves- 2964 t mon grading 59.98% REO (1986); 0.282 Mt @ 1.05% mon (1987)	Roskill, 1988; Jackson and Christiansen, 1993
	Arimoor	Nigeria	Benue Plateau					
	Australind	Australia	Western Australia	33-14S	115-45E	Jackson and Christiansen, 1993	6 Mt @ 0.03% mon (15% HM)	Jackson and Christiansen, 1993
	Ayer Kuning	Malaysia	Perak					
	Badarmokam	Bangladesh					1.765 Mt @ 0.28% mon (1983)	ESCAP and ABMRGG, 1988
	Banda Aceh	Indonesia	Sumatra	5-35N	95-20E			
	Banka Island (Bangka)	Indonesia	Pulau Banka (Banka Island)	2-15S	106-00E			
	Baraghoriapara	Bangladesh	Moheshkhali Island				0.888 Mt @ 0.1% mon (1983)	ESCAP and ABMRGG, 1988
	Barrytown	New Zealand	South Island/Westland	42-14S	171-19E	Towner, 1992	10.8 Mt @ 0.1-0.3% mon (1970's); 73.3 Mt @ 0.001% mon or 0.00055% REO (1989)	ESCAP and ABMRGG, 1988; Jackson and Christiansen, 1993
	Batu Gajah	Malaysia	Perak					
	Bayside (Yoganup North)	Australia	Queensland					
	Beenup (Scott River)	Australia	Western Australia				5% HM	ESCAP and ABMRGG, 1988
	Beihei (Beihai, Peibhai?) District	China	Guangxi	21-29N	109-06E	Towner, 1992	1-2% HM; 530 Mt ore (1989)	ESCAP and ABMRGG, 1988; Jackson and Christiansen, 1993
	Belitung (Billiton)	Indonesia	Banka-Belitung Island	2-50S	107-55E			
	Berhala Island	Indonesia						
	Beruwala	Sri Lanka		6-29N	79-59E	ESCAP and ABMRGG, 1988		

Appendix A. REE Deposits  
USGS OF02-189

DEPOSIT TYPE	Deposit or district name	STATUS	Mineralogy			Geochronology
			REE Mineralogy	Other Ore or Significant Minerals	Gangue and Rock-forming Minerals	Age (method, mineral, rock)
	Angoche	Prospect (1988)	mon	ilm, zir, rut, mag		
	Antete area	Past producer	mon	Ti		
	Aracruz	Past byproduct producer (1989)	mon	ilm, rut, zir	qtz	Late Tertiary
	Arimoor	Past byproduct producer (1988)	mon	cas		
	Australind		mon	ilm, rut, zir, leu, gar	qtz	Quaternary
	Ayer Kuning	Byproduct producer (1988)	mon	cas		
	Badarmokam		mon	ilm, leu, mag, zir, rut		
	Banda Aceh	Occurrence	mon	Ti-mag, zir	qtz, fld, chl	
	Banka Island (Bangka)	? Poss byproduct of Sn mining	mon, xen, all	cas, ilm, pyr, mar, hem, rut, zir, tour		
	Baraghoripara		mon	ilm, rut, leu, zir		
	Barrytown	Under development (1988)	mon	ilm, gar, mag, zir, rut, Au, U-thor, cas	qtz, fld	Quaternary
	Batu Gajah	Byproduct producer (1988)	mon, xen	cas		
	Bayside (Yoganup North)	Exhausted (1998)	mon	Ti, Zr		Pliocene-Pleistocene
	Beenup (Scott River)	Production ceased 4/99	mon	ilm, zir	cly	Pleistocene-Recent
	Beihei (Beihai, Peibhai?) District	Producer byproduct monazite	mon	ilm, zir, rut	qtz	Cenozoic
	Belitung (Billiton)	Past small byproduct producer	mon, xen, all	cas, ilm, pyr, mar, hem, rut, zir, tour		
	Berhala Island	Occurrence	mon			
	Beruwala		mon	zir, ilm, gar		

Appendix A. REE Deposits  
USGS OF02-189

DEPOSIT TYPE	Deposit or district name	Host Rock(s)	Company	COMMENTS	REFERENCES
	Angoche		Kenmare Resources (1988)		Roskill, 1988; O'Driscoll, 1988
	Antete area				Neary and Highley, 1984
	Aracruz	Grupo Barreiras sand	Nuclebras de Monazita e Associados Ltda. (1989)		Anstett, 1986; Hedrick and Templeton, 1991; Jackson and Christiansen, 1993
	Arimoor				Roskill, 1988
	Australind	sand			Jackson and Christiansen, 1993
	Ayer Kuning		Tronah Mines Malaysia Bhd. (1988)		Roskill, 1988
	Badarmokam				ESCAP and ABMRGG, 1988
	Banda Aceh			In northern Sumatra.	Skillen, 1996a
	Banka Island (Bangka)	beach sand		One placer on this island was said to contain too much mon to permit profitable recovery of cassiterite.	Overstreet, 1967; Möller, 1989a,b; ESCAP and ABMRGG, 1988
	Baragoriapara				ESCAP and ABMRGG, 1988
	Barrytown	sand of Nine Mile Fm	Grampian Mining (199?)	Marine placer beach and dune sands extending over a distance of 16 km along the coast. Deposit averages 10 m thick.	Towner, 1992; Christie and others, 2000; ESCAP and ABMRGG, 1988; Hedrick, 1993
	Batu Gajah		Several		Roskill, 1988
	Bayside (Yoganup North)		Consolidated Rutile Ltd.	Exhausted.	O'Driscoll, 1988; Hedrick and Templeton, 1991; Hedrick, 1995, 1996
	Beenup (Scott River)		BHP Titanium Minerals Pty. Ltd.	Deposit contains 20% clay. First prod 1997. Operation closed due to processing problems.	Hedrick, 1995, 1996, 1998; Harben and Kuzvart, 1996; Industrial Minerals, 1999; ESCAP and ABMRGG, 1988
	Beihei (Beihai, Peibhai?) District	coastal plain sands	State-owned	Mixed river and marine placers along coastline. Ama 60% of mined material may be from river sands. Mined by farmers collectives.	Towner, 1992; Towner and others, 1988; Jackson and Christiansen, 1993; ESCAP and ABMRGG, 1988; Hedrick and Templeton, 1991
	Belitung (Billiton)				Hedrick and Templeton, 1991; Overstreet, 1967; ESCAP and ABMRGG, 1988
	Berhala Island			In the Strait of Malacca.	ESCAP and ABMRGG, 1988
	Beruwala				ESCAP and ABMRGG, 1988; Neary and Highley, 1984; Overstreet, 1967; ESCAP, 1989

Appendix A. REE Deposits  
USGS OF02-189

DEPOSIT	Location					Resources	Source & Date of Estimate(s)
TYPE	Deposit or district name	Country	State or Province	Latitude	Longitude	Source	Tonnage and grade
	Bilugyun and Kyaikkami Beach	Myanmar		16-20N	97-27E		
	Birchfield	New Zealand	South Island				
	Birthday Gift (Murray Basin)	Australia	New South Wales				61 Mt @ 3.6% HM Lishmund and others, 1999
	Boulougne	USA	Florida				
	Bowen (Abbot Point)	Australia	Queensland	19-53S	148-05E	Jackson and Christiansen, 1993	
	Brejo Grande - Pacatuba	Brazil	Sergipe	10-30S	36-26W	Azevedo Branco, 1984	0.062 Mt mon Azevedo Branco, 1984
	Bridge Hill Ridge	Australia	New South Wales	32-25S	152-28E	Towner, 1992	
	Bruce Bay	New Zealand	South Island				
	Brunswick-Altamaha	USA	Georgia	31-19N	81-28W	Towner, 1992	65.85 Mt @ 0.0288% mon (1982) Jackson and Christiansen, 1993
	Buena (Buena Norte, Buena Sul)	Brazil	Rio de Janeiro	21-31S	41-05W	Jackson and Christiansen, 1993	0.83% mon Jackson and Christiansen, 1993
	Bukit Duabelas	Indonesia	Sumatra (East)	1-57S	102-40E		
	Bunbury	Australia	Western Australia	33-19S	115-38E		
	Busselton East	Australia	Western Australia	33-40S	115-23E	Jackson and Christiansen, 1993	
	Byfield (Bayfield)	Australia	Queensland	22-48S	150-46E	Jackson and Christiansen, 1993	2400 Mt @ 1.14% HM; 0.0005% mon Roskill, 1988; Jackson and Christiansen, 1993
	Cabin Bluff	USA	Fl or GA				
	Cable Sands	Australia	Western Australia				
	Cam Hoa	Vietnam	Ha Tinh	18-13N	105-52E	ESCAP, 1990	
	Cam Nhung	Vietnam	Ha Tinh	18-18N	105-48E	ESCAP, 1990	
	Camaratuba	Brazil	Rio Grande do Norte	06-54S	35-00W	Jackson and Christiansen, 1993	44.7 Mt @ 0.55% mon Jackson and Christiansen, 1993
	Capel	Australia	Western Australia	33-33S	115-33E		

Appendix A. REE Deposits  
USGS OF02-189

DEPOSIT TYPE	Deposit or district name	STATUS	Mineralogy			Geochronology
			REE Mineralogy	Other Ore or Significant Minerals	Gangue and Rock-forming Minerals	Age (method, mineral, rock)
	Bilugyun and Kyaikkami Beach	Occurrence	mon			
	Birchfield		mon	ilm, zir		
	Birthday Gift (Murray Basin)	HM Prospect		ilm, zir, rut		Tertiary
	Boulougne	Past producer	mon	ilm, leu, rut, zir		
	Bowen (Abbot Point)	Prospect	mon	ilm, rut, zir	qtz	
	Brejo Grande - Pacatuba	?	mon	ilm, zir		Quaternary- Holocene
	Bridge Hill Ridge	REE Occurrence	mon	zir, rut, ilm, Th	qtz	Quaternary
	Bruce Bay		mon	ilm, zir		
	Brunswick-Altamaha	Occurrence	mon	ilm; minor rut, leu, zir, mag, Th	qtz	Pleistocene
	Buena (Buena Norte, Buena Sul)	Producer byproduct monazite	mon	ilm, zir, rut	qtz	Late Tertiary
	Bukit Duabelas	Occurrence	mon	ilm, mag, zir, cas		
	Bunbury	Past byproduct producer	mon, xen	ilm, mag, zir, rut, gar		Pleistocene-Recent
	Busselton East	Prospect	mon	ilm, rut, zir, leu	qtz	Holocene
	Byfield (Bayfield)	Prospect	mon	ilemnite, zir, rut	qtz	Late Tertiary
	Cabin Bluff					
	Cable Sands	Past byproduct producer	mon, xen	ilm, zir		Pleistocene-Recent
	Cam Hoa	?	mon, xen	ilm, zir		
	Cam Nhung	?	mon, xen	ilm, zir		
	Camaratuba	?	mon, xen	ilm, rut, zir, gar	tour, qtz	Late Tertiary
	Capel	Past byproduct producer	mon, xen	ilm, leu, zir, rut; minor cas, gar, kya, crn		Pleistocene-Recent



Appendix A. REE Deposits  
USGS OF02-189

DEPOSIT TYPE	Deposit or district name	Host Rock(s)	Company	COMMENTS	REFERENCES
	Bilugyun and Kyaikkami Beach	black sands			ESCAP, 1998
	Birchfield				ESCAP and ABMRGG, 1988
	Birthday Gift (Murray Basin)	beach sand	RZM Pty. Ltd.	In Murray Basin. Coarse-grained beach placer. Resource estimate is indicated + inferred .	Lishmund and others, 1999; Pearson, 1999; Mineral Deposits Ltd., 2000, accessed at URL <a href="http://www.mineraldeposits.com.au/">http://www.mineraldeposits.com.au/</a> in Feb., 2000
	Boulougne		Humphrey's Mining Co. (1979)	Deposit is exhausted.	Neary and Highley, 1984; Garnar, 1981; Pirkle and others, 1974
	Bowen (Abbot Point)	sand			Jackson and Christiansen, 1993
	Brejo Grande - Pacatuba	sediments			Azevedo Branco, 1984
	Bridge Hill Ridge	dune sand		Marine placer and wind-blown dunes.	Towner, 1992; Towner and others, 1988; ESCAP and ABMRGG, 1988
	Bruce Bay				ESCAP and ABMRGG, 1988
	Brunswick-Altamaha			Marine placer.	Anstett, 1986; Towner, 1992; Towner and others, 1988
	Buena (Buena Norte, Buena Sul)	dune and beach sand	Indústrias Nucleares do Brasil SA (INB)		Anstett, 1986; Overstreet, 1967; Kendall, 1996; Hedrick, 1997; Jackson and Christiansen, 1993
	Bukit Duabelas	beach and dune sand			Skillen, 1996a
	Bunbury		Cable Sands Ltd.	Dry mining operation. Produced xen as well as mon.	Hedrick and Templeton, 1991; Overstreet, 1967; Harben and Kuzvart, 1996; Dreissen, 1990
	Busselton East	sand			Jackson and Christiansen, 1993
	Byfield (Bayfield)	sand	RZM (1988)	Steep wind-blown sand dunes. Near Yeppoon.	Jackson and Christiansen, 1993; ESCAP and ABMRGG, 1988; Roskill, 1988
	Cabin Bluff				Cocker, 1998
	Cable Sands		Cable Sands Pty. Ltd. (1986)	In Murray Basin.	Anstett, 1986; O'Driscoll, 1988
	Cam Hoa	dune sand		Coastal placer. average thickness of 1.2 m. Part of the Ky Anh-Cam Xuyen group. Locations of Cam Hoa and Cam Nhung may be reversed.	O'Driscoll, 1996; ESCAP, 1990
	Cam Nhung	dune sand		Coastal placer with 2 ore bodies. Part of the Ky Anh-Cam Xuyen group. Locations of Cam Hoa and Cam Nhung may be reversed.	O'Driscoll, 1996; ESCAP, 1990
	Camaratuba	dune sand			Jackson and Christiansen, 1993
	Capel		Westralian Sands (1999)	Dry mining operation. Produced xen as well as mon?	Anstett, 1986; Castor, 1994; Hedrick and Templeton, 1991; Hedrick, 1995, 1996; Overstreet, 1967; Dreissen, 1990

Appendix A. REE Deposits  
USGS OF02-189

DEPOSIT	Location					Resources	Source & Date of Estimate(s)	
TYPE	Deposit or district name	Country	State or Province	Latitude	Longitude	Source	Tonnage and grade	
	Capel (North Capel)	Australia	Western Australia	33-31S	115-35E	Towner and others, 1988	0.08% mon	Jackson and Christiansen, 1993
	Capel South	Australia	Western Australia	33-37S	115-27E	Jackson and Christiansen, 1993	40% HM; 25.3 Mt @0.06% mon (1989)	ESCAP and ABMRGG, 1988; Jackson and Christiansen, 1993
	Cat Khanh	Vietnam	Binh Dinh or Nghia Binh?	13-30N	105-12E	ESCAP, 1990	8.97 Mt @ 0.117% mon (7.7% HM)	Jackson and Christiansen, 1993
	Cataby	Australia		30-43S	115-31E	Jackson and Christiansen, 1993	569 Mt @ 3.22% HM (1989)	Hedrick and Templeton, 1991
	Changan	China	Guangond/Hainan Island					
	Chatrapur (Chartrapur, Orissa Sands Complex/OSCOM)	India	Orissa	19-18N	84-57E	Jackson and Christiansen, 1993	Proven-- 240 Mt @ 0.625% mon, 9.6% ilm, 0.5% rut, 0.42% zir, 3.29% sill + Inferred-- 350 Mt (1982); 224 Mt @ 0.632% mon or 0.3476% REO (1989)	ESCAP and ABMRGG, 1988; Jackson and Christiansen, 1993
	Chavara (Quilon)- IREL	India	Kerala	08-57N	76-30E	Jackson and Christiansen, 1993	Total for deposit 0.12 Mt mon; 0.5-1.0% mon (1973); 118 Mt @ 0.16% mon or 0.0856% REO (1989)	ESCAP and ABMRGG, 1988; Roskill, 1988; Jackson and Christiansen, 1993
	Chavara (Quilon)- KMML	India	Kerala/ Kollam	09-00N	76-30E	Jackson and Christiansen, 1993	114.8 Mt @ 0.16% mon or 0.088% REO (1989)	Jackson and Christiansen, 1993
	Cheyne Bay	Australia	Western Australia	34-34S	118-45E	Australia National Mapping Agency, 2001, accessed at URL <a href="http://www.auslig.gov.au/mapping">http://www.auslig.gov.au/mapping</a>		
	Chingshankangchow	Taiwan					0.765 Mm <sup>3</sup> @ 13.0% mon, 20.4% ilm, 18.4% zir, 2.1% rut (1968)	ESCAP and ABMRGG, 1988
	Chumphon	Thailand		10-30N	99-10E			
	Coleroon - Sirkazhi	India	Tamilnadu/ Thanjavur	11-15N	79-45E	ESCAP and ABMRGG, 1988		

Appendix A. REE Deposits  
USGS OF02-189

DEPOSIT			Mineralogy			Geochronology
TYPE	Deposit or district name	STATUS	REE Mineralogy	Other Ore or Significant Minerals	Gangue and Rock-forming Minerals	Age (method, mineral, rock)
	Capel (North Capel)	Past byproduct producer; N. part of deposit exhausted (1987)	mon, xen	ilm, zir, leu, rut	qtz	Pleistocene-Recent
	Capel South	Past byproduct producer	mon, xen	ilm, leu, zir, rut		Pleistocene-Recent
	Cat Khanh	Current producer	mon, xen	ilm, zir, rut, leu		
	Cataby	Past byproduct producer	mon	ilm, rut, zir	qtz	Pleistocene
	Changan	Possible resource	mon			
	Chatrapur (Chartrapur, Orissa Sands Complex/OSCOM)	Producer byproduct monazite	mon	ilm, rut, leu, zir, kya, gar, sil	qtz, sta, amphs	Quaternary
	Chavara (Quilon)- IREL	Producer byproduct monazite	mon	ilm, rut, zir, leu, sil, gar	qtz	Quaternary
	Chavara (Quilon)- KMML	Byproduct producer	mon	ilm, rut, zir, leu, sil, gar	qtz	Quaternary
	Cheyne Bay	Past small producer	mon			
	Chingshankangchow	Occurrence	mon	ilm, zir, rut, mag	qtz	
	Chumphon	Byproduct producer (1988)	mon	cas		
	Coleroon - Sirkazhi	Occurrence	mon	ilm, zir, gar		

Appendix A. REE Deposits  
USGS OF02-189

DEPOSIT TYPE	Deposit or district name	Host Rock(s)	Company	COMMENTS	REFERENCES
	Capel (North Capel)	marine, dune sands	Westralian Sands (1999)	Dune deposits.	Anstett, 1986; O'Driscoll, 1988; Towner and others, 1988; Hedrick and Templeton, 1991; Hedrick, 1999; Overstreet, 1967; Griffiths, 1992; ESCAP and ABMRGG, 1988; Roskill, 1988
	Capel South	beach sand		Discovered 1954.	Welch and others, 1975; Overstreet, 1967; Jackson and Christiansen, 1993; ESCAP and ABMRGG, 1988
	Cat Khanh		Bimal Minerals Co. Ltd.	Coastal placer. 3 ore horizons in placer.	O'Driscoll, 1996; ESCAP, 1990
	Cataby	beach sand	Minproc Chemicals Pty. Ltd and KMCX Western Australia Pty. Ltd. (1990)		Anstett, 1986; Hedrick and Templeton, 1991; Jackson and Christiansen, 1993
	Changan			Not developed because most of area is under cultivation.	ESCAP and ABMRGG, 1988
	Chatrapur (Chartrapur, Orissa Sands Complex/OSCOM)	sand dunes	Indian Rare Earths Ltd.	Byproduct of Ti mining. Belt of sand dunes in 1500 m wide and 19 km long. Relatively low U+Th (50-60 ppm) in ilmenite concentrate.	Anstett, 1986; Hedrick and Templeton, 1991; Towner, 1992; ESCAP and ABMRGG, 1988; Overstreet, 1967; Harben and Kuzvart, 1996; Russell, 1991; Jackson and Christiansen, 1993
	Chavara (Quilon)- IREL	beach sand	Indian Rare Earths Ltd.	Byproduct of Ti mining. Mon distribution is patchy. Ore is 18% HM.	Anstett, 1986; Hedrick and Templeton, 1991; Overstreet, 1967; Harben and Kuzvart, 1996; Towner, 1992; ESCAP and ABMRGG, 1988
	Chavara (Quilon)- KMML	beach sand	Kerala Minerals and Metals Ltd.	Byproduct of Ti mining. Mon occurrence is patchy.	Anstett, 1986; O'Driscoll, 1988; Hedrick and Templeton, 1991; Overstreet, 1967; Harben and Kuzvart, 1996; ESCAP and ABMRGG, 1988
	Cheyne Bay			Produced 1949-1950.	ESCAP and ABMRGG, 1988
	Chingshankangchow			Offshore sand bar.	ESCAP and ABMRGG, 1988
	Chumphon				Hedrick and Templeton, 1991; Hedrick and Templeton, 1990
	Coleroon - Sirkazhi			Deposits stretch 14 km from Coleroon River mouth to Sirkazhi.	ESCAP and ABMRGG, 1988

Appendix A. REE Deposits  
USGS OF02-189

DEPOSIT		Location				Resources		Source & Date of Estimate(s)
TYPE	Deposit or district name	Country	State or Province	Latitude	Longitude	Source	Tonnage and grade	
	Congolone (Moma-Congolone, Ancoche)	Mozambique	Nampula	16-01S	40-05E	Premoli, 1994	166.8 Mt @ 2.94% ilm, 0.2% zr, 0.05% rut, 0.0066% mon (1990)	Premoli, 1994
	Coojarloo	Australia	Western Australia	30-40S	115-20E	Towner, 1992	Proven-- 431.3 Mt @ 3.4% HM + Probable-- 138 Mt @ 3.0% HM; 177 Mt @ 3.7% HM (0.2% mon); 0.59 Mt @ 0.009% mon (1990)	Roskill, 1988; Hedrick, 1998; Jackson and Christiansen, 1993
	Cooloola	Australia		26-05S	153-07E	Jackson and Christiansen, 1993	0.00846% mon	Jackson and Christiansen, 1993
	Coromandel Peninsula	New Zealand	North Island	37-00S	175-52E	Estimate for center of area		
	Cox's Bazaar	Bangladesh					5.119 Mt @ 0.04% mon (1983)	ESCAP and ABMRGG, 1988
	Cumberland Island	USA	Georgia	30-54N	81-27W	Jackson and Christiansen, 1993	241 Mt @ 0.0178% mon or 0.011% REO (1982)	Jackson and Christiansen, 1993
	Cumuruxatiba (Curumuxatiba, Comoxatiba)	Brazil	Bahia	18-22S	40-42W	Towner, 1992		
	Curumbin	Australia	Queensland	28-08S	153-29E	Australia National Mapping Agency, 2001, accessed at URL <a href="http://www.auslig.gov.au/mapping">http://www.auslig.gov.au/mapping</a>		
	Curtis Island	Australia	Queensland	23-38S	151-10E	Australia National Mapping Agency, 2001, accessed at URL <a href="http://www.auslig.gov.au/mapping">http://www.auslig.gov.au/mapping</a>	2% HM	ESCAP and ABMRGG, 1988
	Da Nang	Vietnam						
	Dardanup	Australia	Western Australia	33-24S	115-45E	NIMA, 2000		
	Dianbai	China	Guangdong	21-30N	111-01E	NIMA, 2001		
	Dongara	Australia	Western Australia	29-15S	114-56E	NIMA, 2001	20 Mt @ 6.6% HM	Industrial Minerals, 2001
	Dong Xuan	Vietnam						

Appendix A. REE Deposits  
USGS OF02-189

DEPOSIT TYPE	Deposit or district name	STATUS	Mineralogy			Geochronology
			REE Mineralogy	Other Ore or Significant Minerals	Gangue and Rock-forming Minerals	Age (method, mineral, rock)
	Congolone (Moma-Congolone, Ancoche)	Byproduct producer	mon	ilm, rut, zir	qtz	
	Coojarloo	Past byproduct producer	mon	ilm, leu, rut, zir	qtz	Early Pleistocene
	Cooloola	Past byproduct producer	mon	ilm, rut, zir	qtz	Pleistocene
	Coromandel Peninsula	Occurrence	mon	ilm, gar, mag, zir		Cenozoic
	Cox's Bazaar	Active prospect (1988)	mon	ilm, mag, zir, leu, rut		
	Cumberland Island	Occurrence	mon	ilm, minor rut, leu, zir	qtz	Pleistocene
	Cumuruxatiba (Curumuxatiba, Comoxatiba)	Producer byproduct monazite (1989)	mon	ilm, zir, rut, Th, mag	qtz	Quaternary
	Currumbin	Past byproduct producer	mon	zir, rut, ilm		
	Curtis Island	Occurrence	mon	ilm, zir, rut		
	Da Nang			Au		
	Dardanup	Under development	mon	ilm		
	Dianbai	Producer byproduct monazite	mon	ilm, zir, rut		
	Dongara	Prospect	mon	ilm, zir, rut, leu		
	Dong Xuan		mon, xen	ilm, zir		

Appendix A. REE Deposits  
USGS OF02-189

DEPOSIT TYPE	Deposit or district name	Host Rock(s)	Company	COMMENTS	REFERENCES
	Congolone (Moma-Congolone, Ancoche)	dune and beach sand	Kenmare	Beach sands, dunes. 4 mineralized areas-- Moma (Namalope-Tupuito), Congolone, Quinga, and Marrua.	Hedrick, 1997; Griffiths, 1989; Jackson and Christiansen, 1993; Premoli, 1994; Brown and Nossal, 1990
	Coojarloo	sand of Bassendean Sand, Yoganup Fm	Tiwest Joint Venture	Munbinea Shoreline- a group of former beaches. Deposit is ama 30 m below water table and is mined by dredging. HM fraction contains 0.2% mon.	Hedrick, 1999; O'Driscoll, 1988; Griffiths, 1992; ESCAP and ABMRGG, 1988; Roskill, 1988
	Cooloola	sand	State of Queensland (1986)	Mining ceased in 1975 and area is now a national park.	Anstett, 1986; Jackson and Christiansen, 1993; ESCAP and ABMRGG, 1988
	Coromandel Peninsula	beach sand		Main deposits include Whitianga (Wharekaho Bay), Wharekawa (Opoutere Beach), Waihi Beach, and Matakana Island.	Christie and others, 2000
	Cox's Bazaar	beach sand		100 km SE of Chittagong.	ESCAP and ABMRGG, 1988; Roskill, 1988
	Cumberland Island	sand		Barrier island. In National Park so development unlikely.	Jackson and Christiansen, 1993; Towner, 1992; Towner and others, 1988; Mertie, 1975
	Cumuruxatiba (Curumuxatiba, Comoxatiba)		Nuclemon Minerio - Quimica Ltda. (1989)	In Vitoria District in Sao Joao da Barra region. Coastal sand.	O'Driscoll, 1988; Overstreet, 1967; Azevedo Branco, 1984
	Currumbin		Currumbin Minerals Pty. Ltd. (1989)	Loc for Currumbin Point.	Hedrick and Templeton, 1991; Overstreet, 1967
	Curtis Island	dune sand		Dunes. All leases surrendered for incorporation into National Park. Loc is general for Curtis Island.	ESCAP and ABMRGG, 1988
	Da Nang				ESCAP and ABMRGG, 1988
	Dardanup		ISK Minerals Pty Ltd.	15 km E of Bunbury.	Griffiths, 1992
	Dianbai		State-owned	Deposit and processing plant.	Hedrick and Templeton, 1991; ESCAP and ABMRGG, 1988
	Dongara		Magnetic Minerals Ltd. (2001)	Lat-long is for town of Dongara.	Industrial Minerals, 2001
	Dong Xuan			Coastal placer.	ESCAP, 1990

Appendix A. REE Deposits  
USGS OF02-189

DEPOSIT	Location					Resources	Source & Date of Estimate(s)	
TYPE	Deposit or district name	Country	State or Province	Latitude	Longitude	Source	Tonnage and grade	
	Durness (Tea Garden)	Australia	New South Wales	32-40S	152-09E	Australia National Mapping Agency, 2001, accessed at URL <a href="http://www.auslig.gov.au/mapping">http://www.auslig.gov.au/mapping</a>		
	Eneabba	Australia	Western Australia	29-47S	115-13E	Estimated location	0.05% mon	Jackson and Christiansen, 1993
	Eneabba North	Australia	Western Australia	29-37S	115-20E	Australia National Mapping Agency, 2001, accessed at URL <a href="http://www.auslig.gov.au/mapping">http://www.auslig.gov.au/mapping</a>		
	Eneabba South	Australia	Western Australia					
	Eneabba West	Australia	Western Australia	29-55S	115-15E	USGS, 2000, MRDS database	150 Mt @ 4% HM; 230 Mt @ 3.1% HM; 43 Mt mon	O'Driscoll, 1988; Hedrick and Templeton, 1991; 1990
	Evans Head- Yuraygir National Park area	Australia	New South Wales	29-05S	153-26E	Australia National Mapping Agency, 2001, accessed at URL <a href="http://www.auslig.gov.au/mapping">http://www.auslig.gov.au/mapping</a>		
	Fakiraghona	Bangladesh	Moheshkhali Island	21-33N	91-57E	NIMA, 2001	0.274 Mt @ 0.02% mon (1983)	ESCAP and ABMRGG, 1988
	Fakirahata	Bangladesh	Moheshkhali Island				0.409 Mt @ 0.047% mon (1983)	ESCAP and ABMRGG, 1988
	Folkston	USA	Georgia					
	Foreshore Beach - Moheshkhali Island	Bangladesh	Moheshkhali Island				0.277 Mt @ 0.05% mon (1983)	ESCAP and ABMRGG, 1988
	Fort Dauphine	Madagascar		25-00S	47-00E	Coakley and others, 1991	60 Mt @ 1.49% mon	O'Driscoll, 1988
	Foulun	Taiwan		24-41N	121-45E	NIMA, 2001	0.23 Mm <sup>3</sup> @ 11.5% mon, 24.9% zir, 22.1% ilm, 3.2% rut (1968)	ESCAP and ABMRGG, 1988
	Fraser Island (Frazer Island)	Australia	Queensland	25-22S	153-07E	Jackson and Christiansen, 1993	2% HM; 1.75% HM, 0.005% mon	ESCAP and ABMRGG, 1988; Jackson and Christiansen, 1993



Appendix A. REE Deposits  
USGS OF02-189

DEPOSIT TYPE	Deposit or district name	STATUS	Mineralogy			Geochronology
			REE Mineralogy	Other Ore or Significant Minerals	Gangue and Rock-forming Minerals	Age (method, mineral, rock)
	Durness (Tea Garden)	Small producer (1988)	mon	Ti, Zr		
	Eneabba	Past byproduct producer	mon	ilm, rut, zir, leu, kya	kaolin	Late Tertiary-Pleistocene
	Eneabba North	Current producer	mon	ilm, rut, zir, leu, kya	kaolin	Late Tertiary-Pleistocene
	Eneabba South	Current producer	mon	ilm, rut, zir, leu, kya	kaolin	Late Tertiary-Pleistocene
	Eneabba West	Current producer	mon	ilm, rut, zir, leu, kya	kaolin	Late Tertiary-Pleistocene
	Evans Head- Yuraygir National Park area		mon			
	Fakiraghona		mon	ilm, zir, rut, leu		
	Fakirahata		mon	ilm, zir, rut, leu		
	Folkston	Past producer	mon	ilm, rut, zir		
	Foreshore Beach - Moheshkhali Island		mon	ilm, zir, rut, leu, mag		
	Fort Dauphine	Past producer	mon	ilm		Cenozoic?
	Foulun	Occurrence	mon	zir, ilm, rut, mag	qtz	
	Fraser Island (Frazer Island)	Past byproduct producer	mon	ilm, zir, rut	qtz	Pliocene-Pleistocene

Appendix A. REE Deposits  
USGS OF02-189

DEPOSIT TYPE	Deposit or district name	Host Rock(s)	Company	COMMENTS	REFERENCES
	Durness (Tea Garden)		BHP, Mineral Deposits Ltd, (1988)	Loc is for town of Tea Garden.	Hedrick and Templeton, 1991; Roskill, 1988
	Eneabba		Westralian Sands (1999)	Mon contains average 58% REE and 7% ThO <sub>2</sub> .	Anstett, 1986; Castor, 1994; Hedrick and Templeton, 1991; Hedrick, 1998; Overstreet, 1967; Roskill, 1988
	Eneabba North		Westralian Sands (1999)	Dry mining operation.	Griffiths, 1992; Hedrick, 1996
	Eneabba South		RGC Mineral Sands Ltd.	Dredge operation.	Griffiths, 1992
	Eneabba West		Westralian Sands (1999)	Dredge operation.	O'Driscoll, 1988; Robjohns, 1990; Griffiths, 1992; Hedrick, 1996
	Evans Head- Yuraygir National Park area	beach sand		Beach strandlines. Environmental legislation has curtailed mining activity in this region.	ESCAP and ABMRGG, 1988
	Fakiraghona			Lat-long is for town of Fakiraghona.	ESCAP and ABMRGG, 1988
	Fakirahata				ESCAP and ABMRGG, 1988
	Folkston		Humphrey's Mining Co. (1979)	Deposit exhausted.	Roskill, 1988; Garnar, 1972
	Foreshore Beach - Moheshkhali Island				ESCAP and ABMRGG, 1988
	Fort Dauphine			Marine placer.	O'Driscoll, 1988; Overstreet, 1967
	Foulun			Lat-long is for the town of Foulun.	ESCAP and ABMRGG, 1988
	Fraser Island (Frazer Island)			Marine placer and high transgressive dunes.	Anstett, 1986; Overstreet, 1967; Jackson and Christiansen, 1993; ESCAP and ABMRGG, 1988

Appendix A. REE Deposits  
USGS OF02-189

DEPOSIT TYPE	Deposit or district name	Location				Source	Resources	Source & Date of Estimate(s)
		Country	State or Province	Latitude	Longitude		Tonnage and grade	
	Fullerton	Australia	New South Wales	32-50S	151-47E	Australia National Mapping Agency, 2001, accessed at URL <a href="http://www.auslig.gov.au/mapping">http://www.auslig.gov.au/mapping</a>		
	Gingin	Australia	Western Australia	31-24S	115-56E	Jackson and Christiansen, 1993	10.02% HM	Jackson and Christiansen, 1993
	Gladstone Mainland	Australia	Queensland	23-50S	151-15E	Australia National Mapping Agency, 2001, accessed at URL <a href="http://www.auslig.gov.au/mapping">http://www.auslig.gov.au/mapping</a>	ama 4% HM	ESCAP and ABMRGG, 1988
	Glogova-Sisesti District	Romania		44-55N	22-58E	Towner and others, 1988		
	Gold Coast	Australia	Queensland	28-00S	153-25E	Australia National Mapping Agency, 2001, accessed at URL <a href="http://www.auslig.gov.au/mapping">http://www.auslig.gov.au/mapping</a>		
	Gordon	Australia	Queensland					
	Green Cove Springs	USA	Florida	29-52N	81-43W	Jackson and Christiansen, 1993	110.1 Mt @ 0.0073% mon or 0.0045% REO (1989)	Jackson and Christiansen, 1993
	Guarapari (Praia do Vaz, Vila Velha, Rastinga, Canto do Riacho, Praia de Diogo)	Brazil	Espirito Santo	20-48S	40-30W	Azevedo Branco, 1984	Measured reserves- 818 t mon @ 60.04% REO (1986); 950 t mon (1987)	Roskill, 1988; Jackson and Christiansen, 1993
	Gympie	Australia	Queensland	26-11S	152-40E	Rand McNally & Company, 1981		
	Haifengtao	Taiwan		23-43N	120-09E	NIMA, 2001		
	Haikang	China	Guangdong	20-56N	110-04E			
	Haishanchow	Taiwan		23-19N	120-06E	NIMA, 2001		
	Ham Tan	Vietnam	Binh Thuan	10-42N	107-35E	ESCAP, 1990		
	Hambantota	Sri Lanka						
	Hanstholm	Denmark	N. Jutland					

Appendix A. REE Deposits  
USGS OF02-189

DEPOSIT TYPE	Deposit or district name	STATUS	Mineralogy			Geochronology
			REE Mineralogy	Other Ore or Significant Minerals	Gangue and Rock-forming Minerals	Age (method, mineral, rock)
	Fullerton	Current producer	mon	ilm, zir, rut		
	Gingin	Occurrence	mon	ilm, rut, zir, leu, kya	qtz	Quaternary
	Gladstone Mainland		mon			
	Glogova-Sisesti District	Occurrence	mon	ilm, rut, gar, zir	qtz, mica, fld	Pliocene-Pleistocene
	Gold Coast	Past byproduct producer	mon	Ti, Zr		Pliocene-Pleistocene
	Gordon	Closed 1999	mon	Ti, Zr		Pliocene-Pleistocene
	Green Cove Springs	Active mine (1999); Past byproduct monazite producer	mon	ilm, rut, mag, leu, zir; minor gar	epi, qtz, sta	Pleistocene
	Guarapari (Praia do Vaz, Vila Velha, Rastinga, Canto do Riacho, Praia de Diogo)	Current(?) Producer byproduct monazite	mon	ilm, zir, rut, mag	qtz	Quaternary
	Gympie	Past byproduct producer	mon	Ti, Zr		Pliocene-Pleistocene
	Haifengtao	Occurrence	mon	zir, ilm, rut		
	Haikang	Producer byproduct monazite	mon, xen	ilm, zir, rut		
	Haishanchow	Occurrence	mon	zir, ilm, rut, mag	qtz	
	Ham Tan	??	mon, xen	ilm, rut, zir, leu, ana		
	Hambantota	Occurrence				
	Hanstholm	Occurrence	mon	ilm, rut, zir		

Appendix A. REE Deposits  
USGS OF02-189

DEPOSIT TYPE	Deposit or district name	Host Rock(s)	Company	COMMENTS	REFERENCES
	Fullerton		Mineral Deposits Ltd.	In Murray Basin.	Hedrick, 1998
	Gingin	beach and dune sand	Westralian Sands and Tioxide Australia (1988)	Marine placer beach and dune sands. Gingin shoreline.	Jackson and Christiansen, 1993; ESCAP and ABMRGG, 1988; Roskill, 1988
	Gladstone Mainland				ESCAP and ABMRGG, 1988
	Glogova-Sisesti District	beach sand		3 ancient beach formations on River Motru.	Towner and others, 1988
	Gold Coast		Currumbin Minerals Pty. Ltd. (1989)		Hedrick and Templeton, 1991
	Gordon		Consolidated Rutile Ltd.	On North Stradbroke island between Tower Ride and South Hill.	Hedrick and Templeton, 1991; Hedrick, 1995, 1996, 1999; Industrial Minerals, 1987b
	Green Cove Springs	sand	Westralian Sands (1999)	Stopped producing mon in 1994.	Anstett, 1986; Hedrick and Templeton, 1991; Towner, 1992; Towner and others, 1988; Hedrick, 1996
	Guarapari (Praia do Vaz, Vila Velha, Rastinga, Canto do Riacho, Praia de Diogo)	sediments of Grupo Barreiras and younger units	Nuclebras de Monazita e Associados Ltda. (1989)		Jackson and Christiansen, 1993; Hedrick and Templeton, 1991; Overstreet, 1967; Towner, 1992; Azevedo Branco, 1984
	Gympie		Currumbin Minerals Pty. Ltd. (1989)		Hedrick and Templeton, 1991
	Haifengtao			Offshore sand bar, not now exposed.	ESCAP and ABMRGG, 1988
	Haikang		State-owned	Deposit and processing plant. Deposits may be a mix of marine and river sands.	Hedrick and Templeton, 1991; ESCAP and ABMRGG, 1988
	Haishanchow			Offshore sand bar.	ESCAP and ABMRGG, 1988
	Ham Tan	beach and dune sand		Coastal placer. 3 placers.	O'Driscoll, 1996; ESCAP, 1990
	Hambantota				ESCAP, 1989
	Hanstholm		Morstal Minerals		Hedrick and Templeton, 1991

Appendix A. REE Deposits  
USGS OF02-189

DEPOSIT TYPE	Deposit or district name	Location				Source	Resources	Source & Date of Estimate(s)
		Country	State or Province	Latitude	Longitude		Tonnage and grade	
	Harrington	Australia	New South Wales	31-52S	152-42E	NIMA, 2001		
	Hawks Nest	Australia	New South Wales	32-40S	152-10E	NIMA, 2001		
	Higgins	Australia	Western Australia	33-35S	115-36E	Jackson and Christiansen, 1993		
	Hilton Head Island	USA	South Carolina	32-12N	80-44W	Jackson and Christiansen, 1993	759.3 Mt @ 0.008% mon (1983)	Jackson and Christiansen, 1993
	Hoanak (Nalbila)	Bangladesh	Moheshkhali Island				0.093 Mt @ 0.004% mon (1983)	ESCAP and ABMRGG, 1988
	Hokitika North	New Zealand	South Island					
	Hokitika South	New Zealand	South Island					
	Huong Dien	Vietnam		16-39N	107-28E	NIMA, 2001		
	Hunts Beach	New Zealand	South Island					
	Hwajinpo	South Korea		38-25N	128-30E	ESCAP and ABMRGG, 1988	Indicated + Inferred-- 0.041 Mt zir + mon @ grade of 0.9% mon + zir	ESCAP and ABMRGG, 1988
	Ibis-Alpha	Australia	Queensland					
	Imuruan Bay	Philippines	Palawan Island	10-45N	119-20E	ESCAP and ABMRGG, 1988	0.05% all + mon + tit (1983)	ESCAP and ABMRGG, 1988
	Induruwa (Kaikawela and Polkotuwa Beaches)	Sri Lanka					15-40% mon	ESCAP and ABMRGG, 1988
	Inani	Bangladesh		21-09N	92-04E	NIMA, 2001	0.729 Mt @ 0.13% mon (1983)	ESCAP and ABMRGG, 1988
	Itapemirim (Boa Vista, Siri)	Brazil	Espirito Santo	21-10S	40-55W	Azevedo Branco, 1984		
	Jangardup	Australia	Western Australia	34-22S	115-37E	Jackson and Christiansen, 1993	30 Mt @6.8% HM, 0.0466% mon, 0.0204 xen	Jackson and Christiansen, 1993
	Jurien Bay	Australia	Western Australia	30-19S	115-10E	Towner, 1992	2 Mt @ 3% HM; 18.3 Mt mon ore @ 1% mon	Roskill, 1988; 1989
	Kabengelwa	Congo (Zaire)					2100 t mon @ 2.8 kg mon/m <sup>3</sup>	O'Driscoll, 1988
	Kaikawela	Sri Lanka		6-22N	80-00E	ESCAP, 1989		
	Kalutara	Sri Lanka		6-35N	79-59E	ESCAP and ABMRGG, 1988		
	Karamea North	New Zealand	South Island					
	Karamea South	New Zealand	South Island					

Appendix A. REE Deposits  
USGS OF02-189

DEPOSIT TYPE	Deposit or district name	STATUS	Mineralogy			Geochronology
			REE Mineralogy	Other Ore or Significant Minerals	Gangue and Rock-forming Minerals	Age (method, mineral, rock)
	Harrington	Past producer	mon			
	Hawks Nest	Past byproduct producer	mon	Ti, zir		
	Higgins	Occurrence	mon?	ilm, zir		Holocene
	Hilton Head Island	Potential resource	mon	ilm, rut, zir, mag, gar	qtz, cly, sta	
	Hoanak (Nalbila)		mon	ilm, rut, mag, zir		
	Hokitika North		mon	ilm, zir, Au		
	Hokitika South		mon	ilm, zir, Au		
	Huong Dien	Occurrence	mon	ilm, zir, rut, mag		
	Hunts Beach		mon	ilm, zir		
	Hwajinpo		mon	ilm, zir		
	Ibis-Alpha	In development (1998)	mon	ilm		
	Imuruan Bay	Occurrence	all, mon	tit, rut, zir, cas, mag, leu		
	Induruwa (Kaikawela and Polkotuwa Beaches)		mon	ilm, zir, gar		
	Inani		mon	ilm, zir, mag, rut, leu		
	Itapemirim (Boa Vista, Siri)	Producer byproduct monazite (1989)	mon	ilm, zir, Th		Tertiary?
	Jangardup	Current HM producer; REE byproduct potential	mon, xen	ilm, zir, leu, rut, gar, kyn	qtz	Pleistocene-Recent
	Jurien Bay	Current producer	mon	ilm, rut, zir, leu, gar	qtz	Pleistocene
	Kabengelwa	Occurrence	mon	cas		
	Kaikawela	Small producer	mon	ilm, zir, bad		
	Kalutara	Past pilot production	mon	zir, ilm, gar		
	Karamea North	Occurrence	mon	ilm, zir		
	Karamea South	Occurrence	mon	ilm, zir		

Appendix A. REE Deposits  
USGS OF02-189

DEPOSIT TYPE	Deposit or district name	Host Rock(s)	Company	COMMENTS	REFERENCES
	Harrington			Operations ceased in 1981 due to exhaustion of resources outside of National Park.	Roskill, 1988
	Hawks Nest		Mineral Deposits Ltd.	Dry mill at Hawks Nest. Lat-long is for the town of Hawk's Nest.	O'Driscoll, 1988
	Higgins	sand		Planned as replacement for Waroona (Hamel).	Jackson and Christiansen, 1993
	Hilton Head Island	dune and beach sand		Mining unlikely, resort area.	Jackson and Christiansen, 1993
	Hoanak (Nalbila)				ESCAP and ABMRGG, 1988
	Hokitika North				ESCAP and ABMRGG, 1988
	Hokitika South				ESCAP and ABMRGG, 1988
	Huong Dien			20 km N of Hue.	ESCAP and ABMRGG, 1988
	Hunts Beach				ESCAP and ABMRGG, 1988
	Hwajinpo			Zir-mon ratio is 4:1. Deposit is along the coast and believed to be a marine placer or a mix of marine and alluvial sands.	ESCAP and ABMRGG, 1988
	Ibis-Alpha		Consolidated Rutile Ltd.	On North Stradbroke Island.	Hedrick, 1998, 1999
	Imuruan Bay			NW Palawan Island. Deposit is not economic.	ESCAP and ABMRGG, 1988
	Induruwa (Kaikawela and Polkotuwa Beaches)			Colombo area. Mon believed derived from nearby pegmatite veins.	ESCAP and ABMRGG, 1988; Neary and Highley, 1984; Overstreet, 1967
	Inani			Lat-long is for the town of Inani.	ESCAP and ABMRGG, 1988
	Itapemirim (Boa Vista, Siri)	Grupo Barreiras and younger sediments	Nuclebras de Monazita e Associados Ltda. (1989)	ThO <sub>2</sub> content of mon 5-12%. In Sao Joao da Barra region.	Hedrick and Templeton, 1991; Overstreet, 1967; Azevedo Branco, 1984
	Jangardup		Cable Sands Ltd. (1988)	Cable Sands Ltd.'s largest operation.	Hedrick, 1995, 1998; Harben and Kuzvart, 1996; Griffiths, 1992; Jackson and Christiansen, 1993; Roskill, 1988
	Jurien Bay			Munbinea shoreline. Heavy minerals are 0.7% mon.	Anstett, 1986; O'Driscoll, 1988; Robjohns, 1990; Towner, 1992; ESCAP and ABMRGG, 1988
	Kabengelwa		Societe Miniere et Industrielle de Kivu	Mon rich in Eu.	O'Driscoll, 1988; Roskill, 1988
	Kaikawela		Sri Lanka Geological Survey Department	South of Colombo. Beach sands locally contain about 40% mon, average about 15%. Exploited since 1952.	ESCAP, 1989
	Kalutara				ESCAP and ABMRGG, 1988; Neary and Highley, 1984; Overstreet, 1967; ESCAP, 1989
	Karamea North				ESCAP and ABMRGG, 1988
	Karamea South				ESCAP and ABMRGG, 1988



Appendix A. REE Deposits  
USGS OF02-189

DEPOSIT TYPE	Deposit or district name	Location				Source	Resources	Source & Date of Estimate(s)
		Country	State or Province	Latitude	Longitude		Tonnage and grade	
	Ke Sung	Vietnam	Thua Thien-Hu	16-30N	107-35E	ESCAP, 1990	Possible--603 t mon + xen	ESCAP, 1990
	Kelani River	Sri Lanka		7-00N	79-50E	ESCAP, 1989		
	Kembajan	Indonesia	Kalimantan (West)	0-33N	110-25E			
	Kerr-McGee deposit	USA		36-07N	88-11W	Towner, 1992		
	King Sound	Australia	Western Australia	16-50S	123-25E	NIMA, 2001		
	Kingscliff (Cudgen)	Australia	Queensland	28-16S	153-34	NIMA, 2000		
	Kirra	Australia	Queensland	29-00S	153-32E	Australia National Mapping Agency, 2001, accessed at URL <a href="http://www.auslig.gov.au/mapping">http://www.auslig.gov.au/mapping</a>		
	Kokkilai	Sri Lanka		8-59N	80-57E	ESCAP and ABMRGG, 1988		
	Koombana Bay	Australia	Western Australia	33-19S	115-39E	Australia National Mapping Agency, 2001, accessed at URL <a href="http://www.auslig.gov.au/mapping">http://www.auslig.gov.au/mapping</a>		
	Kudiraimozhi (Kudraimouzi)	India	Tamil Nadu				Indicated + Inferred-- 370 Mt @8.9% HM; 14. Mt HM	Minerals Deposits Ltd. Website, 2001; Taylor, 1995
	Kudremala Point (Kudremalai)	Sri Lanka		8-58N	79-54E	ESCAP, 1989		
	Kulwin (Koolwin)	Australia	Victoria	35-05S	142-45E		24 Mt @11.5% HM	Mineral Deposits Ltd. Webpage, Feb., 2000
	Kusipo	South Korea		30-20N	126-30E	ESCAP and ABMRGG, 1988	Measured-- 0.0025 Mt mon @ grade of 0.12% mon	ESCAP and ABMRGG, 1988/1976
	Kutubdai Island	Bangladesh	Kutubdai Island				0.405 Mt @0.0015% mon (1983)	ESCAP and ABMRGG, 1988
	Kutubjum	Bangladesh	Moheshkhali Island				0.578 Mt @0.035% mon (1983)	ESCAP and ABMRGG, 1988
	Ky Khang	Vietnam	Ha Tinh	18-12N	106-05E	ESCAP, 1990		
	Ky Ninh	Vietnam	Ha Tinh	18-00N	106-10E	ESCAP, 1990		
	Long Hai	Vietnam		10-25N	107-10E	ESCAP, 1990		
	Ludlow	Australia						

Appendix A. REE Deposits  
USGS OF02-189

DEPOSIT TYPE	Deposit or district name	STATUS	Mineralogy			Geochronology
			REE Mineralogy	Other Ore or Significant Minerals	Gangue and Rock-forming Minerals	Age (method, mineral, rock)
	Ke Sung	Occurrence	mon, xen	ilm, zir		
	Kelani River	Occurrence				
	Kembajan	Occurrence	mon			
	Kerr-McGee deposit	Occurrence	mon	ilm, rut, zir	qtz	Late Cretaceous
	King Sound	Prospect (1988)	mon	ilm, mag, leu, rut, zir		
	Kingscliff (Cudgen)	Small producer (1988)	mon	Ti, Zr		Pliocene-Pleistocene
	Kirra	Small producer (1988)	mon	Ti, Zr		Pliocene-Pleistocene
	Kokkilai		mon	ilm, rut, zir		
	Koombana Bay	Past producer byproduct monazite	xen	ilm, zir, rut, leu		
	Kudiraimozhi (Kudraimouzi)	Potential resource	mon	ilm, rut, zir, gar, sil, bad		
	Kudremala Point (Kudremalai)	Occurrence				
	Kulwin (Koolwin)	HM Prospect				Tertiary
	Kusipo		mon	ilm, zir, mag		
	Kutubdai Island		mon	ilm, zir, leu, rut		
	Kutubjum		mon	ilm, zir, rut, leu, mag		
	Ky Khang	Small producer	mon, xen	ilm, zir		
	Ky Ninh	Occurrence?	mon, xen	ilm, zir		
	Long Hai		mon			
	Ludlow	Occurrence	mon			

Appendix A. REE Deposits  
USGS OF02-189

DEPOSIT TYPE	Deposit or district name	Host Rock(s)	Company	COMMENTS	REFERENCES
	Ke Sung	beach and dune sand.		Coastal placer. Part of Thuan An group of deposits.	O'Driscoll, 1996; ESCAP, 1990
	Kelani River				ESCAP, 1989
	Kembajan				Skillen, 1996a
	Kerr-McGee deposit	sand of the McNairy Fm		Marine placer.	Towner, 1992; Towner and others, 1988
	King Sound		Perseverance Corp. Ltd. (1988)	In Fitzroy and May River estuaries.	Roskill, 1988
	Kingscliff (Cudgen)		Currumbin Minerals (1988)		Hedrick and Templeton, 1991; Roskill, 1988
	Kirra		Currumbin Minerals (1988)		Hedrick and Templeton, 1991; Roskill, 1988
	Kokkilai			Deposit confined to the beach.	ESCAP and ABMRGG, 1988; ESCAP, 1989
	Koombana Bay			Discovered 1949. Closed 1966. Part of Minniup shoreline beach and dune deposits. Near Bunbury.	ESCAP and ABMRGG, 1988
	Kudiraimozhi (Kudraimouzi)				Harben and Kuzvart, 1996
	Kudremala Point (Kudremalai)			South of Mannar.	ESCAP, 1989
	Kulwin (Koolwin)		Renison Goldfields	In Murray Basin.	Hedrick, 1999; Mineral Deposits Ltd., 2000, accessed at URL <a href="http://www.mineraldeposits.com.au/">http://www.mineraldeposits.com.au/</a> in Feb., 2000
	Kusipo			50 km North of Mokpo. Deposit is along coast and believed to be a marine placer or a mix of marine and alluvial sands.	ESCAP and ABMRGG, 1988
	Kutubdai Island				ESCAP and ABMRGG, 1988
	Kutubjum				ESCAP and ABMRGG, 1988
	Ky Khang			Coastal placer. 4 orebodies.	O'Driscoll, 1996; ESCAP, 1990
	Ky Ninh	dune sand		Coastal placer. Part of Ky Anh-Cam Xuyen group of deposits.	O'Driscoll, 1996; ESCAP, 1990
	Long Hai				ESCAP, 1990
	Ludlow		Westralian Sands Co. (1988)		Roskill, 1988

Appendix A. REE Deposits  
USGS OF02-189

DEPOSIT TYPE	Deposit or district name	Location				Source	Resources Tonnage and grade	Source & Date of Estimate(s)
		Country	State or Province	Latitude	Longitude			
	Manavalakuruchi	India	Tamilnadu/ Kanyakumari	08-12N	77-20E	Towner, 1992	103.7 Mt @ 2.5% mon or 1.37% REO (1989)	Jackson and Christiansen, 1993
	Massidon (Murray Basin)	Australia	New South Wales	33-05S	141-15E			
	Mashabuto	Congo (Zaire)	Obaye				45 t mon @ 3 kg mon/m <sup>3</sup>	Roskill, 1988
	Matara	Sri Lanka		5-57N	80-32E	ESCAP, 1989		
	Mataraca	Brazil	Paraiba	06-30S	35-00W	Azevedo Branco, 1984		
	Matarbari Island	Bangladesh	Matarbari Island	21-42N	91-53E	NIMA, 2001	0.069 Mt @ 0.029% mon (1983)	ESCAP and ABMRGG, 1988
	Maxville	USA	Florida	29-55N	81-45W	Jackson and Christiansen, 1993		
	Mi Tho	Vietnam	Binh Dinh	13-45N	109-15E	ESCAP, 1990	Possible-- 6574 t mon + xen	ESCAP, 1990
	Minninup	Australia	Western Australia	33-28S	115-34E	Jackson and Christiansen, 1993	8% HM	Jackson and Christiansen, 1993
	Moebase (Moebane)	Mozambique	Zambezia	17-01S	38-29E	Premoli, 1994	1300 Mt @3.8% HM	Hedrick, 1997
	Moguiquel	Mozambique	Nampula	15-23S	40-16E	Premoli, 1994		
	Mogwembo	Sierra Leone						
	Mokonui	New Zealand	South Island					
	Momi River	Indonesia	Irian Jaya					
	Moreton Island	Australia	Queensland	27-11S	153-24E	Jackson and Christiansen, 1993		
	Mullaittivu	Sri Lanka		9-15N	80-48E	ESCAP and ABMRGG, 1988		
	Munmorah	Australia	New South Wales	33-12S	151-35E	Jackson and Christiansen, 1993	71.2 Mt @ 0.81% HM, 0.006% mon	Jackson and Christiansen, 1993
	Nabiac	Australia	New South Wales	32-00S	152-30E	Jackson and Christiansen, 1993	2 Mt @ 0.005% mon	Jackson and Christiansen, 1993
	Nanyang (Nangang)	China	Guangdong/Hainan Island				Measured-- 8.2 Mm <sup>3</sup> @0.79 kg mon/m <sup>3</sup> (6500 t mon), 41.9 kg ilm/m <sup>3</sup> (1982)	ESCAP and ABMRGG, 1988
	Nanshanhai	China	Guangdong	21-32N	111-37E	NIMA, 2001		

Appendix A. REE Deposits  
USGS OF02-189

DEPOSIT TYPE	Deposit or district name	STATUS	Mineralogy			Geochronology
			REE Mineralogy	Other Ore or Significant Minerals	Gangue and Rock-forming Minerals	Age (method, mineral, rock)
	Manavalakuruchi	Producer byproduct monazite	mon	ilm, rut, zir, gar, sil, bad	qtz	Quaternary
	Massidon (Murray Basin)	Potential resource				Tertiary
	Mashabuto		mon			
	Matara	Occurrence	mon	ilm, zir, rut		
	Mataraca	Prospect	mon	ilm, zir, rut, gar, tour	qtz	Pleistocene-Holocene
	Matarbari Island		mon	ilm, zir, mag, leu, rut		
	Maxville	Occurrence	mon	ilm, zir	qtz, sta	
	Mi Tho	Active Producer?	mon, xen	ilm, zir		
	Minninup	Producer (1988)	mon, xen	ilm, leu, zir	qtz	Quaternary
	Moebase (Moebane)		mon	ilm, rut		
	Moguiquel		mon	ilm, rut		
	Mogwembo	Occurrence	mon	rut		
	Mokonui		mon	ilm, zir, Au		
	Momi River		xen, mon	zir		
	Moreton Island	Past small producer	mon	ilm, rut, zir, leu	qtz	Quaternary
	Mullaittivu		mon	ilm, rut, zir		
	Munmorah	Past byproduct producer	mon	ilm, rut, zir	qtz	Late Tertiary
	Nabiac	Past byproduct producer	mon	ilm, rut, leu, zir, gar	qtz	Pleistocene
	Nanyang (Nangang)	Producer byproduct monazite	mon, xen	ilm, zir, rut	qtz	Cenozoic
	Nanshanhai	Producer byproduct monazite	mon, xen	ilm, zir, rut	qtz	Cenozoic

Appendix A. REE Deposits  
USGS OF02-189

DEPOSIT TYPE	Deposit or district name	Host Rock(s)	Company	COMMENTS	REFERENCES
	Manavalakuruchi		Indian Rare Earths Ltd.	Byproduct of Ti mining. Mon discovered in 1909 and first worked in 1911.	Anstett, 1986; Jackson and Christiansen, 1993; O'Driscoll, 1988; Hedrick and Templeton, 1991; Neary and Highley, 1984; Towner, 1992; ESCAP and ABMRGG, 1988
	Massidon (Murray Basin)			Fine-grained off-shore deposit.	Mineral Deposits Ltd., 2000, accessed at URL <a href="http://www.mineraldeposits.com.au/">http://www.mineraldeposits.com.au/</a> in Feb., 2000
	Mashabuto				Roskill, 1988
	Matara				ESCAP, 1989
	Mataraca	sediments		Marine placer.	Towner, 1992; Towner and others, 1988; Azevedo Branco, 1984
	Matarbari Island				ESCAP and ABMRGG, 1988
	Maxville	sand		Extension of Green Cove Springs deposit.	Jackson and Christiansen, 1993
	Mi Tho			Coastal placer. In Cat Khanh area.	O'Driscoll, 1996; ESCAP, 1990
	Minninup	beach and dune sand	Cable Sands Ltd. (1988)	Marine placer beach and dune deposits. Part of Minniup shoreline. South of Bundury.	Jackson and Christiansen, 1993; ESCAP and ABMRGG, 1988; Roskill, 1988
	Moebase (Moebane)		Genbique (1996)	Marine + eolian placers. 2 Mt of black sands reported to grade 78% ilm, 2% rute, 13% zir, 5% mon (de Kun, 1987).	Hedrick, 1997; Premoli, 1994; de Kun, 1987
	Moguiquel			Marine + eolian placers.	Premoli, 1994
	Mogwembo		Sierra Rutile (1988)		Roskill, 1988
	Mokonui				ESCAP and ABMRGG, 1988
	Momi River			High radioactivity.	Skillen, 1996a; ESCAP and ABMRGG, 1988
	Moreton Island	beach and dune sand	AMC (1988)	Marine placer, dunes. Shut down by the government.	Jackson and Christiansen, 1993; ESCAP and ABMRGG, 1988
	Mullaittivu				ESCAP and ABMRGG, 1988; ESCAP, 1989
	Munmorah	sand		Marine placer.	Anstett, 1986; Jackson and Christiansen, 1993
	Nabiac	sand	RZ Mines Pty. Ltd. (1989)		Hedrick and Templeton, 1991; Jackson and Christiansen, 1993
	Nanyang (Nangang)		State-owned		Hedrick and Templeton, 1991; Towner, 1992; ESCAP and ABMRGG, 1988
	Nanshanhai			Lat-long is for the town of Nanshanhai.	Wen Lu, 1998; Towner, 1992; Roskill, 1988

Appendix A. REE Deposits  
USGS OF02-189

DEPOSIT	Location					Resources	Source & Date of Estimate(s)	
TYPE	Deposit or district name	Country	State or Province	Latitude	Longitude	Source	Tonnage and grade	
	Narngula (Geraldton)	Australia	Western Australia					
	Naracoopa	Australia	Tasmania	39-55S	144-06E	NIMA, 2001	25 Mt @ 5.2% HM (1989)	Hedrick and Templeton, 1991
	Natchez Trace deposit	USA	Tennessee	35-50N	88-12W	Towner, 1992		
	Nayaru	Sri Lanka		9-08N	80-53E	ESCAP, 1989		
	Newcastle	Australia	New South Wales	32-55S	151-45E	NIMA, 2000		
	Newrybar	Australia	New South Wales	28-46S	153-34E	Jackson and Christiansen, 1993	22 Mt @ 1.1% HM, 0.0418% mon (1990)	Jackson and Christiansen, 1993
	Nha Trang	Vietnam						
	Nijhum Dwip	Bangladesh					0.379 Mt @ 0.005% mon (1983)	ESCAP and ABMRGG, 1988
	Nile Delta / Rosetta	Egypt		31-00N	31-00E	Jackson and Christiansen, 1993	Reserves-- 4.6 Mt, Resource--40. Mt, Estimate-- contains 0.18 Mt mon; 44.4 Mt @ 0.5% mon (1989)	Roskill, 1988; Jackson and Christiansen, 1993
	North Camden (Kerr-McGee deposit)	USA	Tennessee	36-07N	88-11W	USGS, 2000, MRDS database		
	North Stradbroke Island - Dunwich	Australia	Queensland				1.5 % HM (0.0015% mon)	Jackson and Christiansen, 1993
	North Stradbroke	Australia	Queensland	27-35S	153-27E	Towner, 1992	1.5 % HM (0.0015% mon)	Jackson and Christiansen, 1993
	North Stradbroke - Yarraman	Australia	Queensland	27-35S	153-27E	Towner, 1992	311 Mt; 0.0015% mon (1.5 % HM)	1998; Jackson and Christiansen, 1993
	North Waroona (North Watoona)	Australia	Western Australia					
	Northeast Dunes	Brazil					145 Mt @0.033% mon (1990)	Jackson and Christiansen, 1993
	Okarito - Five Mile Beach	New Zealand	South Island					
	Old Hickory (Stony Creek)	USA	Virginia	34-12-21N	105-43-47W	USGS, 2000, MRDS database	210 Mt @ 6.5% HM; Reserves--73 Mt @ 8.1% HM, proven-- 27 Mt @ 10.2% HM	??; Skillen, 1996b
	Palghat	India	Kerala/ Palghat					
	Panirchara	Bangladesh	Moheshkhali Island				1.595 Mt @ 0.033% mon (1983)	ESCAP and ABMRGG, 1988

Appendix A. REE Deposits  
USGS OF02-189

DEPOSIT TYPE	Deposit or district name	STATUS	Mineralogy			Geochronology
			REE Mineralogy	Other Ore or Significant Minerals	Gangue and Rock-forming Minerals	Age (method, mineral, rock)
	Narngula (Geraldton)	Producer byproduct monazite	mon	ilm, zir		
	Naracoopa		mon	ilm, zir, other?		
	Natchez Trace deposit	Occurrence	mon	ilm, rut, zir, kya	qtz	LCretaceous
	Nayaru	Occurrence	mon	ilm, rut, zir		
	Newcastle	Current Producer	mon			
	Newrybar		mon	ilm, rut, zir, gar	tour, qtz	Quaternary
	Nha Trang			cas, wlf		
	Nijhum Dwip		mon	ilm, mag, zir, rut		
	Nile Delta / Rosetta	Small past producer?	mon	ilm, rut, zir, mag, gar	qtz	Pliocene
	North Camden (Kerr- McGee deposit)	Occurrence	mon	ilm, rut, zir	qtz	Late Cretaceous
	North Stradbroke Island - Dunwich	Past byproduct producer	mon	Ti, Zr		Pliocene-Pleistocene
	North Stradbroke	Past producer byproduct monazite	mon	ilm, rut, zir	qtz	Pliocene-Pleistocene
	North Stradbroke - Yarraman	Past producer (1966-1972); planned future prod	mon	ilm, zir, rut	qtz	Late Tertiary-Quaternary
	North Waroona (North Watoona)					
	Northeast Dunes	Prospects	mon	ilm, rut, zir	qtz	
	Okarito - Five Mile Beach		mon	ilm, zir, Au		
	Old Hickory (Stony Creek)	Active Mine (1999), no REE prod	mon?	ilm, zir		
	Palghat	Occurrence	mon	zir		
	Panirchara		mon	ilm, zir, rut, leu, mag		



Appendix A. REE Deposits  
USGS OF02-189

DEPOSIT TYPE	Deposit or district name	Host Rock(s)	Company	COMMENTS	REFERENCES
	Narngula (Geraldton)		Westralian Sands (1999)	Dry mill at this site.	Harben and Kuzvart, 1996; Industrial Minerals, 1979; Griffiths, 1992
	Naracoopa			On King Island between Victoria and Tasmania in the Bass Strait.	Hedrick and Templeton, 1991
	Natchez Trace deposit	sand of the McNairy Fm		Marine placer.	Towner, 1992; Towner and others, 1988
	Nayaru				ESCAP, 1989
	Newcastle		RZM Pty. Ltd.		Hedrick, 1999; Roskill, 1988
	Newrybar	dune and beach sand		Marine placer.	Jackson and Christiansen, 1993
	Nha Trang				ESCAP and ABMRGG, 1988
	Nijhum Dwip				ESCAP and ABMRGG, 1988
	Nile Delta / Rosetta	sand		Marine placer.	Jackson and Christiansen, 1993; Roskill, 1988; El Gemmizi, 1985
	North Camden (Kerr- McGee deposit)	McNairy Sand-- shoreline- complex sand	Kerr-McGee (1971)		Wilcox, 1971
	North Stradbroke Island - Dunwich		Consolidate Rutile Ltd. (1989)		Hedrick and Templeton, 1991
	North Stradbroke	beach and dune sand	Consolidate Rutile Ltd. (1993)	Beach and dune deposits. Past producer of byproduct mon.	Anstett, 1986; Hedrick, 1998; Overstreet, 1967; Roskill, 1988; Griffiths, 1992
	North Stradbroke - Yarraman		Westralian Sands (1999)	Beach and dune deposits, 4 km South of Point Lookout on NE part of island. First prod planned for 1999. Deposit is low grade with areas that contain up to 10% fines.	Anstett, 1986; Hedrick, 1987; Overstreet, 1967; Griffiths, 1992; Industrial Minerals, 1987b
	North Waroona (North Watoona)		Cable Sands Pty. Ltd. (1988)		Harben and Bates, 1990; Roskill, 1988
	Northeast Dunes	dune sand			Jackson and Christiansen, 1993
	Okarito - Five Mile Beach				ESCAP and ABMRGG, 1988
	Old Hickory (Stony Creek)		Westralian Sands (1999)	Mine had startup problems with mining and in the separation plant.	Industrial Minerals, 1989b; Pearson, 1999; Hedrick, 1999
	Palghat				ESCAP and ABMRGG, 1988
	Panirchara				ESCAP and ABMRGG, 1988

Appendix A. REE Deposits  
USGS OF02-189

DEPOSIT	Location					Resources	Source & Date of Estimate(s)	
TYPE	Deposit or district name	Country	State or Province	Latitude	Longitude	Source	Tonnage and grade	
	Paranagua	Brazil	Parana				Measured reserves-- 55 t mon grading 1.81% REO (1985)	Roskill, 1988
	Pebane district	Madagascar		17-09S	37-50E	Premoli, 1994		
	Peitungshanchow	Taiwan					5 Mm <sup>3</sup> @ 12.6% mon, 25.9% zir, 22.7% ilm, 2.3% rut (1968)	ESCAP and ABMRGG, 1988
	Phan Thiet	Vietnam		10-38N	108-05E	ESCAP, 1990		
	Phuket	Thailand						
	Pi-In	South Korea						
	Pinkenba	Australia	Queensland	27-26S	153-07E	Australia National Mapping Agency, 2001, accessed at URL <a href="http://www.auslig.gov.au/mapping">http://www.auslig.gov.au/mapping</a>		
	Pitinga	Brazil	Amazonas					
	Polkotuwa	Sri Lanka		6-29N	79-59E	NIMA, 2001		
	Port Clinton	Australia					120 Mt @ 3% HM	Hedrick, 1993
	Porto Seguro District	Brazil	Bahia	16-26S	39-05W			
	Prachuap Khiri Khan (Prajub Kirikhan, Prachuab Kiri Khan)	Thailand		11-49N	99-49E			
	Prado area	Brazil	Bahia	17-24S	39-12W	Jackson and Christiansen, 1993	Measured reserves-- 4564 t mon grading 19.98% REO	Roskill, 1988/1985
	Prowse	Australia	Western Australia					
	Pudavakattu	Sri Lanka		8-53N	81-05E	ESCAP, 1989		

Appendix A. REE Deposits  
USGS OF02-189

DEPOSIT			Mineralogy			Geochronology
TYPE	Deposit or district name	STATUS	REE Mineralogy	Other Ore or Significant Minerals	Gangue and Rock-forming Minerals	Age (method, mineral, rock)
	Paranagua		mon			
	Pebane district	Producer byproduct monazite	mon	ilm, zir, rut	qtz	Quaternary
	Peitungshanchow	Occurrence	mon	zir, ilm, rut, mag	qtz	
	Phan Thiet					
	Phuket	Byproduct producer (1988)	mon, xen	cas		
	Pi-In	Past producer (1988)	mon			
	Pinkenba	Past byproduct producer	mon	Ti, Zr		Pliocene-Pleistocene
	Pitinga		mon, xen	cas, Zr, Ta, Nb		
	Polkotuwa	Small producer	mon	ilm, zir, bad		
	Port Clinton					
	Porto Seguro District	Past byproduct producer, Current?	mon	ilm, zir	qtz	
	Prachuap Khiri Khan (Prajuab Kirikhan, Prachuab Kiri Khan)	Intermittent byproduct producer	mon, xen	zir, ilm, rut, leu, col/tan		
	Prado area	Past byproduct producer, Current?	mon, xen, all	ilm, zir, spinel, gar, thor	qtz, sta, kya	Recent
	Prowse	Past producer	mon			
	Pudavakattu	Occurrence	mon	ilm, rut, zir		

Appendix A. REE Deposits  
USGS OF02-189

DEPOSIT TYPE	Deposit or district name	Host Rock(s)	Company	COMMENTS	REFERENCES
	Paranagua				Roskill, 1988/1985
	Pebane district	beach sand		Marine placer containing 70-85% heavy minerals.	Coakley and others, 1991; Towner, 1992; Towner and others, 1988; Premoli, 1994; de Kun, 1987
	Peitungshanchow			Offshore sand bar.	ESCAP and ABMRGG, 1988
	Phan Thiet				ESCAP and ABMRGG, 1988
	Phuket				Hedrick and Templeton, 1990
	Pi-In				Roskill, 1988
	Pinkenba		Consolidate Rutile Ltd.		Hedrick and Templeton, 1991
	Pitinga		Parapanema Mineracao (1988)		Roskill, 1988
	Polkotuwa	beach sand	Sri Lanka Geological Survey Department	South of Colombo. Beach sands locally contain ama 40% mon, average about 15%. Exploited since 1952.	ESCAP, 1989
	Port Clinton			Within Shoalwater Military Training Area.	Hedrick, 1993
	Porto Seguro District		Nuclebras de Monazita e Associados Ltda. (1989)	Mon contains 1 to >9% ThO <sub>2</sub> .	Hedrick and Templeton, 1991; Overstreet, 1967
	Prachuap Khiri Khan (Prajuab Kirikhan, Prachuab Kiri Khan)		Sakorn Minerals Co. Ltd.		Hedrick and Templeton, 1991; Skillen, 1992; ESCAP and ABMRGG, 1988
	Prado area	beach sand	Nuclebras de Monazita e Associados Ltda. (1989)	USGS Mineral Resources Data System record by Page gives location as 18-46-55S, 40-22-53W.	Hedrick and Templeton, 1991; Jackson and Christiansen, 1993; Overstreet, 1967; Azevedo Branco, 1984; Leonardos, 1974
	Prowse				ESCAP and ABMRGG, 1988
	Pudavakattu			Deposit relatively low grade.	ESCAP, 1989

Appendix A. REE Deposits  
USGS OF02-189

DEPOSIT TYPE	Deposit or district name	Location				Source	Resources Tonnage and grade	Source & Date of Estimate(s)
		Country	State or Province	Latitude	Longitude			
	Pulmoddai	Sri Lanka		08-57N	80-57E	Towner, 1992	6 Mt @ 0.3% mon; Proven-- 4.0 Mt @ 0.24% mon, 56% ilm, 6.4-8% zir, 6.4% rut; 1.593 Mt @ 0.15% mon or 0.082% REO (1989)	Jayawardena, 1986b; ESCAP and ABMRGG, 1988; Jackson and Christiansen, 1993
	Puri	India	Orissa/ Puri	19-45N	85-25E	ESCAP and ABMRGG, 1988		
	Putai Chow	Taiwan					0.2 Mm <sup>3</sup> @ 13.5% mon, 25.0% zir, 22.0% ilm, 2.5% rut	ESCAP and ABMRGG, 1988/1968
	Quang Ngan	Vietnam	Thua Thien-Hu	16-38N	107-25E	ESCAP, 1990	3261 t of mon + xen	ESCAP, 1990
	Quelemane	Mozambique	Zambezia	17-53S	36-51E		520 Mt @ 4.5% heavy minerals	Hedrick, 1997
	Qui Nhon (includes Hoi Loch, Bai Bang, Vinh Cuu, Bo Ngua)	Vietnam						
	Rainbow Beach	Australia	Queensland	25-54S	153-05E	Australia National Mapping Agency, 2001, accessed at URL <a href="http://www.auslig.gov.au/mapping">http://www.auslig.gov v.au/mapping</a>		
	Ranong	Thailand						
	Richards Bay	South Africa	Natal	28-42S	32-10E	Coakley and others, 1991	>700 Mt sand; 4980 Mt @ 0.023% mon or 0.013% REO (1989)	Roskill, 1988; Jackson and Christiansen, 1993
	Ross	New Zealand	South Island					
	Sai-Lao (Quoinghi)	China	Guangdong/Hainan Island	19-15N	110-36E	Towner, 1992	170. (ind. res); Measured-- 2539 t mon, 0.74 Mt ilm, 0.067 Mt zir (1982)	; ESCAP and ABMRGG, 1988
	Saltwater Lagoon	New Zealand	South Island					
	Sandalwood	Australia	Western Australia	34-57S	140-08E	NIMA, 2000		
	Sao Joao de Barra (Barra Sao Joao)	Brazil	Rio de Janeiro	21-23S	41-03W	Azevedo Branco, 1984	Measured reserves-- 8177 t mon grading 59.99% REO	Roskill, 1988/1985
	Sao Mateus	Brazil	Espirito Santo	19-38S	40-53W	USGS, 2000, MRDS database		

Appendix A. REE Deposits  
USGS OF02-189

DEPOSIT TYPE	Deposit or district name	STATUS	Mineralogy			Geochronology
			REE Mineralogy	Other Ore or Significant Minerals	Gangue and Rock-forming Minerals	Age (method, mineral, rock)
	Pulmoddai	Byproduct producer	mon	ilm, rut, zir, sil, gar, mag, tour	qtz, shell fragments	Quaternary
	Puri		mon	ilm		
	Putaichow	Occurrence	mon	zir, ilm, rut, mag	qtz	
	Quang Ngan	Occurrence	mon, xen	ilm, zir		
	Quelemané	Occurrence?	mon; minor lop, sam	rut, zir, col		
	Qui Nhon (includes Hoi Loch, Bai Bang, Vinh Cuu, Bo Nguá)					
	Rainbow Beach	Past byproduct producer	mon	Ti, Zr		Pliocene-Pleistocene
	Ranong	Byproduct producer (1988)	mon, xen	cas		
	Richards Bay	Byproduct producer	mon	ilm, rut, zir, mag, leu, gar	qtz	Pleistocene
	Ross		mon	ilm, zir, Au		
	Sai-Lao (Quoinghi)	Producer byproduct mon	mon	ilm, zir, rut, ana, cas, mag, chr	qtz, tour	Cenozoic
	Saltwater Lagoon		mon	ilm, zir, Au		
	Sandalwood	Current HM producer; REE byproduct potential	mon	ilm, zir		Pleistocene-Recent
	Sao Joao de Barra (Barra Sao Joao)	Producer byproduct mon?	mon	ilm, zir		Tertiary?, Quaternary
	Sao Mateus	Occurrence	mon			Quaternary

Appendix A. REE Deposits  
USGS OF02-189

DEPOSIT TYPE	Deposit or district name	Host Rock(s)	Company	COMMENTS	REFERENCES
	Pulmoddai	beach sand	Ceylon Mineral Sands Corp.	Byproduct of Ti mining. Old beach deposit (1.2 m above sea level) and Modern beach. Deposit replenished by annual monsoon.	Anstett, 1986; Hedrick and Templeton, 1991; Overstreet, 1967; Skillen, 1992; Harben and Kuzvart, 1996; Jackson and Christiansen, 1993; Harben, 1991; ESCAP and ABMRGG, 1988; Jayawardena, 1986a, b
	Puri				ESCAP and ABMRGG, 1988
	Putachow			Offshore sand bar.	ESCAP and ABMRGG, 1988
	Quang Ngan	eolian dunes and beach sand		Part of Thuan An group of deposits. Coastal placer.	O'Driscoll, 1996; ESCAP, 1990
	Quelemané		Genbique (1996)		Hedrick, 1997; Overstreet, 1967
	Qui Nhon (includes Hoi Loch, Bai Bang, Vinh Cuu, Bo Ngua)				ESCAP and ABMRGG, 1988
	Rainbow Beach		Currumbin Minerals Pty. Ltd. (1989)		Hedrick and Templeton, 1991
	Ranong				Hedrick and Templeton, 1990
	Richards Bay	dune and beach sand	Rio Tinto PLC/Billiton PLC (1999)		Anstett, 1986; de Kun, 1987; Hedrick and Templeton, 1991; Jackson and Christiansen, 1993; Skillen, 1995
	Ross				ESCAP and ABMRGG, 1988
	Sai-Lao (Quoinghi)		Guangdong Metallurgical Industries Bureau	Marine placer. Deposit and processing plant. Deposit mined by commune farmers.	Hedrick and Templeton, 1991; Towner, 1992; Towner and others, 1988; ESCAP and ABMRGG, 1988; Wu and others, 1996
	Saltwater Lagoon				ESCAP and ABMRGG, 1988
	Sandalwood		Cable Sands Ltd.	First production- 1998.	Hedrick, 1999
	Sao Joao de Barra (Barra Sao Joao)	Grupo Barreiras and younger sediments- beach sand	Nuclebras de Monazita e Associados Ltda. (1989)	USGS Mineral Resources Data System record by Page gives location as 21-17-48S, 42-03-50W.	Leonardos, 1974; Overstreet, 1967; Hedrick and Templeton, 1991; Azevedo Branco, 1984
	Sao Mateus	beach sand			Leonardos, 1974

Appendix A. REE Deposits  
USGS OF02-189

DEPOSIT TYPE	Deposit or district name	Location				Source	Resources Tonnage and grade	Source & Date of Estimate(s)
		Country	State or Province	Latitude	Longitude			
	Se Petiba	Brazil	Rio de Janeiro	22-32S	44-46W	USGS, 2000, MRDS database		
	Serra (Jacareipe)	Brazil	Espirito Santo	20-10S	39-20W	Jackson and Christiansen, 1993	0.0436 Mt @ 0.80% mon	Jackson and Christiansen, 1993
	Shikhali	Bangladesh					2.757 Mt @ 0.14% mon (1983)	ESCAP and ABMRGG, 1988
	Singkep	Indonesia	Sumatra- Singkep Island (Pulau Singkep)	0-30S	104-25E			
	Slupsk	Poland						
	Soledad	USA	California					
	South Ham Tam	Vietnam	Binh Thuan					
	Stockton (Stockton Bight)	Australia	New South Wales	32-50S	151-51E	Towner, 1992		
	Stratham South	Australia	Western Australia	33-28S	115-35E	Australia National Mapping Agency, 2001, accessed at URL <a href="http://www.auslig.gov.au/mapping">http://www.auslig.gov v.au/mapping</a>		
	Subrang	Bangladesh					0.348 Mt @ 0.59% mon (1983)	ESCAP and ABMRGG, 1988
	Takua Pa	Thailand		8-53N	98-21E			
	Teknaf	Bangladesh		20-52N	92-18E	NIMA, 2001	1.94 Mt @ 0.16% mon (1983)	ESCAP and ABMRGG, 1988
	Tingtouechow	Taiwan					0.018 Mm <sup>3</sup> @ 9.6% mon, 20.9% zir, 19.5% ilm, 5.2% rut (1968)	ESCAP and ABMRGG, 1988
	Tirrukkovil (Tirukkovil)	Sri Lanka		7-07N	81-51E	ESCAP and ABMRGG, 1988		
	Tolagnaro	Madagascar		25-02S	47-00E	NIMA, 2001	75 Mt @ 3.84% zir, 0.96% mon, 5.12% rut	Mining Journal, 1989b
	Tomago (Newcastle, Clybucca)	Australia	New South Wales	32-48S	151-43E	Towner, 1992	1.5-2.0% HM	ESCAP and ABMRGG, 1988
	Toscanini	Namibia		20-50S	13-25E	NIMA, 2001		
	Trail Ridge (Highland Trail Ridge, Starke Trail Ridge)	USA	Florida	30-02N	82-02W	Towner, 1992	-0.001% mon	Mertie, 1975



Appendix A. REE Deposits  
USGS OF02-189

DEPOSIT TYPE	Deposit or district name	STATUS	Mineralogy			Geochronology
			REE Mineralogy	Other Ore or Significant Minerals	Gangue and Rock-forming Minerals	Age (method, mineral, rock)
	Se Petiba	Occurrence	mon			Quaternary
	Serra (Jacareipe)	Occurrence	mon	ilm, zir, rut	qtz	Late Tertiary - Holocene
	Shilkhali		mon	ilm, zir, rut, leu, mag		
	Singkep	Past producer of by-product mon	mon, xen, all	cas, ilm, pyr, mar, hem, rut, zir, tour		
	Slupsk	Occurrence	mon	ilm, zir, gar		
	Soledad	Unknown	mon	ilm, apa, mag, zir		
	South Ham Tam	Occurrence	mon, xen	ilm, zir		
	Stockton (Stockton Bight)	Current Producer but no mon production recently	mon	zir, rut, ilm, Th	qtz	Holocene
	Stratham South	Past producer	mon			
	Subrang		mon	ilm, leu, zir, rut, mag		
	Takua Pa		mon	cas		
	Teknaf		mon	ilm, zir, leu, rut, mag		
	Tingtouechow		mon	zir, ilm, rut		
	Tirrukkovil (Tirukkovil)	Occurrence	mon	zir, ilm, rut		
	Tolagnaro	Under development (1989)	mon	zir, rut, ilm		
	Tomago (Newcastle, Clybucca)	Past byproduct producer	mon	zir, rut, ilm, gar, Th	qtz	Pleistocene
	Toscanini	Occurrence	mon			
	Trail Ridge (Highland Trail Ridge, Starke Trail Ridge)	Occurrence	mon	ilm, leu, rut, sta, zir, kya, sil	qtz, tour, cor, gar, epi	Pleistocene

Appendix A. REE Deposits  
USGS OF02-189

DEPOSIT TYPE	Deposit or district name	Host Rock(s)	Company	COMMENTS	REFERENCES
	Se Petiba	beach sand			Leonardos, 1974
	Serra (Jacareipe)	dune and beach sand		Placers associated with veins, stockwork in gneiss.	Anstett, 1986; Overstreet, 1967; Azevedo Branco, 1984; Jackson and Christiansen, 1993
	Shilkhali				ESCAP and ABMRGG, 1988
	Singkep	beach sand		Tin producer.	Hedrick and Templeton, 1991; Möller, 1989a; Overstreet, 1967; ESCAP and ABMRGG, 1988
	Slupsk			On Baltic Sea.	Roskill, 1988
	Soledad			In Los Angeles County.	Roskill, 1988
	South Ham Tam				O'Driscoll, 1996; ESCAP, 1990
	Stockton (Stockton Bight)	dune and beach sand	Mineral Deposits Ltd.	Marine placer. Dredge operation. Feeds Hawks Nest plant.	Hedrick and Templeton, 1991; Lishmund and others, 1999; Griffiths, 1992; Towner, 1992
	Stratham South			Loc for town of Stratham.	ESCAP and ABMRGG, 1988
	Subrang				ESCAP and ABMRGG, 1988
	Takua Pa				Hedrick and Templeton, 1991
	Teknaf			Lat-long is for the town of Teknaf.	ESCAP and ABMRGG, 1988
	Tingtouechow				ESCAP and ABMRGG, 1988
	Tirrukkovil (Tirukkovil)				ESCAP and ABMRGG, 1988; ESCAP, 1989
	Tolagnaro		Omnis (51%) and QIT-Fer et Titane (49%) in 1989	A coastal lagoon, 8 km E of Tolagnaro. Lat-long is for town of Tolagnaro.	Mining Journal, 1989b
	Tomago (Newcastle, Clybucca)	dune and beach sand	RZM Pty Ltd.	Wind blown sand dunes and plains separated from the coast by a younger dune system. Dry mill at Tomago.	Hedrick and Templeton, 1991; Lishmund and others, 1999; Towner, 1992; Jackson and Christiansen, 1993; ESCAP and ABMRGG, 1988
	Toscanini			A 22 mile long mon-bearing placer occurs on the west coast adjacent to Skeleton Coast Park.	McManus and Schneider, 1994; Murray, 1991
	Trail Ridge (Highland Trail Ridge, Starke Trail Ridge)	aeolian sand	DuPont	Marine placer.	Loughbrough, 1992; Towner, 1992; Mertie, 1975

Appendix A. REE Deposits  
USGS OF02-189

DEPOSIT	Location					Resources	Source & Date of Estimate(s)
TYPE	Deposit or district name	Country	State or Province	Latitude	Longitude	Source	Tonnage and grade
	Trivandrum	India	Kerala	8-29N	76-55E	NIMA, 2001	
	Tungshanchow	Taiwan		23-34N	120-04E	NIMA, 2001	8.85 Mm <sup>3</sup> @ 11.8% mon, 18.0% zir, 16.5% ilm, 2.3% rut (1968)
	Tutunup	Australia					
	Ussangoda	Sri Lanka		6-46N	80-23E	NIMA, 2001	
	Vero Beach	USA	Florida				0.2% mon
	Viney Creek	Australia	New South Wales	32-37S	152-07E	Jackson and Christiansen, 1993	0.8% HM
	Vinh Cam Ranh	Vietnam		11-53N	109-10E	NIMA, 2001	
	Vinh Giat	Vietnam					
	Vinh Mi (Vinh My)	Vietnam	Thua Thien-Hu	16-20N	107-45E	ESCAP, 1990	Possible reserves-- 2057 t of mon
	Vitoria District	Brazil	Bahia, Espirito Santo	18-22S	40-42W	USGS, 2000, MRDS database	
	Vohibarika area	Madagascar		16-17S	48-59E	NIMA, 2001	
	Vung Tau	Vietnam					
	Waisantingchow	Taiwan					3.04 Mm <sup>3</sup> @ 11.2% mon, 18.9% ilm, 16.7% zir, 1.8% rut (1968)
	Wangtzeliaochow	Taiwan					0.55 Mm <sup>3</sup> @ 10.9% mon, 22.8% zir, 21.4% ilm, 3.1% rut (1968)
	Wangyehchow	Taiwan					0.96 Mm <sup>3</sup> @ 12.1% mon, 24.4% zir, 23.1% ilm, 5.0% rut (1968)
	Waroona (Hamel)	Australia	Western Australia	32-50S	115-55E	Jackson and Christiansen, 1993	Proven-- 0.655 Mt @ 0.35% mon
	Waroona (Hamel)	Australia	Western Australia	32-51S	115-55E	Towner, 1992	15% HM
	Waroona (Hamel)	Australia	Western Australia				
	Waroona (Hamel)	Australia	Western Australia				5 Mt @ 14.2% HM

Appendix A. REE Deposits  
USGS OF02-189

DEPOSIT TYPE	Deposit or district name	STATUS	Mineralogy			Geochronology
			REE Mineralogy	Other Ore or Significant Minerals	Gangue and Rock-forming Minerals	Age (method, mineral, rock)
	Trivandrum	Occurrence	mon			
	Tungshanchow		mon	zir, ilm, rut, mag	qtz	
	Tutunup	Occurrence	mon			
	Ussangoda					
	Vero Beach	Past small producer byproduct mon	mon, xen	ilm, rut, zir	sta, kya, tour, epi, gar	
	Viney Creek	Current Producer but no mon prod recently	mon	zir, rut, ilm	qtz	Quaternary
	Vinh Cam Ranh		mon	ilm, zir, rut, mag	qtz	
	Vinh Giat		mon	ilm, zir, mag, rut	qtz	
	Vinh Mi (Vinh My)	Occurrence	mon, xen	ilm, zir, rut		
	Vitoria District	Active producer (1985)	mon	ilm, zir, rut, mag	qtz	Quaternary
	Vohibarika area	Past producer	mon			
	Vung Tau		mon	ilm, zir, mag, rut	qtz	
	Waisantingchow	Occurrence	mon	ilm, zir, rut, mag	qtz	
	Wangtzeliaochow	Occurrence	mon	zir, ilm, rut, mag	qtz	
	Wangyehchow	Occurrence	mon	zir, ilm, rut, mag	qtz	
	Waroona (Hamel)	Closed 1997	mon, xen	ilm, zir, rut, leu	qtz, sta, kya	Pleistocene-Recent
	Waroona (Hamel)	Closed 1992?	mon	ilm, zir, leu		Late Tertiary-Pleistocene
	Waroona (Hamel)	Closed 1997	mon, xen?	ilm, zir, leu		
	Waroona (Hamel)	Past byproduct producer	mon	ilm, leu, rut, zir		

Appendix A. REE Deposits  
USGS OF02-189

DEPOSIT TYPE	Deposit or district name	Host Rock(s)	Company	COMMENTS	REFERENCES
	Trivandrum				ESCAP and ABMRGG, 1988;
	Tungshanchow			Offshore sand bar.	ESCAP and ABMRGG, 1988
	Tutunup		Westralian Sands Co. (1988)		Roskill, 1988
	Ussangoda				ESCAP, 1989
	Vero Beach		Riz Mineral Co. (1945)		Mertie, 1975; Garnar, 1972
	Viney Creek	beach sand	Mineral Deposits Ltd.	Marine placer. Dredge operation. In Murray Basin. Feeds Hawks Nest plant.	Hedrick, 1998; Jackson and Christiansen, 1993; Lishmund and others, 1999; Griffiths, 1992
	Vinh Cam Ranh				ESCAP and ABMRGG, 1988
	Vinh Giat				ESCAP and ABMRGG, 1988
	Vinh Mi (Vinh My)	beach sand		Coastal placer. Part of Thuan An group of deposits. Average deposit thickness 1.6 m.	O'Driscoll, 1996; ESCAP and ABMRGG, 1988; ESCAP, 1990
	Vitoria District	beach sand	Nuclebras de Monazita e Associados Ltda (Nuclemon)		Harben, 1984; Leonardos, 1974
	Vohibarika area				Neary and Highley, 1984
	Vung Tau				ESCAP and ABMRGG, 1988
	Waisantingchow			Offshore sand bar.	ESCAP and ABMRGG, 1988
	Wangtzeliaochow			Offshore sand bar.	ESCAP and ABMRGG, 1988
	Wangyehchow			Offshore sand bar.	ESCAP and ABMRGG, 1988
	Waroona (Hamel)	dune and beach sand	Westralian Sands Ltd.	Dry mining operation. Waroona shoreline. Deposit contains ama 20% clay. North of Bunbury.	O'Driscoll, 1988; Jackson and Christiansen, 1993; Griffiths, 1992
	Waroona (Hamel)		ISK Minerals Pty Ltd.	112 km S of Perth.	Griffiths, 1992; Loughbrough, 1992
	Waroona (Hamel)		Cable Sands Ltd. (1988)	Dry mining operation. Waroona shoreline. Deposit contains ama 20% clay. North of Bunbury.	Loughbrough, 1992; ESCAP and ABMRGG, 1988; Hedrick and Templeton, 1991; Hedrick, 1998
	Waroona (Hamel)	dune and beach sand	Ravensthorpe Mining and Investment (1988)	Heavy minerals are 0.35% mon. South operations replaced north operations in 1988.	Jackson and Christiansen, 1993; Roskill, 1988

Appendix A. REE Deposits  
USGS OF02-189

DEPOSIT TYPE	Deposit or district name	Location				Source	Resources Tonnage and grade	Source & Date of Estimate(s)
		Country	State or Province	Latitude	Longitude			
	Wemen	Australia	New South Wales	34-55S	142-45E		20 Mt @ 3.7% HM	Mineral Deposits Ltd. Webpage, Feb., 2000
	Westport (includes Nine Mile Beach, Carters Beach)	New Zealand	South Island	41-06S	171-24E	Jackson and Christiansen, 1993		
	Williamstown	Australia	New South Wales				2% HM	ESCAP and ABMRGG, 1988
	WIM 150 (Drung South, CRA, Horsham)	Australia	Victoria	36-43S	142-12E	Towner, 1992	0.75 Mt mon + xen; 750 Mt @ 4% HM; 2475 Mt @ 0.138% mon (1990); resource-- 4900 Mt @ >2.8% HM (mon is 1.4% of HM, xeno is 0.4% of HM); Proven-- >1000. Mt @ >3% HM, Proven-- 0.58 Mt mon, 0.17 Mt xen	1990; 2000; Jackson and Christiansen, 1993; Castor, 1994/1990; Roskill, 1988
	Wonnerup	Australia	Western Australia	33-37S	115-25E	Jackson and Christiansen, 1993		
	Wonnerup Beach	Australia	Western Australia	33-37S	115-25E	Jackson and Christiansen, 1993		
	Woorack	Australia	Victoria					
	Wuzhaung (Baoding)	China	Guangdong/Hainan Island	18-43N	110-22E	Towner, 1992	Measured-- 9 Mm <sup>3</sup> @ 1.03 kg mon/m <sup>3</sup> (9253 t mon), 15.36 kg ilm/m <sup>3</sup> , 3.0 kg zir/m <sup>3</sup> (1982)	ESCAP and ABMRGG, 1988
	Xinglong	China	Guangdong/Hainan Island					
	Xitou	China	Guangdong					
	Yangjiang (Nanshanhai)	China	Guangdong	21-51N	11-56E			
	Yarloop	Australia	Western Australia	32-58S	115-54E	NIMA, 2000		
	Yarraman	Australia	Queensland					
	Yoganup (Yoganup Central)	Australia	Western Australia	33-39S	115-33E	NIMA, 2000	12-15% HM	ESCAP and ABMRGG, 1988

Appendix A. REE Deposits  
USGS OF02-189

DEPOSIT TYPE	Deposit or district name	STATUS	Mineralogy			Geochronology
			REE Mineralogy	Other Ore or Significant Minerals	Gangue and Rock-forming Minerals	Age (method, mineral, rock)
	Wemen	Active (2001)		ilm, zir, rut		Tertiary
	Westport (includes Nine Mile Beach, Carters Beach)	Prospect	mon	ilm, gar, zir, mag, U-thor, Au, rut, cas	qtz, fld	Quaternary
	Williamstown	Prospect		rut, ilm, zir		
	WIM 150 (Drung South, CRA, Horsham)	Potential resource	mon, xen	zir, ilm, rut, leu, ana	qtz	Early Pleistocene
	Wonnerup		mon, xen	ilm, zir, rut, leu, gar	qtz	Holocene
	Wonnerup Beach	Past producer	mon	ilm, zir		
	Woonack	Potential resource	mon	ilm, zir		
	Wuzhaung (Baoding)	Producer byproduct monazite	mon	ilm, zir, rut, ana, cas, mag, chr	qtz, tour	Cenozoic
	Xinglong	Producer byproduct monazite	mon	ilm, zir, rut, ana, cas, mag, chr	qtz, tour	
	Xitou	Producer byproduct monazite	mon	ilm, zir, rut		
	Yangjiang (Nanshanhai)	Producer byproduct monazite	mon, xen	ilm, zir, rut		
	Yarloop	Current Producer	mon	ilm, zir		Pleistocene-Recent
	Yarraman	Current Producer?	mon			
	Yoganup (Yoganup Central)	Current Producer?	mon, xen	ilm, leu, zir, rut		Pleistocene-Recent

Appendix A. REE Deposits  
USGS OF02-189

DEPOSIT TYPE	Deposit or district name	Host Rock(s)	Company	COMMENTS	REFERENCES
	Wemen		RZM Pty. Ltd.	In Murray Basin. Coarse-grained beach placer.	Hedrick, 1999; Lishmund and others, 1999; Mineral Deposits Ltd., 2000, accessed at URL <a href="http://www.mineraldeposits.com.au/">http://www.mineraldeposits.com.au/</a> in Feb., 2000
	Westport (includes Nine Mile Beach, Carters Beach)	sand of the Nine Mile Fm	Austpac Titanium Ltd.	Marine placer.	McPherson, 1978; Towner, 1992; Jackson and Christiansen, 1993; Christie and others, 2000; ESCAP and ABMRGG, 1988
	Williamstown		Mineral Deposits Ltd. (1977)	Parabolic dunes.	ESCAP and ABMRGG, 1988
	WIM 150 (Drung South, CRA, Horsham)		CRA (1988)	In Murray Basin. Fine-grained off-shore deposit. Fine-grained nature of the sands ( 50 microns) has prevented development. Deposit contains 100,000 t Y <sub>2</sub> O <sub>3</sub> .	Castor, 1994; Garnar and Stanaway, 1994; McIntyre, 1990; Robjohns, 1990; Griffiths, 1992; Towner, 1992; Roskill, 1988; Mineral Deposits Ltd., 2000, accessed at URL <a href="http://www.mineraldeposits.com.au/">http://www.mineraldeposits.com.au/</a> in Feb., 2000
	Wonnerup	dune and beach sand		Beach resources depleted, mining dunes in 1993. Disc 1959.	Jackson and Christiansen, 1993
	Wonnerup Beach			Closed 1967. Beach and dune deposits of Minniup shoreline. Near Busselton.	ESCAP and ABMRGG, 1988
	Woorack		RGC Ltd. (1999)		Hedrick, 1999
	Wuzhaung (Baoding)		Guangdong Metallurgical Industries Bureau (1997)	Marine placer. Deposit and processing plant. Deposit mined by commune farmers. Tailings discarded in ocean. Mon contains 5-6% ThO <sub>2</sub> and 51% REO.	Hedrick and Templeton, 1991; Towner and others, 1988; ESCAP and ABMRGG, 1988
	Xinglong		Guangdong Metallurgical Industries Bureau (1997)	Deposit and processing plant.	Hedrick and Templeton, 1991; ESCAP and ABMRGG, 1988
	Xitou		State-owned	Deposit and processing plant.	Hedrick and Templeton, 1991; ESCAP and ABMRGG, 1988
	Yangjiang (Nanshanhai)		State-owned	Deposit and processing plant. Probably mixed beach and river placers on coastal plain.	Hedrick and Templeton, 1991; ESCAP and ABMRGG, 1988
	Yarloop		Cable Sands Ltd. (1997)	55 km N of Bunbury. Same as Bunbury deposit?	Hedrick, 1998, 1999; Roskill, 1988
	Yarraman		Consolidated Rutile Ltd.	On North Stradbroke Island.	Hedrick, 1999
	Yoganup (Yoganup Central)		Westralian Sands (1999)	Discovered 1954. Mon richest at base of deposit and increases westward. Yoganup shoreline.	Fetherston and others, 1997; ESCAP and ABMRGG, 1988



Appendix A. REE Deposits  
USGS OF02-189

DEPOSIT	Location					Resources	Source & Date of Estimate(s)	
TYPE	Deposit or district name	Country	State or Province	Latitude	Longitude	Source	Tonnage and grade	
	Yoganup Extended	Australia	Western Australia	33-36S	115-40E	Jackson and Christiansen, 1993	>40 Mt ore; 13.% HM; 0.056% mon	1988 (ore); Jackson and Christiansen, 1993
	Yoganup North (Boyanup)	Australia	Western Australia	33-29S	115-44E	Towner, 1992	12-15% HM	ESCAP and ABMRGG, 1988
	Yulee	USA	Ga or Fl					
	Zhanjiang district	China	Guangdong	21-12N	110-28E	Towner and others, 1988	Measured-- 3.0 Mt; Indicated- 7.0 Mt	ESCAP and ABMRGG, 1988
PLACER, Alluvial								
	Atlantida	Uruguay		35-12S	55-48W	Jackson and Christiansen, 1993	3.2% mon	
	Ban Yun	Thailand	Phuket				0.2% Y2O3, 0.004% mon (1971)	ESCAP and ABMRGG, 1988
	Bang Lin	Thailand	Rayong					
	Batang Berjantai area	Malaysia	Selangor	03-20N	101-30E	ESCAP and ABMRGG, 1988		
	Batang Padang	Malaysia	Selangor					
	Bates Hole area	USA	Wyoming/Carbon County					
	Bear Valley	USA	Idaho/Valley County	44-21N	115-24W	Jackson and Christiansen, 1993	Total production of 10,000 t REO; 109.9 Mt @ 0.0155% mon or 0.010% REO (1982)	Castor, 1994; Jackson and Christiansen, 1993
	Beihei District	China	Guangxi	21-29N	109-05E			
	Bidor Malaya Mine	Malaysia						
	Big Creek	USA	Idaho/Valley County	44-28N	115-59W	Jackson and Christiansen, 1993	10,000 mt REO; 116.1 Mt @ 0.04% mon (1982)	; Jackson and Christiansen, 1993
	Carolina monazite belt	USA						
	Chamberlin District	USA	Idaho	45-19N	115-07W	USGS, 2000, MRDS database	0.64 Myd <sup>3</sup> - Moose Meadows; 3.84 Myd <sup>3</sup> - Root Ranch	Cater and others, 1973

Appendix A. REE Deposits  
USGS OF02-189

DEPOSIT			Mineralogy			Geochronology
TYPE	Deposit or district name	STATUS	REE Mineralogy	Other Ore or Significant Minerals	Gangue and Rock-forming Minerals	Age (method, mineral, rock)
	Yoganup Extended	Past byproduct producer	mon	ilm, leu, zir, rut	qtz	Early Pleistocene
	Yoganup North (Boyanup)	Past byproduct producer; Closed 1998	mon	ilm, zir, leu, rut	qtz	Early Pleistocene
	Yulee					
	Zhanjiang district	Producer byproduct monazite	mon, xen	ilm, zir, rut	qtz	Cenozoic
PLACER, Alluvial						
	Atlantida		mon			
	Ban Yun		mon	cas, ilm, zir	qtz	
	Bang Lin		mon	cas, Th		
	Batang Berjantai area	Producer byproduct mon/xen	mon, xen	cas, ilm, zir, rut		Quaternary
	Batang Padang	Producer byproduct mon/xen	mon, xen	cas, ilm, zir, rut		Quaternary
	Bates Hole area	Occurrence	mon	thor?, zir		Quaternary
	Bear Valley	Small past producer	mon; minor lop, xen, ferg	ilm, mag, gar; minor zir, sam, col	qtz	Pleistocene
	Beihei District		mon	ilm, rut, zir		
	Bidor Malaya Mine	Producer	mon			
	Big Creek	Past producer	mon, Y-lop, Y-eux	ilm, gar, mag; minor zir	qtz	Pleistocene
	Carolina monazite belt		mon, xen			
	Chamberlin District	Occurrence	all	zir, cin, ilm, mag		Quaternary

Appendix A. REE Deposits  
USGS OF02-189

DEPOSIT TYPE	Deposit or district name	Host Rock(s)	Company	COMMENTS	REFERENCES
	Yoganup Extended	sand and clay of Yoganup Fm	Westralian Sands (1999)	Yoganup shoreline. Feeds North Capel plant.	Anstett, 1986; Collins and Baxter, 1984; Hedrick and Templeton, 1991; Hedrick, 1995, 1996; Jackson and Christiansen, 1993; ESCAP and ABMRGG, 1988; Roskill, 1988
	Yoganup North (Boyanup) Yulee	sand and clay of Yoganup Fm	Westralian Sands (1999)	Yoganup shoreline.	Hedrick, 1999; O'Driscoll, 1988; Hedrick and Templeton, 1991; ESCAP and ABMRGG, 1988 Cocker, 1998
	Zhanjiang district		State-owned	Deposit and processing plant. Mixed beach and river placers on coastal plain.	Hedrick and Templeton, 1991; Towner and others, 1988; ESCAP and ABMRGG, 1988
PLACER, Alluvial					
	Atlantida	sand			Jackson and Christiansen, 1993
	Ban Yun Bang Lin			Mon has a high Th content.	ESCAP and ABMRGG, 1988 ESCAP and ABMRGG, 1988
	Batang Berjantai area				Towner and others, 1988; Towner, 1992; ESCAP and ABMRGG, 1988; Hedrick and Templeton, 1991
	Batang Padang				Towner and others, 1988; Towner, 1992; ESCAP and ABMRGG, 1988; Hedrick and Templeton, 1991
	Bates Hole area	sandstone and conglomerate of the Wind River and White River Fmts, recent placers		High radioactivity.	King, 1991
	Bear Valley	fluvial sands, gravel		Includes Porter placer.	Anstett, 1986; Jackson and Christiansen, 1993; Castor, 1994; Overstreet, 1967; Schmidt and Mackin, 1970
	Beihei District Bidor Malaya Mine			Mixed river and marine placers along coastline. Lat-long is for town of Beihei along coast, but may not be in correct province.	Hedrick and Templeton, 1991; Towner and others, 1988 J. Hedrick, 2002, written commun.
	Big Creek Carolina monazite belt	fluvial sands			Anstett, 1986; Jackson and Christiansen, 1993; Castor, 1994; Overstreet, 1967 Castor, 1994
	Chamberlin District	alluvium			Cater and others, 1973

Appendix A. REE Deposits  
USGS OF02-189

DEPOSIT	Location					Resources	Source & Date of Estimate(s)
TYPE	Deposit or district name	Country	State or Province	Latitude	Longitude	Source	Tonnage and grade
	Chao Fa Mine	Thailand	Phuket				
	Chumphon	Thailand	Chumphon				0.05% mon (1971)
	Circle	USA	Alaska	65-30N	144-45W	Nokleberg and others, 1997	
	Dianbai	China	Guangdong	21-33N	111-16E		
	El Dorado Creek area	USA	AK	65-56N	166-12W	USGS, 2000, MRDS database	
	Fortymile	USA	Alaska	64-20N	142-00W	Nokleberg and others, 1997	
	Gambang area	Malaysia	Pahang				
	Gold Fork-Little Valley	USA	Idaho/Valley County	44-41N	115-58W	Jackson and Christiansen, 1993	296 Mt @ 0.016% mon or 0.0098% REO (1981)
	Heinze Basin	Myanmar	Thanintharyi	14-36N	98-03E	ESCAP, 1998	
	Horse Creek (Aiken County)	USA	South Carolina	33-30N	81-54W	USGS, 2000, MRDS database	19 Mt @ 0.041% mon or 0.026% REO (1983)
	Hot Springs	USA	Alaska	65-10N	151-00W	Nokleberg and others, 1997	
	Iditarod	USA	Alaska	62-30N	158-30W	Nokleberg and others, 1997	
	Janghowon	South Korea		37-10N	127-30E	ESCAP and ABMRGG, 1988	0.017 Mt mon @ grade of 0.07% mon (1968)
	Jos Plateau	Nigeria		09-30N	08-00E		
	Kanbauk	Myanmar	Thanintharyi	14-36N	98-03E	ESCAP, 1998	
	Kinta Kellas Batu Gajah Mine	Malaysia	Perak				
	Kinta Valley (Lahat)	Malaysia	Perak	04-30N	101-10E	ESCAP and ABMRGG, 1988	
	Kluan Tong Mine	Thailand	Phuket				
	Kuala Lumpur area	Malaysia	Selangor	03-00N	101-45E	ESCAP and ABMRGG, 1988	
	Kuwn-Thong	Thailand	Phuket				0.03% mon (1971)

Appendix A. REE Deposits  
USGS OF02-189

DEPOSIT TYPE	Deposit or district name	STATUS	Mineralogy			Geochronology
			REE Mineralogy	Other Ore or Significant Minerals	Gangue and Rock-forming Minerals	Age (method, mineral, rock)
	Chao Fa Mine		mon	cas, Th		
	Chumphon	Producer byproduct mon/xen	mon	cas, ilm, zir		
	Circle			Au, Sn, W		
	Dianbai		mon, xen	Ti, Zr		
	El Dorado Creek area		mon, xen	cas, sch, U-zir, flu, mag		
	Fortymile			Au, Sn, Pb, W, Hg		
	Gambang area	Producer byproduct mon/xen	xen, mon	cas, ilm, rut, zir		
	Gold Fork-Little Valley	Occurrence	mon	Au, ilm, zir, gar, mag; minor tit	qtz	Pleistocene
	Heinze Basin	Occurrence	mon			
	Horse Creek (Aiken County)	Past producer of monazite	mon, xen	ilm, rut, zir, Au, cor, mag, sta	qtz, cly	Cenozoic, Cretaceous
	Hot Springs			Au, cas, chr		
	Iditarod			Au, chr, sch, cas, apy, irut, cin		
	Janghowon		mon	zir		
	Jos Plateau		xen, mon	zir, Sn, Ta, Nb		
	Kanbauk	Occurrence	mon	zir		
	Kinta Kellas Batu Gajah Mine	Producer	mon, xen			
	Kinta Valley (Lahat)	Producer byproduct mon/xen	mon, xen	cas, ilm, zir, rut		Quaternary
	Kluan Tong Mine	Producer byproduct mon/xen	mon	cas, Th, U		
	Kuala Lumpur area	Producer byproduct mon/xen	mon, xen	cas, ilm, Au, zir, rut		Quaternary
	Kuwn-Thong		mon	cas, ilm, zir	qtz	

Appendix A. REE Deposits  
USGS OF02-189

DEPOSIT TYPE	Deposit or district name	Host Rock(s)	Company	COMMENTS	REFERENCES
	Chao Fa Mine			Mon in amang dumps contains ama 15.7% ThO <sub>2</sub> .	ESCAP and ABMRGG, 1988
	Chumphon				ESCAP and ABMRGG, 1988
	Circle	alluvial, colluvial sediments			Nokleberg and others, 1997
	Dianbai			Deposit type classification is uncertain.	Hedrick and Templeton, 1991; Towner and others, 1988
	El Dorado Creek area	stream sediments		Panned concentrate contained 0.029% Eu and 0.02% U.	Killeen and Ordway, 1955
	Fortymile	stream and bench sediments			Nokleberg and others, 1997
	Gambang area				ESCAP and ABMRGG, 1988
	Gold Fork-Little Valley	fluvial sand		Past gold placer producer.	Anstett, 1986; Overstreet, 1967
	Heinze Basin	aluvium			ESCAP, 1998
	Horse Creek (Aiken County)	fluvial sand, Tuscaloosa Fmt sediments		Flood plain. Reconcentration of heavy minerals from Tuscaloosa Fmt. Includes Hollow (Holley) Creek and other drainages.	Jackson and Christiansen, 1993; Cocker, 1998; Mertie, 1975
	Hot Springs			Buried bench gravels.	Nokleberg and others, 1997
	Iditarod				Nokleberg and others, 1997
	Janghowon			60 km North of Chongju. Deposit is inland and believed to be composed of river sands. Deposit type classification is uncertain.	ESCAP and ABMRGG, 1988
	Jos Plateau			Placers derived from alkaline granites.	Möller, 1989a; de Kun, 1987
	Kanbauk			Heavy mineral sands.	ESCAP, 1998
	Kinta Kellas Batu Gajah Mine				J. Hedrick, 2002, written commun.
	Kinta Valley (Lahat)				Towner and others, 1988; Towner, 1992; ESCAP and ABMRGG, 1988; Hedrick and Templeton, 1991
	Kluan Tong Mine			Mon has high Th values and ama 4.08% U <sub>3</sub> O <sub>8</sub> .	ESCAP and ABMRGG, 1988
	Kuala Lumpur area				Towner and others, 1988; Towner, 1992; ESCAP and ABMRGG, 1988; Hedrick and Templeton, 1991
	Kuwn-Thong				ESCAP and ABMRGG, 1988

Appendix A. REE Deposits  
USGS OF02-189

DEPOSIT TYPE	Deposit or district name	Location				Source	Resources	Source & Date of Estimate(s)
		Country	State or Province	Latitude	Longitude		Tonnage and grade	
	Kwangsangun	South Korea		35-10N	126-50E	ESCAP and ABMRGG, 1988	0.048 Mt mon at grade of 0.05% mon (1968)	ESCAP and ABMRGG, 1988
	Kyan Chaung	Myanmar	Thanintharyi	13-30N	98-20E	ESCAP, 1998		
	Lahat Mine	Malaysia	Perak					
	Lamawpyin-Shwedu Chaung	Myanmar	Mergui district					
	Layan	Thailand	Phuket				2.2% Y2O3, 0.36% mon (1971)	ESCAP and ABMRGG, 1988
	Long Valley	Idaho					Total production-- 6427 t mon	Roskill, 1988
	Madianhe	China	Guangdong/Dianbai	21-33N	111-16E			
	Main Khao	Thailand	Phuket				0.11% Y2O3, 0.007% mon (1971)	ESCAP and ABMRGG, 1988
	Mageng (Magang)	China	Hubei/ Tongcheng					
	Marion	USA	North Carolina					
	McGrath	USA	Alaska	62-45N	155-00W	Nokleberg and others, 1997		
	Mit-Thawi	Thailand	Phang-nga				0.12% mon (1971)	ESCAP and ABMRGG, 1988
	Momi River	Indonesia	Irian Jaya					
	Mogok	Myanmar	Shan/Sagaing	22-54-30N	96-30E	ESCAP, 1998		
	Mong Kung	Myanmar	Northern Shan	21-37N	97-31-30E	ESCAP, 1998		
	Muong Hum	Vietnam					0.4 Mt REO	Dzien, 1990
	Namdaecheon River (Muju area)	South Korea		35-00N	126-40E	ESCAP and ABMRGG, 1988	0.028 Mt mon @ grade of 0.14% mon (1982)	ESCAP and ABMRGG, 1988
	Oak Grove	USA	Tennessee	36-23N	88-10W	Towner, 1992	174.6 Mt @ 0.155% mon or 0.09% REO (1982)	Jackson and Christiansen, 1993
	Pearsol Creek	USA	Idaho	44-31N	116-05W	Jackson and Christiansen, 1993	172.5 Mt @ 0.0186% mon (1982)	Jackson and Christiansen, 1993
	Pitinga	Brazil	Amazonas	00-45S	60-07W	Towner, 1992		
	Port Clarence	USA	Alaska	65-40N	166-30W	Nokleberg and others, 1997		
	Qinzhou (Qinxian)	China	Guangxi	21-59N	108-36E			
	Ramey Meadows	USA	Idaho	45-16N	115-11W	USGS, 2000, MRDS database	1.7 Myd <sup>3</sup> @ 13.5 lbs HM/yd <sup>3</sup>	Cater and others, 1973

Appendix A. REE Deposits  
USGS OF02-189

DEPOSIT TYPE	Deposit or district name	STATUS	Mineralogy			Geochronology
			REE Mineralogy	Other Ore or Significant Minerals	Gangue and Rock-forming Minerals	Age (method, mineral, rock)
	Kwangsangun		mon	zir		
	Kyan Chaung	Occurrence	mon			
	Lahat Mine	Occurrence	mon, xen			
	Lamawpyin-Shwedu Chaung	Occurrence	mon			
	Layan	Producer byproduct mon/xen	mon	cas, zir	qtz	
	Long Valley	Past producer	mon	ilm, gar, zir		
	Madianhe					
	Main Khao	Producer byproduct mon/xen	mon	cas, ilm, zir	qtz	
	Mageng (Magang)	Occurrence?				
	Marion	Past byproduct producer	mon, xen	Au, sand, gravel		
	McGrath		mon	Au, cin, bis, chr, zir, mag, pyr, sch		
	Mit-Thawi	Producer byproduct mon/xen	mon	cas, ilm	qtz	
	Momi River	Occurrence	xen, mon	zir		
	Mogok	Occurrence	mon	zir, uran, sam		
	Mong Kung	Occurrence	mon	col, cas, tan, mag		
	Muong Hum		all			
	Namdaecheon River (Muju area)		mon	ilm, mag, zir, Au, col		
	Oak Grove	Occurrence	mon	ilm, rut, leu, zir, kya	tour, qtz, sta	Late Cretaceous
	Pearsol Creek	?	mon	ilm, mag, zir, gar	qtz	
	Pitinga	Potential. byproduct	xen, Y-Nb mineralization	cas, zir, pyro, col, tan		
	Port Clarence		mon, xen	Au, cas, sch, cin, zir, col, tan, wlf		
	Qinzhou (Qinxian)	Producer byproduct monazite	mon	ilm, zir		
	Ramey Meadows	Occurrence	all	mag, zir, ilm		Quaternary



Appendix A. REE Deposits  
USGS OF02-189

DEPOSIT TYPE	Deposit or district name	Host Rock(s)	Company	COMMENTS	REFERENCES
	Kwangsangun Kyan Chaung	alluvium		10 km N of Kwangju. Deposit is inland and believed to be composed of river sands. Deposit type classification uncertain.	ESCAP and ABMRGG, 1988 ESCAP, 1998
	Lahat Mine		Beh Minerals		J. Hedrick, 2002, written commun.
	Lamawpyin-Shwedu Chaung	stream sediments			ESCAP, 1998
	Layan				ESCAP and ABMRGG, 1988
	Long Valley Madianhe				Roskill, 1988 Wen Lu, 1998
	Main Khao Mageng (Magang)				ESCAP and ABMRGG, 1988 Wen Lu, 1998
	Marion		Imperial Mining Co. (1990)		Hedrick and Templeton, 1991; Towner and others, 1988
	McGrath				Nokleberg and others, 1997
	Mit-Thawi Momi River				ESCAP and ABMRGG, 1988 ESCAP and ABMRGG, 1988
	Mogok			Heavy mineral sands.	ESCAP, 1998
	Mong Kung	river sand			ESCAP, 1998
	Muong Hum				Dzien, 1990
	Namdaecheon River (Muju area)			Deposits are associated with the Namdaecheon river.	ESCAP and ABMRGG, 1988
	Oak Grove	sand of the McNairy Fm		Alluvial terrace.	Anstett, 1986; Towner, 1992; Jackson and Christiansen, 1993
	Pearsol Creek				Jackson and Christiansen, 1993
	Pitinga		Mineração Taboca SA	Greisenization of biotite granite produced primary mineralization. Weathered zone has associated placers.	O'Driscoll, 1989; Towner, 1992
	Port Clarence				Nokleberg and others, 1997
	Qinzhou (Qinxian)		State-owned	Deposit with processing plant. Deposit type classification is uncertain.	Hedrick and Templeton, 1991; ESCAP and ABMRGG, 1988
	Ramey Meadows	alluvium			Cater and others, 1973

Appendix A. REE Deposits  
USGS OF02-189

DEPOSIT	Location					Resources	Source & Date of Estimate(s)	
TYPE	Deposit or district name	Country	State or Province	Latitude	Longitude	Source	Tonnage and grade	
	Ranchi-Purulia	India	Bihar	23-25N	86-00E	Jackson and Christiansen, 1993	86.5 Mt @ 0.31% mon (1989)	Jackson and Christiansen, 1993
	Rio Tercero	Argentina	Cordoba	32-02S	64-12W	Jackson and Christiansen, 1993	31.7Mt @ 0.0173% mon	Jackson and Christiansen, 1993
	Ruby Meadows	USA	Alaska	64-25N	154-20W	Nokleberg and others, 1997		
	Ruby Meadows	USA	Idaho/Valley County					
	Sai-Chon	Thailand	Phuket				0.02% mon (1971)	ESCAP and ABMRGG, 1988
	Sakagyi	Myanmar	Sagaing	22-55-58N	96-13E	ESCAP, 1998		
	Sao Gonçalo do Sapucaí area	Brazil	Minas Gerais	21-56S	45-40W	Azevedo Branco, 1984	28M m <sup>3</sup> with 0.05 t mon; 0.066% mon	Mining Journal, 1990a; Jackson and Christiansen, 1993
	Silica Mine	USA	Tennessee	36-02N	88-11W	Jackson and Christiansen, 1993	26.7 Mt @ 0.013% mon or 0.0079% REO (1989)	Jackson and Christiansen, 1993
	Sin-Krasom	Thailand	Phang-nga				0.02% mon (1971)	ESCAP and ABMRGG, 1988
	Soun-Miyang	South Korea		36-55N	127-20E	ESCAP and ABMRGG, 1988	0.025 Mt mon @ grade of 0.07% mon (1968)	ESCAP and ABMRGG, 1988
	Southern Malayan Batu Gajah Mine	Malaysia	Perak					
	Thawi-Thap	Thailand	Phang-nga				0.05% mon (1971)	ESCAP and ABMRGG, 1988
	Tolovana	USA	Alaska	65-30N	148-10W	Nokleberg and others, 1997		
	Tronoh Mines	Malaysia	Perak					
	Wan Hapalam	Myanmar	Shan	21-32N	97-18E	ESCAP, 1998		
	Warm Spring Creek placers	USA	Wyoming/Fremont County					
	Witchit	Thailand	Phuket				0.001% mon (1971)	ESCAP and ABMRGG, 1988
	Xintou	China	Guangdong					
	Xun Jiang	China	Guangxi	23-30N	110-50E	ESCAP and ABMRGG, 1988	66.7 Mt @ 6% HM (1982)	Jackson and Christiansen, 1993
	Yadanabon Mine	Myanmar	Thanintharyi	11-17-05N	99-17E	ESCAP, 1998	30% mon	ESCAP, 1998
	Yongsanpo	South Korea		34-55N	126-40E	ESCAP and ABMRGG, 1988	0.02 Mt mon @ grade of 0.07% mon (1968)	ESCAP and ABMRGG, 1988
	Yueyang	China	Hunan	29-23N	113-06E			
	Zhanjiang	China	Guangdong	21-12N	110-28E	Towner and others, 1988		

Appendix A. REE Deposits  
USGS OF02-189

DEPOSIT			Mineralogy			Geochronology
TYPE	Deposit or district name	STATUS	REE Mineralogy	Other Ore or Significant Minerals	Gangue and Rock-forming Minerals	Age (method, mineral, rock)
	Ranchi-Purulia	Byproduct REE from Ti mining	mon	ilm, rut, zir, apa, col, mag	qtz	
	Rio Tercero	Occurrence	mon	Th		Quaternary
	Ruby Meadows		all	Au, cas, sch, Pt, Bi		
	Ruby Meadows		mon	Au, mag, gar, zir, ilm, crn		
	Sai-Chon		mon	cas, ilm, zir	qtz	
	Sakagyi	Occurrence	mon	zir, U		
	Sao Gonçalo do Sapucaí area	Under development (1989)	mon	ilm, Au, zir, gar		Cenozoic
	Silica Mine	Producer, but does not recover REO	mon	qtz, ilm, rut, leu, zir	qtz	Cretaceous
	Sin-Krasom		mon	cas, ilm	qtz	
	Soun-Miyang		mon	zir		
	Southern Malayan Batu Gajah Mine	Producer	mon			
	Thawi-Thap	Producer byproduct monazite	mon	cas, ilm, zir	qtz	
	Tolovana		mon	Au, mag, PGE, ilm, chr, spinel, cin, sti, sch, cas		
	Tronoh Mines	Producer	mon			
	Wan Hapalam	Occurrence	mon	gar, cas, hem, rut		
	Warm Spring Creek placers	Occurrence	mon	Au		Quaternary
	Witchit		mon	cas, ilm	qtz	
	Xintou		mon, xen	Ti, Zr		
	Xun Jiang	Prospect (1993)	mon	ilm; minor rut, zir	qtz	Cenozoic
	Yadanabon Mine			wlf, Sn	qtz	
	Yongsanpo		mon	zir		
	Yueyang	Byproduct producer?	mon			
	Zhanjiang		mon, xen	ilm, zir, rut	qtz	Cenozoic

Appendix A. REE Deposits  
USGS OF02-189

DEPOSIT TYPE	Deposit or district name	Host Rock(s)	Company	COMMENTS	REFERENCES
	Ranchi-Purulia	sand		Byproduct of Ti mining.	Anstett, 1986; Hedrick and Templeton, 1991
	Rio Tercero	fluvial sand		Valley fill. Mon contains 60% REO and 3.8% ThO <sub>2</sub> .	Jackson and Christiansen, 1993
	Ruby Meadows			Buried placer deposit.	Nokleberg and others, 1997
	Ruby Meadows		Merlin Mining NL (1987)	7 claims near Burgdorf. Preliminary estimates indicate about 100 Mm <sup>3</sup> with ama 0.16% Y and 0.85 g/t Ta.	Industrial Minerals, 1987a
	Sai-Chon				ESCAP and ABMRGG, 1988
	Sakagyi		SA Mineracao da Trindade	Heavy mineral sands in vicinity of pegmatite.	ESCAP, 1998
	Sao Gonçalo do Sapucaí area	fluvial sand	SA Mineração da Trindade (Samitri, 1989)	Sands contain 0.66% mon.	Mining Journal, 1990; O'Driscoll, 1989; Azevedo Branco, 1984; Jackson and Christiansen, 1993
	Silica Mine	sand		HM stockpiled from past production of silica sand.	Anstett, 1986; Jackson and Christiansen, 1993; Roskill, 1988
	Sin-Krasom				ESCAP and ABMRGG, 1988
	Soun-Miyang			40 km NW of Chongju. Deposit is inland and believed to be a river placer.	ESCAP and ABMRGG, 1988
	Southern Malayan Batu Gajah Mine				J. Hedrick, 2002, written commun.
	Thawi-Thap				ESCAP and ABMRGG, 1988
	Tolovana				Nokleberg and others, 1997
	Tronoh Mines		Ayer, Kuning & Kampar		J. Hedrick, 2002, written commun.
	Wan Hapalam	alluvial sand			ESCAP, 1998
	Warm Spring Creek placers	black sands in alluvial and terrace material			King, 1991
	Witchit				ESCAP and ABMRGG, 1988
	Xintou			Deposit type classification in uncertain.	Hedrick and Templeton, 1991
	Xun Jiang	river sand		River plain. Deposit averages 5 m thick.	Towner, 1992; Towner and others, 1988; Jackson and Christiansen, 1993; ESCAP and ABMRGG, 1988
	Yadanabon Mine			Mon occurs in stream and probably in granite.	ESCAP, 1998
	Yongsanpo			Deposit is inland and believed to be a river placer.	ESCAP and ABMRGG, 1988
	Yueyang		State-owned		Hedrick and Templeton, 1991
	Zhanjiang			Mixed beach and river placers on coastal plain.	Hedrick and Templeton, 1991; Towner and others, 1988

Appendix A. REE Deposits  
USGS OF02-189

DEPOSIT	Location					Resources	Source & Date of Estimate(s)
TYPE	Deposit or district name	Country	State or Province	Latitude	Longitude	Source	Tonnage and grade
<b>PLACER, Uncertain origin</b>							
	Bangalore	India	Mysore/ Bangalore				
	Careacu	Brazil	Minas Gerais	22-02S	45-42W	NIMA, 2001	2500 t mon (1987)
	Chilka Lake	India	Orissa	19-46N	85-20E	NIMA, 2001	
	Cordislandia	Brazil	Minas Gerais				8200 t mon (1987)
	Cuxhaven	Germany					10 Mt HM
	Gaya	India	Bihar/ Gaya	24-47N	85-00E	NIMA, 2001	
	Hazaribagh	India	Bihar/ Hazaribagh				
	Kembajan Mountains	Indonesia	Kalimantan				
	Koraput	India	Orissa/ Koraput				
	Sabarkantha	India	Gujarat/ Sabarkantha				
	Sanbagoma	Mauritania		15-35N	11-57W	Arab Organisation for Mineral Resources, 1987	
	Sinoe County	Liberia		5-20N	8-40W	NIMA, 2001	
	Visakhapatnam	India	Andra Pradesh	17-42N	83-18E	NIMA, 2001	
	Tin fields	Rwanda					
<b>PLACER, Paleoplacer</b>							
	Archie Lake	Canada	Saskatchewan				
	Baja Guainia area	Colombia					
	Bald Mountain	USA	Wyoming/Albany County	44-48N	10-48W	Jackson and Christiansen, 1993	18.1 Mt @ 0.13% mon or 0.077% REO (1983)
	Elliott Lake (Blind River)-Denison	Canada	Ontario	46-29N	82-32W	Jackson and Christiansen, 1993	106 Mt @ 0.01% REO (1989)
	Elliott Lake (Blind River)-Quirke-Panel	Canada	Ontario	46-30N	82-38W	Jackson and Christiansen, 1993	68.2 Mt @ 0.0073% REO (1989)
	Elliott Lake (Blind River)-Stanleigh	Canada	Ontario	46-24N	82-38W	Jackson and Christiansen, 1993	49.9 Mt @ 0.0086% REO
	Grass Creek area	USA	Wyoming/Hot Springs County				

Appendix A. REE Deposits  
USGS OF02-189

DEPOSIT TYPE	Deposit or district name	STATUS	Mineralogy			Geochronology
			REE Mineralogy	Other Ore or Significant Minerals	Gangue and Rock-forming Minerals	Age (method, mineral, rock)
<b>PLACER, Uncertain origin</b>						
	Bangalore	Occurrence	mon			
	Careacu	Occurrence	mon			
	Chilka Lake		mon	ilm, rut, zir		
	Cordislandia	Occurrence	mon			
	Cuxhaven		mon?	ilm, rut, zir		
	Gaya	Occurrence	mon			
	Hazaribagh	Occurrence	mon	zir		
	Kembajan Mountains	Occurrence	mon			
	Koraput	Occurrence	mon	zir		
	Sabarkantha	Occurrence	mon			
	Sanbagoma		mon			
	Sinoe County		mon	zir, ilm, rut, chr		
	Visakhapatnam	Occurrence	mon	ilm, zir		
	Tin fields		mon	Sn		
<b>PLACER, Paleoplacer</b>						
	Archie Lake	Occurrence	mon	ilm		Archean
	Baja Guainia area	Occurrence	mon			Precambrian
	Bald Mountain	Potential resource	mon	ilm, Au, zir, mag, hem	qtz	Middle Cambrian
	Elliott Lake (Blind River)- Denison	Past U producer with byproduct REE	U-mon, bran	uran, bran, zir, pyr, Th	qtz	Early Proterozoic
	Elliott Lake (Blind River)- Quirke-Panel	Past U producer with byproduct REE	U-mon, bran	uran, bran, zir, pyr, Th	qtz	Early Proterozoic
	Elliott Lake (Blind River)- Stanleigh	U producer; Potential REE resource	U-mon, bran	uran, bran, zir, pyr, Th	qtz	Early Proterozoic
	Grass Creek area	Occurrence	mon	zir, Nb, Ti, Th, U, V		Cretaceous

Appendix A. REE Deposits  
USGS OF02-189

DEPOSIT TYPE	Deposit or district name	Host Rock(s)	Company	COMMENTS	REFERENCES
<b>PLACER, Uncertain origin</b>					
	Bangalore				ESCAP and ABMRGG, 1988
	Careacu			Lat-long is for town of Careacu.	Jackson and Christiansen, 1993
	Chilka Lake			Deposits on landward shore.	ESCAP and ABMRGG, 1988
	Cordislandia				Jackson and Christiansen, 1993
	Cuxhaven			Mineral sands.	O'Driscoll, 1988
	Gaya			Lat-long is for town of Gaya.	ESCAP and ABMRGG, 1988
	Hazaribagh				ESCAP and ABMRGG, 1988
	Kembajan Mountains			In West Kalimantan.	ESCAP and ABMRGG, 1988
	Koraput				ESCAP and ABMRGG, 1988
	Sabarkantha				ESCAP and ABMRGG, 1988
	Sanbagoma	arenaceous sedimentary rock			Arab Organisation for Mineral Resources, 1987
	Sinoe County			General location for county.	Roskill, 1988
	Visakhapatnam			Lat-long is for town of Visakhapatnam.	ESCAP and ABMRGG, 1988
	Tin fields			Mon is reportedly widespread in the tin fields of Rwanda.	de Kun, 1987
<b>PLACER, Paleoplacer</b>					
	Archie Lake	gneiss		A 5 to 6 m thick stratabound zone can be traced over a strike length of 600 m. 30 km ESE of Uranium City.	Saskatchewan Geological Survey, 1991
	Baja Guainia area	quartzite		Between Donaco and Santa Elena.	USGS and INGEOMINAS, 1983
	Bald Mountain	conglomerate		Fossil fluvial placer. Little Big Horn River area. Two sites contain at least 1.0 kg mon/t of rock. Resource is poorly defined.	Castor, 1994; Jackson and Christiansen, 1993; King, 1991
	Elliott Lake (Blind River)-Denison	quartz-pebble conglomerate	Denison Mines and SM Yttrium Canada Ltd. (1988)	Grauch classifies as U deposit; Mariano as a Proterozoic quartz-pebble conglomerate.	Harben and Bates, 1990; Jackson and Christiansen, 1993; Mariano, 1989; Möller, 1989a; Roskill, 1988
	Elliott Lake (Blind River)-Quirke-Panel	quartz-pebble conglomerate	Rio Algom (1993)	Grauch classifies as U deposit; Mariano as a Proterozoic quartz-pebble conglomerate.	Harben and Bates, 1990; Jackson and Christiansen, 1993; Mariano, 1989; Möller, 1989a; Roskill, 1988; Anstett, 1986
	Elliott Lake (Blind River)-Stanleigh	quartz-pebble conglomerate	Rio Algom (1993)	Uranium producer.	Anstett, 1986; Jackson and Christiansen, 1993; Harben and Bates, 1990; Mariano, 1989; Möller, 1989a; Roskill, 1988
	Grass Creek area	Mesaverde Formation-radioactive black sandstone		Paleo-beach placers. North segment- T46N R98W secs. 8, 9, 16.	King, 1991

Appendix A. REE Deposits  
USGS OF02-189

DEPOSIT	Location					Resources	Source & Date of Estimate(s)
TYPE	Deposit or district name	Country	State or Province	Latitude	Longitude	Source	Tonnage and grade
	McLean Lake	Canada	Saskatchewan				
	Oak Grove	USA	Tennessee	36-23N	88-10W	USGS, 2000, MRDS database	~ 5% HM
	Onemile Creek area	USA	Wyoming/Carbon County				
	Wheeler River	Canada	Alberta				
	Witwatersrand	South Africa					
	Williams Lake- Maw zone	Canada	Saskatchewan				Estimate-- 0.336 Mt @ 0.25% Y203
							Saskatchewan Geological Survey, 1991
<b>PHOSPHORITE</b>							
	Abu Tartar	Egypt	Western Desert	25-26N	30-02E	USGS, 2000, MASMILS database	>0.2% REE
	Blackfoot Bridge	USA	Idaho	42-07N	111-31W	Jackson and Christiansen, 1993	5.9 Mt @ 0.16% mon (1984)
	Bofal-Loubboira (Wadi Guellouar)	Mauritania		16-25N	13-45W	Boujo and Jiddou, 1989	
	Caldwell Canyon	USA	Idaho	42-44N	111-22W	Jackson and Christiansen, 1993	11 Mt @ 0.155% mon (1984)
	Champ	USA	Idaho	42-40N	111-16W	Jackson and Christiansen, 1993	
	Conda	USA	Idaho	42-44N	111-32W	Jackson and Christiansen, 1993	
	Dnieprodzerzhinsk	Ukraine	Dnepropetrovsk Oblast				
	Gay and South Forty	USA	Idaho	43-03N	112-07W	Jackson and Christiansen, 1993	18 Mt @ 0.1% mon (1989)
	Henry	USA	Idaho	42-53N	111-28W	Jackson and Christiansen, 1993	0.847 Mt @ 0.189% mon (1989)
	Husky	USA	Idaho	42-42N	111-15W	Jackson and Christiansen, 1993	23 Mt @ 0.16% mon (1989)
	Kunyang	China	Yunnan	24-40N	102-35E		> 0.05% REO, 8-25% P2O5
	Maybe Canyon (Maybe)	USA	Idaho	42-45N	111-18W	Jackson and Christiansen, 1993	6.35 Mt @ 0.16% mon (1989)
	Mountain Fuel	USA	Idaho	42-39N	111-17W	Jackson and Christiansen, 1993	5.4 Mt @ 0.166% mon (1989)
	North Henry	USA	Idaho	42-54N	111-30W	Jackson and Christiansen, 1993	3.2 Mt @ 0.119% REO (1985)
	Schevchenko	Kazakhstan					



Appendix A. REE Deposits  
USGS OF02-189

DEPOSIT TYPE	Deposit or district name	STATUS	Mineralogy			Geochronology
			REE Mineralogy	Other Ore or Significant Minerals	Gangue and Rock-forming Minerals	Age (method, mineral, rock)
	McLean Lake	Occurrence	xen		cly	
	Oak Grove	Occurrence	mon	ilm, zir, leu, rut, kya	sta, tour, cly	Late Cretaceous
	Onemile Creek area	Occurrence	U-thor, bran?	cof, tgum		Early Proterozoic
	Wheeler River		xen			
	Witwatersrand		mon	Au, uran		
	Williams Lake- Maw zone	Occurrence	Y + HREE		tour, qtz	
<b>PHOSPHORITE</b>						
	Abu Tartar	Active P mine		coll, carbonate-fapa, carbonate-hapa, wav, pyr, mar, Mn-apa	dol, ank, mont, cal, gyp-anhy, Fe oxides, gla, qtz, carbonaceous matter	Late Cretaceous
	Blackfoot Bridge	Occurrence	mon	coll, van, uran, pyr	cly	Permian
	Bofal-Loubboira (Wadi Guellouar)	Occurrence				Middle Eocene
	Caldwell Canyon	Occurrence	mon	coll, van, uran, pyr	cly	Permian
	Champ	Occurrence	mon	coll, van, uran, pyr	cly	Permian
	Conda		mon	coll, van, uran, pyr	cly	Permian
	Dnieprodzerzhinsk	Producer		U, P		
	Gay and South Forty	Occurrence	mon	coll, van, uran, pyr	cly	Permian
	Henry	Past byproduct producer?	mon	coll, van, uran, pyr	cly	Permian
	Husky	Occurrence	mon	coll, van, uran, pyr	cly	Permian
	Kunyang	Occurrence	coll, mon	var	cld, cal, cly	Cambrian
	Maybe Canyon (Maybie)	Past byproduct producer?	mon	coll, van, uran, pyr	cly	Permian
	Mountain Fuel	Occurrence	mon	coll, van, uran, pyr	cly	Permian
	North Henry	Occurrence	mon	coll, van, uran, pyr	cly	Permian
	Shevchenko	Byproduct producer of Eu (1995)		U, P		

Appendix A. REE Deposits  
USGS OF02-189

DEPOSIT TYPE	Deposit or district name	Host Rock(s)	Company	COMMENTS	REFERENCES
	McLean Lake	Athabasca Group sandstone		Above McLean Lake U deposits. Xenotime masses contain approx 10 % Y.	Saskatchewan Geological Survey, 1991
	Oak Grove	McNairy Formation- sand	Ethyl Corp. (1989)		Wilcox, 1971; Cocker, 1998
	Onemile Creek area	Magnolia Formation- conglomerate, quartzite		T18N R78W sec 6 and N/2 sec 7.	King, 1991
	Wheeler River	Athabasca Group sandstone		HREE-U concentrations.	Castor, 1994
	Witwatersrand	conglomerate		Au-U mining.	Möller, 1989a
	Williams Lake- Maw zone	Athabasca Group sandstone			Saskatchewan Geological Survey, 1991
<b>PHOSPHORITE</b>					
	Abu Tartar	Duwi (Phosphate) Formation		REE is potential byproduct.	Hussein and El Sharkawi, 1990; de Kun, 1987; Schroter, 1989; British Sulphur Corporation, 1987; Industrial Minerals, 1995
	Blackfoot Bridge	mudstone		0.1% REE in P ore.	Jackson and Christiansen, 1993
	Bofal-Loubboira (Wadi Guellouar)	limestone; clay; red sandstones			Boujo and Jiddou, 1989; de Kun, 1987
	Caldwell Canyon	mudstone		0.1% REE in P ore.	Jackson and Christiansen, 1993
	Champ	mudstone		0.1% REE in P ore. Phosphate mining ceased in 1986.	Jackson and Christiansen, 1993
	Conda	mudstone		0.1% REE in P ore. Phosphate mining ceased in 1984.	Jackson and Christiansen, 1993
	Dnieprodzerzhinsk			Uraniferous phosphorites.	Will and others, 1995
	Gay and South Forty	mudstone		0.1% REE in P ore.	Jackson and Christiansen, 1993
	Henry	mudstone		0.12% REE in P ore.	Jackson and Christiansen, 1993
	Husky	mudstone		0.1% REE in P ore.	Jackson and Christiansen, 1993
	Kunyang	phosphate rock			Wu and others, 1996
	Maybe Canyon (Maybie)	mudstone		0.1% REE in P ore.	Jackson and Christiansen, 1993
	Mountain Fuel	mudstone		0.1% REE in P ore.	Jackson and Christiansen, 1993
	North Henry	mudstone		0.1% REE in P ore.	Jackson and Christiansen, 1993
	Shevchenko			Uraniferous phosphorite deposit. Eu produced as a coproduct of uranium production.	Will and others, 1995

Appendix A. REE Deposits  
USGS OF02-189

DEPOSIT	Location					Resources	Source & Date of Estimate(s)	
TYPE	Deposit or district name	Country	State or Province	Latitude	Longitude	Source	Tonnage and grade	
	Smoky Canyon	USA	Idaho	42-43N	111-08W	Jackson and Christiansen, 1993	35.5 Mt @ 0.158% mon (1989)	Jackson and Christiansen, 1993
	Swan Lake Gulch	USA	Idaho	42-38N	111-25W		63 Mt ore measured + indicated	U.S. Geological Survey, 1975
	Trail Creek	USA	Idaho	42-44N	111-25W	Jackson and Christiansen, 1993	27 Mt @ 0.159% mon (1984)	Jackson and Christiansen, 1993
	Wooley Valley	USA	Idaho	42-50N	111-24W	Jackson and Christiansen, 1993		
	Xinhua	China	Guizhou/Zhijin	26-42N	105-45E	NIMA, 2000	0.08-0.2% REO	Wu, 1998
	Zhijin	China	Guizhou	26-41N	105-37E		> 0.05% REO, 8-25% P <sub>2</sub> O <sub>5</sub>	Wu and others, 1996
<b>OTHER- Bauxite- or laterite-hosted</b>								
	Lake Innes	Australia	New South Wales	31-30S	152-53E	Australia National Mapping Agency, 2001, accessed at URL <a href="http://www.auslig.gov.au/mapping">http://www.auslig.gov.au/mapping</a>	12.4 Mt @.004% Sc	Hedrick, 1998
	Xiuwen	China	Guizhou	26-51N	106-35E	NIMA, 2001	0.1-0.2% REO, 55-80% Al <sub>2</sub> O <sub>3</sub>	Wu and others, 1996
<b>OTHER- F Deposits</b>								
	Rexspar (Birch Island)	Canada	British Columbia					
	Buffalo Fluorspar	South Africa	Transvaal	24-30S	28-30E	Jackson and Christiansen, 1993	50 Mt @ 1% mon (1989)	Jackson and Christiansen, 1993
	Encantada-Buena Vista area	Mexico	Coahuila	28-30N	102-30W	USGS, 2000, MRDS database		
	Fatima area	Mexico	Coahuila	28-33N	102-31W	USGS, 2000, MRDS database		
	Gallinas Mountains	USA	New Mexico	34-12N	105-44W	Jackson and Christiansen, 1993	0.046 Mt @ 2.95% REO (1983)	Jackson and Christiansen, 1993
	Naboomspruit	South Africa						
	Snowbird	United States	Montana	46-47N	144-47W	Metz and others, 1985		

Appendix A. REE Deposits  
USGS OF02-189

DEPOSIT TYPE	Deposit or district name	STATUS	Mineralogy			Geochronology
			REE Mineralogy	Other Ore or Significant Minerals	Gangue and Rock-forming Minerals	Age (method, mineral, rock)
	Smoky Canyon	Byproduct producer?	mon	coll, van, uran, pyr	cly	Permian
	Swan Lake Gulch	Potential producer		coll, V, U, F	cly	Permian
	Trail Creek	Occurrence	mon	coll, van, uran, pyr	cly	Permian
	Wooley Valley	Past byproduct producer?	mon	coll, van, uran, pyr	cly	Permian
	Xinhua		coll, mon			Early Cambrian
	Zhijin	Occurrence	coll, mon	var	cld, cal, cly	Cambrian
<b>OTHER- Bauxite- or laterite-hosted</b>						
	Lake Innes	Occurrence				
	Xiuwen	Occurrence		dsp, gib, rut, ana, zir, tit	tour, kao, chl, musc, epi, gar	
<b>OTHER- F Deposits</b>						
	Rexspar (Birch Island)					
	Buffalo Fluorspar	Occurrence	mon, all, bas	flu, apa		Middle Proterozoic
	Encantada-Buena Vista area	Producer of F		flu, Sr		
	Fatima area	Small past producer of Sr and RE?		flu, str	cal	Late Oligocene?
	Gallinas Mountains	Very small past producer	bas	flu, gal, mal, Cu-sulfides, pyr	qtz, cly	Permian
	Naboomspruit	Small byproduct producer	mon			
	Snowbird	Occurrence	par, xen	flu, qtz		

Appendix A. REE Deposits  
USGS OF02-189

DEPOSIT TYPE	Deposit or district name	Host Rock(s)	Company	COMMENTS	REFERENCES
	Smoky Canyon	mudstone		P mine.	Jackson and Christiansen, 1993
	Swan Lake Gulch	phosphatic shale, shale, limestone		Production planned for 2004.	U.S. Geological Survey, 1975
	Trail Creek	mudstone		0.1% REE in P ore.	Jackson and Christiansen, 1993
	Wooley Valley	mudstone		0.11% REE in P ore.	Jackson and Christiansen, 1993
	Xinhua	black shale, phosphorite, siliceous sediments, carbonate		REE present as isomorphous replacements in collophane.	Wen Lu, 1998; Li and others, 1996
	Zhijin	phosphate rock			Wu and others, 1996
<b>OTHER- Bauxite- or laterite-hosted</b>					
	Lake Innes	laterite		Ni-Co-Sc laterite deposit formed from weathering of a serpentine.	Hedrick, 1998
	Xiuwen	bauxite		Bauxites occur at bottom of lower Carboniferous strata overlying Cambrian dolomites.	Wu and others, 1996
<b>OTHER- F Deposits</b>					
	Rexspar (Birch Island)			See description under Alkaline deposits.	
	Buffalo Fluorspar	granite		Veins in leptite pendants of the Bushveld Granite.	Neary and Highley, 1984; Jackson and Christiansen, 1993; Gieré, 1996; Watson and Snyman, 1975
	Encantada-Buena Vista area	limestone, shale			U.S. Geological Survey, 2001, Mineral Resources Data System
	Fatima area	limestone with associated rhyolite porphyry			U.S. Geological Survey, 2001, Mineral Resources Data System
	Gallinas Mountains	sandstone		About 65 t of bas concentrate produced in the 1950's from Cu-F veins and breccia fillings probably associated with alkalic trachyte.	Castor, 1994; Möller, 1989a; Jackson and Christiansen, 1993; Gieré, 1996
	Naboomspruit				Harben and Kuzvart, 1996; Castor, 1994
	Snowbird			Hydrothermal fluorite and quartz-bearing carbonate veins.	Metz and others, 1985

Appendix A. REE Deposits  
USGS OF02-189

DEPOSIT	Location					Resources	Source & Date of Estimate(s)
TYPE	Deposit or district name	Country	State or Province	Latitude	Longitude	Source	Tonnage and grade
OTHER - Pb Deposits							
	Korsnas Mine	Finland					Total production-- 0.86 Mt @ 0.91% REO
	M'Fouati	Congo (Zaire)					Neary and Highley, 1984
OTHER - Uranium Deposits							
	Agnew Lake	Canada	Ontario	16-22N	81-45W	NIMA, 2001	
	Bancroft-Haliburton area	Canada	Ontario	45-30N	77-30W	Woolley, 1987	
	Denison	Canada					
	Eagle Creek	USAK		64-42N	162-46W	Nokleberg and others, 1997	ama 2% REE in grab samples
	Mary Kathleen	Australia	Queensland	20-44S	140-01E	Jackson and Christiansen, 1993	6.8 Mt tailings @ 4% REO (1990)
	McArthur River	Canada	Saskatchewan	57-45N	106-00W	Fayek and Kyser, 1997	
	Port Pirie (Radium Hill)	Australia	South Australia	33-12S	138-00E	Jackson and Christiansen, 1993	
	Wheeler River	Canada	Alberta				
OTHER-- Uncertain							
	Alto Ligonha	Mozambique		15-45S	39-00E	U.S. Bureau of Mines, 1991	
	Baima	China	Guangxi/Luchuan				
	Boorama	Somalia		10-03N	43-05E	Arab Organisation for Mineral Resources, 1987	
	Changling	China	Jiangxi				
	Dalucao	China	Sichuan				
	Dongqing	China	Jilin/Antu				
	Duémé	Benin					

Appendix A. REE Deposits  
USGS OF02-189

DEPOSIT			Mineralogy			Geochronology
TYPE	Deposit or district name	STATUS	REE Mineralogy	Other Ore or Significant Minerals	Gangue and Rock-forming Minerals	Age (method, mineral, rock)
<b>OTHER - Pb Deposits</b>						
	Korsnas Mine	Past byproduct producer (1988)	mon	gal, apa	cal, fld, dio	Precambrian
	M'Fouati	Occurrence		Pb		
<b>OTHER - Uranium Deposits</b>						
	Agnew Lake					
	Bancroft-Haliburton area		all	U, Th, apa, cor, fld, mag, mica, flu, gar, gra, mlyb, sod, dol, tlc	alb, pyx, bio, qtz, sca	
	Denison	U producer; Potential REE resource				
	Eagle Creek		ves	U, Th		
	Mary Kathleen	Past Producer w/ reserves	all, stil	uran, uph, gar, fapa, pyr, cpyr, pyrh		Precambrian
	McArthur River	Occurrence	uran, xen			
	Port Pirie (Radium Hill)	Potential producer	dav, xen	uran, rut, zir, Sc, ilm, mag, pyr, cpyr		
	Wheeler River	Occurrence		U		
<b>OTHER-- Uncertain</b>						
	Alto Ligonha			Nb, Ta, gemstones		
	Baima					
	Boorama	Occurrence	pyro	pyro, Ta		
	Changling					
	Dalucao					
	Dongqing					
	Duémé		mon			

Appendix A. REE Deposits  
USGS OF02-189

DEPOSIT		Host Rock(s)	Company	COMMENTS	REFERENCES
TYPE	Deposit or district name				
<b>OTHER - Pb Deposits</b>					
	Korsnas Mine	gneiss, skarn	Outokumpu Oy (1988)	Vein cuts mica gneiss.	Roskill, 1988; Neary and Highley, 1984; Gieré, 1996; Isokangas, 1978
	M'Fouati				Roskill, 1988
<b>OTHER - Uranium Deposits</b>					
	Agnew Lake			Uranium deposit with associated rare earths. 65 km east of Elliot Lake.	Roskill, 1988
	Bancroft-Haliburton area	alkaline syenite, mafic alkaline rocks, alkaline granite		Location is generalized. Uranium deposit with associated rare earths.	Roskill, 1988; Woolley, 1987
	Denison		Denison Mines Ltd. (1986)		Anstett, 1986
	Eagle Creek	pulaskite dikes in Cretaceous granitic pluton, marble, and schist		U, Th, and REE minerals along margins of alkaline dikes.	Nokleberg and others, 1997
	Mary Kathleen	skarn, calc-silicate metasediments, granite		Ore ran 35% all, 40% garnet, 10% apatite. Production of uranium ceased in 1982.	Harben and Bates, 1990; Neary and Highley, 1984; Möller, 1989a; Jackson and Christiansen, 1993; Gieré, 1996
	McArthur River			Y and HREE substitute in uraninite. Xenotime is found in Athabasca Sandstone.	Fayek and Kyser, 1997
	Port Pirie (Radium Hill)	uranium tails		Tails from Radium Hill U mining operations which exploited veins in Precambrian gneiss and schist cut by intrusives.	Jackson and Christiansen, 1993; Möller, 1989a; Dreissen, 1990
	Wheeler River	sandstone		REE associated with sandstone U deposits.	Harben and Kuzvart, 1996
<b>OTHER-- Uncertain</b>					
	Alto Ligonha			Location is very approximate.	U.S. Bureau of Mines, 1991
	Baima				Wen Lu, 1998
	Boorama				Arab Organisation for Mineral Resources, 1987
	Changling				Wen Lu, 1998
	Dalucao			In Dechang.	Shi Zemin and Li Xiaoyu, 1995
	Dongqing				Wen Lu, 1998
	Duémé				de Kun, 1987



Appendix A. REE Deposits  
USGS OF02-189

DEPOSIT	Location					Resources	Source & Date of Estimate(s)
TYPE	Deposit or district name	Country	State or Province	Latitude	Longitude	Source	Tonnage and grade
	Fremont Butte	USA	Wyoming/Sublette County				
	Gangkou	China	Hunan/Yueyang				
	Grenville	Canada					
	Hueyang Mine	China	Hunan				
	Jabal Ar Rabuts	Saudi Arabia		25-35N	41-03E	Arab Organisation for Mineral Resources, 1987	
	Jabal Awja	Saudi Arabia		25-50N	41-01E	Arab Organisation for Mineral Resources, 1987	
	Jabal Ebed	Saudi Arabia		25-57N	40-53E	Arab Organisation for Mineral Resources, 1987	
	Jabal Kuara	Saudi Arabia		25-47N	40-55E	Arab Organisation for Mineral Resources, 1987	
	Kavaronge	Congo (Zaire)					
	Kutessiask	Kyrgyzstan					
	Little Friar Mountain	USA	Virginia	37-46N	79-06W	USGS, 2000, MRDS database	
	Marhuanta	Venezuela	Bolivar	7-05N	63-31W	USGS, 2000, MRDS database	
	Mengwang	China	Yunan/Menghai				
	Moshikeng	China	Guangdong/Puning	29-55N	121-15E	NIMA, 2001	
	Nanshanxia	China	Guangdong/Yangxi				
	No. 101	China	Shandong/Lingyi				
	Owella Estate (Matale)	Sri Lanka					
	Rodeo de Los Molles	Argentina					
	Ryunan	China	Jiangxi				
	San Antonio	Venezuela	Bolivar	7-44-35N	63-34-30W	USGS, 2000, MRDS database	
	Sanlangyan	China	Hunan/Huarong	29-39N	112-47E	NIMA, 2001	
	Sao Sebastio da Bela Vista	Brazil	Minas Gerais				4100 t mon (1987)
	Saulia	Congo (Zaire)		02-55S	25-45E	est. from de Kun, 1987	Jackson and Christiansen, 1993
	Shuitai	China	Guangxi/Shanglin				
	Sudbury	Canada	Ontario				
	Tanmen	China	Hainan/Lingshui				

Appendix A. REE Deposits  
USGS OF02-189

DEPOSIT TYPE	Deposit or district name	STATUS	Mineralogy			Geochronology
			REE Mineralogy	Other Ore or Significant Minerals	Gangue and Rock-forming Minerals	Age (method, mineral, rock)
	Fremont Butte	Occurrence				Late Archean
	Gangkou					
	Grenville					
	Hueyang Mine					
	Jabal Ar Rabuts	Occurrence	all	Th		
	Jabal Awja	Occurrence	all	Nb, Ta		
	Jabal Ebed	Occurrence	mon	Th		
	Jabal Kuara	Occurrence	all	Th		
	Kavaronge		mon	Sn		
	Kutessiask	Producer	Y-syn			
	Little Friar Mountain	Occurrence		Ta, Nb, fld		Precambrian
	Marhuanta	Occurrence				Proterozoic
	Mengwang					
	Moshikeng					
	Nanshanxia					
	No. 101					
	Owella Estate (Matale)		all			
	Rodeo de Los Molles	Occurrence	bri, all	apa		
	Ryunan					
	San Antonio	Occurrence				
	Sanlangyan					
	Sao Sebastio da Bela Vista	Occurrence	mon			
	Saulia	Small producer (1987)	Eu-mon	Sn		
	Shuitai					
	Sudbury			Ni		
	Tanmen					

Appendix A. REE Deposits  
USGS OF02-189

DEPOSIT TYPE	Deposit or district name	Host Rock(s)	Company	COMMENTS	REFERENCES
	Fremont Butte	granitoid		Mineralization along cracks and veins; fault and shear-zone related. T32N R107W sec. 21, NW/4.	King, 1991
	Gangkou				Wen Lu, 1998
	Grenville		Soquem (1988)		Roskill, 1988
	Hueyang Mine				Roskill, 1988
	Jabal Ar Rabuts				Arab Organisation for Mineral Resources, 1987
	Jabal Awja				Arab Organisation for Mineral Resources, 1987
	Jabal Ebed				Arab Organisation for Mineral Resources, 1987
	Jabal Kuara				Arab Organisation for Mineral Resources, 1987
	Kavaronge				de Kun, 1987
	Kutessiask				Will and others, 1995
	Little Friar Mountain	hypersthene granite			
	Marhuanta			Deposit is described as disseminated, stratabound.	U.S. Geological Survey, 2001, Mineral Resources Data System
	Mengwang				Wen Lu, 1998
	Moshikeng			Lat-long is for the town of Moshikeng.	Wen Lu, 1998
	Nanshanxia				Wen Lu, 1998
	No. 101				Wen Lu, 1998
	Owella Estate (Matale)			Allanite contains 15-20% REE.	ESCAP, 1989
	Rodeo de Los Molles	granite		Described as a hydrothermal replacement deposit.	Gieré, 1996
	Ryunan				Roskill, 1988
	San Antonio				Ministerio de Minas e Hidrocarburos, 1959
	Sanlangyan			Lat-long is for the town of Sanlangyan.	Wen Lu, 1998
	Sao Sebastio da Bela Vista				Jackson and Christiansen, 1993
	Saulia			Has produced mon.	de Kun, 1987
	Shuitai				Wen Lu, 1998
	Sudbury			REE associated with nickel deposits.	Harben and Kuzvart, 1996
	Tanmen				Wen Lu, 1998

Appendix A. REE Deposits  
USGS OF02-189

DEPOSIT	Location					Resources	Source & Date of Estimate(s)
TYPE	Deposit or district name	Country	State or Province	Latitude	Longitude	Source	Tonnage and grade
	Taohualashan	China		39-00N	101-20E	Zhang Peishan and others, 1995	
	Umgabab	South Africa					
	Unsan	North Korea					
	Urumqi	China	Gansu				
	Wadi el Sahrm	Egypt		24-44N	35-01E	Arab Organisation for Mineral Resources, 1987	
	Wuzhou	China	Guangxi/Hexian	23-29N	111-19E	NIMA, 2001	
	Xing'an	China		45-10N	120-30E	Zhang Peishan and others, 1995	
	Xueshan	China	Guangdong/Xinfeng				

Appendix A. REE Deposits  
USGS OF02-189

DEPOSIT TYPE	Deposit or district name	STATUS	Mineralogy			Geochronology
			REE Mineralogy	Other Ore or Significant Minerals	Gangue and Rock-forming Minerals	Age (method, mineral, rock)
	Taohualashan				bio, cal	Precambrian?
	Umgabab	Past small producer	mon			
	Unsan					
	Urumqi					
	Wadi el Sahrm	Occurrence	all			
	Wuzhou					
	Xing'an		hing, mon	pyro, col, gad, zir	qtz, fld, rie, pyx	Jurassic-Cretaceous
	Xueshan					

Appendix A. REE Deposits  
USGS OF02-189

DEPOSIT TYPE	Deposit or district name	Host Rock(s)	Company	COMMENTS	REFERENCES
	Taohualashan	marble, calcite biotite schist, dolomitic marble		Marble has sedimentary characteristics. Deposit has been classified as metasedimentary, "marine facies volcano- sedimentary carbonatite", and hydrothermal origin.	Zhang Peishan and others, 1995
	Umgabab			40 km S of Durban.	Roskill, 1988
	Unsan			Deposit is a gold mine.	Roskill, 1988
	Urumqi				Harben and Bates, 1990
	Wadi el Sahrm				Arab Organisation for Mineral Resources, 1987
	Wuzhou				Wen Lu, 1998
	Xing'an	alkaline granite; hornfels, tuff			Zhang Peishan and others, 1995
	Xueshan				Wen Lu, 1998