Complex refinables indicative list
All assumed to be UVCB Isolated Intermediates handled under strictly controlled conditions
Last updated: 25 February 2009

	Name	CAS n°	EC n°	EC Descriptor	Classification (in the Annex I of Directive 67/548/EEC)	Company description		Composition				Waste n°	Number of Consortium registrations	Total number of Consortium registrations	Tonnage bands declared			
						In-house name and/or process originating from	Physical form	Element	Species	Concentration range (%)	(Species) Hazard classification				> 1000 tonnes/year		100-1000 tonnes/year	
	Metallics																	
	Doré	69029-47-6	273-793-6	Gold and silver bullion.	Not classified	Doré metal (raw silver) smelting in the anodal furnace	Bullion, sheet, bar, ingot, grains, crystals	Ag	Metallic	70-99			9?	4			1	1ii
						Doré anode silver		Au	Metallic	0,2-15				3	1	1ii	1	1osii
						Raw gold/silver		Pb + Fe + Ni + Mg		0-5				2			1	1ii
						Various metallurgical processes or production residue		Cu		0-15				0				
						Silver and/or gold refining		Bi + Te	Metallic	0-10				0				
								Au		0-95				0				
								Al	Metallic	0,01-0,07				0				
								Sb + Se + Sn		0-2				0				
								Pd + Pt		0-5				0				
								Rh + Ru		0-0,5				0				
								As		0-0,05				0				
	Residues, silver refining	97926-88-0	308-309-5	Product resulting from the smelting, refining and/or use of silver and its alloys obtained from primary and secondary sources and including recycled plant intermediates. It consists primarily of silver and may contain other residual non-ferrous metals and their compounds.	Not classified (CMR 1&2, R50/53)	Spent silver anodes from silver electro-refining	Sheet	Ag	Metallic Ag	98,8 - 99,55			11?	2			2	1tii + 1ii
								Pb		0,01 - 0,02				0				
								Cu		0,3 - 0,8				0				
								Bi		0,004 - 0,006				0				
								Te		0,01 - 0,02				0				
								Au		0,02 - 0,58				0				
								Al		0,01 - 0,07				0				
								Sb		0,01 - 0,04				0				
								Se		< 0,01				0				
	Precious Metal matte	98072-52-7	305-506-6	Not available	Not classified	Precious metal matte, after Ni, Co, Cu and S is removed from Ni-matte, the undissolved material is melted in a furnace: the slag is removed and the remaining material is PM matte,	Grain, bar or ingot	PM		0,3-99			8?	2			1	1osii
					T, N	PGM Bullion and metallics		Ag		0,3-85				3			1	1osii
						PGM scraps		Pt		0-99				1				
						Hi-grade Ag bullion	Ingot or bar	Pd		0,1-99				1			1	1osii
						Low grade Ag bullion	Ingot or bar	Au		0,5-3				1			1	1osii
								Ir		0-10				0				
								Rh		0-10				0				
								Pb		0-70				0				
								Sn		0,1-4				0				
								Te		0,4-11				0				
								Ni		0-55				0				
								Co		1-12				0				
								Cu		0-60				0				
								Fe		1,4-35				0				
								As		0,4-12				0				
								S		7,1-35				0				
								Al, Si		< 0,5								
								Cr		0,1-4,8				0				
								Zn		0,5-3								
								Sb		25-30				0				
	Silver, crusts	69029-57-8	273-799-9	Product formed when zinc is mixed into de-copperized lead where it combines with silver and is skimmed off in blocks. Lead is removed from the blocks by applying hydraulic pressure. Consists primarily of copper, gold, lead, silver and zinc.	Not classified	Silver crusts from lead refining	Ingot or bar	Ag		4-55			8?	1				
						Also called silver-lead alloy (residue), triple alloy or PGM-lead alloy.		PGM + Au		9-13				2				
								Pb		18-63				0				
								Cu		1-4				0				
								Zn		20-35				0				
								Sn		0,014-0,017				0				
								Sb		0,05-0,25				0				

by Consortium Members				Highest tonnage band in Consortium	Associated registration deadline	Pre-SIEF sizes	Proposed SIEF Formation Facilitator	Proposed Lead Registrant
10-100 tonnes/year		1-10 tonnes/year						
3 1 1	1osii + 2tii 1tii 1ii					31	None	
						27	None	
1 2 1	1tii 2tii 1tii					19	None	
1 2	1osii 1tii + 1ii					25	None	

								Bi		0,010-0,025				0			
								Te		0,006-0,015				0			
	Residues																
	Residues, precious metal cementation	102110-50-9	310-051-3	The residues obtained by the addition of aluminium or zinc to end liquors obtained from secondary refining of gold, iridium, osmium, palladium, platinum, rhenium, ruthenium or silver. Composed primarily of the precious metals, ammonium chloride and chlorides of aluminium, magnesium and zinc.	Not classified (CMR 1&2, R50/53)	Cementation silver silver precipitate	Black-grey, moist powder (20% H2O)	Ag	AgCl	65-97			7?	4			1	1tii
								Ag	Ag	0-0,03				0			
						Gold leaching residue, from gold leaching to Kaldo converter		Fe		0-11				0			
						Cementation of electrolyte bleed, from silver electro- refining		Cl		0-22				0			
						Cementation of silver chloride from leaching gold slime		Au		0-12	T; R23 - Xi; R36/37/38 -N; R50			1			
						Precipitate recovered from PM-bearing solution.		Cu		0-90				0			
						Pt-Cu cement (Pt cemented on Cu)		Se		0,005-35				0			
						Pd cement (Reduced red palladium salt)		Bi		0-5				0			
						PM cement (PM cemented from several solutions before they are further treated)		Pt		0,08-2				0			
								Pd		0,08-2				0			
								Rh		0-1				0			
								Ir		0-0,02				0			
								Ru		0,1-2				0			
								Os		0-0,01				0			
								Te		0,02-25				0			
								Ti		0-0,6							
								As		0-5				0			
								Ba		0-20				0			
								Cr		0-15				0			
								Co		0-10				0			
								Ni		0-10				0			
								Si		0-10				0			
								S		0-20				0			
								Sn		0-10				0			
								Sb		0-1							
								Na		0-7							
								Pb		0-3							
								NH3/NH4		0-5				0			
	Slimes and sludges, precious metal refining	98072-61-8	308-516-0	Not available	Not classified	Silver electrolytic refining	(Black) Moist powder (20-50% H2O) or solution or mixture / preparation	PM		0-99			12?	4			2	1tii + 1osii
						Gold anode slime		Ag		0,001-65				1			
						Pre-leaching solution of the raw gold slime		Pb	$PbSO_4$	0-50				1			
				Indicative definition proposed by the Consortium:		Roasted, dried slime (Se-free) from silver refining	sheet	Cu	Cu, $CuSO_4$, Cu_2O	0-98				1			1	1osii
						PGM slime		Se, Cd, Tl, W	SeO_2	0-16	T; R23/25; R33 - R53			0			
				"Sludges and Slimes (are sometimes used synonomously), are reaction products from precious metals hydrometallurgy refining operations, either as separated out or as solids after drying."	T, N	Assorted residues containing PGM		S		0-15				1			1	1tii
					C	PGM Liquors		As, Ba, Mg	As2O3, BaSO4	0-10	T; R23/25; N;R50/53			1			1	1tii
						PGM residue after Cu and Se removal		Al		0-97				0			
						(Fe+Pd) Metal-hydroxide residue from PM production		Bi	Bi_2O_3	0-35				0			
						Hydroxide sludges		Cl	Cl^-	0-30	T; R23 - Xi; R36/37/38 -N; R50			1			1	1tii
						Cu and Ni free slime	sheet	Ni	NiO	0-85	Carc. Cat3;R40-R43			1			1	1osii
						Anode slime from Ag electrolysis		Si	SiO_2	0-98				2			1	1ii
						Anode slime from Cu electrolysis	Solution or mixture / preparation	Sb, K, Ti, Te	Sb_2O_3, TeO_2	0-20	Not classified			1	1	1ii		
								Au	AuCl; Au_2Te	0,00005-50				0				

2	1osii + 1ii	1	1ii			21	None	
1	1tii							
1	1tii	1	1ii			33	Vale Inco Europe	
		1	1ii					
		1	1ii					
1	1osii							

								Pd	Pd	0-95				0					
								Pt		0,4-12				0					
								Ir, Re, Rh, Os		0-50									
								Sn, Na, Pb	SnO_2,	0-30				0					
								Fe		0-98				0					
								Co, Cr, Zn		0-50				0					
								Mn, Mo, Hg, Be		0-1				0					
								Ca		0-45				0					
								As		0-3									
								Br, Cl		0-50				0					
								I		0-2				0					
								C	CO3	0-25				0					
								Borax											
								HCl		0-6M				0					
						Concentrates:	Powder, wet solids	Pd		< 39,9		Could be wastes for some MS		0					
						Rich,		Pt		< 21				1					
						Weak/poor PM concentrates,		Rh		0,0014				1					
						Incinerator feeds,		Ag		4-40				1					
						Primary feeds,		Au		< 2,5				1			1	1ii	
						Ag-rich PGM primary feed,		Total PM		10-75				1					
						PGM cake,		Te		5-17,9				0					
						Pd/Pt concentrate,		Bi	Bi_2O_3, $BiCl_3$	5-10				1					
						Cu-PGM concentrate,		Sb		0,5-1				1	1	1tii			
						Cu-Ni-PGM concentrate from PGMs refining		Cu	CuS	1 - 15				1	1	1tii			
								Cl		2,4				0					
								S	S	2-16				0					
								Fe	Fe_2O_3	0,5 - 25				0					
								Pb	PbCl	0,2-10				0					
								As	AsH_3O_4, AsCl	0,5 - 6				0					
								Co		0,2				0					
								Ni	NiS	1-3,1				0					
								Sn		1-2				0					
								Na	$NaFe_3(SO_4)_2(OH)_6$	1,5-32				0					
								Si	SiO_2	3-13				0					
						Leach insolubles and blacks:	Powder (moist powder [35-45% H2O], sludge, sponge	PM		0-65				1			1	1ii	
						Leach residues, PGM refining		PGM		10-90				0					
						Other PM material, leach residues from PM plant		Al	Al_2O_3	0-5				0					
						Primary leach residue from PM-feed material leaching (residue from Ni and Cu matte leaching)		Si	SiO2	0-15				0					
						Secondary leach residue, from a late stage in the PGM process		Ca	CaO	0-35				0					
								Fe		0-10				0					
								Cu		0-35				0					
								Pb		0-30				0					
								Te + Bi + Se		0-15				0					
								Sn + As + Sb + Ni + Zn + Ba + Mo + B + Mn		0-20				0					
								Mg	MgO	0-2				0					
								Ti	TiO_2	0-2				0					
								Cr	Cr_2O_3	0-15				0					
								Co		0,5-10				0					
								S		5-20				0					
								Cl		14-16				0					
						(Prepared PM sweeps)		PM		0,5-90				0					
								Au		0,5-5				0					
								Ag		2-8				0					
								Pt		0,01-0,5				0					
								Pd		0,01-0,5				0					
	Residues, copper-iron-lead-nickel-matte, sulphuric acid-insol.	102110-49-6	310-050-8	Not available	Not classified (CMR 1&2, R50/53)	PM refining		PGM		0-20				1	1	1tii			
								Al		0-2				0					
								Fe		0-38				0					
								Si		0-15				0					
								Ca		0-15				0					
								Cu		0-55				0					
								Pb		0-2				0					
								Ni		0-9				0					
								As		0-4				0					
								Se		0-12				0					
								Te		0-5				0					
								Zn, Mo, B		0-15				0					
								S		6-21				0					
								Mg		0-2				0					
								Bi, Sb, Sn, Ba, Mn		<1				0					

1 1 1	1tii 1tii 1ii	1 1	1ii 1tii					

	Residues, copper speiss acid leaching // Leaching slime (Ni-free)	100656-54-0	309-643-4	The product obtained by acid leaching of copper speiss. Composed primarily of antimony, arsenic and lead with high precious metal content.	Not classified	Copper refining	Powder	Ag	AgCl	7-20				0				
								Se	Ag_2Se, $CuAg_2Se$	9-12				0				
								Cu	Cu, $CuSO_4$	0,5-16				0				
								As		1,5 -4,9				0				
								Ni	Ni, $NiSO_4$	0,03 -20				0				
								Te	H_2TeO_3	0,23 - 3				0				
								Au	Au, $AuSO_4$	0,62-1,3				0				
								Pt		0,02-0,1				0				
								Pd		0,1-0,4				0				
								Pb	PbSO4	3-15				0				
	Slimes and Sludges, copper pickling wastewater treatment	91081-71-9	293-678-4	Sludges formed by the precipitation of compounds of non-ferrous metals arising from the neutralizing during effluent treatment of wash waters and spent pickling acids used for the cleaning and removal of oxide from copper and copper alloys.	Not classified	Sludges formed by the precipitation of compounds of non-ferrous metals arising from the neutralizing of waste water from precious metals production (waste water treatment).	Sludge or moist [35-60% H2O] powder	Ag		0,10-0,46			4?	1				
								As		0,80-1,54				0				
								Ca		24,99-26,78				0				
								Cu		3,28-5,97				0				
								Ni		0,005-0,14				0				
								Pb		0,07-0,24				0				
								S		16,27-20,64				0				
								Se		0,13-1,33				0				
								Te		0,08-0,19				0				
	Waste solids, precious metal refining	98072-70-9	308-526-5	Not available	Not classified	(Spent) catalysts for PGM recovery, PGM carbon residues.	Variable	PGM		0,1-5				1				
								C		5-50				0				
								Solvents		0-50				0				
	Furnace By-Products																	
	Slags, doré furnace slags	67711-98-2	266-975-1	Slag produced as a by-product in the furnace smelting of metal wastes rich in gold and silver. Principal components are usually tellurium, selenium and copper with minor amounts of lead, antimony and other metals.	Not classified (CMR 1&2, R50/53?)	Silver refining	Solution or mixture / preparation, Conous clump (later crushed into big pieces)	Ag, Au, Pt, Pd, Rh	AgO	0,3-2,6	Not classified	Could be a waste: 10 07 01 Slags (first and second smelting)		1	1	1tii		
						Tailings of flotation process for PM recovery from doré furnace slag.	Powder	As	As_2O_3	0,2-7	Carc. Cat1;R45 - T+;R28 - C;R34 - N;R50-53		1	1	1tii		
						Doré slag	Grain	Bi	Bi2O3, $Bi_2O_3.SiO_2$	0,2-5,2	Not classified		1			1	1tii	
								Cu	Cu_2O	1,5-7	Xn;R22 - N;R50/53		0					
								Fe	Fe_2O_3	1,2-5	Not classified		0					
								Na	Na_2O	0,1-5	Not classified		0					
								Ni	NiO	0,2-10	Carc Cat 1;R49 - T;R48/23 - R43 - R53		0					
								Pb	PbO, $PbO.SiO_2$	8-70	Repr. Cat1;R61 - Repr.Cat1;R62 - Xn;R20/22 - R33 -N;R50-53		0					
								Te	TeO_2	0,4-1,8	Not classified		0					
								Sb	Sb2O3, SbO.SiO2	1,5-12			0					
								Te		< 0,6			0					
								Ba	BaSO4	5-28			0					
								Si		5-15								
								Cl						0				
	Slags, precious metal refining	98072-60-7	308-515-5	Not available	Not classified (CMR 1&2, R50/53?)	Doré metal (raw silver) smelting / converting in the Kaldo furnace	Powder or grains, irregular lumps of up to 300 mm with few fines	PM		0-8		Could be a waste: 10 07 01 Slags (first and second smelting)	9?	6	2	1osii + 1ii	2	2tii
						PGM refining		Pb	PbO	0-75				0				
								Cu	CuO	0-11				0				
						PM depleted fraction of the flotation circuit		Se		0-5				0				
						Slags and sweeps		Te		0-3				1			1	1tii
						Borax slag		Zn	ZnO	0-60				1				
								Mg	MgO	0-6				0				
								Ba	BaO	0-25				0				
								Cr		0-1,5				0				
								Sr + Tl + Zr		0-5				0				

		1	1ii			25	None	
1	1tii							
2	2ii					26	None	
1	1tii							

								Sb		0-12				0				
								Sn		0-12				0				
								S		0-28				0				
								As		0-5				0				
								Bi		0-15				0				
								Si	SiO_2	0-30				0				
								Fe	FeO	0-30	Not classified			0				
								Ni		0-3				0				
								Ca	CaO	0-9				0				
								Al	Al2O3	0-19				0				
								Cl	Cl^-	0,02-0,8				0				
								Te	TeO_2	0-15				0				
								Na	Na_2SiO_4	0-10	T; R23 - Xi; R36/37/38 -N; R50			0				
								Na	Na_2O	0-30				0				
								Nd		0-2				0				
								C	CO3									
								P		0-20								
								Borax (disodium tetraborate decahydrate)		0-40				0				
	Slags, silver smelting	97926-95-9	308-315-8	Product resulting from the smelting of silver and its alloys obtained from primary and secondary sources and including recycled plant intermediates. Consists primarily of SiO2 and other gangue constituents and may contain other residual non-ferrous metals and their compounds.	Not classified	Ag rotary furnace slag	Rock-like lumps with few fines, gradually breaking into powder	Ag		0,01-12				2			2	1osii + 1tii
						Litharge slag	Stratified blocks, breaking to lumps	Pb	PbO	50-70				1			1	1osii
								Zn	ZnO	9-12				0				
								Si	SiO2	5,5-6,5				0				
								Fe	FeO	3,5-4,5				0				
								Cu	CuO	2-5				0				
								Sb	Sb2O3	2,5-3,5				0				
								Sn		0,5-1,5				0				
								As		0,5				0				
								Ni		0,1								
	Slags, precious metal recovery lead refining	69029-85-2	273-826-4	Inorganic slags produced from treatment of calcined scrap metals and oxides with borax, litharge and sodium carbonate followed by fusion.	Not classified		Solid granules							0				
	Flue dust, precious metal refining	98072-44-7	308-496-3	The dust obtained from the refining of materials from primary and secondary sources containing gold, iridium, osmium, palladium, platinum, rhenium, ruthenium and silver. Composed primarily of lead with traces of other metals.	Not classified									2				
														0				
														0				
	Flue dust, silver refining	97926-57-3	308-276-7	Product resulting from the smelting, refining and/or use of silver and its alloys obtained from primary and secondary sources and including recycled plant intermediates. Consists primarily of oxides and halide compounds of silver and lead and may contain other residual non-ferrous metals and their compounds.	Not classified (Xn?)	Silver and PGM refining wet dedusting system of technological gas from Kaldo furnace	Moist (20-30% H2O), black powder	PGMs		5-10		Could be a waste: 10 07 03 solid wastes from gas treatment		3			2	1osii + 1tii
						Also called Venturii slime Baghouse dust		Ag		0,01-18				1			1	1ii
								Al		0-10				1				
								As + B		0-2,5				0				
								Bi		0-15				0				
								Br		0-2				0				
								Ca		2-15				0				
								Ce		0-5				0				
								Cl		0,3-30				0				

1	1tii							
2	1osii + 1tii			2?		19	None	
1 1	1ii 1osii			8?		22	None	

								Cr		0-2				0				
								Cu + Fe		0-8				0				
								K		0-5				0				
								Mg		0-5				0				
								Ni + S + Sb + Sn + Zr	Sb2O3	0-6				0				
								Pb	PbO	2-80				0				
								Se + Te + Zn		0-16				0				
								Na	Na2O	3,8-5								
								Si		1-25				0				
	Silver, dross	97468-34-3	306-987-7	N/A	Not classified			Ag		0,1-10				2			1	1tii
								Pb	PbO	43-85				0				
								Zn	ZnO	25-35				0				
	Leach residues, precious metals smelting scrap	100995-79-7	309-770-5	The residues obtained from the leaching of scrap and waste materials containing gold, iridium, osmium, palladium, platinum, rhenium, ruthenium or silver. Composed primarily of alumina and silica with traces of all of the precious metals.	Not classified	Crushed crucibles,	Powder, granules, crushed refractories, solid	PM but Ag and Pt		0-10		Could be a waste: 10 07 05 sludges and filter cakes from gas treatment		4			1	1osii
						Crushed (refractory) bricks, pots from PGM refining, PGM filter cake		Ag, Pt		0-25				3			1	1osii
								PGM		0-20				0				
								Al	Al2O3	0-35				1			1	1tii
								Si	SiO2, SiC	0-75				0				
								Fe		0-10				0				
								Pb		0-30								
								As, Pb, Ni, Ba, S, K, P, Cr, Sb, Sn, Zn		0-5				0				
								Bi, Ca, Te, Se	CaO	0-15				0				
								Ti	TiO2	0-2								
								Cl	Cl-	0-5				0				
								Cr	Cr2O3	0-20				0				
								Cu, Mg	MgO	0-50				0				
	Leach residues, doré furnace slags	67711-99-3	266-976-7	Residue after leaching niter slag. Principal constituents are compounds of tellurium and copper, with lesser selenium, lead, antimony and iron.	Not classified			PM						1			1	1tii
								Te						0				
								Cu						0				
								Se						0				
								Pb										
								Sb						0				
								Fe						0				
	Leach residues, precious metal recovery lead refining	69029-72-7	273-813-3	Salt extract from the treatment of speiss refining residue with aqua regia followed by alkali fusion. Consists of precious metals and their salts.	Not classified									1			1	1tii
														0				
	Miscellaneous																	
	Balsams, copaiba, sulfurised, mixed with turpentine, gold salts	68990-27-2	273-589-7	Not available	Not classified	Gold refining								0				
														0				
	Silver electrolyte	None	None			Silver electrolysis Reaction mass of copper nitrate and silver nitrate	solution	Cu(NO3)2	Cu(NO3)2	57				2			1	1ii
								AgNO3	AgNO3	39				1				
								Pd(NO3)2	Pd(NO3)2	3,6				0				
								HNO3	HNO3	7				0				
								H2O	H2O					0				
	Secondary refinables	None	None											1			1	1ii
	Miscellaneous intermediates	None	None											1				

1	1osii			3?		14	None	
1	1tii	2	2ii	10?		20	None	
		2	1ii + 1tii					
						14	None	
						14	None	
				3?		15	Ecomundo	

1	1ii	1	1osii					
1	1ii							