

Table 1. Summary of characterisation/classification discussions held on PM Refinables at 20-21 May 2010 PM Refiners WG meeting

Group	Material	Lowest classification tier ARCHE	Characterisation @ Outotec	T/D pre-test @ ECTX	Highest classification tier ARCHE (up tp 24h T/D pre-test results)	Further test?	Reason	Comment
1a	Doré pure	Acute toxicity Cat. 3 Skin corrosion/irritation Cat. 1B Serious eye damage/eye irritation Cat. 1 Respiratory or skin sensitisation Resp./Skin Sens. Cat. 1 Germ cell mutagenicity Cat. 1B Carcinogenicity Cat. 1A Reproductive toxicity Cat. 1A STOT SE Cat. 3	Done	Done	Hazardous to aquatic environment Acute Chronic Cat. 1	Yes, 24h T/D pre-test	Repeat test	Repeat test with new sample form (granules instead of stripes) if results comparable, no further T/D work if results very different, further T/D work: o 1 mg/l /l 7 d and 28 d, analysing Cu and Ag o 100 mg/l /l 7 d, analysing only for Ag (and Cu?) o eventually 10 mg/l /l 7 d, analysing Cu (or Ag) depending on results of 1 and 100 mg/l
1b	Doré impure	STOT RE Cat. 1 Hazardous to aquatic environment Acute Chronic Cat. 1	Done	Done	None	Yes, full T/D	Confirm absence of classification	T/D 1 mg/l /l 7 - 28 days for Ag and Cu T/D 100 mg/l /l 7 days for Cu and Ag: o If negative, no classification confirmed o If positive (classified), conduct 10 mg/l T/D test for classifying element (e.g.: Cu)
2	Matte, PM refining	Acute toxicity Cat. 3 Skin corrosion/irritation Cat. 1B Serious eye damage/eye irritation Cat. 1 Respiratory or skin sensitisation Resp./Skin Sens. Cat. 1 Carcinogenicity Cat. 2 Reproductive toxicity Cat. 1A STOT RE Cat. 1 Hazardous to aquatic environment Acute Chronic Cat. 1	Done	Done	Reproductive toxicity Cat. 1A Hazardous to aquatic environment Acute Chronic Cat. 1	Yes, characterisation @ Outotec	Repeat test	Repeat test with new sample representative of what is placed on the market
						Yes, 24h T/D pre-test	Repeat test	Repeat 24 h T/D pre-test at ECTX and depending on results: o If negative, perform a 100 mg/l /l 7 days T/D test to confirm absence of classification o If positive, perform a 1 mg/l /l 7-28 days T/D test analysing classifying elements (e.g.: Pb)
3a	Boro-silicate slags, PM refining	Acute toxicity Cat. 2 Skin corrosion/irritation Cat. 1B Serious eye damage/eye irritation Cat. 1 Respiratory or skin sensitisation Resp./Skin Sens. Cat. 1 Carcinogenicity Cat. 1A Reproductive toxicity Cat. 1A STOT RE Cat. 1 Hazardous to aquatic environment Acute Chronic Cat. 1	Done	Done	Carcinogenicity Cat. 2 Reproductive toxicity Cat. 1A STOT RE Cat. 2 Hazardous to aquatic environment Acute Chronic Cat. 1	No	N/A	Classified Acute 1/Chronic 1 aquatic environment
3b	Phosphate slags, PM refining	Acute toxicity Cat. 2 Skin corrosion/irritation Cat. 1B Serious eye damage/eye irritation Cat. 1 Respiratory or skin sensitisation Resp./Skin Sens. Cat. 1 Carcinogenicity Cat. 1A Reproductive toxicity Cat. 1A STOT RE Cat. 1 Hazardous to aquatic environment Acute Chronic Cat. 1	Done	Done	Carcinogenicity Cat. 2 Reproductive toxicity Cat. 1A Specific target organ toxicity - repeated exposure Cat. 2 Hazardous to aquatic environment Acute Chronic Cat. 1	Yes, full T/D	Refine to a lower classification category	1 mg/l /l 7 d and 28 d T/D analysing Ag and Pb: o If positive, no further test o If negative, test 10 mg/l
3c	Silicate slags, PM refining	Acute toxicity Cat. 2 Skin corrosion/irritation Cat. 1B Serious eye damage/eye irritation Cat. 1 Respiratory or skin sensitisation Resp./Skin Sens. Cat. 1 Carcinogenicity Cat. 1A Reproductive toxicity Cat. 1A STOT RE Cat. 1 Hazardous to aquatic environment Acute Chronic Cat. 1	Done	Done	Acute toxicity Cat. 3 Skin corrosion/irritation Cat. 2 Serious eye damage/eye irritation Cat. 1 Respiratory or skin sensitisation Skin Sens. Cat. 1 Carcinogenicity Cat. 1A Reproductive toxicity Cat. 1A STOT RE Cat. 2 Hazardous to aquatic environment Acute Chronic Cat. 1	Yes, full T/D	Refine to a lower classification category	1 mg/l at 7 d and 28 d T/D analysing Cu and Pb: o If result at 7 days is positive: confirm environmental classification o If result at 7 days is negative: stop test and repeat 7 days test with 10 mg/l loading
3d	Borate slags, PM refining		Assumed to be similar to boro-silicate slag	Done		Yes, characterisation @ Outotec	N/A	Composition assumed to be similar to boro-silicate but release of Zn in T/D indicates different profile
						Yes, full T/D	Refine to a lower classification category	1 mg/l at 7 d and 28 d T/D analysing Zn (and Pb): o If result at 7 days is positive: confirm environmental classification o If result at 7 days is negative: stop test and repeat 7 days test with 10 mg/l loading
4	Slimes and sludges, PM refining	Acute toxicity Cat. 2 Skin corrosion/irritation Cat. 1A Serious eye damage/eye irritation Cat. 1 Respiratory or skin sensitisation Resp./Skin Sens. Cat. 1 Germ cell mutagenicity Cat. 1B Carcinogenicity Cat. 1A Reproductive toxicity Cat. 1A STOT SE STOT SE Cat. 3 STOT RE Cat. 1 Hazardous to aquatic environment Acute Cat. 1	None; assumed to be metal oxides, chlorides (soluble + classified)		Acute toxicity Cat. 2 Skin corrosion/irritation Cat. 1A Serious eye damage/eye irritation Cat. 1 Respiratory or skin sensitisation Resp./Skin Sens. Cat. 1 Germ cell mutagenicity Cat. 2 Carcinogenicity Cat. 1A Reproductive toxicity Cat. 1A STOT RE Cat. 1 Hazardous to aquatic environment Acute Cat. 1	Yes, 24h T/D pre-test	Refine to a lower classification category	Pending outcome of elemental analysis and expected species (as per input material and process) provided by Aurubis and Heraeus

5.1	Residues, FeCuPbNi matte leaching	Acute toxicity Cat. 2 Skin corrosion/irritation Cat. 1B Serious eye damage/eye irritation Cat. 1 Respiratory or skin sensitisation Resp./Skin Sens. Cat. 1 Germ cell mutagenicity Cat. 1B Carcinogenicity Cat. 1A Reproductive toxicity Cat. 1A Specific target organ toxicity - single exposure STOT SE Cat. 3 STOT SE Cat. 1 Hazardous to aquatic environment Acute Chronic Cat. 1	Elemental analysis characterisation available from Members	+ Done	Acute toxicity Cat. 3 Skin corrosion/irritation Cat. 1B Serious eye damage/eye irritation Cat. 1 Respiratory or skin sensitisation Resp./Skin Sens. Cat. 1 Germ cell mutagenicity Cat. 2 Carcinogenicity Cat. 1A Reproductive toxicity Cat. 1A STOT SE Cat. 1 Hazardous to aquatic environment Acute Chronic Cat. 1	Yes, full T/D	Refine to a lower classification category	1 mg/l at 7 d and 28 d T/D analysing Pb, Cu, Ni, and Ag
5.2	Residues, Cu speiss acid leaching	Acute toxicity Cat. 2 Skin corrosion/irritation Cat. 1B Serious eye damage/eye irritation Cat. 1 Respiratory or skin sensitisation Skin Sens. Cat. 1 Carcinogenicity Cat. 1A Reproductive toxicity Cat. 1A STOT RE Cat. 1 Hazardous to aquatic environment Acute Chronic Cat. 1	Done	Done	Acute toxicity Cat. 3 Skin corrosion/irritation Cat. 2 Serious eye damage/eye irritation Cat. 1 Respiratory or skin sensitisation Skin Sens. Cat. 1 Carcinogenicity Cat. 1A Reproductive toxicity Cat. 1A STOT RE Cat. 2 Hazardous to aquatic environment Acute Chronic Cat. 1	No	N/A	Accept classification
6.1	Ag electrolyte	Acute toxicity Cat. 4 Skin corrosion/irritation Cat. 1A Serious eye damage/eye irritation Cat. 1 Respiratory or skin sensitisation Resp./Skin Sens. Cat. 1 Carcinogenicity Cat. 2 Reproductive toxicity Cat. 1A STOT RE Cat. 2 Hazardous to aquatic environment Acute Chronic Cat. 1	None; assumed in acid (HNO3) phase		Skin corrosion/irritation Cat. 1A Serious eye damage/eye irritation Cat. 1 Carcinogenicity Cat. 2 Reproductive toxicity Cat. 1A STOT RE Cat. 2 Hazardous to aquatic environment Acute Chronic Cat. 1	No	N/A	Accept classification
6.2	Au electrolyte	Acute toxicity Cat. 4 Serious eye damage/eye irritation Cat. 1 Respiratory or skin sensitisation Resp./Skin Sens. Cat. 1 Hazardous to aquatic environment Acute Chronic Cat. 1	None; assumed in acid (HCl) phase		Acute toxicity Cat. 4 Serious eye damage/eye irritation Cat. 1 Respiratory or skin sensitisation Resp./Skin Sens. Cat. 1 Hazardous to aquatic environment Acute Chronic Cat. 1	No	N/A	Accept classification
7	Flue dusts, PM refining	Acute toxicity Cat. 3 Skin corrosion/irritation Cat. 1B Serious eye damage/eye irritation Cat. 1 Respiratory or skin sensitisation Resp./Skin Sens. Cat. 1 Germ cell mutagenicity Cat. 1B Carcinogenicity Cat. 1A Reproductive toxicity Cat. 1A STOT SE STOT SE Cat. 3 STOT RE Cat. 1 Hazardous to aquatic environment Acute Chronic Cat. 1	None; assumed to be mainly metal oxides (soluble + classified)		Acute toxicity Cat. 3 Skin corrosion/irritation Cat. 1B Serious eye damage/eye irritation Cat. 1 Respiratory or skin sensitisation Resp./Skin Sens. Cat. 1 Germ cell mutagenicity Cat. 1B Carcinogenicity Cat. 1A Reproductive toxicity Cat. 1A STOT SE STOT SE Cat. 3 STOT RE Cat. 1 Hazardous to aquatic environment Acute Chronic Cat. 1	No	N/A	Accept classification
8	Residues, PM refining cementation and reduction	Acute toxicity Cat. 2 Skin corrosion/irritation Cat. 1B Serious eye damage/eye irritation Cat. 1 Respiratory or skin sensitisation Resp./Skin Sens. Cat. 1 Germ cell mutagenicity Cat. 2 Carcinogenicity Cat. 1A Reproductive toxicity Cat. 1A STOT RE Cat. 1 Hazardous to aquatic environment Acute Chronic Cat. 1	None; assumed to be mainly metal oxides and chlorides (soluble + classified)		Acute toxicity Cat. 2 Skin corrosion/irritation Cat. 1B Serious eye damage/eye irritation Cat. 1 Respiratory or skin sensitisation Resp./Skin Sens. Cat. 1 Germ cell mutagenicity Cat. 2 Carcinogenicity Cat. 1A Reproductive toxicity Cat. 1A STOT RE Cat. 1 Hazardous to aquatic environment Acute Chronic Cat. 1	No	N/A	Accept classification
9.1a	Materials for reclaim, PM without support	Acute toxicity Cat. 2 Skin corrosion/irritation Cat. 1A Serious eye damage/eye irritation Cat. 1 Respiratory or skin sensitisation Resp./Skin Sens. Cat. 1 Germ cell mutagenicity Cat. 1B Carcinogenicity Cat. 1A Reproductive toxicity Cat. 1A STOT SE STOT SE Cat. 3 STOT RE Cat. 1 Hazardous to aquatic environment Acute Cat. 1	None; assumed to be metallic			No	N/A	Distinguish composition and classification from rest of group 9.1
9.1b	Materials for reclaim, PM with metallic support	Acute toxicity Cat. 2 Skin corrosion/irritation Cat. 1A Serious eye damage/eye irritation Cat. 1 Respiratory or skin sensitisation Resp./Skin Sens. Cat. 1 Germ cell mutagenicity Cat. 1B Carcinogenicity Cat. 1A Reproductive toxicity Cat. 1A STOT SE STOT SE Cat. 3 STOT RE Cat. 1 Hazardous to aquatic environment Acute Cat. 1	None; assumed to be metallic			No	N/A	Distinguish composition and classification from rest of group 9.1

9.1c	Materials for reclaim, PM with carbon support	Acute toxicity Cat. 2 Skin corrosion/irritation Cat. 1A Serious eye damage/eye irritation Cat. 1 Respiratory or skin sensitisation Resp./Skin Sens. Cat. 1 Germ cell mutagenicity Cat. 1B Carcinogenicity Cat. 1A Reproductive toxicity Cat. 1A STOT SE STOT SE Cat. 3 STOT RE Cat. 1 Hazardous to aquatic environment Acute Cat. 1	None; assumed to be metallic + C (C drives the classification)			No	N/A	Distinguish composition and classification from rest of group 9.1
9.1d	Materials for reclaim, PM with ceramic support	Acute toxicity Cat. 2 Skin corrosion/irritation Cat. 1A Serious eye damage/eye irritation Cat. 1 Respiratory or skin sensitisation Resp./Skin Sens. Cat. 1 Germ cell mutagenicity Cat. 1B Carcinogenicity Cat. 1A Reproductive toxicity Cat. 1A STOT SE STOT SE Cat. 3 STOT RE Cat. 1 Hazardous to aquatic environment Acute Cat. 1	Done	Done	Acute toxicity Cat. 2 Respiratory or skin sensitisation Resp./Skin Sens. Cat. 1 Germ cell mutagenicity Cat. 2 Carcinogenicity Cat. 1B Reproductive toxicity Cat. 1A STOT RE Cat. 1 Hazardous to aquatic environment Acute Chronic Cat. 1	Yes, full T/D	N/A	1 mg/l 7 and 28 d T/D analysing Ag, Ni and Co
9.2	Materials for reclaim, bricks, crucibles, trays, etc.	Acute toxicity Cat. 2 Skin corrosion/irritation Cat. 1A Serious eye damage/eye irritation Cat. 1 Respiratory or skin sensitisation Resp./Skin Sens. Cat. 1 Germ cell mutagenicity Cat. 1B Carcinogenicity Cat. 1A Reproductive toxicity Cat. 1A STOT RE Cat. 1 Hazardous to aquatic environment Acute Chronic Cat. 1	None; assumed to be metallic		Acute toxicity Cat. 4 Respiratory or skin sensitisation Resp./Skin Sens. Cat. 1 Carcinogenicity Cat. 2 Reproductive toxicity Cat. 1A STOT RE Cat. 2 Hazardous to aquatic environment Acute Chronic Cat. 1	Yes, 24h T/D pre-test	Refine to a lower classification category	Need to confirm release of Cr and other metals
9.3	Materials for reclaim, PM production by-products (e.g. PM sweeps)	Acute toxicity Cat. 2 Skin corrosion/irritation Cat. 1A Serious eye damage/eye irritation Cat. 1 Respiratory or skin sensitisation Resp./Skin Sens. Cat. 1 Germ cell mutagenicity Cat. 1B Carcinogenicity Cat. 1A Reproductive toxicity Cat. 1A STOT SE STOT SE Cat. 3 STOT RE Cat. 1 Hazardous to aquatic environment Acute Chronic Cat. 1	None; assumed to be mainly metallic oxides (soluble + classified)		Respiratory or skin sensitisation Skin Sens. Cat. 1 Carcinogenicity Cat. 2 Reproductive toxicity Cat. 1A STOT RE Cat. 1 Hazardous to aquatic environment Chronic Cat. 2	No	N/A	Accept classification
10	PGM rich Lead bullion	Acute toxicity Cat. 3 Skin corrosion/irritation Cat. 1B Serious eye damage/eye irritation Cat. 1 Respiratory or skin sensitisation Resp./Skin Sens. Cat. 1 Germ cell mutagenicity Cat. 2 Carcinogenicity Cat. 1A Reproductive toxicity Cat. 1A STOT SE Cat. 3 STOT RE Cat. 1 Hazardous to aquatic environment Acute Chronic Cat. 1	None; read-across from information from Pb Consortium		Acute toxicity Cat. 3 Respiratory or skin sensitisation Skin Sens. Cat. 1 Carcinogenicity Cat. 2 Reproductive toxicity Cat. 1A STOT RE Cat. 1 Hazardous to aquatic environment Acute Chronic Cat. 1	No	N/A	Obtain information from Pb Consortium and determine need for further test