



IAEA

International Atomic Energy Agency

Mining and Processing Safety and Radiation Protection

A Balance

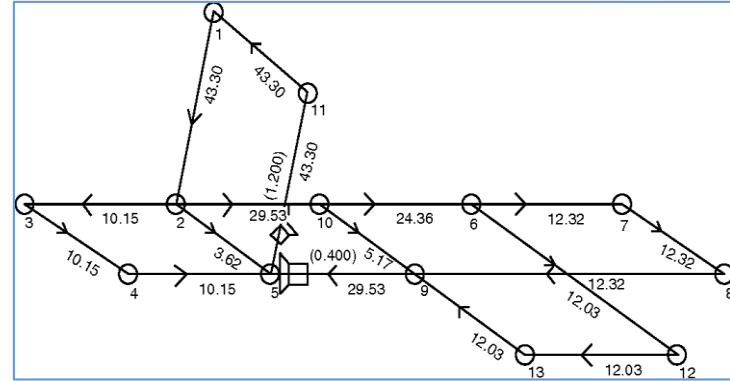
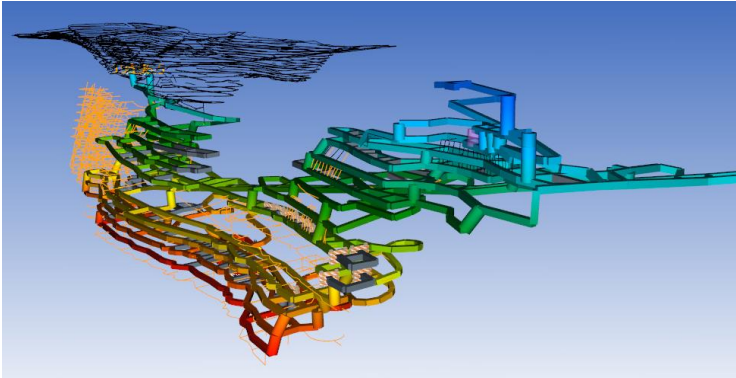
- Safety is a priority for all mining and processing operations
- Acute and chronic exposure hazards and risks
- Risk management approach:
 - Identify
 - Quantify
 - Control
- Standardised approach (avoid risk prioritisation)
- Control commensurate with the level of risk for all risks
- Limited resources to address issues (money, time, effort)

Mining Hazards



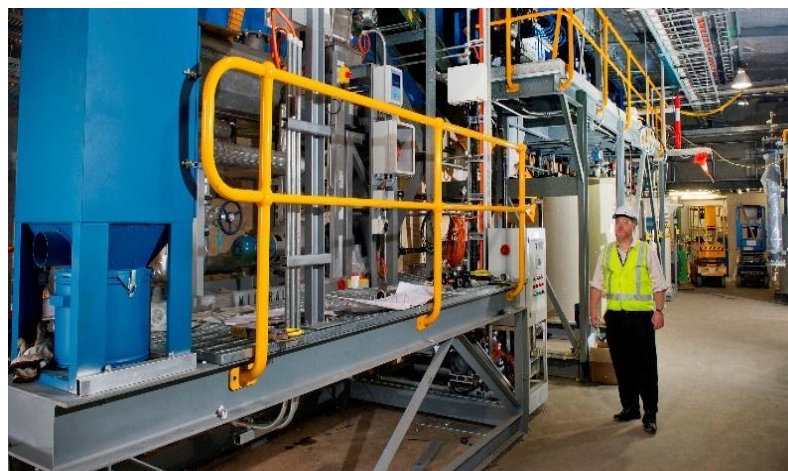
- Dust (inorganic, silica)
- Diesel exhaust emissions
- Hazardous substances:
 - Gases and vapours
 - Solids and liquids
- Noise, Vibration
- Thermal / heat stress
- Asbestos and synthetic mineral fibres
- Non-ionising radiation (e.g. welding flash)
- Ionising Radiation

Mine Ventilation



- What should it control ?
 - Radon and radioactive dust
 - Blasting fumes
 - Dust, silica
 - Diesel fumes
 - Heat

Processing Plant



Processing Plant

- What should be controlled ?
 - Working at heights
 - Hazardous chemicals
 - Moving parts
 - Confined spaces...



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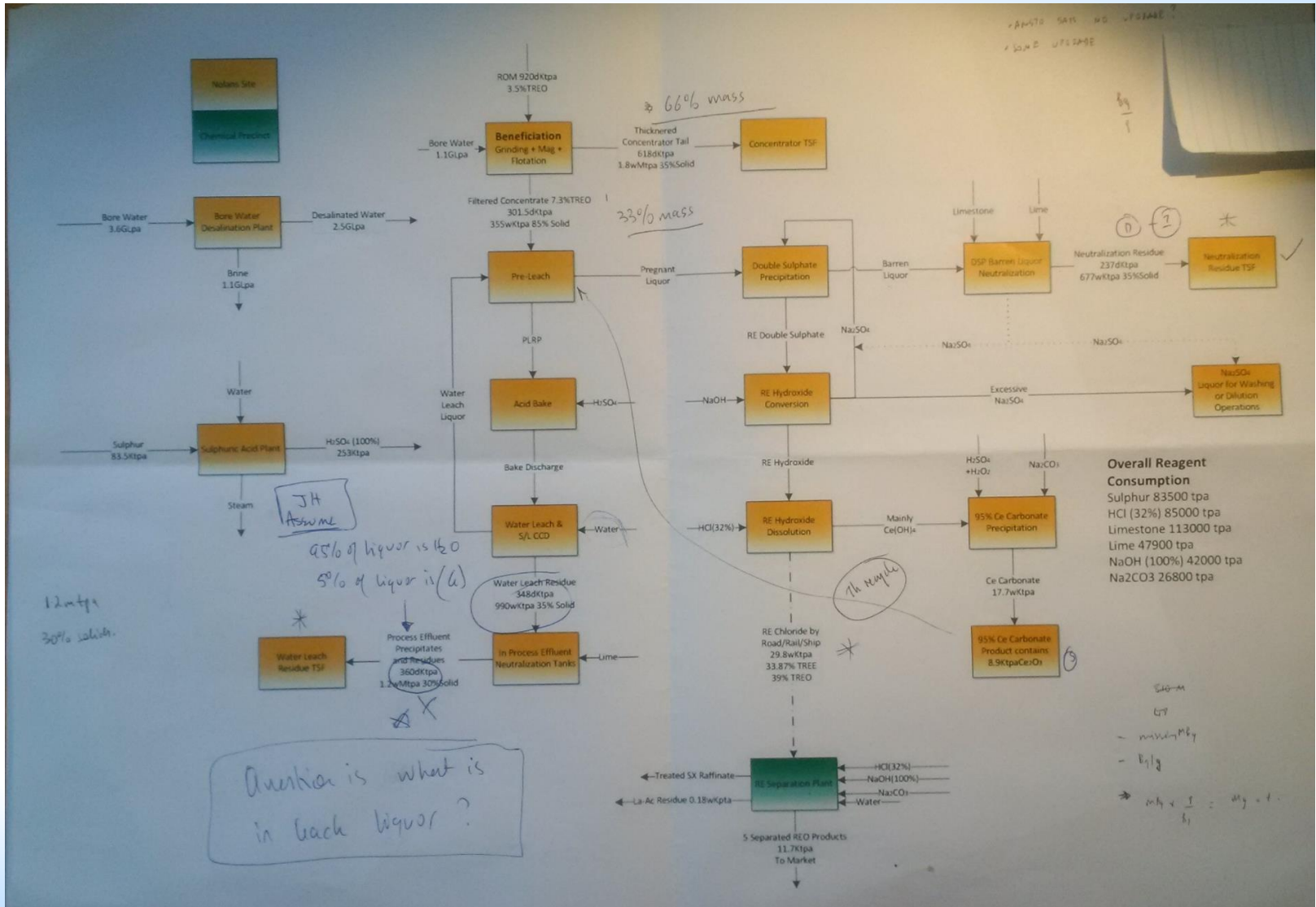
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Radionuclide Content

Radio Nuclide	Ore	Beneficiation Tailings		Beneficiation Concentrate	Residue Facility Tailings		Carbonate Product	Chloride Product
	Bq/g	Solids (Bq/g)	Liquids (Bq/l)	Solids (Bq/g)	Solids (Bq/g)	Liquids (Bq/l)	Solids (Bq/g)	Solids (Bq/g)
Th232	9.6	5.0	0	19.0	8.3	92.4	0.35	0.00
Ra228	9.6	5.5	0	18.0	10.1	145.4	0.10	0.46
Th228	9.6	5.0	0	19.0	9.5	93.5	0.29	0.08
U238	2.1	1.0	0	4.5	2.8	17.3	0.05	0.00
U234	2.1	0.9	0	4.6	3.0	16.3	0.06	0.00
Th230	2.1	0.5	0	5.5	4.7	34.7	0.19	0.00
Ra226	2.1	0.8	0	4.8	2.2	12.9	0.04	0.04
Pb210	2.1	0.7	0	5.1	2.6	0.2	0.06	0.00
Po210	2.1	1.0	0	4.5	2.0	0.3	0.02	0.00
Ac227	0.0	0.0	0	0.0	0.0	0.0	0.03	0.35

Radionuclide Content

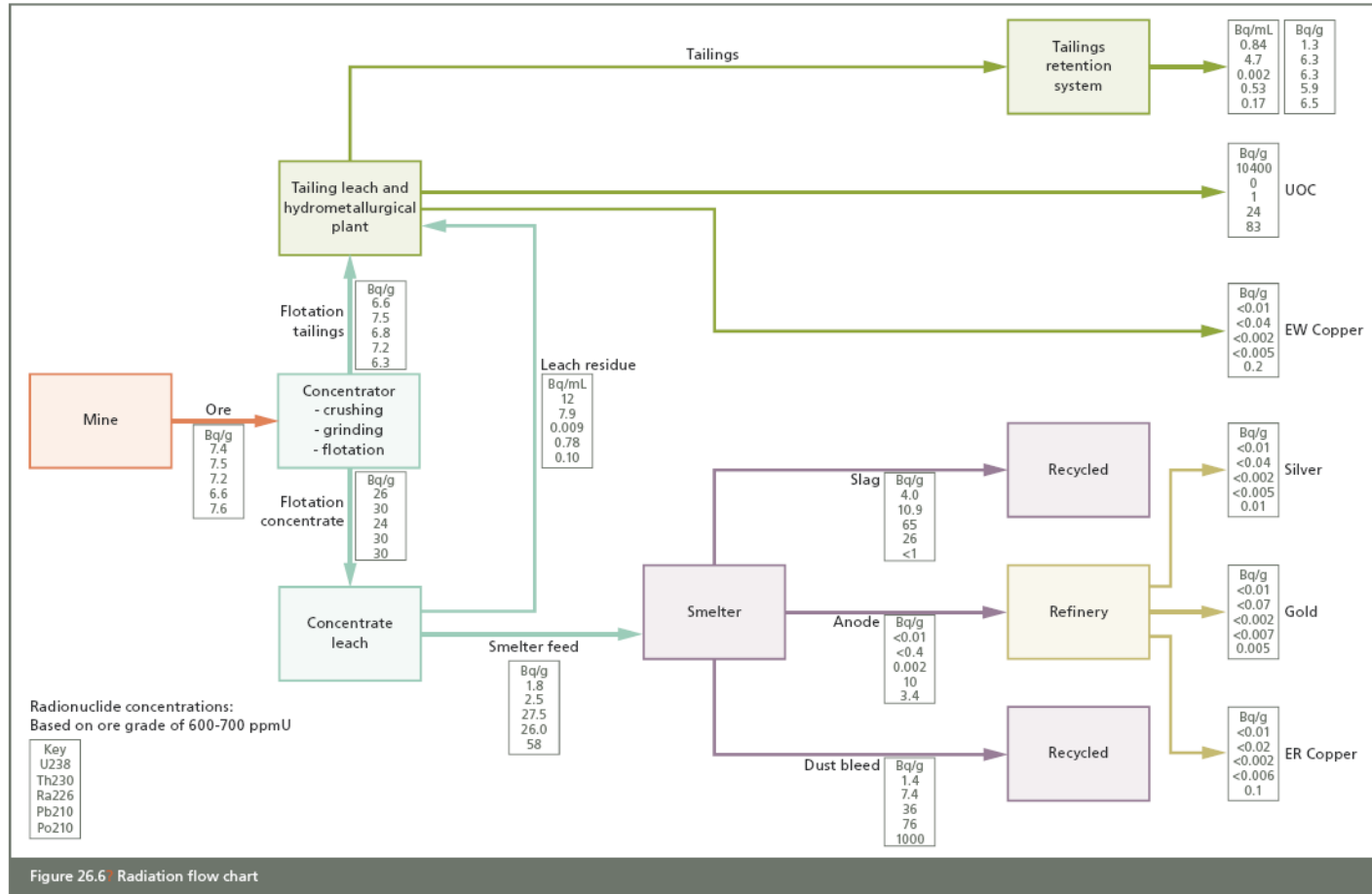


Figure 26.6 Radiation flow chart

“It is not just the Radiation”

- Risks in perspective
 - Radiation is one of a number of hazards
 - Controls commensurate with risk
 - Radiation risk well defined
- IAEA
 - Graded approach to regulation
 - Controls commensurate with the risk
 - Understand the risks
- Management Plans
 - Compliance basis
 - Consider all hazards (eg; OHSMP)
 - Must be useful and practical