Chemical Hygiene Plan – Appendix I
Carlsbad Laboratory Task Risk Analysis

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1 Chemical Analysis

Dept/Area: Carlsbad Quality Control Laboratory				
TRA No: CAR – 01			**Reviewed by:** Graham O'Brien Johnson	**Date:** 1/30/2025
Task: Chemical Analysis			**Approved by:** Graham O'Brien Johnson	**Date:** 1/30/2025
Step	**Task Steps**	**Potential Hazards**	**Controls**	
1	Examine work area	All hazardous work area conditions.	Always inspect work areas before starting a job, remove hazards if possible and report. Review SDSs, SOPs and all relevant documentation before starting job. Wear/use all required PPE. Identify all safety equipment in the event of an emergency.	
2	Inspect equipment	Chemical exposure, cuts and abrasions	Inspect all glassware: discard and replace any chipped, scratched or broken. Inspect all necessary PPE to ensure in good working condition	
3	Boil sample	Thermal energy, chemical exposure	Use caution when handling hot liquids. Always use tongs when removing boiling samples from hotplate.	
4	Titrate sample	Chemical exposure	Always wear nitrile gloves and safety glasses when handling chemicals.	
5	Clean station	Chemical exposure, slips, trips and falls, cuts.	Dump hazardous waste appropriately, see TRA. Wash glassware, inspect for cracks and chips. Be careful with slippery, soapy water and glassware. Clean any chemical or product spills on counter or floor.	

2 Compressed Air Usage

Dept/Area: Carlsbad Quality Control Laboratory				
TRA No: CAR – 02			**Reviewed by:** Graham O'Brien Johnson	**Date:** 1/30/2025
Task: Compressed Air Usage			**Approved by:** Graham O'Brien Johnson	**Date:** 1/30/2025
Step	**Task Steps**	**Potential Hazards**	**Controls**	
1	Examine work area	All hazardous work area conditions.	Always inspect work areas before starting a job, remove hazards if possible and report.	
2	Place face shield on	Dust in eyes, inhaling dust	Make sure face shield is on correctly so won't fall off.	
3	Turn air valve on.	Pinch points	Watch for pinch points when turning the valve on.	
4	Bring hose to desired position	Tripping hazard	Keep hose out of walkways, minimize excess hose	
5	Use compressed air	Pinch points, dust in eyes, inhaling dust, flying debris, hearing damage	When using air hose, watch for pinch points when holding down handle. When cleaning, watch to stay clear of grinders so you do not get caught on anything. Never blow air on yourself or others.	
6	Sweep floor	Slips, trips and falls	Sweep floor after blowing product on the floor	
7	Turn off air valve	Pinch points and stored energy in the flex line	Turn valve off when done with air wand. Watch for pinch points.	
8	Bleed air line	Pinch points, dust in eyes, inhaling dust, flying debris, hearing damage	Always bleed the line by pressing down on the handle until flow stops. Keep all hearing and face protection on until line is bled.	

3 Grinding Samples

Dept/Area: Carlsbad Quality Control Laboratory				
TRA No: CAR – 03			**Reviewed by:** Graham O'Brien Johnson	**Date:** 1/30/2025
Task: Grinding Samples			**Approved by:** Graham O'Brien Johnson	**Date:** 1/30/2025
Step	**Task Steps**	**Potential Hazards**	**Controls**	
1	Examine work area	All hazardous work area conditions.	Always inspect work areas before starting a job, remove hazards if possible and report.	
2	Inspect equipment	Pinch point, electrical energy, kinetic energy, hearing damage	Inspect pulverizer at beginning of each shift prior to operating. Look for frayed wires, faulty switches, bypassed safety mechanisms. Lock and tag out any defective equipment. Watch for pinch points.	
3	Turn on grinder	Pinch point, electrical energy, kinetic energy, hearing damage	Make sure all safety switches are connected and in good working condition.	
4	Grind sample	Pinch points, dust in eyes	Do not bypass guards. Keep lid closed to minimize dust.	
5	Clean grinder	Pinch points, dust in eyes, hearing damage, flying debris	Ensure grinder is off and de-energized. Wear face shield and hearing protection. Do not point compressed air at yourself or others.	

4 Hazardous Waste Disposal

Dept/Area: Carlsbad Quality Control Laboratory				
TRA No: CAR – 04			**Reviewed by:** Graham O'Brien Johnson	**Date:** 1/30/2025
Task: Hazardous Waste Disposal			**Approved by:** Graham O'Brien Johnson	**Date:** 1/30/2025
Step	**Task Steps**	**Potential Hazards**	**Controls**	
1	Examine work area	All hazardous work area conditions.	Always inspect work areas before starting a job, remove hazards if possible and report. Review SDSs, SOPs and all relevant documentation before starting job. Wear/use all required PPE. Identify all safety equipment in the event of an emergency.	
2	Inspect jugs and drums for spill, leaks or cracks	Chemical exposure, slips, trips and falls.	Be aware of leaks or spills to avoid slips, trips and falls or exposure to chemicals.	
3	Pour waste into funnel	Chemical exposure, slips, trips and falls.	Ensure drums are not full prior to pouring. Double-check the waste being dumped matches the waste in the drum. Log the amounts and types of waste dumped. Clean any spills promptly.	
4	Return all equipment and lock Conex.	Chemical exposure, slips, trips and falls, pinch points	Remove jugs and equipment from Conex. Close door, minding the wind. Replace padlock.	

5 Potassium Cyanide Handling and Disposal

Dept/Area: Carlsbad Quality Control Laboratory				
TRA No: CAR – 05			**Reviewed by:** Graham O'Brien Johnson	**Date:** 1/30/2025
Task: Potassium Cyanide Handling and Disposal			**Approved by:** Graham O'Brien Johnson	**Date:** 1/30/2025
Step	**Task Steps**	**Potential Hazards**	**Controls**	
1	Examine work area	All hazardous work area conditions.	Always inspect work areas before starting a job, remove hazards if possible and report. Review SDSs, SOPs and all relevant documentation before starting job. Wear/use all required PPE. Identify all safety equipment in the event of an emergency.	
2	Secure work area	All hazardous work area conditions.	Remove all unnecessary persons from work area. Put up signs indicated dangerous chemicals in use, authorized personnel only. Alert all staff present of the use of potassium cyanide (KCN).	
3	Take extra precautions	Chemical exposure	Always have a second, trained employee as an observer in case of incident. Wear additional PPE, including disposable apron and sleeves, second pair of nitrile gloves, dust mask if desired. Full face respirator and medical grade oxygen must be available on-site.	
4	Ensure the fume hood is on and functioning properly.	Chemical exposure	Keep sash at designated height. Test airflow before every time KCN is to be used.	
5	Keep bottle locked in poison cabinet or fume hood.	Chemical exposure	Keep KCN locked in the designated poison cabinet when not in use. When in use, keep in designated KCN fume hood. Do not leave bottle open unless actively in use.	

6	Keep pH 10 buffer and bleach on hand.	Chemical exposure	Have pH 10 buffer and dilute bleach solution available whenever KCN is to be used. Never use acids in KCN fume hood. Contact with acids will liberate toxic hydrogen cyanide gas.
7	In the event of a KCN spill	Chemical exposure	For minor spills, blot paper towel with pH 10 solution, wipe up spill, and dispose in Satellite Accumulation Area (SAA). For larger spills, sweep up into disposable container and place in SAA. For spills outside of fume hood, evacuate all personnel and contact emergency response and EHS. Place empty KCN bottles in SAA, or rinse three times, collecting rinsate in SAA, and dispose in trash.
8	Return all chemicals and equipment	Chemical exposure	Return KCN to posion cabinet, lock, secure key in lockbox. Remove outer gloves, sleeves and apron, and dispose in SAA. Wipe all surfaces first with pH 10 buffer, then with bleach, using paper towels, and dispose of in SAA. Fill out log sheets and place in KCN binder.

6 Reagent Preparation

Dept/Area: Carlsbad Quality Control Laboratory				
TRA No: CAR – 06			**Reviewed by:** Graham O'Brien Johnson	**Date:** 1/30/2025
Task: Reagent Preparation			**Approved by:** Graham O'Brien Johnson	**Date:** 1/30/2025
Step	**Task Steps**	**Potential Hazards**	**Controls**	
1	Examine work area	All hazardous work area conditions.	Always inspect work areas before starting a job, remove hazards if possible and report. Review SDSs, SOPs and all relevant documentation before starting job. Wear/use all required PPE. Identify all safety equipment in the event of an emergency.	
2	Wear appropriate PPE	Chemical exposure, slips, trips and falls.	FR clothing or lab coat, nitrile gloves, safety glasses are always required. Concentrated acids and bases require face shield and apron or fume hood. See potassium cyanide TRA for specific requirements.	
3	Inspect equipment	Chemical exposure, cuts and abrasions	Inspect all glassware: discard and replace any chipped, scratched or broken. Inspect all necessary PPE to ensure in good working condition	
4	Combine reagents	Chemical exposure	Pour and weigh chemicals slowly and carefully Contain and cleanup spills immediately. Never add water to acid, always add acid to water.	
5	Mix reagents	Chemical exposure, rotating equipment, Electrical energy	Ensure mixer is unplugged in when not in use. Remove any strings, lanyards, necklaces or other dangling items. Keep hair up and out of reach.	
6	Transfer reagents	Chemical exposure, slips, trips and falls, back strain, potential energy.	Pour slowly and carefully to avoid spills. Make sure all containers are closed before moving. Use proper lifting technique.	

7	Clean station	Chemical exposure, slips, trips and falls, cuts.	Dump hazardous waste appropriately, see TRA. Wash glassware, inspect for cracks and chips. Be careful with slippery, soapy water and glassware. Clean any chemical or product spills on counter or floor.

7 Truck Safety

Dept/Area: Carlsbad Quality Control Laboratory				
TRA No: CAR – 07			**Reviewed by:** Graham O'Brien Johnson	**Date:** 1/30/2025
Task: Truck Safety			**Approved by:** Graham O'Brien Johnson	**Date:** 1/30/2025
Step	**Task Steps**	**Potential Hazards**	**Controls**	
1	Perform vehicle inspection	All hazardous work area conditions.	Always inspect work areas before starting a job, remove hazards if possible and report. Fill out vehicle inspection form each shift before usage.	
2	Wear appropriate PPE	Slips, trips and falls, mobile equipment	Hard hat, safety glasses, high-visibility FR clothing and 8" lace-up steel toe metatarsal boots are all required within the plant. Have a radio on hand for entering restricted areas. Safety belt must be worn by all passengers at all times while in the vehicle.	
3	Signal all movement	Mobile equipment	Honk twice before reversing and hank once before driving forward. Obey posted speed limits, 5 mph in plant, 10 mph by warehouse.	
4	Stop safely	Mobile equipment	Come to a complete stop at all stops signs and crossings. If the driver exits the vehicle, it must be in Park, turned off, and have the wheels chocked.	