Health, Safety & Environment (HSE) Plan

Anomalous Environmental Signatures

Remote Field Operations

Operator: NRGscapes LAB

Base of Operations: Caravan + 4WD
Region: Pilbara, Western Australia
Operational Mode: Solo-pair, remote, off grid

Last Update	Name	Version Number
24/01/2026	Dr. Andrew Morgan	Rev A
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1. Purpose and Scope

This document provides step-by-step operational guidance for managing health, safety, environmental, and security risks while conducting remote fieldwork in the Pilbara. It is written so that, in any credible situation, the operator can answer:

- *What do I do?*
- *How do I do it safely?*
- *When do I stop and leave?*

The plan applies to all phases of work:

- Deployment
- Travel
- Camp setup
- Operations
- Pack-down
- Emergency response
- Return

2. Core Safety Principles (Non-Negotiable)

Residual risk may remain HIGH in remote fieldwork contexts where hazards cannot be eliminated; however, operations proceed only where risks are understood, controlled as far as reasonably practicable, and actively managed.

1. Solo means conservative – abort earlier than you would with a team.
2. Vehicle is primary refuge – unless unsafe, stay with it.
3. Distance is protection – do not approach hazards, people, animals, or phenomena.
4. Early decision-making – small problems escalate rapidly in the Pilbara.
5. No heroics – observation does not justify exposure.
6. For solo remote field operations, residual HIGH risk may proceed only with explicit justification, additional controls, and heightened monitoring. Residual EXTREME risk is not permitted.

Residual Risk Acceptance

For solo remote field operations, residual HIGH risk may proceed only with explicit justification, additional controls, and heightened monitoring documented in the JSA. Residual EXTREME risk is not permitted under any circumstances.

Decision Authority and Self-Approval

- The operator is the decision authority
- Conservative bias is mandatory
- Abort decisions require no justification beyond risk
- Continuing with HIGH risk requires written justification (JSA)

Remote solo fieldwork inherently involves hazards that cannot be fully eliminated due to environmental isolation, delayed external response, and variable conditions. In this context, residual risk may remain **HIGH** even after controls are applied.

Operations may proceed only where risks are clearly identified, reduced as far as reasonably practicable, and actively managed through conservative decision-making, continuous reassessment, and predefined abort thresholds.

Where residual risk escalates beyond the operator's capacity to safely manage, operations must be suspended or aborted regardless of task objectives.

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3. Environmental Hazards - Context, Risks, and Controls

Remote work in the Pilbara exposes the operator to rapidly changing and extreme environmental conditions. These hazards are not theoretical; they are well-documented contributors to serious injury and fatalities in remote WA operations. Because assistance may be delayed or unavailable, early recognition and conservative response are critical.

The controls below are designed to reduce exposure, provide clear decision points, and prevent escalation from manageable discomfort to life-threatening situations.

3.1 Extreme Heat

Context and Risk Explanation: Extreme heat is the primary operational hazard in the Pilbara. Heat illness can develop rapidly, often before the operator recognises impairment.

Cognitive decline frequently precedes physical collapse, making self-monitoring essential.

Indicators:

- Ambient temperature rising above 38 °C
- Light-headedness, headache, irritability
- Slowed decision-making or confusion
- Reduced urine output or dark urine

What To Do:

1. Stop physical work immediately at first indicators.
2. Move to shade (vehicle or caravan preferred).
3. Actively cool the body: remove outer layers, increase airflow, apply cool packs to neck/groin if available.
4. Drink water steadily with electrolytes.

How To Operate Safely:

- Plan physical tasks only between sunrise–10 am and after 4 pm.
- Set hydration reminders every 30–45 minutes.
- Record daily water intake.

Abort Criteria:

- Cognitive impairment or confusion
- Persistent dizziness or nausea
- Forecast temperatures exceeding 45 °C without reliable shelter

3.2 Cold Exposure (Overnight / Storm Conditions)

Context and Risk Explanation: Although daytime heat dominates, cold stress can occur overnight, during storms, or when wet. Hypothermia can develop quietly, particularly when fatigued.

What To Do:

1. Change into dry thermal layers immediately.
2. Insulate from the ground using a mat or vehicle seat.
3. Use a sleeping system rated for below expected minimum temperatures.

How To Prevent:

- Maintain one sealed bag of dry clothing and
- Avoid sleeping directly on the ground.

Cold exposure during night operations is further addressed in **Section 7 (Night Operations)**, including scope limitations and stop-work triggers.

3.3 Storms, Flooding, and Cyclonic Weather

Context and Risk Explanation: Storm systems in the Pilbara can escalate rapidly. Flash flooding, road washouts, and falling debris present severe risks, particularly when towing or camped in low-lying areas.

Early Indicators:

- Distant thunder, sudden wind shifts, barometric pressure drops
- Bureau of Meteorology warnings

What To Do:

1. Cease all operations immediately and secure loose equipment.
2. Relocate to high ground if near drainage lines.
3. Remain inside vehicle or caravan.

Flood-Specific Rules:

- Never drive through water of unknown depth or flow.
- If water rises around the vehicle: stay put and activate communications.

Abort Criteria:

- Severe thunderstorm or cyclone warnings
- Forecast rainfall >50 mm in catchment areas

3.4 Lightning

Context and Risk Explanation: Lightning poses a direct strike risk and can induce electrical surges in equipment. Remote locations offer limited protection.

What To Do:

1. Stop all outdoor activity immediately.
2. Disconnect external antennas if safe to do so.
3. Enter vehicle or caravan and remain inside.

Do NOT:

- Shelter under trees
- Handle metal equipment or tripods

4. Personal Protective Equipment (PPE) – Purpose, Rationale, and Application

PPE provides a critical personal safety buffer in remote operations where environmental exposure, sharp objects, heat, dust, and wildlife hazards are present. In isolated settings, even minor injuries can escalate due to delayed treatment, making preventative protection essential.

4.1 Daily Wear PPE

- Long-sleeve UV-rated clothing – reduces solar radiation exposure, dehydration risk, and minor abrasion.
- Wide-brim hat – protects face, neck, and ears from prolonged sun exposure.
- Safety boots – provide ankle support, puncture resistance, and protection from uneven terrain.
- Eye protection – shields eyes from dust, insects, glare, and flying debris.
- Cold-nighttime PPE.

4.2 Task-Specific PPE

- Protective gloves – prevent cuts, burns, and contact injuries when handling equipment or recovery gear.
- Dust mask or respirator – reduces inhalation of fine particulate matter during wind or vehicle movement.

Operational Rule: PPE must be worn before exposure occurs, including cold PPE. Delaying PPE use until discomfort or hazard is present significantly increases injury risk.

5. Equipment Systems – Purpose, Limits, and Use

All equipment used in remote operations serves either a life-support, communication, mobility, or safety function. Failure to understand equipment limits is a leading cause of escalation in remote incidents.

Critical equipment redundancy is defined in Appendix L.

5.1 Communications Systems

Purpose Explanation: Reliable communication is the single most important survival factor in solo remote work. Redundancy ensures that a single failure does not result in complete isolation.

- Satellite phone – primary long-range voice communication independent of terrestrial networks.
- UHF radio – short-range communication with nearby vehicles or sites.
- PLB / EPIRB – emergency beacon, last-resort emergency distress signal when direct communication fails.

How To Use Safely:

- Perform a daily function check on all devices.
- Keep devices always charged and accessible.
- Establish fixed check-in times: _____ AM / _____ PM.
- Initiate escalation if check-in missed by _____ hours.

5.2 Medical and Emergency Equipment

Purpose Explanation: Medical equipment enables immediate response to injury or illness when professional care may be hours or days away. Early intervention significantly improves outcomes.

- Trauma dressings – control bleeding and prevent shock.
- Snake bite kit – immobilisation and pressure bandaging for venomous bites.
- Antiseptic supplies – reduce infection risk.
- Pain relief – manage pain to maintain functional decision-making.

Operational Guidance:

- Treat injuries immediately.
- Assume evacuation may be delayed.
- Monitor condition continuously after treatment.

5.3 Vehicle and Caravan Systems

Purpose Explanation: The vehicle and caravan together function as transport, shelter, power supply, and emergency refuge. Loss of vehicle capability dramatically increases risk.

- 4WD vehicle – primary mobility and refuge platform.
- Dual battery system – supports communications and refrigeration.
- Recovery gear – enables self-recovery from sand or mud.
- Fuel reserves – ensure range beyond planned travel.

Operational Rule: The vehicle is not abandoned unless remaining poses greater danger.

6. Hostile Encounters – Context and Response

Hostile encounters may involve people, animals, or anomalous phenomena. In all cases, avoidance, distance, and early withdrawal are the safest strategies.

6.1 Human Encounters

Context Explanation: Remote regions occasionally attract individuals engaging in illegal, intoxicated, or unpredictable behaviour. Solo operators are particularly vulnerable.

- Aggressive posture – indicates possible escalation.
- Confrontational questioning – may precede hostility.

What To Do:

- Do not argue or justify presence.
- Increase distance immediately.
- Enter vehicle and depart.
- Notify authorities when safe.

Local Police Station: _____

6.2 Phenomenological / Anomalous Encounters

Context Explanation: Reports of anomalous craft, orbs, entities, or energy manifestations describe potential disorientation, stress responses, and equipment interference. Regardless of interpretation, these represent situational hazards.

- Disorientation – may impair judgement.
- Equipment interference – can compromise navigation or communications.

What To Do:

- Stop movement and maintain orientation.
- Do not approach or pursue.
- Power down non-essential electronics if interference occurs.
- Withdraw to vehicle.
- Leave area if symptoms develop.

Physiological Red Flags:

- Nausea or dizziness
- Head pressure
- Confusion or altered perception

7. Night Operations

7.1 Scope and Applicability

Night operations are defined as any field activity conducted between sunset and sunrise, including observation, monitoring, data collection, transit within a site, and camp-based operations. Site applicability is declared in **Appendix C**.

Night work is recognised as a **risk-elevated operating condition** due to reduced visibility, increased fatigue, environmental exposure, and delayed emergency response. Night operations are permitted **only where explicitly assessed, justified, and controlled** in accordance with this HSE Plan.

This section applies to:

- Solo remote field operations
- Observational activities conducted from camp or vehicle
- Any movement or task undertaken after dark

Fatigue self-assessment shall be conducted using Appendix J prior to and during night operations.

7.2 Rationale for Night Operations

Certain observational and environmental phenomena of interest occur predominantly or exclusively during night-time conditions. Night operations are therefore undertaken intentionally and selectively, rather than incidentally.

Night work is not treated as a routine extension of daytime operations. Instead, it is recognised as a higher-risk operating condition and is conducted only where the activity cannot be reasonably deferred to daylight hours.

To manage the elevated risk associated with night operations, task scope is deliberately reduced, exposure time is limited, and conservative abort thresholds are applied. Night activities are restricted to passive observation and monitoring only, with no pursuit, terrain exploration, or non-essential movement permitted.

Night operations proceed only where the associated risks have been assessed under a night-specific JSA and reduced as far as reasonably practicable in accordance with this HSE Plan.

7.2 Risk Elevation Framework

Night operations do not introduce fundamentally new hazards but **increase the likelihood** of existing hazards materialising.

Accordingly: **For night operations, Likelihood ratings in the Risk Matrix shall be increased by +1 level unless explicitly mitigated.**

The Risk Matrix itself is unchanged (see **Appendix B – Risk Matrix**), but risk ratings applied in:

- JSAs (Appendix F)
- Site-Specific Addenda (Appendix C and templates)
- Task checklists

must reflect this elevation.

Residual EXTREME risks are **not permitted** during night operations.

7.3 Primary Night-Specific Hazards

The following hazards are recognised as materially elevated at night:

- Reduced situational awareness and depth perception
- Navigation error and spatial disorientation
- Fatigue and cold-related cognitive, and circadian impairment
- Wildlife strike and unexpected human presence
- Cold exposure, hypothermia, and loss of dexterity
- Lightning and storm proximity detection delays
- Delayed emergency response and recovery
- Increased ambiguity in anomalous or energetic observations

These hazards must be explicitly considered in the JSA and Site-Specific Addendum for any night work.

7.4 Cold Exposure and Thermal Risk (Night-Specific)

Despite extreme daytime heat, arid and remote environments can experience **rapid radiative cooling at night**, resulting in significant cold stress. Cold exposure is recognised as a **credible HSE hazard** during night operations and may result in:

- Impaired judgement
- Reduced manual dexterity
- Accelerated fatigue
- Increased injury severity
- Degraded emergency response capability

General cold exposure controls are outlined in **Section 3.2** and apply in addition to night-specific controls. Cold exposure must be assessed and controlled in accordance with:

- **Appendix C – Site-Specific Addendum** (local temperature ranges)
- **Appendix F – JSA** (task-specific exposure)
- **Night Operations Checklist** (Section 7.9)

7.5 Permitted Scope of Night Operations

To manage elevated risk, the scope of night operations is deliberately restricted.

Permitted activities:

- Passive observation
- Remote or stationary data collection
- Monitoring from vehicle or established camp
- Limited equipment operation within defined perimeter

Prohibited activities at night:

- Terrain exploration and pursuit or approach of anomalous phenomena
- Off-track movement beyond predefined safe zones
- Non-essential vehicle travel
- Complex equipment reconfiguration requiring fine motor control

Tasks that cannot be reduced below HIGH residual risk at night must be deferred to daylight hours.

7.6 Controls and Requirements

Visibility and Navigation

- Adequate lighting (primary and backup) must be available
- GPS waypoint for camp and vehicle must be logged before dark
- No movement beyond pre-identified safe perimeter
- No reliance on visual terrain cues alone

Fatigue Management

- Planned rest period before night work
- Defined maximum duration for night tasks
- Mandatory rest and warm-up breaks
- Continuous self-assessment for alertness

Thermal Protection

- Insulating layers staged before sunset
- Windproof outer layer available
- Head and hand protection worn as required
- No prolonged static exposure without insulation
- Hot beverage capability available

Communications

- Satellite phone powered and accessible
- PLB carried on body
- Scheduled check-ins maintained
- Batteries protected from cold exposure

7.7 Anomalous or Unusual Activity at Night

Night-time observations of anomalous aerial, environmental, or energetic phenomena are treated as **information-gathering events only**.

Due to increased ambiguity at night:

- No signalling, pursuit, or interaction is permitted
- Increased standoff distance must be maintained
- Exposure duration should be minimised
- Any physiological, cognitive, or equipment interference requires immediate withdrawal

Controls in this section must align with:

- **Appendix C – Site-Specific Addendum**
- **Appendix F – JSA**
- **Operational Checklists**

7.8 Emergency Response Considerations (Night)

Emergency response capability is reduced at night due to:

- Reduced visibility
- Slower access and extraction
- Delayed aviation response
- Increased navigation difficulty

Accordingly:

- Abort thresholds are lower at night
- Self-rescue capability must be prioritised
- Early withdrawal is preferred to extended exposure
- PLB activation criteria remain unchanged

7.9 Night Operations Go / No-Go Checklist

Night operations may proceed only if **all** the following are satisfied:

- ☐ Operator is rested and alert
- ☐ Weather stable and monitored
- ☐ No storm cells within ___ km
- ☐ Cold protection staged and worn
- ☐ Lighting systems operational
- ☐ Camp and vehicle GPS logged
- ☐ Communications live
- ☐ Abort criteria reviewed

Failure of any item constitutes a **No-Go** decision.

7.10 Stop-Work Triggers (Night Operations)

Night operations must cease immediately if:

- Cold stress symptoms appear (shivering, numbness, confusion)
- Fatigue impairs judgement or coordination
- Weather deteriorates beyond forecast
- Communications are lost
- Vehicle mobility is compromised
- Unexpected human presence occurs
- Anomalous activity escalates unpredictably
- Any risk escalates to **EXTREME**

7.11 Cross-References

This section must be read in conjunction with:

- **Appendix B – Risk Matrix, Appendix C – Site-Specific Addendum**
- **Appendix F – Job Safety Analysis**
- **Operational Checklists (Preparation, Deployment, Operations, Pack-down)**

8. Emergency Contacts – Planning Requirement

Advance identification of emergency contacts reduces response time and confusion during critical incidents. All contacts must be verified prior to deployment.

This section records baseline emergency contacts. Site-specific contacts must be completed in **Appendix C** and **Site-Specific Templates** for each deployment.

Emergency Services: 000

Emergency & Site Contact Register

Mine Sites / Industrial Facilities

Site Name	Emergency Control Room / Contact Name	Phone	Radio / Channel	Notes

Campgrounds / Ranger Stations

Name	Contact Person / Office	Phone	Radio / Channel	Notes

Personal Emergency Contacts

Priority	Name	Relationship	Phone	Notes
Primary				
Secondary				

9. Emergency Scenarios – Explanation and Response

Emergency response in remote solo field operations prioritises early recognition, conservative decision-making, and escalation before conditions deteriorate.

The operator is the primary decision authority and is required to bias decisions toward early withdrawal, self-preservation, and external notification rather than prolonged self-resolution.

Where uncertainty exists, escalation is preferred over continued exposure.

9.1 Injury or Illness

Explanation: Even minor injuries can become life-threatening in remote environments. Immediate stabilisation and early communication are critical.

Procedure:

- Stop work immediately.
- Apply first aid.
- Assess ability to self-evacuate.
- Contact emergency services or site contacts.
- Activate PLB / EPRIB emergency beacon if condition deteriorates.

Decision & Escalation:

- Cease all non-essential activity immediately.
- If injury or illness affects mobility, cognition, or thermal regulation, escalate without delay.
- Self-rescue may be attempted only if it does not increase risk.
- PLB / EPRIB emergency beacon activation is mandatory if self-rescue is not achievable.

9.2 Vehicle Breakdown

Explanation: Leaving a disabled vehicle significantly increases exposure risk. Vehicles provide shelter, visibility, and access to communications.

Procedure:

- Stay with vehicle.

- Activate communications.
- Display high-visibility markers.
- Ration water and conserve energy.

Decision & Escalation:

- Attempt basic self-recovery only if safe to do so.
- If mobility is not restored within 30 minutes, notify nominated contact.
- If vehicle cannot provide shelter or environmental exposure increases, escalate immediately and prepare for PLB / EPROB emergency beacon activation.

9.3 Lost or Disoriented (On Foot)

Explanation: Continued movement while disoriented often increases distance from safety and complicates rescue.

Procedure:

- Stop moving.
- Sit and stabilise.
- Use GPS or map to reorient.
- Remain at last known point if uncertain.

Decision & Escalation:

- Stop movement immediately to prevent compounding disorientation.
- Attempt re-orientation using GPS, known waypoints, and terrain recognition within 15 minutes.
- If orientation is not restored, notify nominated contact and remain in a safe, visible position.
- PLB / EPIRB emergency beacon activation applies if disorientation persists or conditions deteriorate.

9.4 Rapid Camp Evacuation

Explanation: Certain hazards require immediate withdrawal rather than mitigation.

Procedure:

- Secure personal safety items first (keys, phone, PLB, water).

- Hitch caravan only if time and conditions allow.
- Evacuate via pre-identified route.

Decision & Escalation:

- Initiate rapid evacuation if environmental conditions, proximity threats, or anomalous activity escalate unpredictably.
- Prioritise personal safety over equipment recovery.
- If evacuation route is compromised or conditions worsen, escalate to nominated contact and prepare for PLB activation.

9.5 Severe Weather Escalation (NEW – Short Subsection)

Severe weather (including storms, lightning, flooding, extreme wind, or sudden temperature drops) is recognised as a **condition that escalates existing hazards**, rather than a standalone emergency.

Detection of severe weather triggers immediate reassessment of all activities and may require rapid camp evacuation, shelter-in-place, or early withdrawal.

If weather conditions deteriorate beyond forecast, restrict movement, or compromise shelter, the response actions outlined under **Rapid Camp Evacuation** and **Vehicle Breakdown** apply.

9.6 Loss of Communications Escalation (NEW – Short Subsection)

Loss of communications is recognised as a **risk amplifier** in remote solo operations.

Temporary loss of communications requires immediate cessation of non-essential activity and attempts to restore contact.

Prolonged or unresolved loss of communications escalates to the response pathways described under **Vehicle Breakdown**, **Lost or Disoriented**, or **Injury / Illness**, depending on circumstances.

PLB activation applies if loss of communications coincides with injury, immobility, deteriorating environmental conditions, or increasing uncertainty.

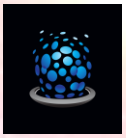
9.5 Decision time frames

For all emergency scenarios, the following decision framework applies unless otherwise stated:

- T0: Hazard or incident recognised
- T+15 minutes: Attempt immediate self-resolution if safe
- T+30 minutes: Notify nominated check-in or site contact
- T+60 minutes: Escalate to external assistance if unresolved
- T+___ hours: Activate PLB / emergency beacon if safety is compromised or condition deteriorates

These timeframes are conservative and may be shortened based on environmental conditions, night operations, injury, or loss of communications.

All incidents and near misses must be documented using Appendix I following safe resolution of the event.



10. Operational Phases – Rationale and Execution

10.1 Deployment

Explanation: Most failures originate before arrival. Preparation reduces downstream risk.

- Notify contacts.
- Confirm weather.
- Inspect vehicle, equipment, and communications.

10.2 Setup

Explanation: Safe camp layout enables rapid response during emergencies.

- Establish shaded safe zones.
- Identify exit routes.
- Confirm communications.

10.3 Operations

Explanation: Fatigue and environmental exposure accumulate over time.

- Work in short blocks.
- Maintain hydration.
- Log observations after events, not during escalation.

10.4 Pack-Down

Explanation: Incidents frequently occur during demobilisation due to fatigue.

- Power down systems.
- Secure equipment.
- Conduct final site sweep.

10.5 Return

Explanation: Formal close-out ensures accountability and recovery.

- Notify contacts.
- Record incidents.
- Rest and recover before next deployment.

11. Environmental Responsibility

- Leave no trace
- Respect cultural sites
- Minimise disturbance

12. Declaration

I acknowledge this plan and commit to operating within its controls and abort criteria.

Name: _____

Signature: _____

Date: _____

Operational Safety Flow Summary – Remote Solo Fieldwork

Applies to all deployments. Read in conjunction with Sections 2–9 and relevant Appendices.)

1. Deployment Phase

Purpose: Safe transit and site arrival

Key Controls

- Vehicle inspection completed
- Fuel, water, food, PPE confirmed
- Communications and emergency equipment tested
- Check-in contact notified of departure

Governing Sections

- Section 2 – Core Safety Principles
- Section 5 – Equipment and Communications
- Appendix C – Site-Specific Addendum

Decision Authority

- Operator may abort deployment at any time

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2. Site Assessment & Setup

Purpose: Establish safe operating baseline

Key Controls

- Site hazards identified and documented
- Weather and environmental conditions assessed
- Communications coverage verified
- Day vs night operations confirmed
- JSA completed (Day or Night as applicable)

Governing Sections

- Section 3 – Environmental Hazards

- Section 4 – PPE
- Section 7 – Night Operations (if applicable)
- Appendix F – Job Safety Analysis

Go / No-Go Decision

- If residual risk is **EXTREME → Abort**
- If residual risk is **HIGH → Proceed only with justification**

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3. Operations Phase

Purpose: Conduct approved field activities

Permitted Activities

- Passive observation only
- No pursuit, terrain exploration, or risk escalation
- Movement minimised, especially at night

Key Controls

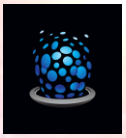
- Continuous situational awareness
- Thermal management (heat/cold)
- Wildlife and human awareness
- Regular self-checks (fatigue, cold, cognition)

Governing Sections

- Section 6 – Hostile Encounters
- Section 7 – Night Operations (if applicable)
- Appendix F – Active JSA

Abort Triggers

- Unexpected hazard escalation
- Weather deterioration
- Loss of situational confidence
- Equipment or comms degradation



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4. Emergency Response (Overrides All Phases)

Purpose: Preserve life and safety

Emergency Conditions

- Injury or illness
- Vehicle breakdown
- Rapid camp evacuation
- Lost or disoriented
- Hostile encounter or threat
- Severe weather escalation
- Loss of communications

Decision Framework

- Early recognition
- Conservative bias
- Time-based escalation
- PLB / EPIRB emergency beacon activation when required

Governing Sections

- Section 9 – Emergency Procedures
- Appendix D – Missed Check-In Escalation

Authority

- Operator authorised to deviate from plan without approval

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5. Pack-Down & Departure

Purpose: Safe disengagement from site

Key Controls

- Equipment secured
- Waste removed
- Site left safe and undisturbed

- Final site check conducted

Governing Sections

- Section 5 – Equipment
- Section 7 – Night Operations (if packing down at night)

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6. Return & Close-Out

Purpose: Confirm safe completion

Key Controls

- Arrival confirmed with check-in contact
- Missed check-in protocol closed
- Any incidents or near-misses noted
- Lessons captured for future deployments

Governing Sections

- Section 2 – Core Safety Principles
- Appendix D – Check-In Protocols

Universal Safety Rule

At any point in this flow, the operator may abort operations without justification if conditions feel unsafe or uncertain. No task or data objective overrides personal safety.

APPENDICES

Appendix A – Definitions and Operational Terms

Clear definitions ensure consistent decision-making under stress and prevent ambiguity in emergency situations.

- **Abort** – A deliberate decision to cease operations and withdraw from the area due to unacceptable risk. Aborting is a success outcome, not a failure.
- **Safe Zone** – A location offering maximum available protection from environmental, human, or anomalous hazards (typically vehicle or caravan).
- **Escalation** – The process of increasing response actions as risk severity increases (e.g., observation → withdrawal → emergency activation).
- **Primary Refuge** – The vehicle or caravan, providing shelter, mobility, communications, and visibility.
- **Last Known Point (LKP)** – The most recent confirmed safe location used as a reference during disorientation or rescue.

Appendix B – Risk Matrix (Qualitative)

This risk matrix follows standard Australian mining and exploration HSE practice, using five categories for both likelihood and consequence. It is suitable for JSAs, SWMS, and permit-to-work documentation and is intentionally conservative for solo remote operations.

For solo remote field operations, residual HIGH risk may proceed only with explicit justification, additional controls, and heightened monitoring. Residual EXTREME risk is not permitted.

Likelihood Definitions

1. Rare (1) – May occur only in exceptional circumstances; not known to have occurred at this site.
2. Unlikely (2) – Could occur but not expected under normal conditions.
3. Possible (3) – Has occurred before or could occur under current conditions.
4. Likely (4) – Will occur in most circumstances or repeatedly during operations.
5. Almost Certain (5) – Expected to occur frequently or continuously.

Consequence Definitions

1. Insignificant (1) – No injury or negligible impact; first aid not required.
2. Minor (2) – First aid treatment required; no lost time.
3. Moderate (3) – Medical treatment and/or lost time injury.
4. Major (4) – Serious injury requiring evacuation or hospitalisation.
5. Catastrophic (5) – Fatality or life-threatening injury.

Risk Matrix Table (5×5 – Colour-Coded with Decision Guidance)

Colour key: 🟢 LOW | 🟡 MEDIUM | 🟠 HIGH | 🔴 EXTREME

Likelihood ↓ / Consequence →	1 Insignificant	2 Minor	3 Moderate	4 Major	5 Catastrophic
1 Rare	🟢 LOW – Acceptable. Work may proceed with standard controls.	🟢 LOW – Acceptable. Work may proceed with standard controls.	🟡 MEDIUM – Acceptable only with additional controls and increased monitoring.	🟠 HIGH – Acceptable only with additional controls, explicit justification, and heightened monitoring. Supervisor or self-approval review required. Consider abort.	🟠 HIGH – Acceptable only with additional controls, explicit justification, and heightened monitoring. Supervisor or self-approval review required. Consider abort.
2 Unlikely	🟢 LOW – Acceptable. Work may proceed with standard controls.	🟢 LOW – Acceptable. Work may proceed with standard controls.	🟡 MEDIUM – Acceptable only with additional controls and increased monitoring.	🟠 HIGH – Acceptable only with additional controls, explicit justification, and heightened monitoring. Supervisor or self-approval review required. Consider abort.	🔴 EXTREME – Unacceptable. Work is prohibited. Immediate abort and withdrawal required.
3 Possible	🟢 LOW – Acceptable. Work may proceed with standard controls.	🟡 MEDIUM – Acceptable only with additional controls and increased monitoring.	🟠 HIGH – Acceptable only with additional controls, explicit justification, and	🔴 EXTREME – Unacceptable. Work is prohibited. Immediate	🔴 EXTREME – Unacceptable. Work is prohibited. Immediate

Likelihood ↓ / Consequence →	1 Insignificant	2 Minor	3 Moderate	4 Major	5 Catastrophic
			heightened monitoring. Supervisor or self-approval review required. Consider abort.	abort and withdrawal required.	abort and withdrawal required.
4 Likely	🟡 MEDIUM – Acceptable only with additional controls and increased monitoring.	🟠 HIGH – Acceptable only with additional controls, explicit justification, and heightened monitoring. Supervisor or self-approval review required. Consider abort.	🟠 HIGH – Acceptable only with additional controls, explicit justification, and heightened monitoring. Supervisor or self-approval review required. Consider abort.	🔴 EXTREME – Unacceptable. Work is prohibited. Immediate abort and withdrawal required.	🔴 EXTREME – Unacceptable. Work is prohibited. Immediate abort and withdrawal required.
5 Almost Certain	🟠 HIGH – Acceptable only with additional controls, explicit justification, and heightened monitoring. Supervisor or self-approval review required. Consider abort.	🟠 HIGH – Acceptable only with additional controls, explicit justification, and heightened monitoring. Supervisor or self-approval review required. Consider abort.	🔴 EXTREME – Unacceptable. Work is prohibited. Immediate abort and withdrawal required.	🔴 EXTREME – Unacceptable. Work is prohibited. Immediate abort and withdrawal required.	🔴 EXTREME – Unacceptable. Work is prohibited. Immediate abort and withdrawal required.

Risk Rating Meaning (Colour Coded)

- LOW (Green): Acceptable. Work may proceed with standard controls.
- MEDIUM (Yellow): Acceptable only with additional controls and increased monitoring.
- HIGH (Orange): Unacceptable without further risk reduction. Supervisor or self-approval review required. Consider abort.
- EXTREME (Red): Unacceptable. Work is prohibited. Immediate abort and withdrawal required.

Solo Operations Override Rule

For solo remote operations:

- Any HIGH risk requires reassessment and implementation of additional controls before proceeding.
- Any EXTREME risk mandates immediate abort, withdrawal to a safe zone, and notification of emergency contacts.

Risk Category Guidance

- LOW (Green): Work may proceed using standard controls.
- MEDIUM (Yellow): Work may proceed only with additional controls and increased monitoring.
- HIGH (Orange): Work must not proceed until risk is reduced.
- EXTREME (Red): Work is prohibited. Immediate abort and withdrawal required.

Solo Operations Rule

Any HIGH or EXTREME risk identified during solo operations triggers reassessment. Any EXTREME risk mandates immediate abort.

Appendix C – General Location Addendum Template

This document allows rapid redeployment to new locations without rewriting the full HSE system.

A separate comprehensive SITE-SPECIFIC addendum that expands on the main points here must be completed for each deployment location (SEE TEMPLATES).

This addendum must explicitly identify whether night operations are anticipated at the site. Where night operations are planned or may reasonably occur, the additional controls and limitations defined in Section 7 (Night Operations) of the HSE Plan apply, and a night-specific JSA must be completed.

Location Name: _____

Coordinates: _____

Access Routes (Primary / Secondary):

- Primary: _____
- Secondary: _____

Night Operations Anticipated: ☐ No (Day Only) ☐ Yes (Section 7 Applies)

Night-Specific Considerations (cold, wind exposure, visibility, wildlife, comms):

_____

Nearest Medical Facility: _____

Nearest Mine / Ranger / Station: _____

Known Environmental Hazards (incl. night-specific) seasonal conditions per Appendix K apply:

_____

Communications Coverage Notes (incl. night limitations):

_____ _____

Local Cultural or Restricted Areas: _____

Appendix D – Missed Check-In Escalation Flow

This protocol ensures timely response if the operator becomes uncontactable.

1. **T0:** Scheduled check-in missed.
2. **T+____ hours:** Attempt contact via satellite phone.
3. **T+____ hours:** Attempt contact via UHF and secondary methods.
4. **T+____ hours:** Notify nominated emergency contact.
5. **T+____ hours:** Notify local authorities or site emergency control.
6. **T+____ hours:** Initiate formal search or welfare check.

(All times to be defined prior to deployment.)

Appendix E – “When in Doubt, Leave” Doctrine

Remote solo operations do not allow for uncertainty to be resolved through discussion or backup. This doctrine formalises conservative withdrawal.

Leave immediately if any of the following occur:

- Loss of situational awareness
- Conflicting or confusing information
- Equipment malfunction clusters
- Physiological symptoms without clear cause
- Intuition indicating elevated risk

Principle:

There is no penalty for leaving early. There may be no recovery from staying too long.

Operational Rule: If unsure whether to continue, the correct decision is to withdraw.

Appendix F – Blank Job Safety Analysis (JSA) Worksheet

This worksheet is to be completed **prior to each task or activity** and reviewed whenever conditions change. It references the Risk Matrix in Appendix B.

Job / Task Details

- **Task Description:** _____
- **Location / Site Name:** _____
- **GPS Coordinates:** _____
- **Date:** _____ **Time:** _____
- **Operator Name:** _____
- **Weather Conditions (forecast & observed):** _____

Emergency Preparedness Check (Tick to Confirm)

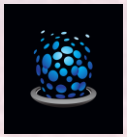
- ☐ Communications checked and operational
- ☐ First aid kit available
- ☐ Water and supplies adequate
- ☐ Evacuation route identified
- ☐ Emergency contacts confirmed

Sign-Off

I confirm that the hazards have been identified, controls implemented, and the task is safe to proceed **within the limits of this HSE Plan**.

- **Operator Signature:** _____ **Date:** _____

Instruction: If conditions change, STOP WORK and complete a new JSA.



Step-by-Step Hazard Identification and Risk Assessment

Task Step	Hazard Identified	Initial Likelihood (1–5)	Initial Consequence (1–5)	Initial Risk (L/M/H/E)	Controls Implemented	Residual Likelihood (1–5)	Residual Consequence (1–5)	Residual Risk (L/M/H/E)

Risk Acceptance and Decision

- **Highest Residual Risk Identified:** ☐ LOW ☐ MEDIUM ☐ HIGH ☐ EXTREME

Decision:

- ☐ Proceed with task (LOW / MEDIUM only)
- ☐ Proceed with additional controls and monitoring
- ☐ Do NOT proceed – task aborted

Justification (if proceeding with HIGH residual risk):

_____

_____

Worked Example – Risk Plotted on Matrix

These examples demonstrate how common Pilbara field hazards are assessed before and after controls.

Hazard Scenario	Initial Likelihood	Initial Consequence	Initial Risk	Controls Applied	Residual Likelihood	Residual Consequence	Residual Risk
Extreme heat during midday fieldwork	Likely (4)	Major (4)	🔴 EXTREME	Shift work to early morning, shade, hydration, rest cycles	Possible (3)	Moderate (3)	🟠 HIGH (proceed only with caution)
Flash flooding risk at creek crossing	Possible (3)	Catastrophic (5)	🔴 EXTREME	Avoid crossings, reroute, wait for conditions to clear	Rare (1)	Catastrophic (5)	🟠 HIGH (no crossing permitted)
Remote vehicle breakdown	Possible (3)	Major (4)	🔴 EXTREME	Vehicle servicing, comms, water reserves	Unlikely (2)	Major (4)	🟠 HIGH
Anomalous energy or craft encounter	Unlikely (2)	Major (4)	🟠 HIGH	Distance, withdrawal, no pursuit, power-down	Rare (1)	Major (4)	🟡 MEDIUM

Residual Risk Principle

Residual risk represents the remaining risk after all reasonable controls are applied. In solo operations:

- Residual HIGH risk requires explicit justification and heightened monitoring.
- Residual EXTREME risk is not permitted under any circumstances.

Night Operations – Job Safety Analysis

JSA Type: Night-Only Operations
Applies To: Passive observation and monitoring after sunset
Linked HSE Sections:

- Section 7 – Night Operations
- Appendix B – Risk Matrix
- Appendix C – Site-Specific Addendum

JSA Header

Field	Entry
Task Description	Night-time passive observation from vehicle / camp
Location	
GPS Coordinates	
Date / Time	
Weather	Clear / Cold / Windy / Storm Risk (circle)
Operator	Solo Operator
JSA Reference	JSA-NIGHT-01
Linked HSE Section	Section 7 – Night Operations

Task Scope Limitation (Mandatory)

This JSA applies **only** to night-time passive observation.
Activities prohibited under this JSA include: pursuit, terrain exploration, off-track movement, and non-essential vehicle travel.
(Ref: Section 7.5 – Permitted Scope of Night Operations)

Hazard Identification and Risk Assessment - Night Operations Risk Table

Risk Key (matches Appendix B)

- 🟢 LOW (Green) – Acceptable. Standard controls.
- 🟡 MEDIUM (Yellow) – Additional controls required.
- 🟠 HIGH (Orange) – Conditional acceptance only.
- 🔴 EXTREME (Red) – Prohibited. Abort.

Risk Acceptance Statement (Colour-Based)

- 🟢 LOW – Proceed
- 🟡 MEDIUM – Proceed with additional controls
- 🟠 HIGH – Proceed only with justification, monitoring, and abort readiness
- 🔴 EXTREME – DO NOT PROCEED

Residual EXTREME (Red) risk is not permitted under Section 7.
(Ref: Appendix B – Risk Matrix; Section 7.2)

Night Operations Risk Assessment Table

Task Step	Hazard	Initial Risk	Controls (What & How)	Residual Risk
Establish night position	Reduced visibility / disorientation	🔴 EXTREME (Red) L3 × C4	Camp GPS logged before dark; defined perimeter; headlamp + backup; no movement beyond perimeter (Sec 7.6)	🟠 HIGH (Orange) L2 × C4
Static observation	Cold exposure / hypothermia	🔴 EXTREME (Red) L4 × C4	Thermal layers; wind protection; hot beverage; time-limited exposure (Sec 7.4)	🟠 HIGH (Orange) L3 × C4
Observation	Fatigue / cognitive impairment	🟠 HIGH (Orange) L3 × C4	Rest before night work; fixed observation window; mandatory breaks (Sec 7.6)	🟠 HIGH (Orange) L2 × C4
Observation	Wildlife encounter	🟠 HIGH (Orange) L3 × C4	Remain in vehicle/camp; lighting sweep before movement; no food exposure (Sec 7.3)	🟠 HIGH (Orange) L2 × C4
Observation	Anomalous / energetic activity	🟠 HIGH (Orange) L2 × C4	Passive observation only; no signalling; increased standoff; immediate withdrawal if symptoms (Sec 7.7)	🟡 MEDIUM (Yellow) L1 × C4
Equipment use	Loss of comms / battery failure	🔴 EXTREME (Red) L3 × C5	Sat phone live; PLB on body; batteries insulated; scheduled check-ins (Sec 7.6, 7.8)	🟠 HIGH (Orange) L2 × C5
Environmental conditions	Storm / lightning proximity	🔴 EXTREME (Red) L3 × C5	Continuous monitoring; lightning threshold; early abort (Sec 7.10)	🟠 HIGH (Orange) L1 × C5

Risk Acceptance Statement

Residual HIGH risks are accepted only because they are inherent to night operations in a remote environment and have been reduced as far as reasonably practicable.
Residual EXTREME risks are **not permitted** under this JSA.
(Ref: Appendix B – Risk Matrix; Section 7.2)

Night Operations Go / No-Go Check (Mandatory)

(Ref: Section 7.9 – Night Operations Go / No-Go)

Check	Yes / No
Operator rested and alert	☐ Yes ☐ No
Cold protection staged and worn	☐ Yes ☐ No
Weather stable; no storm cells within ___ km	☐ Yes ☐ No
Lighting systems operational	☐ Yes ☐ No
Camp and vehicle GPS logged	☐ Yes ☐ No
Communications live and tested	☐ Yes ☐ No
Abort criteria reviewed	☐ Yes ☐ No

Any "No" = No-Go.

Night-Specific Stop-Work Triggers

(Ref: Section 7.10 – Stop-Work Triggers)

Work must cease immediately if any of the following occur:

- Cold stress symptoms (shivering, numbness, confusion)
- Fatigue affecting judgement or coordination
- Loss of communications
- Weather deterioration beyond forecast
- Unexpected human presence
- Escalation of anomalous activity
- Any risk escalates to **EXTREME**

Decision

Decision	Tick
Proceed with night operations under this JSA	☐
Proceed with additional controls	☐
Abort / Defer to daylight	☐

Justification (required if proceeding with HIGH residual risk):

_____

_____

Sign-Off

Field	Entry
Operator Name	
Signature	
Date	

Standard Day Operations – Job Safety Analysis

JSA Type: Night-Only Operations
Applies To: Passive observation and monitoring after sunset
Linked HSE Sections:

- Sections 3–6 (Environmental Hazards, PPE, Equipment, Hostile Encounters)
- Appendix B – Risk Matrix
- Appendix C – Site-Specific Addendum

JSA Header

Field	Entry
Task Description	Day-time passive observation from vehicle / camp
Location	
GPS Coordinates	
Date / Time	
Weather	Clear / Cold / Windy / Storm Risk (circle)
Operator	Solo Operator
JSA Reference	JSA-NIGHT-01
Linked HSE Section	

Task Scope Limitation (Mandatory)

This JSA applies **only** to day-time passive observation.
Applies to daylight field activities
(Ref: Section 3-6 – Permitted Scope of Day Operations)

Risk Key (Appendix B)

- 🟢 LOW (Green) – Acceptable. Standard controls.
- 🟡 MEDIUM (Yellow) – Additional controls required.
- 🟠 HIGH (Orange) – Conditional acceptance only.
- 🔴 EXTREME (Red) – Prohibited. Abort.

Risk Acceptance Statement (Colour-Based)

- 🟢 LOW – Proceed
- 🟡 MEDIUM – Proceed with additional controls
- 🟠 HIGH – Proceed only with justification, monitoring, and abort readiness
- 🔴 EXTREME – DO NOT PROCEED

Residual EXTREME (Red) risk is not permitted under standard day operations.
(Ref: Appendix B – Risk Matrix)

Day Operations Go / No-Go Check

Check	Yes / No
Weather within forecast limits	☐ Yes ☐ No
Heat controls in place	☐ Yes ☐ No
Communications operational	☐ Yes ☐ No
Vehicle serviceable	☐ Yes ☐ No
Operator fit and alert	☐ Yes ☐ No

Any "No" = No-Go or defer.

Day Operations Risk Assessment Table

Task Step	Hazard	Initial Risk	Controls (What & How)	Residual Risk
Travel to site (daylight)	Vehicle incident / wildlife strike	🟠 **HIGH (Orange)** L3 × C5	Daylight travel only; conservative speed; wildlife scanning; rest breaks (Sec 5, Checklists)	🟠 **HIGH (Orange)** L2 × C5
Establish camp / position	Slips, trips, terrain hazards	🟡 **MEDIUM (Yellow)** L2 × C3	Clear ground selection; daylight setup; PPE worn; situational awareness (Sec 3, 4)	🟢 **LOW (Green)** L1 × C3
Operations / observation	Heat stress / dehydration	🔴 **EXTREME (Red)** L4 × C4	Early start; shade; hydration ≥500 mL/hr; rest cycles; cease at threshold (Sec 3.1)	🟠 **HIGH (Orange)** L3 × C4
Operations / observation	Fatigue	🟠 **HIGH (Orange)** L3 × C4	Task rotation; rest breaks; self-monitoring; abort if impaired (Sec 6)	🟡 **MEDIUM (Yellow)** L2 × C4
Operations / observation	Anomalous / unusual activity	🟠 **HIGH (Orange)** L2 × C4	Daylight visibility; standoff distance; no pursuit; passive observation only (Sec 6.2)	🟡 **MEDIUM (Yellow)** L1 × C4
Equipment use	Manual handling / minor injury	🟡 **MEDIUM (Yellow)** L2 × C2	Correct lifting; gloves; deliberate movements; daylight visibility (Sec 4)	🟢 **LOW (Green)** L1 × C2
Environmental conditions	Storms / lightning	🔴 **EXTREME (Red)** L3 × C5	Weather monitoring; early shutdown; lightning exclusion distance (Sec 3.3–3.4)	🟠 **HIGH (Orange)** L1 × C5
Communications	Loss of comms	🟠 **HIGH (Orange)** L3 × C5	Sat phone live; PLB on body; scheduled check-ins (Sec 5, App C)	🟠 **HIGH (Orange)** L2 × C5

Appendix G – Checklists

☑ *CHECKLIST 1: PREPARATION (BEFORE LEAVING HOME)*

Purpose: Ensure the operator, vehicle, equipment, and communications are ready before committing to remote deployment.

Personal readiness

- ☐ Physically well (no illness, dehydration, fatigue, medication impairment)
- ☐ Adequate rest in previous 24 hours
- ☐ Mental readiness confirmed (no stress, distraction, or urgency bias)

Documentation & planning

- ☐ HSE Plan reviewed
- ☐ JSA drafted for expected tasks
- ☐ Emergency contacts list updated (mines, rangers, campgrounds, 000)
- ☐ Route plan prepared (primary + alternate)
- ☐ Check-in schedule agreed and logged
- ☐ Weather forecast checked (heat, storms, wind, flooding)

Vehicle & mobility

- ☐ Fuel tanks full + reserve fuel
- ☐ Tyres (including spare) checked
- ☐ Recovery gear onboard (snatch strap, shovel, boards)
- ☐ Jack, tools, belts, fluids checked
- ☐ Navigation systems operational (GPS, maps)

Communications & safety

- ☐ Satellite phone charged + tested
- ☐ UHF / radio operational
- ☐ PLB / EPIRB registered and accessible
- ☐ Torch / headlamp + spare batteries
- ☐ First aid kit complete and accessible

Supplies

- ☐ Water supply (minimum contingency ≥ 72 hrs)
- ☐ Food supply (non-perishable)
- ☐ Sun protection (hat, sunscreen, long sleeves)
- ☐ Cold weather layers (nights, storms)
- ☐ Fire extinguisher

Decision:
☐ READY TO DEPLOY ☐ DO NOT DEPLOY (rectify deficiencies)

🚙 *CHECKLIST 2: DEPLOYMENT / TRAVEL TO SITE*

Purpose: Maintain situational awareness and abort early if conditions deteriorate.

- ☐ Departure time logged
- ☐ Check-in contact notified of departure
- ☐ Weather reassessed immediately before travel
- ☐ Drive conservatively (no urgency, no night travel unless essential)
- ☐ Avoid water crossings unless verified safe
- ☐ Stop and reassess if:
    - Heat stress symptoms appear
    - Visibility drops (dust, rain)
    - Road conditions deteriorate

Abort triggers:

- ☐ Storm cells developing
- ☐ Track impassable
- ☐ Vehicle warning lights
- ☐ Personal fatigue or heat stress

🏕️ *CHECKLIST 3: ARRIVAL & SETUP (CAMP / OUTPOST)*

Purpose: Establish a safe operating base before any task begins.

Site selection

- ☐ High ground (no flood channels)
- ☐ Clear exit route
- ☐ Vehicle oriented for rapid departure
- ☐ No overhead hazards (trees, rockfall)
- ☐ Distance from public tracks if required

Environmental assessment

- ☐ Wind direction noted
- ☐ Heat exposure managed (shade established)
- ☐ Storm horizon checked
- ☐ Lightning risk assessed

Safety setup

- ☐ First aid kit accessible
- ☐ Comms powered and reachable
- ☐ PLB placed on body (not in vehicle)
- ☐ Escape plan identified (on foot and by vehicle)

JSA

- ☐ JSA completed before operations
- ☐ Risk level acceptable
- ☐ Controls implemented

🔍 *CHECKLIST 4: OPERATIONS (FIELD ACTIVITY)*

Purpose: Maintain control, awareness, and abort authority during tasks.

General conduct

- ☐ Work within daylight hours **unless night operations are assessed and authorised**
- ☐ Maintain hydration schedule
- ☐ Regular self-checks for heat / cold stress
- ☐ No pursuit or approach of unknown phenomena

Environmental hazards

- ☐ Monitor temperature continuously
- ☐ Cease work during lightning activity
- ☐ Cease work if winds exceed safe limits
- ☐ Monitor ground conditions for flooding

Anomalous / hostile encounters (person or phenomenon)

- ☐ Maintain distance
- ☐ Do not pursue or signal
- ☐ Power down non-essential equipment if interference suspected
- ☐ Withdraw calmly to safe distance
- ☐ Abort if risk escalates beyond MEDIUM

Communications

- ☐ Scheduled check-ins maintained
- ☐ Missed check-in protocol understood
- ☐ Emergency comms kept powered

📦 *CHECKLIST 5: PACK-DOWN*

Purpose: Avoid incidents during fatigue-prone end-of-task period.

- ☐ Work ceased before exhaustion
- ☐ Equipment powered down safely
- ☐ No hot equipment packed immediately
- ☐ Site inspected for hazards before movement
- ☐ Vehicle inspected before departure
- ☐ Departure time logged
- ☐ Check-in contact notified

🏠 *CHECKLIST 6: RETURN & CLOSE-OUT*

Purpose: Ensure safe return and formal closure of operation.

- ☐ Travel conducted conservatively
- ☐ Fatigue monitored
- ☐ Arrival home logged
- ☐ Check-in contact notified of safe return
- ☐ Equipment inspected for damage
- ☐ JSA archived
- ☐ Notes logged (conditions, hazards, anomalies)
- ☐ Any incidents reported and reviewed

Checklist – Risk Assessment

🔗 **RISK MATRIX LINKAGE KEY (REFERENCE)**

- **L** = Likelihood (1 Rare → 5 Almost Certain)
- **C** = Consequence (1 Insignificant → 5 Catastrophic)
- **Risk Levels:**
  - 🟢 LOW
  - 🟡 MEDIUM
  - 🟠 HIGH
  - 🔴 EXTREME

☑ *CHECKLIST 1: PREPARATION - RISK LINKAGE*

Checklist Item	Primary Hazard Addressed	Typical Uncontrolled Risk	Control Effect (Target Residual Risk)
Physically well, rested	Fatigue, medical event	L3 × C4 = 🔴 EXTREME	L1 × C4 = 🟠 HIGH
Mental readiness confirmed	Poor judgement	L3 × C3 = 🟠 HIGH	L1 × C3 = 🟡 MEDIUM
Weather forecast checked	Heat, storms, flooding	L4 × C4 = 🔴 EXTREME	L2 × C4 = 🟠 HIGH
Route + alternates planned	Becoming stranded	L3 × C5 = 🔴 EXTREME	L1 × C5 = 🟠 HIGH
Check-in schedule set	Delayed rescue	L3 × C5 = 🔴 EXTREME	L1 × C5 = 🟠 HIGH
Vehicle inspected	Breakdown remote	L3 × C4 = 🔴 EXTREME	L1 × C4 = 🟠 HIGH
PLB, sat phone tested	Loss of comms	L3 × C5 = 🔴 EXTREME	L1 × C5 = 🟠 HIGH
Water ≥72 hrs	Dehydration	L4 × C4 = 🔴 EXTREME	L1 × C4 = 🟠 HIGH

Key point: Preparation does not eliminate consequence — it **reduces likelihood**.

🚙 *CHECKLIST 2: DEPLOYMENT / TRAVEL - RISK LINKAGE*

Checklist Item	Hazard	Uncontrolled Risk	Residual Intent
Conservative driving	Crash	L3 × C5 = 🔴 EXTREME	L1 × C5 = 🟠 HIGH
Avoid water crossings	Drowning, vehicle loss	L3 × C5 = 🔴 EXTREME	L1 × C5 = 🟠 HIGH
Abort for storms	Lightning, flooding	L4 × C4 = 🔴 EXTREME	L1 × C4 = 🟠 HIGH
Stop for fatigue	Impaired response	L3 × C4 = 🔴 EXTREME	L1 × C4 = 🟠 HIGH

Abort authority here is mandatory for EXTREME risks.

🏕️ *CHECKLIST 3: ARRIVAL & SETUP - RISK LINKAGE*

Checklist Item	Hazard	Uncontrolled Risk	Residual Intent
High ground camp	Flash flooding	L3 × C5 = 🔴 EXTREME	L1 × C5 = 🟠 HIGH
Clear exit route	Entrapment	L3 × C4 = 🔴 EXTREME	L1 × C4 = 🟠 HIGH
PLB on body	Separation from vehicle	L3 × C5 = 🔴 EXTREME	L1 × C5 = 🟠 HIGH
Lightning assessment	Strike	L3 × C5 = 🔴 EXTREME	L1 × C5 = 🟠 HIGH
JSA completed	Uncontrolled task risk	Variable (often 🔴)	Reduced to 🟡 / 🟠

CHECKLIST 4: OPERATIONS - RISK LINKAGE

Checklist Item	Hazard	Uncontrolled Risk	Residual Intent
Hydration schedule	Heat illness	L4 × C4 = 🔴 EXTREME	L2 × C4 = 🟠 HIGH
Cease during lightning	Fatal strike	L3 × C5 = 🔴 EXTREME	L1 × C5 = 🟠 HIGH
No pursuit of phenomena	Unknown interaction	L2 × C4 = 🟠 HIGH	L1 × C4 = 🟡 MEDIUM
Power down if interference	Equipment / personal harm	L2 × C4 = 🟠 HIGH	L1 × C4 = 🟡 MEDIUM
Maintain distance	Escalation risk	L2 × C4 = 🟠 HIGH	L1 × C4 = 🟡 MEDIUM

Important: Anomalous encounters are treated as **credible hazards**, not curiosities.

CHECKLIST 5: PACK-DOWN - RISK LINKAGE

Checklist Item	Hazard	Uncontrolled Risk	Residual Intent
Avoid fatigue pack-down	Injury	L3 × C3 = 🟠 HIGH	L1 × C3 = 🟡 MEDIUM
Equipment cooled	Burns / fire	L2 × C3 = 🟠 HIGH	L1 × C3 = 🟡 MEDIUM
Vehicle re-check	Breakdown	L2 × C4 = 🟠 HIGH	L1 × C4 = 🟠 HIGH

CHECKLIST 6: RETURN & CLOSE-OUT - RISK LINKAGE

Checklist Item	Hazard	Uncontrolled Risk	Residual Intent
Fatigue monitoring	Crash	L3 × C5 = 🔴 EXTREME	L1 × C5 = 🟠 HIGH
Arrival logged	Missed rescue	L3 × C5 = 🔴 EXTREME	L1 × C5 = 🟠 HIGH
JSA archived	Loss of evidence	L2 × C3 = 🟠 HIGH	L1 × C3 = 🟡 MEDIUM
Incident review	Repeat hazard	L3 × C4 = 🔴 EXTREME	L1 × C4 = 🟠 HIGH

Appendix H - Templates

Appendix F – Job Safety Analysis (JSA) Worksheet (Landscape)

Complete prior to task commencement. Reference Risk Matrix (Appendix B).

Task Description	
Location / Site Name	
GPS Coordinates	
Date / Time	
Weather Conditions (Forecast & Observed)	
Operator Name	

Task Step	Hazard	Init Likelihood (1–5)	Init Consequence (1–5)	Init Risk	Controls Implemented (What & How)	Resid Likelihood (1–5)	Resid Consequence (1–5)	Residual Risk

Decision: ■ Proceed ■ Proceed with additional controls ■ Abort task

Justification (required if proceeding with HIGH residual risk):

Operator Signature: _____ Date: _____

Appendix F – Job Safety Analysis (JSA) Worksheet

Page 2 – Task Hazard Analysis (Continuation for Complex Tasks)

Task Step	Hazard	Init Likelihood (1–5)	Init Consequence (1–5)	Init Risk	Controls Implemented (What & How)	Resid Likelihood (1–5)	Resid Consequence (1–5)	Residual Risk

Instruction: Continue numbering task steps sequentially from Page 1. If conditions change, STOP WORK and reassess using a new JSA.

Completed Example – Job Safety Analysis (JSA)
Pilbara Solo Remote Field Operation (Example Only)

Task Description	Remote orb observation and data collection near Pilbara mine access track
Location / Site Name	Pilbara Region – Remote Track (example only)
GPS Coordinates	-22.XXXX, 118.XXXX
Date / Time	Example scenario
Weather Conditions	Clear morning; extreme heat forecast (41°C); storms possible PM
Operator Name	Solo Operator

Task Step	Hazard	Init L (1–5)	Init C (1–5)	Init Risk	Controls Implemented (What & How)	Resid L (1–5)	Resid C (1–5)	Residual Risk
Setup equipment	Heat stress / dehydration	4	4	EXTREME	Early morning work only; shade canopy; hydration ≥500 mL/hr; rest breaks every 30 min; cease if symptoms.	3	3	HIGH
Observation	Anomalous energy or craft interaction	2	4	HIGH	Maintain distance; no pursuit; keep vehicle ready; power down non-essential equipment if interference; withdraw if symptoms.	1	4	MEDIUM
Pack-down	Fatigue and heat load	3	3	HIGH	Cease work before exhaustion; checklist-guided pack-down; hydrate; cool down; pre-drive vehicle checks.	2	2	MEDIUM

Decision: Proceed with additional controls and heightened monitoring. Residual EXTREME risks not accepted.

Appendix C – Site-Specific Addendum Template

Purpose: This addendum records location-specific hazards, controls, contacts, and conditions that apply to a particular field site or deployment area. It must be completed in addition to the base HSE Plan, Risk Matrix, and JSA.

C1. Site Identification

Site Name / Descriptor: _____

Region / Area: _____

Nearest Town / Mine / Outpost: _____

GPS Coordinates (Primary): _____

Secondary / Escape Coordinates: _____

Access Type (tick): Public / Mine / Station / Remote

C2. Land Status & Permissions

Land Tenure: Crown / Pastoral / Mining / Indigenous / Other

Access Permission Obtained: Yes / No / Pending

Permit or Authority Reference: _____

C3. Environmental Conditions

Typical Day Temperature Range: _____ to _____ °C

Typical Night Temperature Range: ____ to ____ °C

Seasonal Hazards: Heat / Storms / Flooding / Dust / Cyclone

Local Terrain Features: _____

C4. Communications & Coverage

Mobile Coverage: None / Intermittent / Reliable

Radio Channels: _____

Satellite Phone Required: Yes / No

PLB / EPIRB Required: Yes / No

C5. Emergency Contacts

Nearest Mine / Control Room: _____

Station Owner / Manager: _____

Park Ranger / Authority: _____

RFDS / Airstrip Access: _____

C6. Access, Egress & Evacuation

Primary Access Route: _____

Alternate Exit Route: _____

Evacuation Method: Self-drive / Assisted / RFDS / Shelter

C7. Site-Specific Hazards

Hazard 1: _____

Hazard 2: _____

Hazard 3: _____

Site-Specific Addendum Template - expanded

Site Identification

- **Site Name / Descriptor:**
- **Region / Area:**
- **Nearest Town / Mine / Outpost:**
- **GPS Coordinates (Primary):**
- **Secondary / Escape Coordinates:**
- **Access Type:**
  ☐ Public track ☐ Mine access road ☐ Station track ☐ Remote/off-track
  Details: _____

Land Status & Permissions

- **Land Tenure:**
  ☐ Crown Land
  ☐ Pastoral Lease
  ☐ Mining Lease
  ☐ Indigenous Land
  ☐ Other: _____
- **Access Permission Obtained:**
  ☐ Yes ☐ Not required ☐ Pending
- **Permit / Authority Reference (if applicable):**

Environmental Conditions (Site-Specific)

Typical Conditions

- **Daytime temperature range:**
  _____ °C to _____ °C
- **Night temperature range:**
  _____ °C to _____ °C
- **Prevailing winds:**

- **Seasonal hazards:**
  ☐ Extreme heat
  ☐ Cold nights
  ☐ Cyclones
  ☐ Storm cells
  ☐ Flooding / washouts
  ☐ Dust storms

Known Local Features

- ☐ Flood plains / creek crossings
- ☐ Rocky escarpments
- ☐ Soft sand / bog risk
- ☐ Wildlife (snakes, cattle, camels)

Details: _____

Communications & Coverage

- **Mobile coverage:**
  ☐ None ☐ Intermittent ☐ Reliable

- Network(s): _____
- **UHF/VHF coverage:**

- Channel(s): _____
- **Satellite phone required:**
  ☐ Yes ☐ No
- **Emergency beacon required (PLB/EPIRB):**
  ☐ Yes ☐ No

Emergency Contacts (Site-Specific)

Complete all that apply. Leave blank if not relevant.

- **Nearest Mine Site / Control Room:**
  Name: _____
  Phone / Radio: _____
- **Station Owner / Manager:**
  Name: _____
  Phone: _____
- **Park Ranger / Authority:**
  Name: _____
  Phone: _____
- **Local Emergency Services (Non-000):**
- **Airstrip / RFDS Access Point:**

Access, Egress & Evacuation

- **Primary access route:**
- **Alternate access / exit route:**
- **Known impassable conditions:**
  ☐ Rain
  ☐ Flooding
  ☐ Night travel
  ☐ Heavy vehicles
  Details: _____
- **Evacuation method if injured:**
  ☐ Self-drive
  ☐ Assisted vehicle
  ☐ RFDS
  ☐ Wait-in-place (shelter)

Site-Specific Hazards (Covered in Base JSA)

Anomalous / Unusual Activity Considerations (If Applicable)

Complete only if relevant to the site.

- **History of unusual aerial / environmental activity:**
  ☐ Yes ☐ No ☐ Unknown
- **Observed or reported phenomena:**
- **Additional controls required:**
  ☐ Increased standoff distance
  ☐ Reduced exposure time
  ☐ No pursuit / no signalling
  ☐ Early abort thresholds

Details: _____

_____

_____

Site-Specific Stop-Work Triggers

Work **must cease immediately** if any of the following occur:

- ☐ Weather deterioration beyond forecast
- ☐ Loss of communications
- ☐ Vehicle immobility
- ☐ Health symptoms (heat stress, injury, disorientation)
- ☐ Unexpected human presence
- ☐ Uncontrolled anomalous or energetic activity
- ☐ Any risk escalates to **EXTREME**

Sign-Off

This addendum has been completed and reviewed **prior to deployment**.

- **Name:** _____
- **Signature:** _____
- **Date:** _____
- **Linked JSA Reference:** _____

Appendix I – Incident / Near Miss Reporting Form

Date: _____
Time: _____
Location: _____

Incident Type (tick all that apply):
☐ Injury / Illness
☐ Near Miss
☐ Equipment Failure
☐ Environmental Hazard
☐ Vehicle Incident
☐ Hostile Encounter
☐ Other: _____

Description of Incident / Near Miss:

_____

_____

Immediate Actions Taken:

_____

Was emergency assistance required? ☐ Yes ☐ No

If yes, describe: _____

Contributing Factors (tick):
☐ Fatigue
☐ Weather
☐ Night Operations
☐ Terrain
☐ Communications
☐ Equipment
☐ Human Factors
☐ Other: _____

Corrective / Preventative Actions Identified:

_____

Reported by: _____

Date: _____

Appendix J - Fatigue Self-Assessment (Pre-Task & Ongoing)

Complete before operations and reassess periodically

Rate each from **0 (none)** to **3 (severe)**:

Indicator	0	1	2	3
Sleep deficit	☐	☐	☐	☐
Physical exhaustion	☐	☐	☐	☐
Cold stress	☐	☐	☐	☐
Cognitive fog / confusion	☐	☐	☐	☐
Reaction time	☐	☐	☐	☐
Motivation / morale	☐	☐	☐	☐

Total Score: _____ / 18

Interpretation

- **0–5:** Acceptable
- **6–10:** Increased monitoring required
- **11–14:** Cease non-essential activities
- **15+:** Abort operations and rest

Action Taken: _____

_____

_____

_____

Appendix K - Seasonal Operating Conditions

Dry Season (Approx. Apr–Oct)

Primary Risks

- Extreme cold at night
- Dehydration
- Fatigue from temperature swings
- Wildlife activity

Controls

- Thermal PPE
- Increased rest cycles
- Conservative night exposure
- Vehicle shelter readiness

Wet Season (Approx. Nov–Mar)

Primary Risks

- Flooding and access loss
- Lightning and storms
- Heat stress
- Isolation due to road closures

Controls

- No travel during storm activity
- Conservative access route selection
- Early withdrawal triggers
- Increased communication frequency

Season Applicable for Deployment:
☐ Dry ☐ Wet

Appendix L – Equipment Redundancy Matrix

Equipment	Primary	Backup	Failure Impact	Action if Both Fail
Communications	Sat phone	PLB / EPIRB	EXTREME	Abort / PLB - EPIRB
Navigation	GPS	Paper map	HIGH	Stop & orient
Lighting	Headlamp	Torch	HIGH	Cease ops
Shelter	Vehicle	Emergency bivvy	EXTREME	Shelter / PLB - EPIRB
Power	Main battery	Power bank	MEDIUM	Power ration
Water	Main supply	Emergency reserve	EXTREME	Abort