AMPC
AUSTRALIAN MEAT PROCESSOR CORPORATION

Smallstock Traceability Study

Assessing SCL Technology for Reading and Recording Smallstock eID Tags

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1.0 Abstract

In response to the upcoming 2025 electronic identification (eID) mandate, this smallstock traceability study was undertaken to evaluate alternative eID systems for sheep processing facilities in Western Australia and New South Wales. The aim was to identify suppliers capable of delivering reliable, mandate-compliant systems tailored to individual plant workflows, reducing reliance on a single dominant supplier and associated risks of monopolisation and cost inflation.

The project, led by the NSW Department of Primary Industries (DPI) and managed by the Australian Meat Processor Corporation (AMPC), involved the installation and trial of eID systems from emerging suppliers across various processing plants in WA and NSW.

Beaufort River Meats was selected as one of the pilot sites for the installation of an eID system provided by SCL, a New Zealand-based company with extensive experience in RFID technology and cattle traceability.

Despite some holiday-related procurement delays, the project was successfully delivered over a 24-week period. Under typical conditions, the full scope – including design, manufacturing, field testing, freight, installation, commissioning, and staff training – would be expected to be completed within approximately three months. The extended timeline, however, allowed for thorough testing and seamless integration, ultimately ensuring a more robust and well-adapted system implementation.

The implemented system included a single-lane, multi-reader unit at receival for accurate eID capture, full carcass tracking through the slaughter floor using sensor and encoder integration with BRM's production software, and a user-friendly interface for seamless data submission to the National Livestock Identification System (NLIS).

Key outcomes included a custom-built system integrated seamlessly into plant operations, with read rates of 98.3% at receival and 100% on the slaughter floor. The SCL team provided excellent support, resolving minor technical issues promptly despite being based overseas.

The project demonstrates that alternative suppliers like SCL can offer robust, fit-for-purpose eID solutions. This diversification enhances industry resilience, promotes competition, and ensures processor readiness ahead of regulatory enforcement.

2.0 Executive Summary

2.1 Overview

Amidst the impending 2025 eID mandate, many processors have relied on a limited pool of eID system providers, raising concerns about supplier monopoly and inflated costs. The NSW DPI, in collaboration with the AMPC, launched this project to evaluate alternative suppliers and expand industry options. These include companies like SCL and Blue Trace, which are relatively less known in the industry, and Allflex, which until recently had limited exposure in the sheep sector within these states.

The primary audience includes red meat processors and levy payers seeking cost-effective, reliable, and fit-for-purpose eID solutions. The results of this project help mitigate risk, inform future procurement decisions, and support readiness for regulatory compliance.

2.2 DPI / AMPC Objectives

The DPI and AMP objectives are straightforward and consist of:

- Assessing the feasibility of adopting an alternative eID system supplier (SCL in our case) in a commercial sheep processing plant.
- Evaluating integration of the system with existing workflows from receival to end-of-life processing.
- Confirming system compliance with the 2025 eID mandate and test its real-time data interface.

2.3 Methodology

To meet these objectives, the project was conducted over a 24-week period at Beaufort River Meats (BRM) in Western Australia. The methodology involved a full end-to-end implementation of SCL's system, with activities including:

- Design and manufacturing of a custom eID system adapted to BRM's workflow comprising of:
  - A **single-lane, multi-reader unit** was installed at the receival area to record eID tags as animals are individually offloaded from the truck, ensuring accurate and efficient data collection from the outset.
  - A **full tracking system** was implemented within the slaughter floor to maintain carcass traceability after eID tag removal. This system integrates reader sensors and an encoder, with full record matching to BRM's existing production software to streamline data flow through to the boning room.
  - A **user-friendly interface** was developed to simplify and facilitate accurate submission of the dataset to the National Livestock Identification System (NLIS).
- Field testing in New Zealand prior to shipment, followed by system freight, installation, and commissioning at BRM.
- Operator training and ongoing technical support delivered in alignment with processor availability.
- Regular project scheduling updates to manage delays due to the festive season and international supply constraints.

2.4 Key Results and Findings

The trial yielded strong technical outcomes and confirmed the operational suitability of the SCL system:

- **RF Interference:** RF interference was identified at both the receival area and within the slaughter floor, likely originating from motor drives within the plant. The issue was resolved within days by SCL's RF engineer, through the development of a custom filter, ensuring accurate tag reading.
- **High Read Rates:** Lowest read rates achieved were 98.3% at receival and 100% within the slaughter floor, exceeding regulatory expectations.

- o **Tag Degradation:** Unread tags were primarily due to degraded signal strength, requiring near-contact proximity for successful reads. This issue was not brand-specific and is attributed to tag aging over time.

- o **Animal Movement:** Instances of animals jumping past the reader affected read accuracy. Installation of anti-jump hooks is recommended to improve read consistency and ensure optimal tag capture.

- o **Important Notice**: SCL emphasised that consistently achieving a 100% read rate on the slaughter floor is not realistically achievable under normal operating conditions. The trial environment was controlled, with all participants—staff and animals alike—on their best behaviour. Notably, the animals involved were sourced from progressive producers who are early adopters of RFID technology. These animals tend to be calmer, more accustomed to handling, and therefore easier to scan accurately.

  In standard operations, read performance is likely to be affected by:

  - ▪ **Animal behaviour**, particularly among less predictable or reactive stock (e.g. kicking, jumping)

  - ▪ **Tag orientation**, such as when the animal's head is turned 180 degrees away from the reader

  - ▪ **Physical anomalies**, like one-legged stands or abnormal positioning, which disrupt line-of-sight for scanning

  These real-world variables mean occasional missed reads should be expected and accounted for in system performance evaluations.

- **Custom System Design:** The system was custom-designed to integrate with BRM's processes without slowing throughput, unlike off-the-shelf options that often require plant adaptations.

- **User Interface and Accessibility:** A localised user interface was provided at both the receival yard and the bleed rail, ensuring clear operational visibility at critical control points, with additional remote access enabled from main office locations for broader oversight and data monitoring.

- **Responsive Technical Support:** SCL's team, despite being based overseas, maintained high availability and responsiveness, with minor issues resolved promptly.

- **Faulty Tags Identified:** A small number of tags appeared to be electronic but were found to contain no transponder. These tags failed to read at both the receival yard and slaughter floor. Upon dissection, they were found to contain only hair and dirt. According to the truck driver and the NVD form, the animals were tagged with EID, suggesting a possible issue with tag integrity or supplier mislabeling.

2.5 Benefits to Industry

This project demonstrates that high-performing eID systems can be delivered by smaller, less established suppliers; challenging the industry's reliance on major players. Key benefits include:

- Expanded supplier options, reducing risk of monopoly and cost escalation.

- Access to custom-designed systems that align with processor-specific workflows.

- Greater flexibility for processors preparing for the eID mandate without compromising compliance or efficiency.

2.6 Future Research, Extension and Recommendations

Based on the results, several steps are recommended to support continued industry progress and adoption:

- Conduct studies across plants of varying sizes and configurations to confirm scalability and modular adaptability. As part of the broader traceability strategy, these studies are already being undertaken by the NSW Department of Primary Industries (DPI) and the Australian Meat Processor Corporation (AMPC). Notably, SCL has indicated that accommodating plant-specific variations would not pose a challenge to their system.

- Read rates to be assessed under real-world operating conditions, rather than controlled or small-scale sample testing, providing a more accurate reflection of system performance.

- Develop a national benchmarking tool to compare system performance, read rates, cost, and integration across different suppliers.

- Increase extension efforts to raise processor awareness of the benefits of custom-built eID systems and available alternatives, such as SCL, to off-the-shelf solutions.

3.0 Introduction

The implementation of electronic identification (eID) for sheep and goats will become mandatory across Australia by July 2025, as part of a national traceability enhancement strategy. This regulatory shift aims to strengthen biosecurity, improve market access, and enable faster, more accurate responses to disease outbreaks. While the eID mandate promises long-term benefits, it has introduced a pressing operational challenge for sheep processors: the need to rapidly implement reliable, compliant, and fit-for-purpose eID systems across diverse plant types and operational environments.

To date, the commercial landscape for eID systems in Australia has been dominated by a small number of major suppliers, particularly Allflex, which has well-established capabilities in the cattle sector but has only recently expanded into sheep eID in Western Australia and New South Wales. Alternative suppliers, such as Blue Trace and SCL, have not yet been widely trialled in commercial sheep processing contexts. This limited supplier diversity presents risks to the industry, including potential monopolisation, price escalation, and limited system adaptability, particularly for small-to-medium sized processors whose operational workflows may not align with off-the-shelf solutions.

This project was undertaken to address a significant knowledge and capability gap: whether lesser-known providers like SCL could offer eID systems that are not only compliant, but also competitively priced, scalable, and tailored to individual plant needs. The central question explored was:

> ➢ *Can a non-dominant eID supplier provide a fully functional, mandate-compliant solution that matches or exceeds the performance of incumbent systems, while offering better integration with existing plant workflows?*

The target audience for this research includes red meat processors, particularly those in WA and NSW who are preparing for eID implementation but are concerned about supplier lock-in, cost, and system suitability. Many of these processors operate older or uniquely configured facilities that may not be compatible with generic or off-the-shelf eID systems without significant disruption to workflow.

The results of this project, delivered through a full-system trial of the SCL eID solution at Beaufort River Meats, will assist processors in making informed procurement decisions, reduce the industry's reliance on a limited pool of suppliers, and provide confidence in the viability of alternative, customised systems. For levy payers and stakeholders, the research supports increased competition, operational flexibility, and cost containment, while ultimately improving the sector's readiness for regulatory enforcement in July 2025.

This project is unique in its focus on the end-to-end implementation of a fully custom-built eID system from a lesser-known supplier, in a real-world, operational sheep processing environment. Unlike previous research that has assessed eID systems in controlled or pilot-scale contexts, this trial was embedded in a commercial plant with all the complexities of daily production, equipment constraints, and human factors. Furthermore, it contributes practical evidence to the growing body of traceability literature (see MLA, 2021; DAWE, 2022), by demonstrating how supplier diversification and system customisation can enhance industry resilience and innovation.

4.0 Project Objectives

This 2025-1054 project aims to assess the SCL eID system to determine its effectiveness and suitability. This evaluation is crucial not only for informing the NSW DPI about the SCL system's performance but also for ensuring that every animal entering the BRM facility is accurately accounted for and tracked through the below objectives:

- Evaluate the SCL eID System: Assess the effectiveness, reliability, and compliance of the SCL eID system in meeting the 2025 mandate requirements for Western Australia.

- Identify Advantages and Disadvantages: Determine the strengths and weaknesses of the SCL system compared to other available eID systems, such as those from Blue Trace and Allflex.

- Ensure Full Compliance: Verify that the SCL system adheres to all regulatory and operational standards required by the new mandate.

- Test Under Operational Conditions: Conduct rigorous testing of the SCL system under real-world conditions to ensure it performs reliably for tracking livestock in both processing plants and paddocks entrance.

- Provide Comprehensive Reporting: Produce a detailed report for the Department of Primary Industries (DPI) outlining the benefits, limitations, and overall performance of the SCL eID system.

- Support Decision-Making: Contribute to a comparative analysis, including the SCL system, Blue Trace, and Allflex, to assist processors in selecting the most suitable eID solution for their needs.

- Facilitate Smooth Implementation: Ensure the SCL system integrates seamlessly with existing operations and supports a smooth transition to the new eID requirements by the mandate deadline.

☑ All objectives were successfully achieved.

5.0 Methodology

This section is divided into two parts. The first part presents the overall project schedule to provide context. The second part focuses on the detailed components of the installed system, as introduced in Section 2.3. Supporting materials are provided in the appendices:

- **Appendix 1** contains a site map with photographs of the installed system;

- **Appendix 2** presents a flow diagram outlining the eID system architecture; and

- **Appendix 3** includes the staff training documentation, covering the use of the HMI screen interface and procedures for data submission to the National Livestock Identification System (NLIS).

5.1 Project Schedule

Timeline (weeks)		-1	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
MS	**Milestones**	29/11/2024	6/12/2024	13/12/2024	20/12/2024	27/12/2024	3/01/2025	10/01/2025	17/01/2025	24/01/2025	31/01/2025	7/02/2025	14/02/2025	21/02/2025	28/02/2025	7/03/2025	14/03/2025	21/03/2025	28/03/2025	04/04/2025	11/04/2025	18/04/2025	25/04/2025	02/05/2025	09/05/2025	16/05/2025	23/05/2025	30/05/2025
MS1	Project Plan	✔																										
MS2	System order		✔																									
MS3	Procurement			✔	✔	✔	✔	✔	✔																			
MS3	Manufacturer					✔	✔	✔	✔	✔	✔	✔																
MS3	Field Testing SA												✔															
MS3	Freight													✔	✔													
MS3	Installation														✔	✔				✔								
MS3 MS4	Commissioning																				✔			✔				
MS4	Training & Handover																							✔				
MS4	Contingency																								✔	✔	✔	

5.2 Installed eID System

5.2.1 Controls System

The system installed at Beaufort River Meats was designed as a tailored solution, based on an industrial PC (IPC) integrated with a soft programmable logic controller (PLC) (**Plate 1**). This configuration was selected due to its favourable balance of performance, reliability, and cost-effectiveness, and aligns well with the operational needs of the plant.

The network architecture consists of a centralised processor for the slaughter line, with a dedicated processor positioned at lairage for live animal intake. In the context of this project, focused solely on eID integration, a single processor was installed at the lairage area, with the bleed rail system connected directly to it. This streamlined setup supports efficient data handling and simplified infrastructure while maintaining the flexibility for future expansion.

Plate 1: PLC

5.2.2 Main Control Cabinet (MCC)

The MCC (**Plate 2**) serves as the central hub for processing and data communication, housing the system processor and all network connections to both BRM infrastructure and third-party devices. It includes a standalone SQL database for secure and localised data management. Typically installed in the electrical control room on the slaughter floor, the MCC requires both power and network connectivity.

For this project, it was recommended that the MCC be positioned in the Operations Manager's office to ensure ease of access while keeping infrastructure discreet.
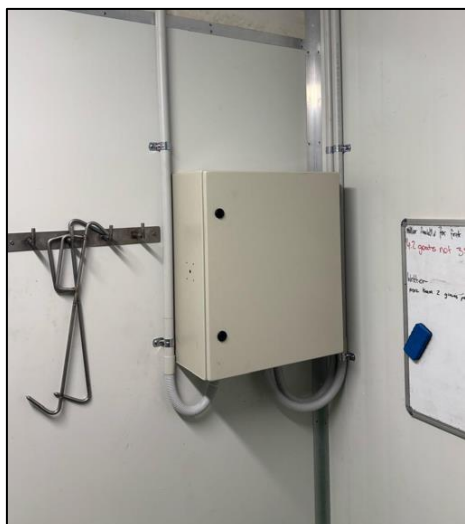
Plate 2: MCC

5.2.3 Receival System (Lairage Truck Unloading System)

The Lairage Unloading system (**Plate 3.1** and Location 1 on **Appendix 1**) is based on a proven single-lane, multi-reader unit design originally developed by Prattley, and was adapted to fit within BRM's existing yard infrastructure. As animals are offloaded from transport vehicles, they are directed through this reader unit, which records each animal's eID tag in real time.

The system is supported by a user interface accessible from the office PC, with an HMI (Human Machine Interface) screen installed next to the lane addressing BRM's operational needs. Functionality includes display of mob details, animal counts, and manual data entry (**Plate 3.2**). It also enables operators to view and input information such as NVD (National Vendor Declaration), LOT numbers, and PICs (Property Identification Codes).

The system supports the upload of NVD data and interaction logs, with flexibility to transmit data to the National Livestock Identification System (NLIS) as a batch.

Plate 3.1: Single Lane Multi Reader Unit

Plate 3.2: HMI Screen at Receivals

5.2.4 Bleed Rail System

The Bleed Rail (**Plate 4.1** and Location 2 on **Appendix 1**) represents the point at which each carcass is formally inducted into the plant's internal tracking system. An integrated eID reader is positioned at this location to confirm the animal's identification and enable the recording of 'end-of-life' data. This data is compiled into a .csv file and submitted to the National Livestock Identification System (NLIS) in batch format at the end of each processing day.

Similarly, the system included an HMI screen installed next to the lane addressing BRM's operational needs including display of animal information for efficient tracking and keep staff organised.
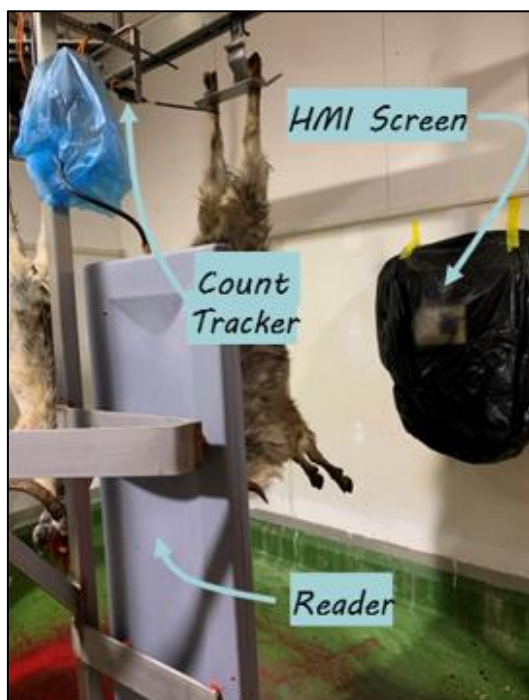
Plate 4.1: Bleed Rail System
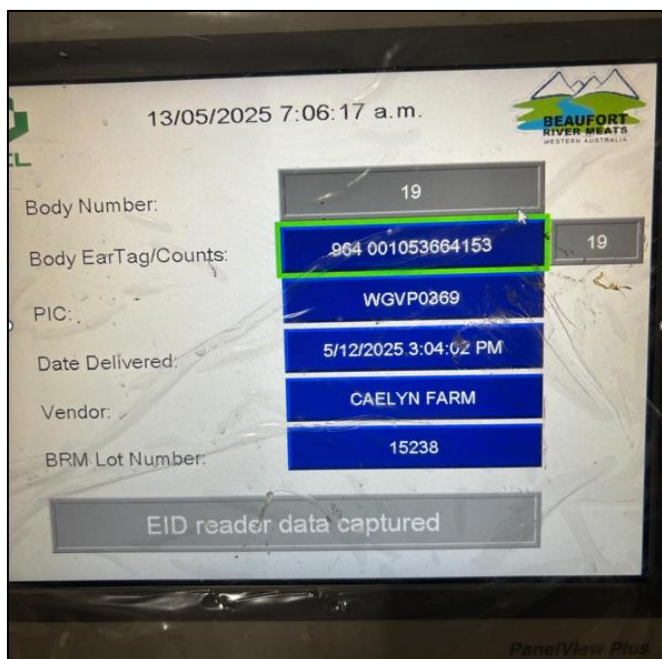
Plate 4.2: HMI Screen at Bleed Rail

5.2.5 Gambrel Up (Full tracking system)

Carcasses are tracked through to the Gambrel Up point (**Plate 5.1** and Location 3 on **Appendix 1**) using a combination of sensors and an encoder as part of the software-based tracking model. This system accounts for chain changeovers as the carcass moves along fixed processing chains and requires a reasonable degree of chain synchronisation for accurate tracking.

At the Gambrel Up point, the RFID transponder embedded in the skid (**Plate 5.2**) is matched to the carcass record, forming the basis of traceability throughout downstream processes.

Plate 5.1: Tracking System at Changeover Point

Plate 5.2: RFID Skids

5.2.6 Grading (Full tracking system)

Once the carcass reaches the grading station, the tracking system (**Plate 6** and Location 4 on **Appendix 1**) communicates directly with the grading software to link each carcass with its corresponding grading record. Grading data can then be stored within the central carcass tracking database, ensuring continuity of information throughout the processing workflow.

Plate 6: Tracking System at Grading

5.2.6 Boning Room Entry System

The system (**Plate 7** and Location 5 on **Appendix 1**) confirms that all skids passing through the grading station have been successfully read.

Plate 7: Tracking System at Boning Room Entry

6.0 Results

The implementation and trial of the SCL electronic identification (eID) system at Beaufort River Meats (BRM) yielded strong technical outcomes, demonstrating its operational suitability, system robustness, and regulatory compliance under real-world commercial conditions. The results are summarised below, with corresponding trial data provided in detail.

6.1 Read Performance and System Accuracy

The performance of the SCL eID system was evaluated through three live trials conducted at Beaufort River Meats—two in the lairage (receival) area and one on the slaughter floor. The purpose was to assess read accuracy under real-world operating conditions and identify any limitations or areas for refinement.

Table 1 summarises the results from the lairage trials conducted on 13 and 14 April 2025. These trials focused on assessing read rates as animals were unloaded from transport and processed through the single-lane reader system. Observations included both system performance and environmental factors affecting tag readability.

Table 2 presents the results from the slaughter floor trial conducted on 15 April 2025. This assessed the system's ability to maintain tracking accuracy from eID tag removal through to grading, using sequence-based alignment and encoder integration.

Table 1: Yards Trial Results Summary – 13 & 14 April 2025

Trial Date	Total Animals Received	Total Reads	Poor Reads	Missed Reads	No Tags	Dupli- cates	Read Rate	Key Observations
13/04/25	309	293	2	6	10	1	98.3%	Some tags had degraded signal strength (likely due to aging). RF interference observed; mitigated using LED removal. Anti-jump hooks recommended.
14/04/25	159	158	3	1	0	0	99.4%	Improved tag read consistency. Refinements from prior trial contributed to enhanced performance.

Table 2: Slaughter Floor Trial Results – 15 April 2025

Trial Date	Total Animals Tracked	Read Rate	Comments
15/04/25	159	100%	All carcasses successfully tracked using sequence and encoder integration from tag removal to grading.

6.2 System Design and Operational Outcomes

The trial confirmed the technical viability and practical advantages of a custom-designed eID solution:

- **RF Interference Management:**
  RF interference, likely caused by motor drives within the plant, was identified at both the lairage and slaughter floor. The issue was resolved within days through the development and implementation of a custom filter by SCL's RF engineer, restoring accurate read functionality.

- **Custom System Design:**
  Unlike off-the-shelf alternatives, the SCL system was tailored to BRM's unique operational flow, integrating seamlessly without affecting processing speed or plant layout.

- **User Interface and Accessibility:**
  The system included a localised user interface at both the receival yard and bleed rail, with remote access from main office locations. This enhanced operational oversight and data management.

- **Data Submission:**
  A streamlined process was implemented for submission of 'end-of-life' data to NLIS, with batch uploads in .csv format at the end of each processing day.

- **Responsive Technical Support:**
  SCL provided high levels of support despite being internationally based. Minor technical issues, including interference and configuration adjustments, were resolved promptly.

7.0 Discussion

The outcomes of this project provide strong evidence supporting the adoption of SCL as a viable and effective eID system supplier for the sheep processing sector. The trial, conducted under real-world conditions at Beaufort River Meats (BRM), demonstrated that a non-dominant supplier can deliver a mandate-compliant, high-performing system tailored to site-specific workflows, challenging the assumption that only established providers like Allflex can meet industry needs.

7.1 Interpretation of Results

The high read rates achieved during both lairage and slaughter floor trials, **98.3%**, **99.4%**, and **100%** respectively, clearly demonstrate that the SCL system meets and, in some instances, exceeds the performance thresholds set by regulatory standards.

However, SCL emphasised that consistently achieving a 100% read rate on the slaughter floor is not realistically achievable under normal operating conditions, though performance is expected to remain well within regulatory expectations. The trial was conducted in a controlled environment, where both staff and animals were operating under ideal circumstances. The animals used were sourced from progressive producers—early adopters of RFID technology—who typically raise calmer, well-handled stock that are easier to scan. In standard operations, however, read performance is likely to be affected by real-world variables such as unpredictable animal behaviour (e.g. kicking or jumping), suboptimal tag orientation (e.g. when an animal's head is turned 180 degrees), and physical anomalies like one-legged stances that disrupt the reader's line of sight. These factors mean that occasional missed reads are expected and should be considered when evaluating system performance.

System issues identified during the trial, such as RF interference and tag degradation, were promptly addressed, either through technical adjustments (e.g., custom filter development) or process recommendations (e.g., anti-jump hook installation). These refinements not only reinforced the robustness of the system but also highlighted SCL's capacity for responsive and practical technical support, even from an overseas base.

The seamless integration of the system into BRM's existing processes, without the need for major infrastructure changes, demonstrates a key advantage over many off-the-shelf solutions. Customisation ensured minimal disruption to throughput, preserved workflow efficiency, and enhanced operational oversight through strategically placed local and remote user interfaces.

7.2 Implications for Industry Adoption

These findings have important implications for processing businesses and other stakeholders preparing for the July 2025 eID mandate. They suggest that processors are not limited to a narrow pool of suppliers and that systems can be customised affordably and effectively to suit specific plant layouts and operational requirements.

The project also provides confidence to smaller or regionally-based processors who may have unique site constraints or limited access to dominant suppliers. **SCL's flexible system architecture and ability to support deployment and troubleshooting provide a scalable solution that can adapt to a variety of plant configurations across the red meat sector.**

Furthermore, the success of this trial supports industry efforts to foster greater supplier diversification, reducing the risk of cost inflation or capacity bottlenecks associated with sole-source dependency. In doing so, it contributes to a more resilient and competitive supply ecosystem.

7.3 Relevance for Future Research and Development

The practical insights gained from this trial serve as a foundation for future research and development in several key areas:

- Further **multi-site trials** are encouraged to validate the performance of SCL's system across different plant sizes, chain speeds, and operational setups. To our knowledge, such trials are already underway at the time of writing this report.

- There is potential to develop a **national benchmarking framework** to compare eID systems based on cost, read accuracy, ease of integration, and support responsiveness.

- Extension efforts should aim to raise industry awareness of **custom-built eID systems**, particularly for processors unfamiliar with suppliers outside the dominant players.

Overall, this project demonstrates that mandate-compliant, high-performing, and site-tailored eID systems can be successfully deployed by smaller or less established providers—providing the industry with confidence, choice, and flexibility ahead of regulatory enforcement.

7.4 Tag Integrity and Supply Chain Reliability

An unexpected but significant finding during the trial was the identification of faulty ear tags – for an entire mob – that appeared to be electronic but were found to contain no transponder (**Plate 8**). These tags, which failed to scan at both the receival yard and the slaughter floor, were believed to be eID-compliant based on information provided by the truck driver and the National Vendor Declaration (NVD) form. Upon dissection, the tags contained only hair and dirt—indicating either a manufacturing fault or mislabelling at the supply level.

This discovery raises concerns about **tag integrity and supply chain reliability**, both of which are critical to the success of the eID mandate. While the issue was isolated and not linked to any specific tag brand, it underscores the need for:

- **Improved traceability and verification** of tag functionality prior to dispatch or use

- **Clearer communication across the supply chain**, including tag suppliers, producers, and processors

- **Potential development of procedures** for identifying and flagging non-functional or counterfeit tags

In the context of regulatory enforcement, such faults—though rare—could undermine the perceived reliability of eID systems if not properly addressed. Future implementation strategies may benefit

from introducing **pre-check protocols or randomised tag audits** to mitigate these risks. Ensuring tag quality at the source will be essential to maintaining confidence in the system's integrity and ensuring consistent read performance across the value chain.

Plate 8: eID tag with no transponder

8.0 Conclusions

This project has successfully demonstrated that a lesser-known supplier, SCL, can deliver a fully compliant, high-performing, and operationally integrated eID system for sheep processing in line with the upcoming July 2025 mandate. Installed and trialled under commercial conditions at Beaufort River Meats (BRM), the system achieved read rates of 98.3% and 99.4% at receival and 100% on the slaughter floor, meeting and exceeding regulatory benchmarks. SCL noted, however, that consistent 100% read rates are unlikely under typical conditions, as factors such as animal behaviour and tag orientation can impact scan accuracy, though performance is expected to remain well within regulatory expectations.

The results confirm that alternative suppliers can offer fit-for-purpose solutions that rival or outperform established market players, while offering the added benefit of customisation to existing plant workflows. This is particularly significant for small-to-medium-sized processors or facilities with legacy infrastructure that may not be compatible with generic off-the-shelf systems.

Technical issues encountered during the trial, such as RF interference and tag degradation, were resolved quickly and effectively, demonstrating the responsiveness and technical competency of the SCL team. The trial also highlighted practical measures, such as the installation of anti-jump hooks and signal filtering, that can further optimise system performance.

For processors, the findings present a compelling case for diversifying supplier options and considering custom-built eID systems as a viable path to compliance. For industry stakeholders and policy makers, this project offers evidence that supplier competition can reduce risk, improve affordability, and promote innovation. Finally, for future research and development, the trial provides a strong foundation for further multi-site testing, benchmarking initiatives, and broader extension to raise awareness of the benefits of tailored eID implementation.

As a final note, we are happy to share all existing and future data from this trial with AMPC and DPI, should they wish to access it, in support of continued research, evaluation, and industry-wide benefit.

9.0 Recommendations

Based on the successful implementation and evaluation of the SCL eID system at Beaufort River Meats, the following recommendations are proposed to support practical industry adoption, guide future research and development, and inform targeted extension activities.

9.1 Practical Application for Industry

- **Encourage adoption of alternative suppliers:** Processors preparing for the July 2025 eID mandate should consider custom-built systems from alternative suppliers such as SCL, particularly where site-specific integration and workflow compatibility are priorities.

- **Prioritise site-specific system design:** Facilities should assess operational constraints (e.g. lairage design, grading flow, chain synchronisation) during system procurement and select vendors capable of tailoring systems accordingly.

- **Implement simple hardware enhancements:** To improve read performance, processors should install anti-jump mechanisms at critical read points and consider periodic checks for tag signal degradation.

- **Address unresolved RF interference issues:** RF interference remains a known challenge at some plants and has yet to be fully resolved in all settings. Given their proven technical capability during this trial, SCL could be commissioned to investigate and resolve these issues as part of future implementation or support services.

- **Batch upload workflows for NLIS submission:** Facilities with limited connectivity or on-site IT resources should adopt .csv batch upload processes, as successfully implemented in this trial, for efficient NLIS compliance.

9.2 Future Research, Development and Evaluation (RD&E)

- **Multi-site trials across varied plant types:** Further trials (currently on going in other plants) should be conducted in plants of different sizes, layouts, and chain speeds to validate the modular adaptability of custom eID solutions.

- **Develop benchmarking tools:** Establish a national framework for comparing eID system performance, including read accuracy, cost, integration effort, and technical support responsiveness.

- **Investigate long-term tag signal degradation:** A focused study on tag lifespan and signal strength variability over time could assist with setting performance expectations and maintenance schedules.

- **Examine tag integrity and traceability issues:** Conduct targeted investigations into non-functional or counterfeit tags – like those observed in this trial – to understand root causes and

recommend supply chain improvements. This may include supplier audits, improved tagging protocols, or pre-scan verification steps to reduce failure risk.

9.3 Adoption and Extension Activities

- **Extension and awareness campaigns:** Promote awareness of viable alternative eID system providers through the DPI, AMPC and MLA-led case studies, webinars, and processor forums.

- **Facilitate peer-to-peer learning:** Encourage knowledge sharing between processors who have trialled alternative systems and those in the early stages of eID implementation.

10.0   Project Outputs

The project delivered a range of tangible outputs designed to support the evaluation, adoption, and future extension of electronic identification (eID) systems for sheep processors. These outputs included technical system components, training resources, and communication materials developed in collaboration with project stakeholders.

10.1 System Deliverables

- **Custom-built eID system installed at Beaufort River Meats (BRM)**, including:
    - Single-lane, multi-reader unit at lairage for real-time eID tag capture.
    - Integrated tracking system through the slaughter floor using encoders and sensors.
    - Custom-configured Human Machine Interface (HMI) and remote access for operational oversight.
    - NLIS-compliant batch upload system for end-of-life data submission.
- **Technical documentation**, including:
    - System flow diagram (**Appendix 2**).
    - Installation photographs and site layout (**Appendix 1**).
    - Staff training guide and user interface instructions (**Appendix 3**).

10.2 Training and Staff Engagement

- **On-site training sessions** delivered by SCL during commissioning and go-live phases:
    - **Dates:** April-May 2025
    - **Location:** Beaufort River Meats, WA
    - **Audience:** BRM yard staff, operators, and management
    - **Content Covered:** System operation, tag reading, HMI interface use, NLIS data upload process

- o **Total Staff Trained:** 5

- **Ongoing technical support** provided remotely by SCL for the duration of the trial, including real-time troubleshooting, RF interference mitigation, and configuration adjustments.

10.3 Industry Communication

- **Industry case study (in progress)** to be shared via AMPC and DPI networks following project finalisation.

  - o **Target Platforms:** DPI website, AMPC website, MLA Red Meat Updates, and relevant processor networks

  - o **Expected Publication Date:** Q3 2025

11.0 Bibliography

DAWE, 2022. Department of Agriculture, Water and the Environment (DAWE), 2022. *Improving Traceability for Livestock and Meat Products in Australia*. [online] Australian Government. Available at: https://www.agriculture.gov.au [Accessed 15 May 2025].

MLA, 2021. Meat & Livestock Australia (MLA), 2021. *Industry Insights: Traceability for Red Meat Supply Chains*. [online] MLA. Available at: https://www.mla.com.au [Accessed 15 May 2025].

12.0 Appendices

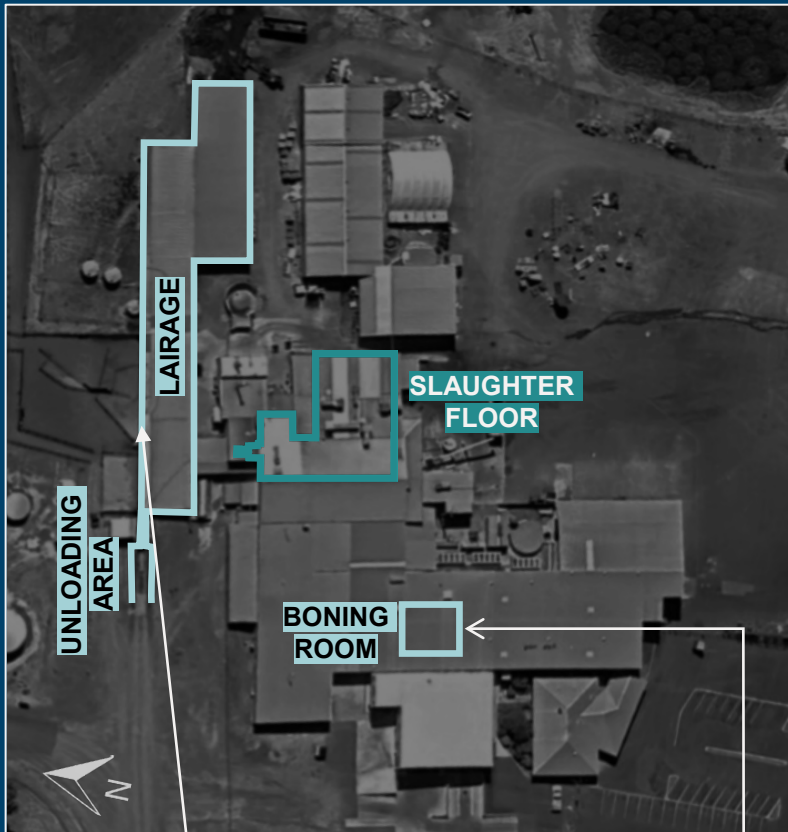The appendices are provided on the following pages.

## 12.1 Appendix 1: Site Map

(Presented on next page)

SITE MAP

2025-1054 Assessing SCL technology for reading and recording smallstock eID tags

Beaufort River Meats | 46 Macri Rd, Beaufort River WA 6394

DRAWN BY: DIDIER ALANOIX
REVISION: A
DATE: 14/05/2025

BEAUFORT RIVER MEATS WESTERN AUSTRALIA

LAIRAGE

UNLOADING AREA

SLAUGHTER FLOOR

BONING ROOM

N

HMI Screen

Count Tracker

Reader

LOCATION 2: BLEED RAIL
SYSTEM: TRACKING MODEL
eID reader confirms animal ID while assigning a carcass number (i.e. Unique Identifier, UID) to the animal for tracking.

NOTE: HEAD REMOVAL
eID tag is lost at this stage; the UID is used for ongoing carcass tracking.

KILLFLOOR

BLEED

KNOCK BOX

HEAD REMOVAL

DETAIN

N

Reader
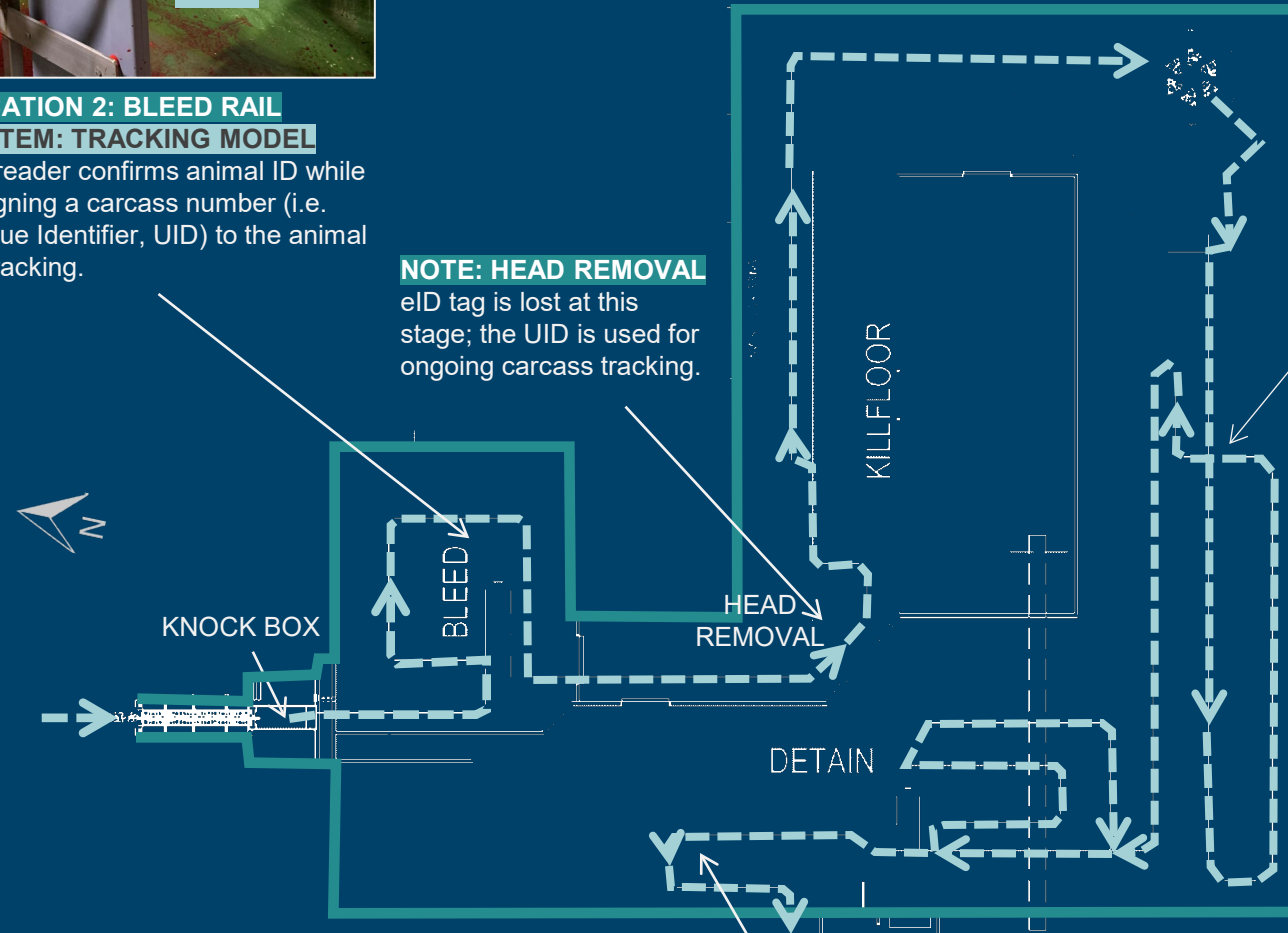
LOCATION 3: CHANGEOVER POINT (GAMBREL UP)
SYSTEM: FULL TRACKING
Carcasses are tracked to Gambrel Up via their UIDs, through sensors and an encoder.

At Gambrel Up, the RFID transponder in the skid is linked to the carcass record and used for ongoing tracking.

HMI Screen

x2 Readers

LOCATION 1: RECEIVAL AREA (LAIRAGE TRUCK UNLOADING)
SYSTEM: SINGLE LANE MULTI READER UNIT
System records eID tags of each animal as they are offloaded from the truck.

LOCATION 5: BONING ROOM ENTRY
SYSTEM: FULL TRACKING
System to confirm that all skids passing through Grading have been read.

Reader

Reader

LOCATION 4: GRADING
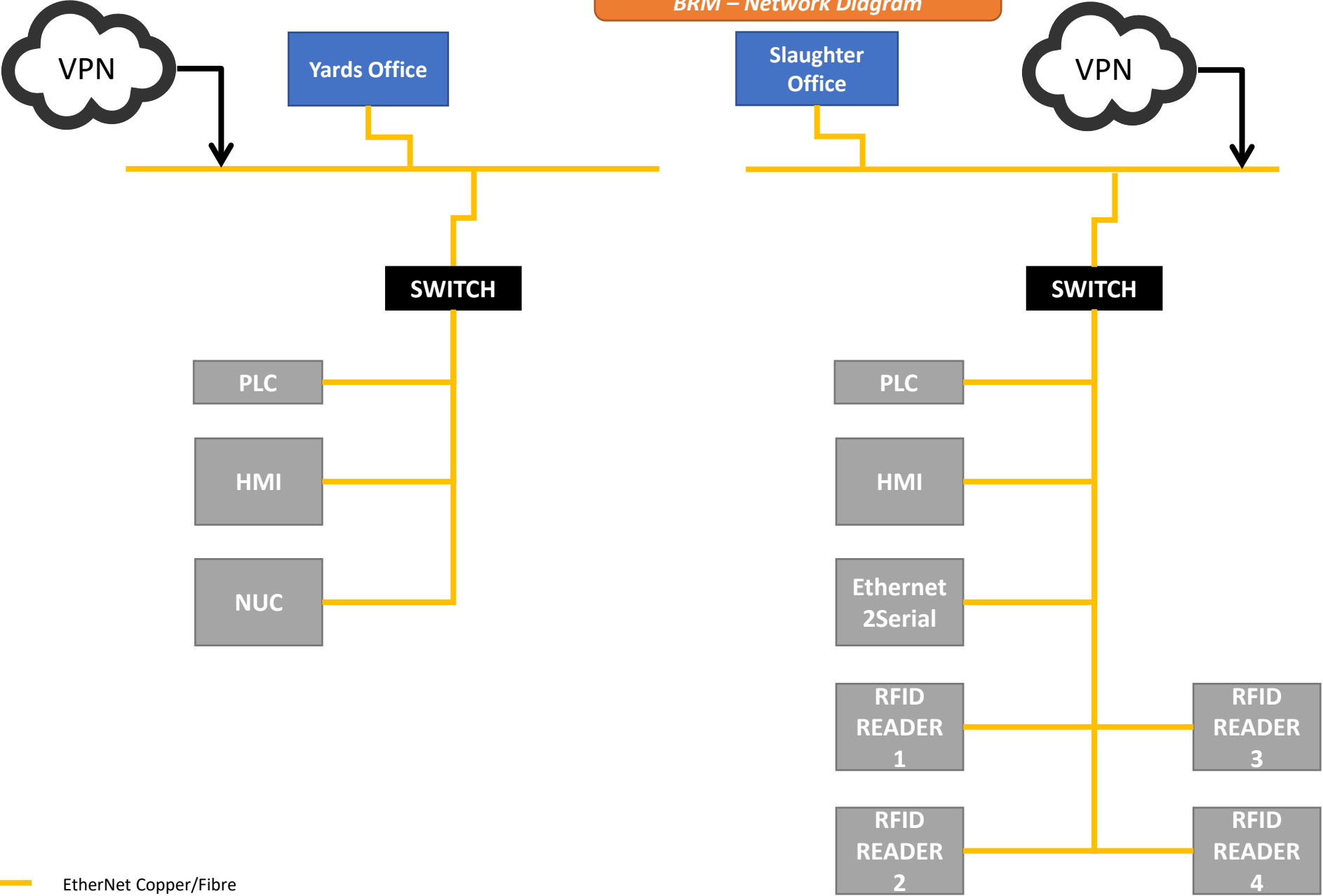**SYSTEM: FULL TRACKING**
Matching tracking records with grading software (Protrace) data to enable full data integration.

12.2 Appendix 2: System Flow Diagram

(Presented on next page)

SCL RFID Tracking System
BRM – Network Diagram

EtherNet Copper/Fibre

BRM network proposal v1.0

12.3 Appendix 3: Staff Training Guide and User Interface Instructions

(Presented on next page)

To set up a truck unload with electronic tags v1.1

Run 'Yards HMI'

Yards HMI

Enter the lot details

Click on 'START SESSION'

Let the mob go through the scanners, and wait until the mob is finished

Click on 'END SESSION'

END
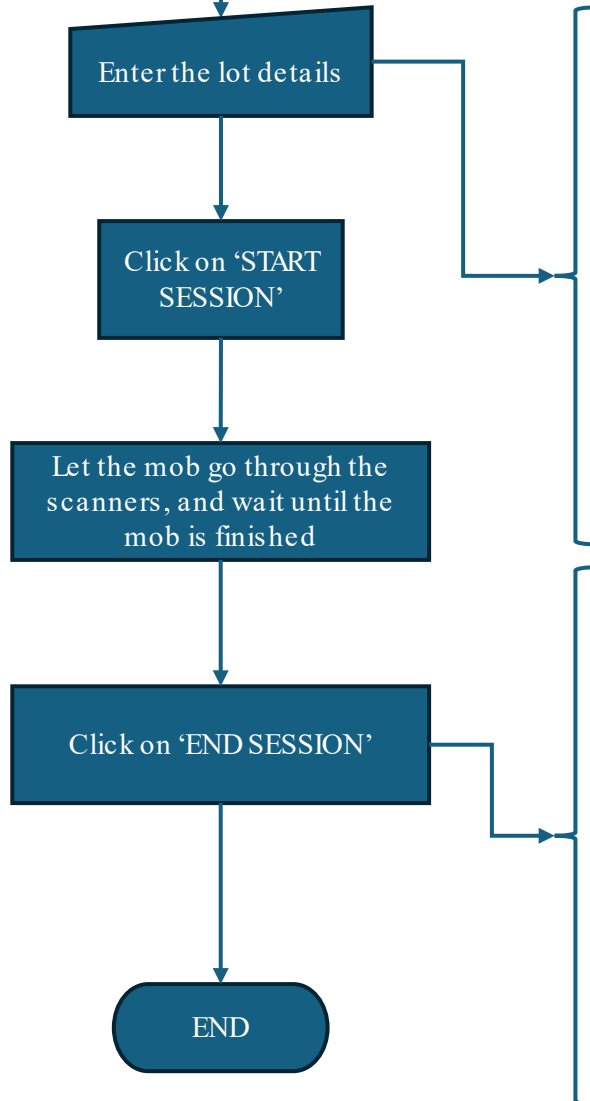
9/05/2025 8:21:18 a.m.

BRM LOT NUMBER:

NVD NUMBER: 0

PIC:

DELIVERY DATE: 9/05/2025

VENDOR:

HEADS ON DOCKET: 0

START SESSION

All entries are mandatory.

11/05/2025 7:53:54 a.m.

	EID	Counts
Unique EarTag	982 123757656622	18
Reader 1	982 123757656621	13
Reader 2	982 123757656622	5
		Reset
Actual Counts	18	
Mob Seq.	50	

END SESSION

SCL

Run 'NLIS – CSV Generator'

Select the file type to generate

For animals have been killed?

For animals have been transferred?

Animals received from the Truck?

Animals received from the Paddock?

Animals moved to Lairage?

Animals moved to Paddock?

NLIS - CSV Generator

NLIS CSV Report

Type
- ● For Slaughter (Kill-Base)   ○ For Internal Stock (Lairage)

Source
- ● From Owner
- ○ From Internal Paddock

Destination
- ○ To Slaughter Floor
- ○ To Internal Paddock

Plant Slaughter PIC: WFAL0024
Plant Paddock PIC: WJWL0240

BRM Docket/Lot Number:

Number of Ear Tags Found ...

Status: |

Connect

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NLIS - CSV Generator

NLIS CSV Report

Type
- ● For Slaughter (Kill-Base)   ○ For Internal Stock (Lairage)

Source
- ○ From Owner
- ● From Internal Paddock

Destination
- ○ To Slaughter Floor
- ○ To Internal Paddock

Plant Slaughter PIC: WFAL0024
Plant Paddock PIC: WJWL0240

BRM Docket/Lot Number:

Number of Ear Tags Found ...

Status:

Connect

Copyright © 2025 - SCL Products v1.2

NLIS - CSV Generator

NLIS CSV Report

Type
- ○ For Slaughter (Kill-Base)   ● For Internal Stock (Lairage)

Source
- ○ From Owner
- ○ From Internal Paddock

Destination
- ● To Slaughter Floor
- ○ To Internal Paddock

Plant Slaughter PIC: WFAL0024
Plant Paddock PIC: WJWL0240

BRM Docket/Lot Number:

Number of Ear Tags Found ...

Status:

Connect

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NLIS - CSV Generator

NLIS CSV Report

Type
- ○ For Slaughter (Kill-Base)   ● For Internal Stock (Lairage)

Source
- ○ From Owner
- ○ From Internal Paddock

Destination
- ○ To Slaughter Floor
- ● To Internal Paddock

Plant Slaughter PIC: WFAL0024
Plant Paddock PIC: WJWL0240

BRM Docket/Lot Number:

Number of Ear Tags Found ...
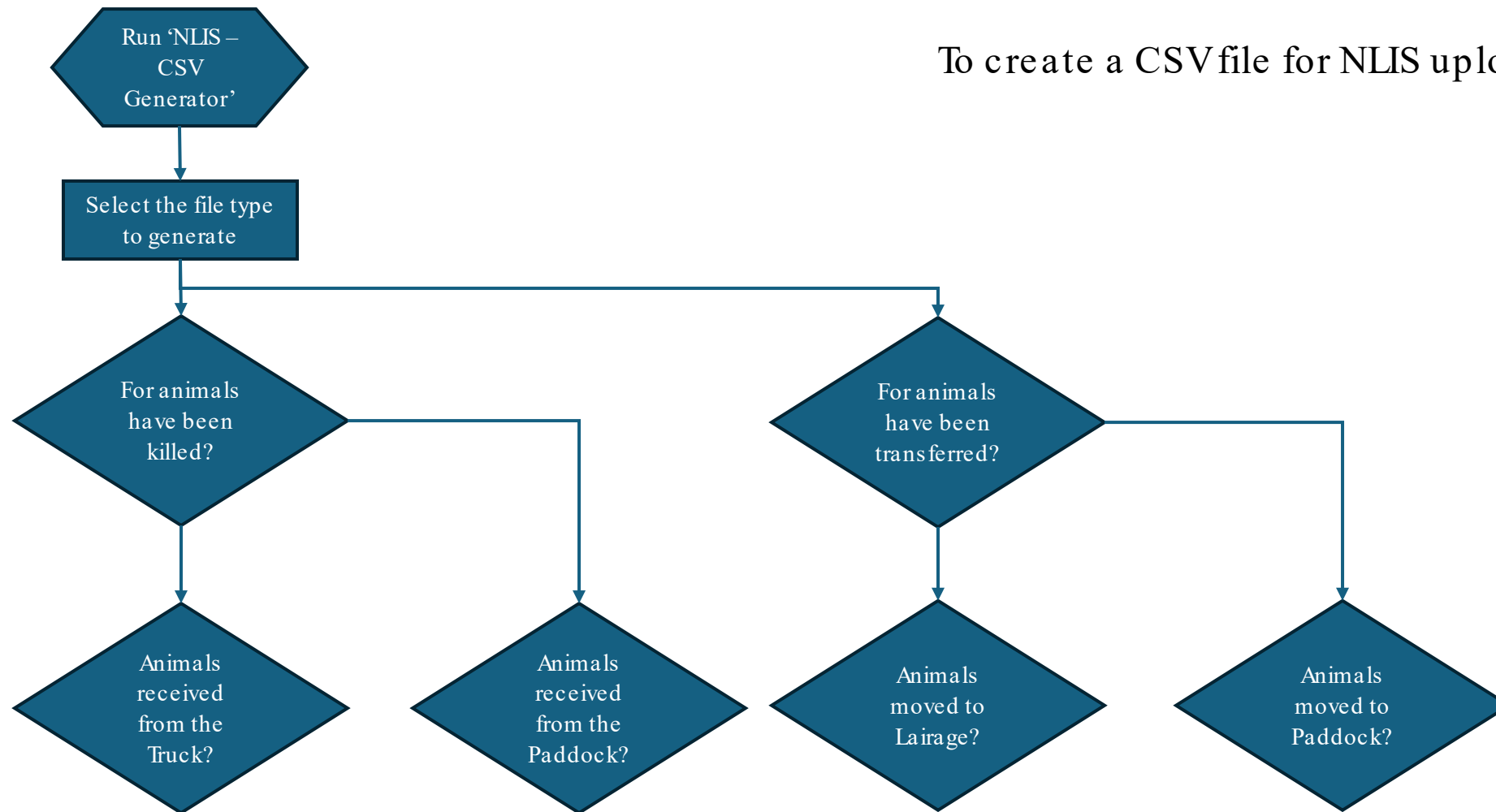
Status:

Connect

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To create a CSV file for NLIS upload v1.1

NLIS CSV Report (SCL)

Type:
- ○ For Slaughter (Kill-Base)
- ⦿ For Internal Stock (Lairage)

Source:
- ○ From Owner
- ○ From Internal Paddock

Destination:
- ⦿ To Sluaghter Floor
- ○ To Internal Paddock

Plant Slaughter PIC: WFAL0024
Plant Paddock PIC: WJWL0240

BRM Docket/Lot Number: 15176

Number of Ear Tags Found ...

Status:

Connect

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NLIS CSV Report (SCL)

Type:
- ○ For Slaughter (Kill-Base)
- ⦿ For Internal Stock (Lairage)

Source:
- ○ From Owner
- ⦿ From Internal Paddock

Destination:
- ⦿ To Sluaghter Floor
- ○ To Internal Paddock

Plant Slaughter PIC: WFAL0024
Plant Paddock PIC: WJWL0240

BRM Docket/Lot Number: 15176

Number of Ear Tags Found **70**

Status: CSV is ready

Connect | Query

D:\SCL\SCL_EarTags_CSV\Transferred_LairageToSlaughter_15176.csv

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Flowchart:

Click 'Connect'
↓
Connected? — NO → Try following options:
- Close and re-run the software
- Check if any issue with the plant network
- Call SCL Support

↓ YES

Click 'Query'
↓
CSV is Ready? — NO → Try following options:
- Make sure the BRM Docket/Lot number is correct
- Make sure this lot number has Ear Tags and scanned
- Call SCL Support

↓ YES

Read NLIS instructions to do so →

Upload the generated file to NLIS
↓
END