

# FarmSense CSU Meeting Packet - Team Briefing

**Date:** February 2026

**Meeting:** CSU San Luis Valley Research Center Partnership

**Purpose:** Brief team members/stakeholders on CSU meeting and outcomes

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## EXECUTIVE SUMMARY

FarmSense met with CSU SLVRC to secure a Letter of Support for our CRD grant application. This partnership is critical for validating our 9-field pilot before the June 29 Water Court Trial. In exchange for CSU's validation, we provide open API access to 1-meter soil data, 4 paid internships, and co-authorship on peer-reviewed papers.

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## MEETING OBJECTIVES

### Primary Goal

Secure Letter of Support from CSU SLVRC by February 14, 2026

### Secondary Goals

Establish CSU as third-party validation partner Clarify mutual benefits and expectations  
Confirm co-location for lysimeter comparison Setup data access and research collaboration framework

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## VISUAL SUMMARY

### Strategic Timeline

This image illustrates the key phases of our deployment strategy, from initial planning to full-scale implementation. The timeline is crucial for understanding our progress and ensuring we meet critical milestones, such as the June 29 Water Court Trial.

### Observation Concept

This image represents the Heavy Edge architecture, which combines physical sensors with dynamic soil mapping and satellite data to provide a comprehensive, forensic-grade view of soil moisture. The concept is central to our approach and will be validated through the CSU partnership.

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## PILOT OVERVIEW

### What We're Deploying

**FarmSense Deterministic Farming OS** - A "Heavy Edge" sensor network that provides forensic-grade irrigation auditing capable of surviving Water Court cross-examination.

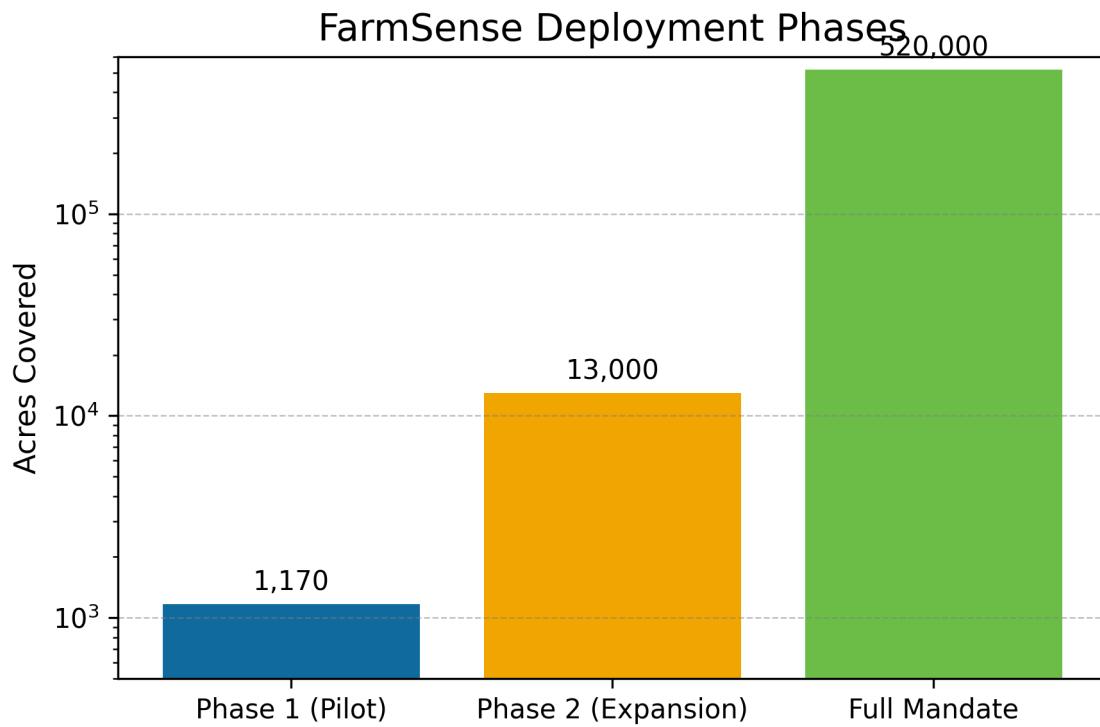


Figure 1: Strategic Timeline

## Architecture

- Tier 1: Physical Sensors (Ground Truth)
  - Horizontal blankets: 18" at 12"/18" depths
  - Master vertical nails: 42" (5-depth) or 60" (7-depth)
- Tier 2: Dynamic Soil Mapping
  - Recursive Bayesian filter learns soil texture
- Tier 3: Satellite Multi-Spectral
  - Sentinel-1/2 for NDVI, NDWI, and SAR radar

Every Jetson Nano is matched with a dedicated gateway hub (LoRa + 5GHz mesh), so the per-field hardware budget covers both pieces of hardware.

## Pilot Specifications

Component	Value
<b>Fields</b>	9 (hub-and-spoke topology)
<b>Acreage</b>	~1,170 acres
<b>Sensors</b>	~108 total
- ~99 horizontal blankets (18", 2-depth)	
- 9 master vertical nails (42" OR 60")	
<b>Measurement points</b>	~270
<b>Primary compute</b>	1 × NVIDIA Jetson Nano

Component	Value
<b>Backup Gateway hubs</b>	Hosted cloud + cold spare on-site Each Jetson Nano pairs with its own gateway hub (LoRa + 5GHz mesh), which increases the per-field hardware cost
<b>Update interval</b>	15 minutes
<b>Spatial resolution</b>	1-meter virtual grid

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## THE CSU PARTNERSHIP

### What We Need from CSU

Requirement	Timeline	Status
<b>Letter of Support</b>	February 14, 2026	Pending
<b>Co-location approval</b>	April 2026	Pending
<b>Research collaboration</b>	Ongoing	Discussed

### What CSU Receives

Benefit	Detail	Value to CSU
<b>Data access</b>	Open API to 1m-resolution soil moisture	Research infrastructure
<b>Internships</b>	2 Ag-Eng + 2 Data Science (paid)	Student development
<b>Co-authorship</b>	Credit on peer-reviewed papers	Academic recognition
<b>Verification</b>	Direct comparison to lysimeter measurements	Methodology validation

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## THE JUNE 29 TRIAL

### Why This Date Matters

The June 29, 2026 Water Court Trial is **IMMUTABLE** - it cannot be moved or postponed. This trial will determine whether FarmSense's forensic-grade data can survive legal cross-examination regarding aquifer depletion in Subdistrict 1.

### What We Must Prove

Requirement	Our Solution
<b>Physical ground truth</b>	Sensor residuals with SHA-256 hashing
<b>Automated compliance</b>	No manual data manipulation

Requirement	Our Solution
<b>Immutable audit trail</b>	Cryptographic signing at well-head
<b>Third-party validation</b>	CSU SLVRC partnership

## Timeline to Trial

Date	Milestone	Status
February 14	CSU Letter of Support due	Pending this meeting
February 28	Grant award notification	Awaiting award
April 15 - May 15	Field installation (9 fields)	Planned
June 1	Full operations begin	Planned
<b>June 29</b>	<b>Water Court Trial</b>	Critical deadline

## SCALING STRATEGY

### Phase 1: Pilot (Spring 2026) Current Focus

- 9 fields, ~1,170 acres
- Validate forensic integrity
- Demonstrate automated compliance
- Secure Water Court acceptance

### Phase 2: Expansion (Fall 2026)

- 100 fields (~13,000 acres)
- ~12 Jetson Nanos
- Distributed architecture
- Validated cost model

### Phase 3: Full Mandate (2027+)

- 520,000 acres (~4,000 fields)
- ~48,000 sensors
- ~110,000 measurement points
- ~445 Jetson Nanos
- **Economic impact: \$25M-\$50M annually**

## COMPETITIVE ADVANTAGE

Feature	FarmSense	Traditional Solutions
<b>Physical residuals</b>	2-depth + 5/7-depth sensors	Satellite-only estimates
<b>Update frequency</b>	15 minutes	Weekly or monthly
<b>Spatial resolution</b>	1-meter grid	30-meter satellite pixels
<b>Processing</b>	Heavy Edge (on-field)	Cloud-dependent

Feature	FarmSense	Traditional Solutions
<b>Compliance</b>	Automated forensic reports	Manual compilation
<b>Failover</b>	Triple redundancy	Single point of failure
<b>Court admissible</b>	Yes, forensic-grade	No, estimates only

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## BUDGET OVERVIEW

### Grant Application (CRD)

- **Requested:** \$149,500
- **Total project value:** \$1,000,000
- **Leveraged funding:** \$850,500

### Budget Allocation

Category	Amount	Purpose
Sensor fabrication	\$60,000	~108 sensors
Compute hardware	\$15,000	Jetson Nano, gateways, cold spare
Installation & labor	\$30,000	Field deployment, calibration
Data infrastructure	\$20,000	Hosted cloud, API development
Project management	\$15,000	Coordination, compliance reporting
Contingency	\$9,500	10% buffer

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## KEY TEAM CONTACTS

### FarmSense Team

- **Lead Architect:** Jeremy Beebe
- **Email:** getfarmsense@gmail.com
- **Phone:** 7198508651
- **Role:** Technical lead, CSU relationship management

### CSU SLVRC Contacts

- **[Name]:** [Title]
- **Email:** [Their email]
- **Role:** [Their role]

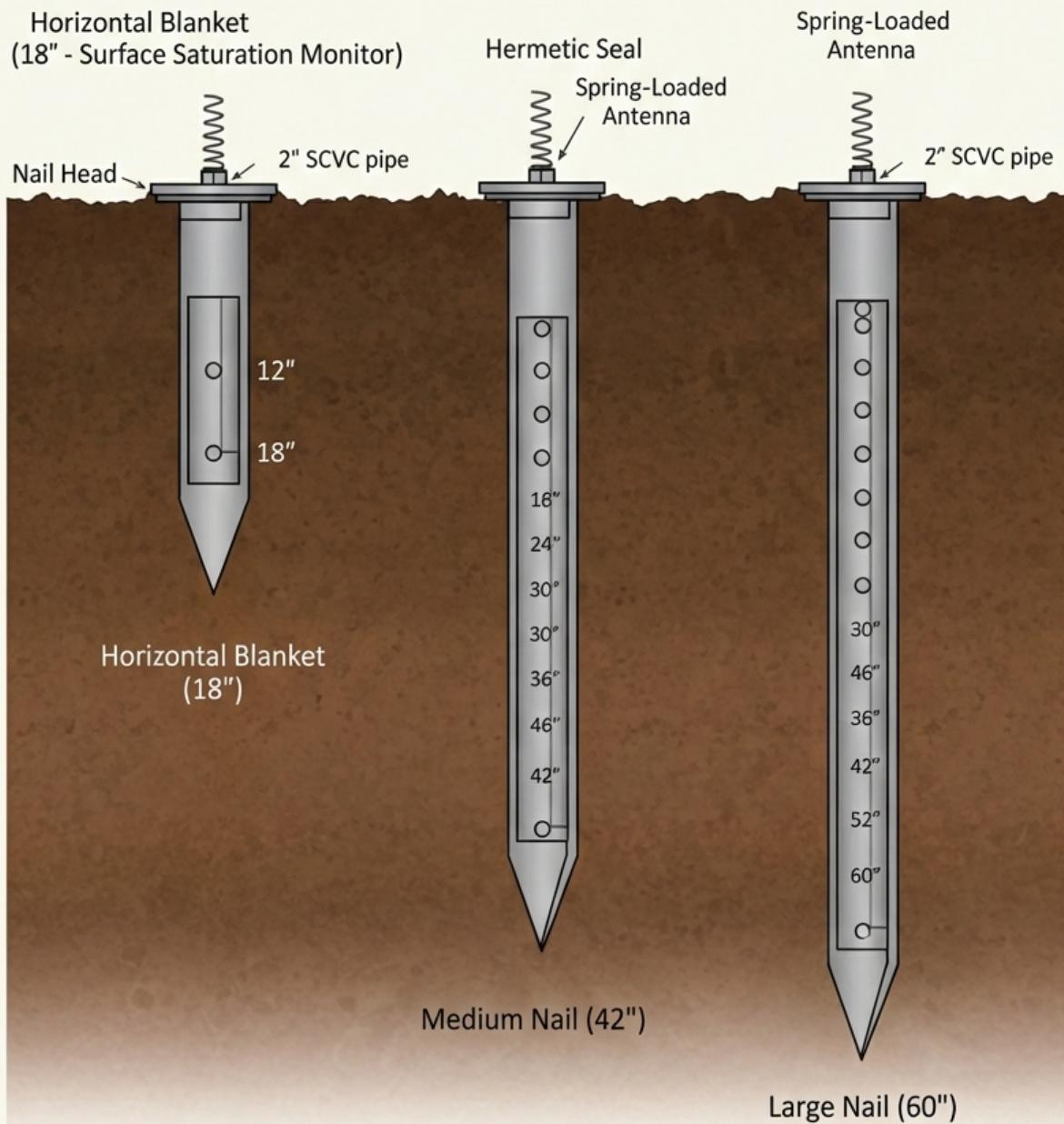
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## MEETING OUTCOMES

### Confirmed

- CSU understands project scope and timeline

## FARMSENSE SOIL MOISTURE HARDWARE - VERTICAL STAKES



Material: 3/16" Stainless Steel  
Casing: 2-inch SCH40 PVC  
Lifespan: 20+ Years

Figure 2: Obsegvation Concept

- Partnership benefits are mutually beneficial
- Letter of Support template will be provided
- Co-location with lysimeters approved in principle

## Pending

- Letter of Support signature (due February 14)
- Formal MOU for data access and co-location
- Kickoff call scheduling (target: March 1)
- Internship candidate identification

## Action Items

Task	Owner	Due Date
Email LOS template	Jeremy	Today (after meeting)
Follow-up summary email	Jeremy	Within 24 hours
Schedule kickoff call	CSU	By February 20
Identify internship candidates	CSU	By March 1
Formalize data access MOU	Both	By March 15

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## FREQUENTLY ASKED QUESTIONS

### Q: Why is CSU's Letter of Support so important?

**A:** Third-party validation from a respected research institution provides credibility for the grant application and demonstrates that FarmSense has been reviewed and endorsed by water research experts.

### Q: What happens if CSU doesn't provide the Letter of Support?

**A:** We have alternative validators identified (local ag consultants, pivot manufacturers), but CSU is our preferred partner due to their research credibility and lysimeter infrastructure.

### Q: Why the rush for February 14?

**A:** This is the CRD grant deadline. Missing this date means we lose the \$149,500 funding and cannot proceed with the pilot before the June 29 trial.

### Q: What if the trial is delayed?

**A:** The trial date is set by the Water Court and is immovable. We must be ready with validated forensic data by June 29.

### Q: How does the CSU partnership help long-term?

**A:** Beyond immediate grant support, CSU collaboration provides:

- Ongoing research credibility

- Peer-reviewed publications
  - Access to student talent pipeline
  - Validation infrastructure for future deployments
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## **NEXT STEPS FOR TEAM**

### **Immediate (This Week)**

- Review meeting outcomes
- Confirm understanding of partnership terms
- Prepare for grant award notification (February 28)

### **Short-term (February - March)**

- Finalize MOU with CSU
- Begin sensor fabrication
- Identify and contact 9 field locations
- Prepare installation documentation

### **Medium-term (April - June)**

- Execute field installation (April 15 - May 15)
  - System calibration and testing (May 15 - June 1)
  - Collect 4 weeks of operational data (June 1 - June 29)
  - Prepare Water Court testimony materials
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## **RESOURCES**

### **Documentation**

- Project FarmSense: Master Documentation (v3.9)
- Software Technical Specification (v3.9)
- Internal System Specifications (v3.9)
- CSU Meeting Brief: Executive Summary (v3.9)
- Grant Application: CRD Community Funding Partnership (v3.9)

### **Technical References**

- Deterministic Farming OS Metrics Framework (v3.9)
  - Strategic Analysis: Gap & Risk Assessment (v3.9)
  - FarmSense Meeting Guide: Track & Talking Points (v3.9)
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## **SUCCESS METRICS**

### **Pilot Phase Success Criteria**

- 15-20% pumping reduction vs. baseline

- Zero deep percolation events at 42"/60" horizons
- 100% Water Court data admissibility
- Forensic data integrity verified
- CSU Letter of Support secured

### **Long-term Success Criteria**

- 520,000 acres under deterministic management
  - 15% district-wide pumping reduction
  - \$25M-\$50M annual economic impact
  - 48,000+ sensors deployed
  - 445+ Jetson Nanos operational
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**Date:** February 2026

**Prepared by:** FarmSense Team