EXHIBIT C2

Integrated Low Impact Development (LID) Stormwater Management System

LCMG Demonstration Garden — City Planning Department, Site Plan Review

1. Purpose and Scope

This exhibit provides a technical description of the integrated Low Impact Development (LID) stormwater management system proposed as part of the LCMG Demonstration Garden site plan. The system is designed for Cheyenne's semi-arid, high-wind climate and serves the dual purpose of capturing and productively reusing rainwater while substantially reducing peak stormwater flows into the municipal storm sewer system.

Wyoming communities are increasingly managing stormwater at the source rather than relying solely on centralized infrastructure. The City of Cheyenne implemented new stormwater utility fees in 2026 and has adopted Low Impact Development standards in its Stormwater Management Manual. The LCMG Demonstration Garden serves as a demonstration site for LID best practices while directly reducing peak-flow surges into the municipal storm sewer system.

This document is submitted to the City Planning Department to demonstrate that the proposed system meets or exceeds LID standards and supports the City's stated goals for resilient, decentralized stormwater management.

2. System Overview

The LCMG stormwater system integrates four complementary components into a unified water management strategy. Together, these components transform the five 22-foot geodesic greenhouse domes from potential stormwater contributors into a net-positive water management asset.

The five domes collectively provide approximately 1,901 square feet of roof catchment area. At full build-out, the system includes 80 food-grade HDPE rain barrels (4,400 gallons of storage) integrated into the 3-foot-high exterior perimeter raised beds surrounding each dome, plus three linear bioswales with a combined geometric storage capacity of approximately 11,220 gallons, for a total on-site storage capacity of approximately 15,620 gallons.

> **Total System Storage: 4,400 gal (barrels) + 11,220 gal (3 bioswales) = 15,620 gallons | Captures 100% of dome runoff from storms up to 13.2 inches, including a 1985-scale 6-inch or 8-inch event**

Using standard hydrologic conversions, one inch of rainfall over the dome roof footprints produces approximately 1,185 gallons of runoff. Under a 6-inch extreme storm comparable to the historic 1985 Cheyenne event (7,110 gallons of dome runoff), the system captures 100 percent. Under an 8-inch scenario (9,479 gallons of dome runoff), the system also captures 100 percent. The three bioswales are designed to fully drain within 24 to 48 hours in the site's clay-dominant soils, restoring storage capacity between events.

3. Component Descriptions

3.1 Component 1 — Active Curb Harvesting (Airport Parkway)

Rather than allowing street runoff from Airport Parkway to flow directly into storm sewers, the project captures this runoff at the source and routes it to irrigate native plants in the right-of-way and the windbreak along the western boundary of Lot 1.

1. Curb-cut inlets: Four 4-inch apertures drilled through the concrete curb along Airport Parkway, positioned to intercept sheet flow from the street surface.
2. Subsurface conveyance: Water flows by gravity through 4-inch Schedule 40 PVC pipes bored beneath the sidewalk, with cleanout junction boxes for maintenance, entering the site without disturbing the public right-of-way.
3. Sediment baffle system: PVC junction boxes at the property line allow volunteers to periodically remove street grit and debris, protecting soil porosity and ensuring long-term infiltration capacity.

This component captures the “first flush” of storm events and filters it through the vegetated landscape. A portion of flow is intentionally directed to native plants planned for the Airport Parkway right-of-way.

3.2 Component 2 — Three-Element Bioswale Network on Lot 1 (“The Swaddle”)

The bioswale network on Lot 1 consists of three interconnected shallow vegetated swales that together form the primary stormwater infiltration and conveyance infrastructure on the site. All three swales are unlined and treated as landscape contouring rather than engineered drainage structures. They are intentionally shallow for pedestrian safety. No trees are planned for Lot 1; the bioswales are planted exclusively with native grasses and sedges — Western Wheatgrass, Blue Grama, and Nebraska Sedge — that tolerate periodic inundation and extended dry periods.

Each swale is 10 feet wide and 100 feet long, graded from each side toward a center depth of 12 inches, yielding an average depth of approximately 0.5 feet. Each swale thus provides a geometric storage volume of 500 cubic feet (approximately 3,740 gallons). The three swales combined provide 1,500 cubic feet (approximately 11,220 gallons) of storage.

North Bioswale — West-to-East along the North Side of the Domes

A 10-foot-wide, 100-foot-long bioswale runs from west to east along the north side of the geodesic dome cluster on Lot 1. This swale is graded from each side toward a center depth of 12 inches and is positioned between the windbreak tree line to the north and the dome perimeter raised beds to the south. Geometric storage capacity: 500 cubic feet (approximately 3,740 gallons).

This swale receives overflow discharged from the northernmost drums of each dome’s barrel system via 3-inch overflow port fittings. When all 880 gallons of barrel storage capacity per dome are reached, water exits automatically through the north-side overflow port of each dome by gravity and enters this west-to-east north bioswale. The swale temporarily detains this overflow, slows peak flows, allows infiltration into the soil, provides sustained moisture for the windbreak during establishment, and captures windblown snow during winter.

North-to-South Bioswale — Between the Windbreak and the Domes

A 10-foot-wide, 100-foot-long bioswale runs from north to south between the windbreak tree line and the western edge of the dome cluster on Lot 1. This swale runs perpendicular to the north bioswale and is directly connected to it at their intersection, forming an L-shaped conveyance path. Geometric storage capacity: 500 cubic feet (approximately 3,740 gallons).

Stormwater entering this swale from the west may originate from the Active Curb Harvesting system on Airport Parkway. A portion of the flow through this north-to-south swale is diverted to native plants planned for the Airport Parkway right-of-way, consistent with the City's LID infiltration goals for the public corridor. Remaining flow continues south, merging with the south bioswale.

South Bioswale — South of the Domes toward Lot 2

A third bioswale runs south of the dome cluster on Lot 1 toward Lot 2. This south-side swale receives overflow from the southernmost drums of each dome's barrel system via dedicated 3-inch overflow port fittings on the south face of each raised bed. When all 880 gallons of barrel storage per dome are reached, water exits automatically through the south-side overflow port by gravity and enters this south bioswale. Geometric storage capacity: 500 cubic feet (approximately 3,740 gallons).

The north-to-south swale between the windbreak and the domes also merges into this south-side flow path, ensuring that all overflow from the integrated swale network is directed in a controlled, non-erosive manner toward the Lot 2 vegetated spillway and forest sink.

3.3 Component 3 — Geodesic Dome Rainwater Harvesting System

Key Technical Specifications

1. Each 22-foot diameter dome has a roof catchment area of approximately 380 square feet, capturing 237 gallons of water per inch of rainfall.
2. Five domes provide a combined catchment area of approximately 1,901 square feet, capturing approximately 1,185 gallons per inch of rainfall across the entire cluster.
3. 16 food-grade HDPE 55-gallon drums per dome provide 880 gallons of on-site thermal storage and irrigation reserve; 80 drums total provide 4,400 gallons of barrel storage.
4. With Cheyenne's average annual precipitation of approximately 15 inches, each dome generates approximately 3,555 gallons of roof runoff per year, cycling through its full storage capacity approximately 4 times per year. The five-dome cluster diverts approximately 17,775 gallons per year from the municipal sewer system.
5. Overflow from dome barrels is directed by gravity to the north bioswale (from north-side drums) or the south bioswale (from south-side drums). There is no separate intermediate swale connecting the domes to Lot 2.

How Rainwater Enters the Drums

Rainfall on the dome surface flows by gravity into a continuous 360-degree looping gutter secured to the dome's structural hubs with heavy-duty brackets every 24 inches. In Cheyenne's high-wind environment, the gutter is pitched slightly toward a single downspout fitted with a Leaf Beater / Debris Excluder to prevent organic debris from entering storage. Water descends the downspout through a

First Flush Diverter, which automatically discards the initial high-sediment runoff before clean water enters the first drum via a top inlet bulkhead fitting. All 16 drums are connected at their base by a 2-inch PVC header pipe buried 12 inches deep within the raised bed soil, employing the Principle of Communicating Vessels: the water level rises equally across all 16 drums simultaneously without any mechanical switching.

How Rainwater Exits the Drums — North Side to North Bioswale

The northernmost drum in each dome's daisy-chain is fitted with a high-set 3-inch overflow port on the north face of the raised bed. Once all 880 gallons of barrel storage capacity are reached, water automatically discharges through this north-side overflow port and flows by gravity into the west-to-east north bioswale running along the north side of the domes. Water exits in a controlled, passive manner without erosion or unmanaged overflow.

How Rainwater Exits the Drums — South Side to South Bioswale

The southernmost drum in each dome's daisy-chain is fitted with a corresponding high-set 3-inch overflow port on the south face of the raised bed. Once all 880 gallons of barrel storage capacity are reached, water simultaneously discharges through this south-side overflow port and flows by gravity into the south bioswale running between the dome cluster and the Lot 2 boundary.

Note: The communicating-vessel equalization ensures that overflow exits both the north-side and south-side ports at approximately the same time. The actual primary direction of overflow can be managed by adjusting the relative heights of the two ports.

Cross-Section of Dome System Components

Function	Component	Purpose	Design Note
Capture	360° looping rain gutter around each dome	Collects 100% of dome surface runoff (237 gal/in/dome)	Aluminum or vinyl; heavy-duty hub brackets every 24"
Filtration	Leaf Beater / Debris Excluder	Protects water quality for edible plants	Primary vertical filter at downspout inlet
First Flush	First Flush Diverter	Discards high-sediment initial roof runoff	Prevents contamination of stored water
Storage	16 HDPE food-grade 55-gal drums	880 gallons of thermal mass and irrigation per dome; 4,400 gal total	FDA-approved HDPE; embedded in raised bed
Distribution	2" PVC header pipe (daisy chain)	Balances water levels across all 16 drums	Communicating vessels principle; buried 12"
North Overflow	3" overflow port — northernmost drum	Gravity discharge to west-to-east north bioswale	Activates when all 880 gal barrel capacity reached
South Overflow	3" overflow port — southernmost drum	Gravity discharge to south bioswale toward Lot 2	Activates when all 880 gal barrel capacity reached

3.4 Component 4 — Vegetated Spillway to Lot 2 "Forest Sink"

During large storm events (10-year or 100-year recurrence intervals), excess water that cannot be absorbed by the three-element bioswale network or dome barrel system is directed through a non-erosive vegetated spillway — a gently sloped, stone-armored channel planted with native grasses — that conveys overflow from the south bioswale on Lot 1 to Lot 2.

Lot 2 functions as a regional infiltration and evapotranspiration engine. The 30 or more fruit trees and 60 or more berry shrubs, combined with understory plantings of native perennials, create a forest sink that actively transpires moisture back into the atmosphere while stabilizing soils and preventing erosion.

4. Stormwater Capture Performance: System Sizing and 1985-Scale Analysis

The following table presents the complete hydrologic sizing calculations for the stormwater capture system, including performance under the 1985-scale historic extreme storm event. All calculations are based on three 10-foot-wide, 100-foot-long bioswales, each with an average depth of 0.5 feet.

Parameter	Value	Formula / Basis	Interpretation
Number of domes	5 domes	Given	Greenhouse complex
Dome diameter	22 ft	Given	—
Catchment area per dome	≈ 380 ft²	$A = \pi \times 11^2 = 380.1$ ft²	Roof footprint only
Total catchment area (5 domes)	≈ 1,901 ft²	5 × 380.1	Roofs only; no hardscape
Rain barrels per dome	16 units	Given	55-gal HDPE drums
Barrel storage per dome	880 gal	16 × 55	Per-dome primary storage
Total barrel storage (5 domes)	4,400 gal	5 × 880	Roof-fed primary storage
Bioswale count	3 swales	North W-E, N-S between windbreak & domes, South toward Lot 2	All on Lot 1
Dimensions per bioswale	10 ft wide × 100 ft long × 12" max depth	10 × 100 × 0.5 avg depth = 500 ft³	Graded to center; avg depth 0.5 ft
Storage per bioswale	≈ 3,740 gal	500 ft³ × 7.48 gal/ft³	At bank-full geometric capacity
Total bioswale storage (3 swales)	≈ 11,220 gal	3 × 500 ft³ = 1,500 ft³ × 7.48	Combined geometric capacity

Parameter	Value	Formula / Basis	Interpretation
Total system storage	≈ 15,620 gal	4,400 + 11,220	Barrels + all 3 bioswales
Gallons per inch of rain (per dome)	≈ 237 gal/in	380.1 ft² × (1/12) ft × 7.48 gal/ft³	Single dome roof runoff
Gallons per inch of rain (5 domes)	≈ 1,185 gal/in	237 × 5	Full cluster roof runoff
Rain to fill barrels alone	≈ 3.7 in	4,400 ÷ 1,185	After this, barrels overflow to bioswales
Rain to fill full system	≈ 13.2 in	15,620 ÷ 1,185	Barrels + all 3 bioswales at capacity
6-in storm (1985-scale) runoff	7,110 gal	1,185 × 6	Well below 15,620 gal — 100% captured*
8-in extreme storm runoff	9,479 gal	1,185 × 8	Still below 15,620 gal — 100% captured*
Annual runoff per dome	≈ 3,555 gal/yr	237 gal/in × 15 in avg precip	Diverted from municipal sewer annually
Storage cycles per year (per dome)	≈ 4.0 ×/yr	3,555 ÷ 880	System fills and drains approximately 4 times/yr
Annual diversion all 5 domes	≈ 17,775 gal/yr	3,555 × 5	Total sewer load reduction per year
Bioswale drawdown time	24–48 hours	Field behavior in clay-dominant soils	Storage capacity restored between events

*At the 6-inch storm scenario, dome runoff (7,110 gal) and at the 8-inch scenario (9,479 gal) both fall well below total system capacity (15,620 gal), meaning the system captures 100% of dome-generated runoff from both events. Note that these calculations apply only to dome roof runoff; the site's pervious areas contribute substantial additional infiltration capacity not included in this analysis.

5. Distribution: Managing Water to the Orchard on Lot 2

The orchard and berry shrubs in Lot 2 receive water via the south bioswale and vegetated spillway. Three distribution strategies are available and may be used in combination:

1. Gravity-Fed Swale (Passive Primary): The south bioswale and vegetated spillway maintain a 1–2% grade, providing a 1-foot drop for every 50–100 feet of run. This ensures overflow water moves toward the orchard without eroding soil, requiring no energy input.
2. Solar-Powered Submersible Pump (Active Supplement): A small low-voltage DC solar pump placed in one of the primary drums can push water through a ½-inch poly-drip line directly to fruit trees when gravity feed alone is insufficient during dry periods.

3. Buried PVC Header (Passive Pressurized): The drum equalization header pipe can be extended underground to the orchard, maintaining consistent water pressure across all drums and enabling passive delivery without a pump.

6. Dual-Function Thermal and Hydraulic Role of Embedded Drums

By embedding the 16 HDPE drums within the 3-foot-high raised bed surrounding each dome, the drums serve a second critical function beyond water storage: they act as a thermal battery, regulating soil temperatures to extend the growing season for the perennial plantings in the raised bed zone.

Water has one of the highest volumetric heat capacities of any common material (approximately 62 BTU/ft³/°F), far exceeding soil or gravel. At 880 gallons (approximately 117.6 cubic feet) of stored water per dome, the drums contain a substantial thermal reservoir. This is complementary to, but distinct from, the Climate Battery described in Exhibit C1: the drum thermal mass operates at the soil surface level and buffers the raised bed against freeze events, while the Climate Battery operates at depth and conditions the dome interior air.

7. Public Health and Mosquito Control

1. Sealed System: Each drum utilizes a closed-head design or locking lid with a fine mesh screen (1/16-inch or smaller) at the inlet, preventing adult mosquitoes from accessing standing water.
2. Biological Controls: Mosquito Dunks (Bacillus thuringiensis israelensis — BTI) are used as a secondary precaution. BTI is an EPA-approved organic biological control agent that is safe for people, pets, wildlife, and edible plant irrigation.
3. Standing Water Elimination: The looping gutter system is pitched to prevent water pooling. The bioswales are designed to infiltrate water within 24 hours, well within the 48-to-72-hour window required for mosquito larvae to reach biting stage.

8. Winterization and Structural Safety

1. Expansion Management: Drums are drained to retain only 10% of their capacity each October. This air gap allows any remaining water to expand upward rather than outward against drum walls, preventing cracking during freeze events.
2. Winter Bypass Diverter: A manual diverter on the downspout redirects gutter flow away from drums during winter months, preventing ice-damming and drum damage.
3. Thermal Buffering: Because the drums are embedded in 3 feet of soil, the earth provides natural insulation that significantly slows the freezing process compared to exposed, free-standing rain barrels.
4. Wind Resistance: Unlike free-standing rain barrels that can overturn when empty in high winds, the drums are structurally contained within the 3-foot timber and metal-lined raised bed, ensuring they remain stationary during 60+ mph Cheyenne wind events.

9. Materials Longevity and Food Safety

1. UV Protection: The perennial living screen and soil burial protect HDPE drums from UV degradation, extending service life from the typical 5–10 years of exposed barrels to an estimated 20–25 years.
2. Food Safety: Only FDA-approved, food-grade HDPE (Recycle Code #2) is used. No harmful chemicals leach into the soil or the edible berries and fruit trees irrigated by the system.
3. Structural Longevity: The corrugated metal sheeting in the exterior raised bed provides a protective structural barrier with a 20+ year design life.
4. Buoyancy Management: The base of each bed is leveled and compacted prior to installation to prevent drum shift or buoyancy under saturated soil conditions.

10. Soil Volume Calculation

To fill a 3-foot-high, 3-foot-wide raised bed around a 22-foot dome (approximately 85 linear feet of outer perimeter), while accounting for the volume occupied by 16 embedded drums:

1. Total bed volume: approximately 20 cubic yards
2. Volume displaced by 16 drums: approximately 4 cubic yards
3. Actual soil needed: approximately 16 cubic yards

11. Complete Materials List

The following table identifies all primary materials used in the LID stormwater system. No vendors or pricing are included.

Material / Component	Quantity	Standard / Spec.	Function and Notes
K-style or U-shape aluminum/vinyl gutters	80 linear ft per dome (approx.)	UV-resistant; ASTM standard profile	Collects 100% of dome runoff (237 gal/in/dome); secured every 24"
Flexible gutter connectors	10–12 units per dome	Non-rigid PVC or aluminum	Allows gutter to follow dome’s non-linear curve
Heavy-duty gutter brackets	35–40 units per dome	Galvanized or powder-coated steel	Spaced every 24" for Cheyenne high-wind/snow loads
Leaf Beater / Debris Excluder	1 per dome	Standard rain harvesting spec	Primary vertical filter at downspout; protects edible-plant water quality
First Flush Diverter	1 per dome	Standard first-flush kit	Discards high-sediment initial runoff before barrel entry
Downspout pipe (3" or 4")	10 ft per dome	Schedule 40 PVC or equiv.	Vertical pipe from gutter to first drum; secured with wall straps
Winter Bypass Diverter	1 per dome	Manual diverter valve	Redirects winter flow away from drums; prevents ice damage

Material / Component	Quantity	Standard / Spec.	Function and Notes
100-micron mesh inline filter	1 per dome	Standard irrigation filter	Secondary filter for drip-irrigation water quality
Gutter end caps and sealant	2 caps / 3 tubes per dome	Waterproof silicone sealant	Seals system near dome door opening
Food-grade HDPE 55-gal drums	16 per dome (80 total)	FDA-approved HDPE Recycle #2	Primary storage (880 gal/dome; 4,400 gal total); thermal mass; embedded in raised bed
2" PVC bulkhead fittings	16 per dome	Schedule 40 PVC	Connects drums at base for communicating-vessel equalization
2" PVC header pipe	Per dome perimeter	Schedule 40 PVC	Buried 12" deep; daisy-chain equalization across all 16 drums
3" overflow port — north side	1 per dome (northernmost drum)	PVC threaded fitting	High-set overflow to west-to-east north bioswale when 880 gal capacity reached
3" overflow port — south side	1 per dome (southernmost drum)	PVC threaded fitting	High-set overflow to south bioswale toward Lot 2 when 880 gal capacity reached
Non-woven geotextile filter fabric	Per swale length × 3 swales	AASHTO M288 Class 2 or equiv.	Lines all three bioswales; allows infiltration while preventing soil washout
Native grass/sedge seed mix	Per swale area × 3 swales	Western Wheatgrass, Blue Grama, Nebraska Sedge	Bio-filtration planting; tolerates inundation and drought
Stone armoring (bioswale edges & spillway)	Per spillway length	Clean angular crushed stone	Non-erosive spillway and vegetated channel armoring
4" Schedule 40 PVC pipe	Per curb-cut run	ASTM D3034 or equiv.	Subsurface conveyance from curb cuts beneath sidewalk
PVC junction/cleanout boxes	4 units	Standard PVC access box	Sediment baffle and maintenance access at property line
Mosquito Dunks (BTI)	Per drum, seasonal	EPA-approved BTI	Biological mosquito larvae control; safe for edible-plant irrigation
Solar submersible pump (optional)	1 per dome cluster	Low-voltage DC, weatherproof	Active distribution to orchard when gravity feed is insufficient

12. Meeting Low Impact Development (LID) Criteria

LID Pillar	Mechanism	Site Implementation	Measured / Expected Benefit
Pillar 1	Source Control	Rain barrels capture precipitation where it falls on dome roof surfaces (237 gal/in/dome; 1,185 gal/in for all 5 domes)	Prevents peak-flow runoff; removes up to 17,775 gal/yr from municipal storm sewer load
Pillar 2	Infiltration & Filtration	Three-element bioswale network (11,220 gal combined storage) allows water to infiltrate and filters pollutants through soil and perennial roots	Recharges local aquifer; removes sediment, heavy metals, and hydrocarbons before reaching Crow Creek
Pillar 3	Evapotranspiration	Harvested water grows perennial living screen and fruit orchard; biological cooling effect	Combats Urban Heat Island effect; transpires moisture back to atmosphere; stabilizes soils

13. Alignment with City of Cheyenne Goals and Regulations

City / Agency Goal	Policy Objective	LCMG Implementation
PlanCheyenne — Foundations Pillar (Resource Stewardship)	Encourage water conservation and xeriscaping throughout the city	System captures 1,185 gal/in across 5 domes; reduces site effective impervious area to near zero; diverts ≈17,775 gal/yr from sewer
BOPU Water Conservation Program	Promotion of rain barrels and smart irrigation; Rain Barrel Rebate Program ($50/barrel)	80 barrels planned (4,400 gal total storage); BOPU rebate program leveraged; serves as Living Lab for residents
Stormwater Management Fee (April 2026 Mandate)	Property owners incentivized to reduce Effective Impervious Area	1,901 ft² of dome roofs converted to net-zero stormwater impact; 15,620 gal total on-site storage provides demonstrable LID compliance

14. Annual Maintenance Calendar

To ensure long-term system performance, LCMG volunteers will follow the maintenance schedule below under a recorded Operation and Maintenance Plan, ensuring the City incurs no ongoing costs.

Month	Focus Area	Action Items
March	System Wake-Up	Close all drain valves; inspect 2" PVC header pipes for frost damage; clear debris from looping gutters on all 5 domes
April	Activation	Switch downspout diverter from Winter Bypass to Collect mode; add first round of Mosquito Dunks to each drum

Month	Focus Area	Action Items
May	Planting & Flow Test	Plant annual fillers among perennials; test gravity flow through all three bioswales (north W-E, N-S, south); inspect swale grades
June–July	Peak Irrigation	Flush 100-micron filters weekly; inspect soil moisture near fruit trees to verify south bioswale and drip efficiency
August	Mosquito Check	Refresh Mosquito Dunks; ensure perennial living screen is not overgrowing gutter inlets
September	Harvest & Clean	Deep-clean First Flush diverters to remove summer dust and sediment before fall rains
October	Winterization	CRITICAL: Open low-point drain valves; drain drums to retain only 10% of their capacity; switch downspout diverter to Winter Bypass to prevent ice-bursting
Nov–Feb	Dormancy Monitoring	Monthly visual inspection of timber retaining wall for frost-heave shifting; ensure all three bioswale paths are clear of heavy snow blockage

15. Quantified Benefits Summary

1. Runoff reduction: The system is designed to capture 100% of dome roof runoff from storms up to 13.2 inches, preventing approximately 4,000–5,000 gallons per typical storm event from entering the City's storm sewer system.
2. Peak flow attenuation: 15,620 gallons of combined barrel and bioswale storage temporarily detains stormwater and releases it through infiltration and controlled conveyance, reducing peak flows that can overwhelm downstream culverts and infrastructure.
3. Pollutant removal: Three bioswales with native grass bio-filtration remove sediment, heavy metals, hydrocarbons, and nutrients from urban runoff before they can reach Crow Creek and the South Platte River watershed.
4. Zero municipal maintenance burden: LCMG volunteers assume full responsibility for system maintenance through a recorded Operation and Maintenance Plan.
5. Annual stormwater diversion: Each dome diverts approximately 3,555 gallons per year; five domes combined represent approximately 17,775 gallons diverted annually from the municipal sewer system.

16. Educational Programming

The LID stormwater system is a teaching tool that will serve thousands of community members. Students from Cheyenne-area schools, homeschool groups, 4-H clubs, and FFA chapters will use the site for hands-on lessons in:

1. Water-wise irrigation: How the LID system captures and productively reuses stormwater instead of relying on municipal water
2. LID principles: How source control, infiltration, and evapotranspiration work together to mimic natural hydrology

3. Native species selection: Which grasses, sedges, and perennials thrive in Wyoming's high-altitude, low-moisture environment
4. Stormwater ecology: How pollutants move through the urban water cycle and how bio-filtration intercepts them
5. Practical systems design: How communicating vessels, gravity feed, and passive overflow logic eliminate the need for complex mechanical controls

17. Engineering Summary

The integrated LID stormwater management system provides a technically sound, quantitatively verified, and publicly beneficial approach to on-site water management. Key design decisions are summarized as follows:

1. Four complementary components — curb harvesting, three-element bioswale network, dome rainwater harvesting, and vegetated spillway to forest sink — operate as an integrated system with redundant capacity.
2. 16 food-grade HDPE 55-gallon drums per dome (880 gal/dome; 4,400 gal total across 5 domes) provide primary capture storage, embedded within raised beds for structural protection and thermal buffering.
3. A west-to-east north bioswale (10 ft wide, 100 ft long) running along the north side of the domes receives overflow from the north-facing drums of all five domes via gravity-fed 3-inch overflow ports. Storage: approximately 3,740 gallons.
4. A north-to-south bioswale (10 ft wide, 100 ft long) running between the windbreak and the domes connects to the north bioswale and routes a portion of flow to native right-of-way plantings. Storage: approximately 3,740 gallons.
5. A south bioswale running south of the dome cluster receives overflow from the south-facing drums of all five domes and conveys water to the Lot 2 vegetated spillway and forest sink. Storage: approximately 3,740 gallons.
6. Total storage of approximately 15,620 gallons (4,400 gal barrels + 11,220 gal bioswales) captures 100% of dome runoff from both a 6-inch event (7,110 gal) and an 8-inch extreme event (9,479 gal).
7. Winterization procedures, sealed drum design, and BTI biological controls address public health and structural durability concerns specific to Cheyenne's climate.
8. The system directly supports PlanCheyenne Foundations Pillar goals, BOPU water conservation programs, and the April 2026 Stormwater Management Fee compliance framework.

End of Exhibit C2 — Integrated LID Stormwater Management System