Drainage Intelligence Report™

Powered by Low Point Convergence Analysis™ (LPCA™)

1234 Sample Street

Report Date: March 13, 2026

Site Information

Address: 1234 Sample Street, Anytown, US

County: Sample County

Parcel Area: 0.60 acres

Aerial imagery: Mapbox

About This Screening Report

This Drainage Intelligence Report was produced using Low Point Convergence Analysis™ (LPCA™), a terrain-based hydrologic screening methodology developed by Low Point Labs. LPCA employs a multi-phase analytic workflow to predict how stormwater runoff may interact with localized topography and parcel features. The process begins by constructing a detailed topographic surface around the parcel using high-resolution, 1-meter LiDAR elevation data. This surface is analyzed with a standard hydrologic modeling technique known as D8 (eight-direction) flow accumulation, which estimates dendritic flow-path routing across the terrain. The LPCA model interprets these results to identify hydrologic points of interest - including areas of dispersed and concentrated flow, depressions, accumulation potential, flow-path convergence, and complex interactions that arise when these features occur in close proximity to one another. Once parcel-scale hydrology is characterized, LPCA's structure-aware logic evaluates these phenomena relative to existing buildings and improvements. The model then contextualizes the predicted hydrologic response by incorporating regional soil characteristics and local weather patterns, offering deeper insight into how surface runoff may interact with the ground surface under real-world conditions.

In many cases, drainage infrastructure - such as culverts, swales, French drains, and catch basins - are likely to already exist at or near the locations identified in this assessment. Where potential drainage issues are flagged, concerned persons should first inspect the condition and functionality of any existing drainage features before assuming new issues are present.

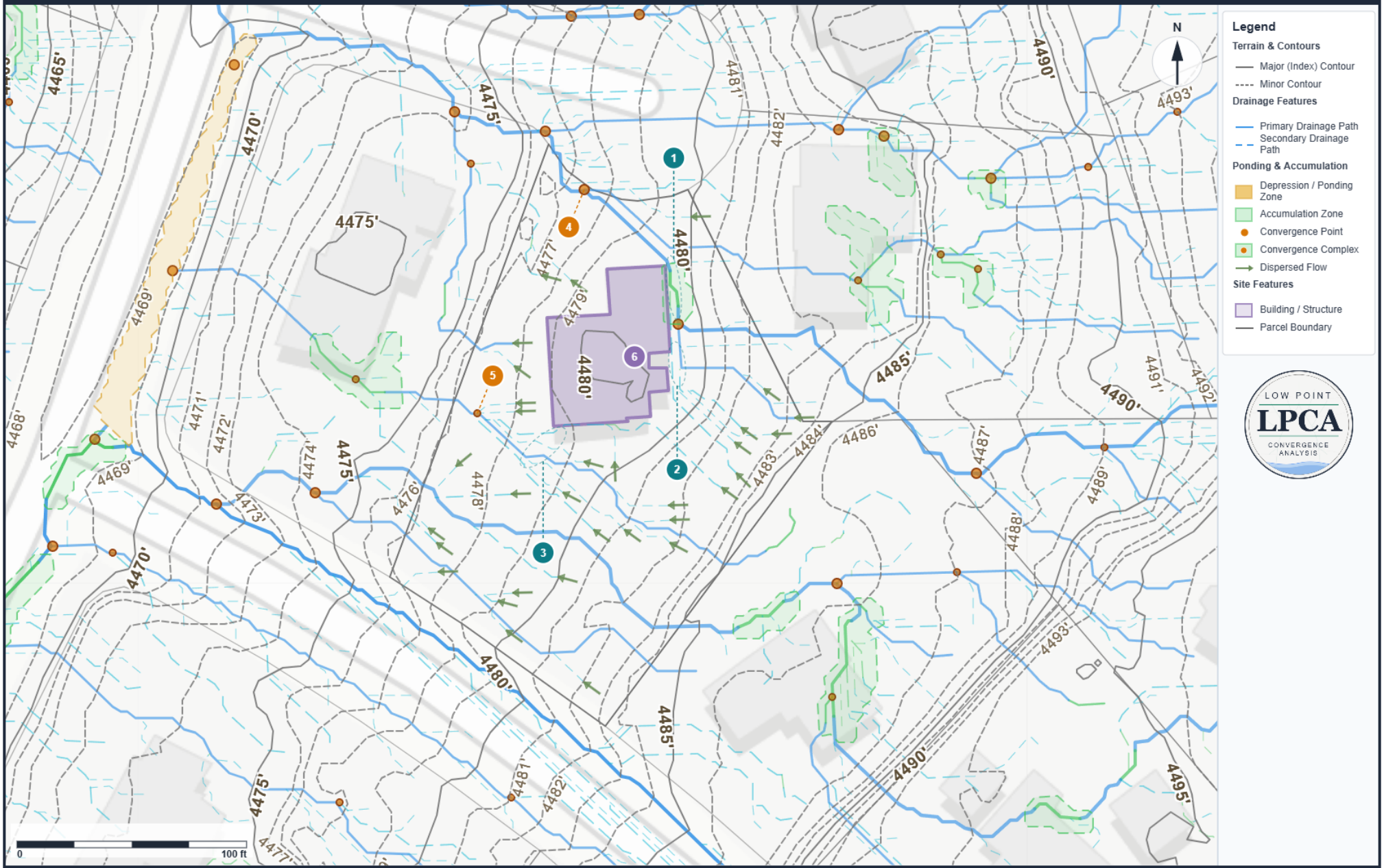
All findings are conceptual and based on bare-earth topography. Actual site conditions - including grading modifications, impervious surfaces, subsurface drainage, and stormwater infrastructure - may substantially alter drainage behavior from what is modeled here. This report is a screening tool intended to inform, educate, and identify areas of potential drainage interest for further on-site investigation by qualified professionals. It is not an engineered drainage design, construction plan, or flood certification.

DISCLAIMER

LPCA is a terrain-based screening methodology that uses publicly available topographic data to identify areas of potential drainage interest. It is not an engineered drainage design, construction plan, or flood certification. Drainage Intelligence Reports are intended for informational purposes and early awareness. For construction, regulatory compliance, or definitive property assessments, always consult a licensed professional engineer.

Parcel Area Analysis Results — Drainage Features

1234 Sample Street



Conceptual visualization only. Not for engineering design or regulatory compliance.
1234 Sample Street | 3/13/2026 | Low Point Labs | Elevation: USGS 3DEP

LPCA Screening Results - Area(s) of Interest

Annotated Feature Table

Drainage Path · Convergence · Depression · Accumulation · Complex · Drainage Cluster · Structure

#	Feature Type	Description
1	Drainage Cluster	Drainage cluster with 2 flow paths, 1 convergence point, and 1 accumulation zone approaching from the northeast and north, carrying significant combined drainage, adjacent to the northeast side of the home
2	Drainage Cluster	Drainage cluster with 3 flow paths approaching from the east and southeast with substantial combined drainage, adjacent to the east side of the home
3	Drainage Cluster	Drainage cluster with 3 flow paths approaching from the southwest with substantial combined drainage, approximately 15 feet south-southwest of the home
4	Convergence	Major convergence point collecting flow from 2 channels with approximately 1.2 acres of contributing area, approximately 35 feet north of the home
5	Convergence	Moderate convergence point collecting flow from 2 channels, approximately 30 feet west of the home
6	Structure	Primary Structure

Interpretation & Analysis

The property at 1234 Sample Street occupies roughly six-tenths of an acre on a uniform slope that rises along its eastern edge and falls toward the northwest, with approximately eight feet of elevation change across the lot. Modeling suggests that surface runoff generally enters from the higher eastern and northeastern portions of the site and travels west-northwest across the yard before exiting near the lower northwestern corner. Minor surface flow paths identified across the property reinforce this pattern, with the vast majority of headwater traces heading west and northwest, consistent with the prevailing topographic gradient. This westward drainage trend means that much of the property's surface water is channeled past or around the home on its way downslope.

The drainage model identifies three distinct clusters of flow activity near the home, plus two convergence points in the surrounding yard. The most consequential is a drainage cluster (1) along the northeast side of the structure, where two flow paths - one carrying significant upstream drainage of roughly 5.3 acres and a second carrying moderate flow - approach from the northeast and north and converge at a point of significant severity adjacent to the building, with a small accumulation zone close to the exterior wall. This cluster represents the single largest concentration of modeled drainage on the property and warrants close attention. Along the east-southeast side of the home, a second cluster (2) groups three flow paths approaching from the east and southeast with moderate peak drainage volume and substantial combined loading, arriving within a few feet of the structure. On the south-southwest side, a third cluster (3) brings three flow paths from the southwest carrying moderate drainage, with one path modeled as reaching the structure's edge. Beyond the clusters, a convergence point (4) to the north of the home collects flow from two channels draining approximately 1.2 acres and sits about 35 feet from the structure, while a second convergence point (5) roughly 30 feet to the west gathers more modest runoff from the surrounding yard.

Soils mapped in this area include gravelly and stony sandy loams. The dominant mapped soil type falls within hydrologic group D, which typically generates higher surface runoff despite being classified as well drained, meaning that during heavier rainfall events the terrain may shed water quickly rather than absorbing it - amplifying the concentrated flows modeled near the home. A secondary soil type mapped in the area is a group-A sandy loam with somewhat excessive drainage, offering higher infiltration where it is present. Precipitation in this region averages roughly 18 inches annually, concentrated in the winter quarter, with roughly nine days per year exceeding a half-inch of rain and recorded single-day maximums above four inches; these infrequent but intense storms are the conditions most likely to activate the modeled drainage paths. Favorably, the property is within an area of minimal flood hazard, the uniform slope promotes positive drainage away from the northwest side of the lot, and the overall grade is gentle enough to limit erosive velocities. This analysis is based on publicly available LiDAR terrain data and regional soil survey mapping - it does not account for existing gutters, underground drainage systems, grading modifications, or subsurface conditions. A professional site evaluation is recommended to verify conditions around the clusters identified along the northeast, east, and southwest sides of the home.

Useful Terminology and Definitions

Accumulation Zone	An area where multiple flow paths converge and water volume increases, often indicating where drainage infrastructure may be needed.
Contributing Area	The total upstream land area that drains to a specific point; larger contributing areas indicate greater potential flow volume at that location.
D8 Flow Accumulation	A hydrologic modeling method that assigns surface water flow from each grid cell to one of its eight neighboring cells based on the steepest downhill slope, used to identify drainage paths and estimate contributing areas.
Convergence Point	A location where two or more drainage paths merge, concentrating flow into a single corridor.
Convergence–Accumulation Complex	A combined feature where flow convergence and accumulation occur together, typically representing the most significant drainage concentration areas on a parcel.
Depression Zone	A topographic low point where water may collect and pond if no outlet or drainage feature is present.
Dispersed Flow	Broad, unconcentrated surface runoff that moves across the landscape following the natural grade before gathering into defined drainage paths. Dispersed flow represents the earliest stage of the runoff process, where precipitation sheds across open ground in response to local slope and terrain shape.
Drainage Cluster	A spatially grouped set of drainage paths, convergence points, or accumulation features near a structure, representing a localized drainage network where multiple flow components interact in close proximity.
Drainage Path (Flow Path)	A modeled route along which surface water flows downhill, classified by contributing area into four tiers from minor sheet flow to major concentrated corridors.
Infiltration Capacity	The rate at which soil can absorb water. Lower capacity (e.g., clay soils, HSG C/D) increases surface runoff and ponding potential.
LiDAR Terrain Data	High-resolution elevation data collected via airborne laser scanning (Light Detection and Ranging), used to model bare-earth topography for drainage analysis.
Runoff	Precipitation that flows over the ground surface rather than infiltrating into the soil, influenced by slope, soil type, and impervious coverage.
Sheet Flow	Shallow, unchannelized water movement across a surface, common on relatively flat or gently sloped terrain before flow concentrates into defined paths.

Regional Characterization Information

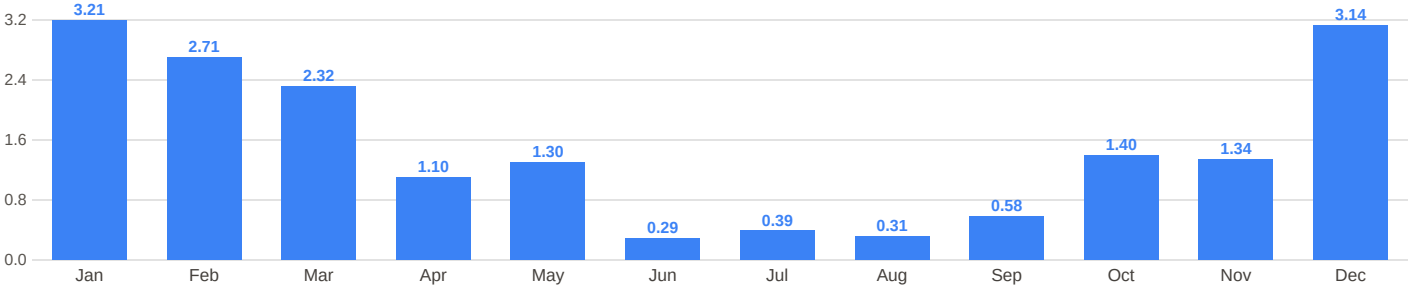
Weather & Climate

Annual Precipitation: 18.1 inches

Avg Temperature Range: 44F - 65F

Month	Avg Hi (F)	Avg Lo (F)	Rec Hi (F)	Rec Lo (F)	Days >=100F	Days <=32F
Jan	43	28	60	-3	0	19.7
Feb	46	28	65	2	0	16.4
Mar	52	32	77	5	0	13.2
Apr	62	40	84	20	0	3.6
May	70	47	93	26	0	0.5
Jun	83	57	101	36	0.1	0
Jul	92	65	105	53	1	0
Aug	89	64	99	50	0	0
Sep	80	57	100	36	0.1	0
Oct	67	46	87	23	0	1.9
Nov	52	34	74	6	0	11.9
Dec	42	27	59	3	0	21.6

Average Monthly Precipitation (in.)



Precipitation Intensity

Days >0.5 in/yr: 9.2

Days >1.0 in/yr: 3.0

Days >2.0 in/yr: 0.5

Max Single-Day: 4.44 in

Storm Patterns

Avg Events/Year: 39.1

Avg Event Duration: 2.2 days

Avg Wet Spell: 2.2 days

Max Wet Spell: 11 days

Precipitation Seasonality

Season	Total (in.)	% of Annual
Winter (Jan-Mar)	8.2	46%
Spring (Apr-Jun)	2.7	15%
Summer (Jul-Sep)	1.3	7%
Fall (Oct-Dec)	5.9	32%

Precipitation Seasonality (CV): 69% — The Coefficient of Variation measures the relative spread of monthly precipitation. A value of 69% indicates high seasonality, meaning precipitation is heavily concentrated in certain months, creating significant seasonal drainage demands and potential for overwhelmed systems during wet periods.

Source: Open-Meteo ERA5 Reanalysis (2014-2023)

Soils

Map Unit Table

Symbol	Map Unit Name	HSG	Drainage Class	% Area
250	Cassiro gravelly sandy loam, 2	D	Well drained	68.4%
960	Kayo stony sandy loam, 2 to 4	A	Somewhat excessively drained	31.6%

Soils Properties Detail

250 — Cassiro gravelly sandy loam, 2 to 4 percent slopes

Texture:	Sandy loam
Ksat:	14.0 – 42.0 µm/sec
AWC:	0.10 – 0.12 cm/cm
Particle Size:	Sand 67.4%, Silt 19.6%, Clay 13%
Depth to Restriction:	114 cm (Paralithic bedrock)
Slope Range:	2 – 4%
Flooding:	None
Ponding:	None

960 — Kayo stony sandy loam, 2 to 4 percent slopes

Texture:	Sandy loam
Ksat:	14.0 – 42.0 µm/sec
AWC:	0.05 – 0.09 cm/cm
Particle Size:	Sand 67.8%, Silt 23.7%, Clay 8.5%
Slope Range:	2 – 4%
Flooding:	Rare (Very brief (4 to 48 hours))
Ponding:	None

Hydrologic Soil Group Definitions

A Low runoff potential; high infiltration rate (sand, gravel)
B Moderate infiltration rate; moderately well-drained (silt loam)
C Low infiltration rate; moderately fine to fine texture (clay loam)
D High runoff potential; very low infiltration rate (clay, shallow bedrock)

Source: USDA SSURGO / Soil Data Access

Flood Zone

Zone: Zone X

Description: Area of Minimal Flood Hazard

FIRM Panel: 123XYZ

Source: FEMA National Flood Hazard Layer (NFHL)