Eagles Flock at Leaf River — Site-Specific Floodplain Review Framework, Route-to-Safety Analysis, and Corridor-Scale Warning Concept

What this document is

A technical-policy review submitted by North Star Group for floodplain and site-plan review discussion. It works through the floodplain-development questions Eagles Flock raises on its specific geometry, sets out the supporting authority, and identifies where engineering or City judgment carries the analysis from here. The aim is to put the relevant pieces in one place for review and to clarify a defined next step.

Thesis

Elevated access and warning/response are both part of the life-safety analysis on this site. Warning/response has clearer CRS Activity 610 relevance; elevated access supports life-safety and review compliance, with CRS treatment dependent on documentation pathway. The body works through the supporting evidence and where the evidence runs out.

1. The site and the engineering problem

Eagles Flock occupies PPIN 26786 (~28 acres) and PPIN 26700 (~1.95 acres), totaling approximately 30 acres in Section 11, T4N, R13W, Forrest County, on River Avenue in East Hattiesburg (Ward 2). The site sits on FIRM Panel 28035C0109F, with regulatory floodway covering most of the parcel and Zone AE flood fringe across the southwest portion. The reach is approximately one mile upstream of USGS gauge 02473000 at Hattiesburg, where the all-time record crest is 34.03 feet (April 1974) and a second documented historic event reached 29.19 feet (April 1983).

The project is pier-founded, with vertical massing and no fill within the floodway. Ground disturbance is limited to selective tree clearing within the pier and building envelope. Wetlands delineation is in progress with Chris Johnson, PE, PS, with Environmental Management Services, Inc.

The engineering problem on this site is not the elevation of any single internal road segment. It is the full route-to-safety sequence:

1. Dwelling unit
2. Internal access on the parcel
3. Off-site public road connection through Lagoon Drive / River Avenue
4. Public route to ground outside the SFHA

Each segment has its own elevation, its own overtopping stage, and its own authority for improvements. Article 5 §C(8)(a) of Ordinance #3294 — which prohibits any encroachment in the regulated floodway absent registered-PE certification of no rise during the base flood — is the hydraulic floor under the analysis on every segment that touches the parcel. The project is being designed for review under §C(8)(a), with no-rise modeling and certification to be provided by the project engineer; that work addresses cumulative encroachment, not only per-structure encroachment.

The supporting analytical infrastructure for the timing piece of route-to-safety analysis already exists. USGS Scientific Investigations Map 3300 (Storm 2014) is a 6.8-mile flood-inundation map library for the Leaf River at Hattiesburg, keyed to gauge 02473000, with profiles at 1-foot stage intervals integrated with NWS AHPS forecasting. SIM 3300 was prepared in cooperation with the City of Hattiesburg, the City of Petal, Forrest County, MEMA, the Mississippi Department of Homeland Security, and the Emergency Management District. Stage-triggered route analysis on the four route-to-safety segments above can build on this existing data product.

The City's published Floodplain Management page identifies rapid-rise conditions in parts of Hattiesburg. The applicable timing profile for the Leaf/Bouie mainstem at Eagles Flock comes from gauge 02473000 stage history, NWS forecast information, the inundation library, and project-specific route-segment elevations. That timing and route analysis would be developed through the project engineer's work and reviewed through the City's normal floodplain process.

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2. The §E(9) elevated-streets analysis

Article 5 §E(9) of Ordinance #3294 reads: "Approval shall not be given for streets within a subdivision, which would be subject to flooding in the base flood. All street surfaces must be located above the base flood elevation." On its face, §E(9) is a subdivision-streets standard tied to plat-based development in mapped floodplain.

What §E(9) accomplishes on the parcel is direct: it requires internal subdivision streets to be elevated above the BFE. What §E(9) does not reach is Lagoon Drive / River Avenue and the off-site public route to ground outside the SFHA. Those segments sit in City municipal-streets authority, on a separate funding cycle and a separate engineering scope.

The "elevated-island" question follows from that geometry. If the off-site segment overtops at an earlier river stage than internal subdivision streets, an elevated internal road may produce an elevated internal segment connected to a lower off-site road. That outcome would deliver part of the §E(9) standard and leave the off-site link as the controlling factor on actual evacuation. The framing here is engineering, not legal: the question is whether internal road elevation, on this geometry, materially extends the time during which the full route-to-safety sequence remains usable.

The candidate answer is elevation where modeling shows network benefit. Where the project engineer's analysis shows that internal elevation extends route-to-safety time at the controlling segment, elevation is doing useful work. Where the analysis shows that the off-site segment overtops first, internal elevation by itself does not produce a complete evacuation route, and the benefit of embankment fill within the floodway becomes more difficult to justify against the added §C(8)(a) modeling burden the same fill would create. Engineering judgment, supported by stage-elevation comparisons across all four route-to-safety segments and by the §C(8)(a) modeling, carries that decision.

The federal NFIP frame is consistent with this engineering treatment. 44 CFR §60.3(d)(3) prohibits floodway encroachments unless hydrologic and hydraulic analyses show no increase in flood levels during the base flood discharge — the same standard §C(8)(a) imposes locally. 44 CFR §60.3(c)(10) governs AE-zone floodway-undesignated areas with a one-foot cumulative rise allowance, which applies to the AE flood-fringe portion of the southwest of the parcel.

Article 1 §B(2) of the City's own ordinance frames the policy context: flood losses are caused by "the cumulative effect of obstructions, both inside and outside the identified Special Flood Hazard Areas." Embankment fill within the floodway falls within the type of obstruction §B(2) contemplates, and the

cumulative-effect frame supports a careful, modeling-based read of what elevation contributes on this geometry.

3. Stage-triggered warning and response

ASFPM's *No Adverse Impact How-to Guide for Emergency Services* (May 2019) is the operative doctrinal document on the relationship between flood timing and life-safety access. The cover language is direct: "One objective of an NAI emergency services program is to get people to safety before their homes are flooded. This Guide reviews ways to use advance warning of an impending flood to protect people and property." Section Three frames the operative question for floodplain managers: "At what flood levels will roads, bridges and evacuation routes need to be closed?" Section Four states the limit on elevation as a stand-alone strategy: "a critical facility can be impacted well before water reaches it. For example, a fire station can be high and dry, but of no use if the roads are underwater."

The 2025 CRS Coordinator's Manual credits Activity 610 (Flood Warning and Response) up to 395 points across four credit elements: Flood Threat Recognition (up to 75 points), Emergency Warning Dissemination (up to 75 points), Flood Response Operations (up to 115 points), and Critical Facilities Planning (up to 75 points). StormReady Community designation contributes separately. The Manual contains no parallel CRS-credited activity for elevated roadways at the same scoring level. Activity 610 credit is documentation-heavy: it depends on adopted plans, layered inundation mapping, annual outreach, NIMS-compliant exercises, and the §330 outreach coordination element. Credit accrues to the community implementing the program, with documentation reviewed in the CRS verification cycle.

Peer-reviewed work supports warning-system effectiveness for life-safety outcomes. Painter and Carr, "Designing Effective Flood Early Warning Systems," *Journal of Flood Risk Management* 18(4) e70145 (2025), and Mahanga et al., "Performance of early warning systems in mitigating flood effects: A review," *Journal of African Earth Sciences* (2024), review the design-and-effectiveness literature. Frimpong, Petrolia, Harri, and Cartwright, "Flood Insurance and Claims: The Impact of the Community Rating System," *Applied Economic Perspectives and Policy* 42 (2020), is a Mississippi and Alabama analysis of CRS class movement and damage-claim reduction. Highfield and Brody (2017) report CRS-driven damage reductions exceeding 40 percent in some contexts. The WMO position is that early warning systems are "an especially cost-effective and reliable way of protecting lives, property, and infrastructure from natural disasters."

The documented community case relevant here is Roseville, California. FEMA's case study *Community Rating System Saves Dollars, Property and Lives* records that Roseville's flood early warning system, after a 100-year event in 1995 prompted over 300 water rescues, reduced water rescues to zero during a comparable 1997 event. Roseville is cited here for warning-system effectiveness on a riverine system with rapid-rise behavior. The open-space dimension of Roseville's program sits in different doctrine — it credits floodplain vacated for non-development, which does not match a project being designed under §C(8)(a) for compatible development within the floodway. That dimension is set aside for this analysis.

A stage-triggered warning and response approach addresses the access timing question directly. Where the route-to-safety analysis identifies an off-site limiting link that internal elevation does not reach, advance notice keyed to gauge-based stage thresholds delivers operating time before access becomes unsafe. Warning serves alongside elevation, not in substitution: elevation addresses the physical passability of segments where the engineering supports it, and warning addresses the timing question across the network. Activity 610 credit attaches to a documented community-scale program, which is the subject of §5 below.

4. CRS relevance, subject to City adoption and documentation

Hattiesburg announced on July 29, 2025 that the City advanced from Class 8 to Class 7 in the FEMA Community Rating System effective April 1, 2026, producing a 15-percent NFIP premium discount for most policyholders citywide. Mayor Toby Barker characterized the advance as "the result of years of hard work by multiple departments" reflecting "investments in infrastructure and floodplain management." The Class 7 band runs 1,500 to 1,999 CRS points; the Class 6 threshold sits at 2,000 points and produces a 20-percent SFHA discount.

The CRS scoring framework in the 2025 manual is additive: communities sum credit across implemented activities, and adding documented activity adds points. The activities that bear most directly on the Eagles Flock review are:

Activity 610 (Flood Warning and Response). Up to 395 points across the four credit elements identified in §3 above, plus separately credited StormReady Community designation. Credit attaches to a documented community-scale program. A corridor-scale system covering more of the City's SFHA carries more credit weight than a single-site alarm. The District-funded path is set out in §5.

Activity 510 (Floodplain Management Planning). Up to 622 points, awarded for an adopted floodplain management plan that meets the 10-step planning process, with credit for plan elements addressing the corridor's specific flood profile. A corridor-scale warning and route-to-safety effort generates plan documentation (inundation mapping, route-segment analysis, response operations) that maps onto Activity 510 credit categories where the City carries it through the planning process.

Activity 540 (Drainage System Maintenance). Up to 570 points, awarded for documented inspection, maintenance, and capital programs on the regulated drainage system. Eagles Flock does not directly contribute Activity 540 credit; the activity is named here because corridor-scale floodplain management coordination touches Activity 540 documentation pathways.

Activity 420 (Open Space Preservation). Activity 420 credits permanent preservation of regulatory floodplain as undeveloped open space. For a project being designed under §C(8)(a) for compatible development within the floodway, the project's CRS relevance comes through Activity 610 and adjacent documentation pathways, not through Activity 420. The activity is named here for completeness, with the doctrine clarified.

The peer-reviewed Mississippi-Alabama evidence (Frimpong et al. 2020) supports CRS class movement as a driver of flood-damage claims reduction in the analysis dataset, not only premium-dollar reduction. Highfield and Brody (2017) report CRS-driven damage reductions exceeding 40 percent in some contexts. Both findings speak to the City's interest in CRS class progression beyond the premium-discount line.

The directional question for the City: a corridor-scale Activity 610 program, if adopted and documented, contributes meaningfully against the Class 6 point threshold. The credit accrues to the community implementing the program. Eagles Flock contributes site-specific data and operational integration; the program itself is a community-scale investment with community-scale documentation, addressed in §5.

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5. The Leaf and Bouie River Development District

Mississippi HB1649 (2020 Regular Session) authorizes the City of Hattiesburg, the City of Petal, and the Board of Supervisors of Forrest County, by order entered on their respective minutes, to establish the Leaf and Bouie River Development District "for the purpose of providing reinvestment back into the District by allowing for the sharing of collective resources to encourage the redevelopment of the District into an economically viable destination." The District is governed by a board including the Mayors of Hattiesburg

and Petal and the Chair of the Forrest County Board of Supervisors. It is authorized to receive and expend revenues from "any source, including, but not limited to, private enterprise, federal and state grants, and those revenues generated within the District's boundaries." Each member authority may use city or county personnel and equipment in furtherance of the District's mission.

A corridor-scale warning and route-to-safety system aligns with the District's authorized purpose. The system serves property along the Leaf-Bouie corridor — Ward 2 and portions of Ward 4 in Hattiesburg, plus corresponding areas in Petal and unincorporated Forrest County, subject to actual coverage design. Capital investment matches against federal grant programs for which the District and member jurisdictions are eligible applicants: BRIC (Building Resilient Infrastructure and Communities), HMGP (Hazard Mitigation Grant Program), USGS Cooperative Matching Funds, and CDBG-DR (Community Development Block Grant — Disaster Recovery). The maintenance load sits with the District and its member jurisdictions over the life of the program.

The corridor-scale frame matters for CRS as well. Activity 610 credit scales with the impact area covered by the warning system — buildings, facilities, and population. A corridor-scale system has a different CRS profile than a single-site alarm. Hattiesburg's existing GIS allows the corridor coverage area to be evaluated against the City's SFHA distribution.

Mississippi institutional capacity for the technical layer is in place. The University of Mississippi's National Center for Computational Hydroscience and Engineering carries direct capacity in river hydraulics, computational hydroscience, flood modeling, and water-system simulation — analytical work for hydraulic-model review and inundation modeling on the Leaf-Bouie corridor. Mississippi State University's Geosystems Research Institute carries geospatial, mapping, remote-sensing, and decision-support capacity — work for route-to-safety mapping, road-elevation overlays, and dashboard concepts. Mississippi State's water-resources engineering carries HEC-RAS / HEC-HMS, watershed analysis, and flood-inundation mapping. Jackson State University's civil and water-resources engineering applies where the discussion expands into urban infrastructure and community-facing flood-warning issues.

A practical structure for a corridor program would draw on USGS, NWS, MEMA, Hattiesburg, Petal, Forrest County, the Leaf and Bouie River Development District, and Mississippi university partners as scope dictates. Relevant technical capacity appears to be available among Mississippi institutions, and the District may provide a local funding and governance vehicle. Organizing the pieces into a single corridor program is itself a step the City and District would need to take.

Items still open at the District level: District activation under HB1649, federal grant alignment and subapplication timing, and the maintenance commitment over the program life. Eagles Flock is positioned to function as a catalyst — a project that puts the corridor concept on the City and District agendas with site-specific data and operational integration. The project is one beneficiary of a corridor system, alongside every other property in the SFHA along the corridor.

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6. The condominium / site-plan review pathway

The Hattiesburg Land Development Code differentiates condominium dwelling from subdivision in its own definitions. LDC §13 defines "Dwelling, Condominium" as "a building or group of buildings in which dwelling units are owned individually and the exterior structure, common areas and facilities are owned in common." It defines "Subdivision" separately as "the division of a lot, tract, or parcel of land into two or more lots, plats, sites, or other divisions of land for the purpose, whether immediate or future, of sale, lease or building development by means of an appropriately recorded legal document," and "Plat" as a recorded map

showing lots, easements, and streets.

The City has an existing procedural track for non-subdivision development. The Planning Division's Pre-Application process and Site Plan Review Application package intake projects on existing parcels, with the Site Plan Review Committee, Planning Commission, and Council each carrying defined roles. Eagles Flock is being prepared for that intake on the existing parcel structure.

State statute aligns with the Code's definitional split. Miss. Code §89-9-5(5) defines the condominium "to divide" as "to divide the ownership thereof by conveying one or more condominiums therein but less than the whole thereof" — division of ownership, not division of land. Miss. Code §89-9-7 treats the condominium as "an estate in real property consisting of an undivided interest in common in a portion of a parcel of real property together with a separate interest in space" in a building. Miss. Code §89-9-33 directs that "local zoning ordinances shall be construed to treat like structures, lots, or parcels in like manner regardless of whether the ownership thereof is divided by sale of condominiums or into community apartments" by lease, "unless a contrary intent is clearly expressed."

Persuasive case authority from other state high courts addresses ownership-form-versus-land-division questions in zoning contexts. *CHR General, Inc. v. City of Newton*, 387 Mass. 351 (1982), holds that "zoning is concerned with the use, without regard to ownership of the property involved." *Bannerman v. City of Fall River*, 391 Mass. 328 (1984), reaches the same result. *Town of York v. Cragin*, 541 A.2d 932 (Me. 1988), holds that subdivision review under the then-applicable Maine statute "refers unmistakably to an interest on the ground." Mississippi has no contrary-intent provision in the condominium chapter expressly bringing condominium projects within the subdivision-streets standard.

The legal question — whether Article 5 §E expresses the "contrary intent" §89-9-33 contemplates as to a condominium project on a single parcel of record — is the subject of City Attorney coordination. The interpretive question on the floodplain-program side, addressed in the body of this memorandum, sits within the Article 4 §C interpretive framework and engages the route-to-safety analysis above. The two threads run in parallel and may require coordination between the Floodplain Administrator and the City Attorney, particularly on the relationship between Article 5 §E, condominium ownership, and site-plan review under Article 4 §C.

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7. Tradeoffs among review paths

The same physical project — pier-founded compatible development under §C(8)(a) with route-to-safety addressed across all four segments — admits three review-path frames. Each carries tradeoffs for the City, the project, and the corridor.

Path A: Elevated subdivision streets under §E. Internal subdivision streets are designed above BFE. The §C(8)(a) no-rise burden has to address the embankment-fill geometry of the elevated streets themselves, which is a harder modeling problem than no-fill pier development by itself. The off-site Lagoon Drive limiting-link question is unaddressed by this path. CRS posture is unchanged by elevated streets as a stand-alone activity.

Path B: Site-plan review under §C(1) and §C(8)(a) with stage-triggered warning and response. The project intakes through Site Plan Review on the existing parcel. Internal access is reviewed under §C(1) ("to the maximum extent practicable" residential building sites, walkways, driveways, and roadways at natural grade with elevation not less than BFE and evacuation routes leading directly out of the SFHA) and the §C(8)(a) no-rise standard. The off-site limiting-link question is addressed through stage-triggered warning and operational closure. CRS posture has potential corridor-scale Activity 610 relevance through the

District-funded path in §5.

Path C: Hybrid. Elevation applied to internal access segments where the engineer's network analysis shows route-to-safety benefit, with stage-triggered warning and response across the rest of the system. The §C(8)(a) modeling is targeted to the elevated segments. CRS posture similar to Path B, with potential additional documentation under FRO/CFP if the hybrid is documented in those credit categories.

The tradeoffs across the three paths:

Dimension	Path A	Path B	Path C
§C(8)(a) modeling burden	Higher (embankment geometry within floodway)	Lower (pier-founded only)	Targeted (per-element)
Off-site Lagoon Drive question	Unaddressed by §E(9) reach	Addressed through warning/response	Addressed through warning/response with elevation where modeling supports it
Life-safety mechanism	Internal segment elevation	Stage-triggered warning + route-to-safety analysis	Combined
Park, marina, boat-ramp concepts	Embankment fill consumes site area	Site-plan integration	Site-plan integration
CRS posture	No additional credit pathway from elevated streets alone	Potential corridor-scale Activity 610 contribution	Potential corridor-scale Activity 610 contribution; potential FRO/CFP documentation if hybrid is documented

Across all three paths, §C(8)(a) no-rise certification, §C(1) review, building code, fire code, stormwater, wetlands, and access-safety review apply equally. The paths differ in how they answer the access-during-flood question and in their interaction with the corridor-scale CRS posture, not in whether they sit within the City's regulatory framework.

The site-plan elements proposed within the project — a riverfront park concept, a marina concept, a public boat-ramp concept tied to the Pinebelt Blueways trail system, and a workforce-pricing target for the housing component — are project amenities that fit each of the three paths. They are general site-plan features being studied at this stage, with specific dimensions and dedications subject to the design and review process. Available legal instruments that would require negotiation with the City sit on a separate track; items outside the project's scope (the District's eventual activation, federal grant subapplication, City municipal-streets improvement on Lagoon Drive) sit on their own tracks.

The corridor's long-term flood resilience is the third dimension worth noting. A project that intakes through the existing Site Plan Review track, supports a District-coordinated corridor warning concept, and contributes site-specific data toward the corridor's CRS posture aligns with the City's stated CRS-improvement direction. The same project carrying embankment fill within the floodway under §E(9), without a corresponding corridor warning posture, would generate the §C(8)(a) modeling load with elevated

subdivision streets serving as one part of the route-to-safety answer rather than the most effective tool for this specific access geometry.

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8. Applicant’s Submitted Position

North Star Group submits this memorandum to place its present analysis in the review record for Eagles Flock.

The analysis proceeds from the existing parcel structure. It treats the condominium component as an ownership form, rather than a division of land into subdivision lots, for the reasons set out in Section 6.

The floodplain discussion is tied to the proposed physical geometry. Pier foundations and no-fill or limited-fill construction present a different hydraulic condition than elevated street embankments inside the regulatory floodway. The no-rise analysis would follow the actual work proposed.

The access discussion is tied to the full route from the dwelling unit to ground outside the SFHA. That route includes internal access, Lagoon Drive / River Avenue, and the public route beyond the site. Internal access elevation is relevant where it improves that full route. The off-site limiting link remains a separate factual condition.

The Leaf-Bouie warning and route-to-safety concept is presented as a separate corridor-scale floodplain-management opportunity. Eagles Flock may contribute site-specific data and a practical test case, but that corridor concept is not presented as a substitute for project-level floodplain compliance.

This submission preserves the applicant’s current position for review with the project materials, engineering data, and applicable City procedures.

Appendix A — Cited authority and case-study summaries

A.1 ASFPM doctrinal authority

ASFPM, *No Adverse Impact How-to Guide for Emergency Services* (May 2019). Cover language: "One objective of an NAI emergency services program is to get people to safety before their homes are flooded." Section Three: "At what flood levels will roads, bridges and evacuation routes need to be closed?" Section Four: "a critical facility can be impacted well before water reaches it. For example, a fire station can be high and dry, but of no use if the roads are underwater."

A.2 FEMA operational authority

The 2025 CRS Coordinator's Manual credits Activity 610 (Flood Warning and Response) up to 395 points across four credit elements: Flood Threat Recognition (75), Emergency Warning Dissemination (75), Flood Response Operations (115), and Critical Facilities Planning (75), with separately credited StormReady Community designation. The Manual contains no parallel CRS-credited activity for elevated roadways. CRS credit is documentation-heavy and community-controlled; specific credit depends on local adoption, documentation, and FEMA verification.

A.3 Peer-reviewed authority

Painter & Carr, "Designing Effective Flood Early Warning Systems," *Journal of Flood Risk Management* 18(4) e70145 (2025). Mahanga et al., "Performance of early warning systems in mitigating flood effects: A review," *Journal of African Earth Sciences* (2024). Frimpong, Petrolia, Harri & Cartwright, "Flood Insurance and Claims: The Impact of the Community Rating System," *Applied Economic Perspectives and Policy* 42

(2020) — Mississippi and Alabama analysis of CRS class movement and flood-damage claims. Highfield & Brody (2017) — CRS-driven damage reductions exceeding 40 percent in some contexts. WMO position: early warning systems are "an especially cost-effective and reliable way of protecting lives, property, and infrastructure from natural disasters."

A.4 Documented community case studies

Roseville, CA. FEMA case study *Community Rating System Saves Dollars, Property and Lives*: a flood early warning system reduced water rescues from 300+ during a 1995 100-year event to zero during a comparable 1997 event. Cited here for warning-system effectiveness on a riverine system. The open-space dimension of Roseville's program sits in different doctrine and is set aside for this analysis.

South Holland, IL. Floodplain management plan, preservation of floodplain as parks and open space, public information, warning sirens, community notification system. Reports Class 5 and 25-percent flood-insurance discount.

Hillsborough County, FL. Retained Class 5 after 2022 verification cycle (25-percent discount; approximately $5.9M annual premium savings in unincorporated Hillsborough).

Boynton Beach, FL. Moved from Class 6 to Class 5 (20 percent → 25 percent SFHA savings).

Arlington, TX. Reports Class 5 and a long-term history of expanding community flood-risk-reduction since joining CRS.

Ventura County, CA. ASFPM NAI Emergency Services Guide: 155 rain gauges, 53 stream gauges, integrated with the federal Advanced Hydrologic Prediction System.

Additional cases. Nashville, TN; Pinellas County, FL — appearing in ASFPM NAI Emergency Services Guide and FEMA case-study materials.

The pattern across the cases is that CRS class movement typically comes from documented, durable, combined programs (open space + warning + floodplain management + public information). Individual activities can matter on their own, but the documented class movements in the case-study set generally trace to multiple coordinated activities.

Sources

- Hattiesburg Flood Damage Prevention Ordinance #3294 (Sept. 7, 2021): Article 1 §A, §B(2); Article 4 §A, §B, §C; Article 5 §C(1), §C(8)(a), §E, §E(8), §E(9), §F; Article 6 §A, §B(15).
- Hattiesburg Land Development Code (September 2020): §13 definitions ("Dwelling, Condominium"; "Subdivision"; "Plat"); Pre-Application and Site Plan Review process.
- City of Hattiesburg Floodplain Management page (hattiesburgms.com/residential/floodplain-management/).
- City of Hattiesburg news release, July 29, 2025 — Class 8 to Class 7, 15-percent SFHA discount effective April 1, 2026.
- Mississippi HB1649 (2020 Regular Session) — Leaf and Bouie River Development District.
- USGS Hattiesburg gauge 02473000: real-time data; Storm, J.B., 2014, *An Expanded Model: Flood-Inundation Maps for the Leaf River at Hattiesburg, Mississippi, 2013*, USGS Scientific Investigations Map 3300.

- NWS Lower Mississippi River Forecast Center, *Flood History of Mississippi*; *Flooding in Mississippi* state profile.
- FEMA: 2025 CRS Coordinator's Manual, Activities 420, 510, 540, and 610; *Community Rating System Saves Dollars, Property and Lives* case study; CRS Eligible Communities, Effective April 1, 2026.
- Mississippi Code: §89-9-5; §89-9-7; §89-9-33.
- Federal floodway standard: 44 CFR §60.3(d)(3); 44 CFR §60.3(c)(10).
- Persuasive case authority: *CHR General, Inc. v. City of Newton*, 387 Mass. 351 (1982); *Bannerman v. City of Fall River*, 391 Mass. 328 (1984); *Town of York v. Cragin*, 541 A.2d 932 (Me. 1988).
- ASFPM: *No Adverse Impact How-to Guide for Emergency Services* (May 2019).
- Mississippi Emergency Management Agency: Floodplain Management / NFIP page.
- Mississippi university capacity: University of Mississippi National Center for Computational Hydroscience and Engineering; Mississippi State University Geosystems Research Institute; Mississippi State University civil and water-resources engineering; Jackson State University civil and water-resources engineering.
- Peer-reviewed: Painter & Carr, *J. Flood Risk Management* 18(4) e70145 (2025); Mahanga et al., *J. African Earth Sciences* (2024); Frimpong, Petrolia, Harri & Cartwright, *Applied Economic Perspectives and Policy* 42 (2020); Highfield & Brody (2017).

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